



## READ THIS AND THE MANUAL BEFORE USING

### HOW THE HOLD DOWN SYSTEM WORKS PAY EXTRA CARE HOLD-DOWNS USE EXTREME PRESSURE

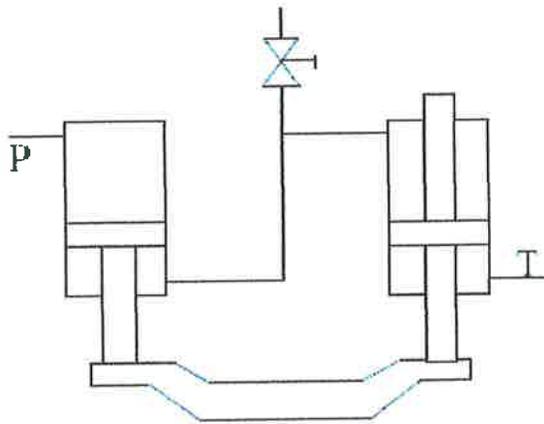
This machine is equipped with hydraulic hold-downs for the punch, plate, or angle sections. Following is how each system works and how to adjust or take care of any malfunctions that may occur.

#### Punch Section

The punch section contains 2 hydraulic hold-downs to hold the plate in place and to hold the plate down during the stripping action. You can manually move the hold-down up and down by the 3 position switch located on the cylinder cover. You will need to make this adjustment when changing dies to give yourself enough clearance to remove the die. The machine is set up using timer KT1 in the electrical box to only allow a return stroke of approx 1/8". When punching a new thickness plate use the manual up switch to raise the hold-down all the way to the top of its stroke and then punch your first hole. After this has been done the stroke will only return approx 1/8". The hold-downs pressure is controlled by pressure switch SP1. It is preset for 30 mpa.

#### Problems that may occur

These two cylinders work on the principle of a series connection. 1 cylinder is a double sided ram the other is a single ended. Due to leakage around the seals of both cylinders you can have the cylinders come out of parallel. When this happens it is important to remedy this problem as soon as possible. On the left hand side of the punch cylinder cover is a guard held on with 4 screws. Behind this cover is a ball valve. While holding the manual switch to the down position open the ball valve and then close. You should then see that the hold-down cylinders become level again. Punching with the hold-down out of level can and will damage the pistons. It is the responsibility of the operator to check this point.



RYAN J. VORSTEG

COMEQ INC.  
[RYANV@COMEQ.COM](mailto:RYANV@COMEQ.COM)

PH: 410-933-8500 ex. 170  
FAX: 410-933-1600



### Shear Section

To activate the hold-down functions the switch that says manual/automatic must be switched over to automatic. If the switch remains on the manual selection the machine will work like a normal GEKA IRONWORKER with no hold downs. Use the machine this way when you are using the other sections with no hold-downs. The shear return is controlled by a timer in the electrical box called KT. This timer is set to return the hold-downs approx 1/8". When a thicker plate is to be sheared, use the up arrow button located near the shear side emergency stop to raise the hold-down. After the new plate thickness is sheared the hold-down will only return 1/8". The hold-downs will work with either the foot pedal or the electric length gauge. The key switch on the electrical box door must be turned to the guard down position and the yellow notcher guard must be completely down. When a function is activated and the hold-down builds pressure it will activate the shear action. If you want to stop the shear from descending simply remove your foot from the pedal and the shear will retract. When working with the electrical length gauge press the **emergency stop**.

### Machines with both Angle and Plate hold down

When the switch is turned to the manual mode of operation the selector valve must be turned to the plate shear section for before for added safety. The plate shear hold down will descend on its own to close the opening of the plate shear section to insure that it is not used. The plate shear and angle shear section are not to be used without the hold down.

### Plate Section

The plate section uses a hydraulic cylinder to move the hold-down against the plate to be sheared.  
**NEVER PLACE A PLATE BEYOND THE HOLD-DOWN.**

### Angle Section

The angle section uses a hydraulic motor to actuate a screw that will hold the angle at the fillet. Never cycle the angle shear hold down without material in place. It is possible to jam the screw in the down position. It should be possible to release the screw by holding the up arrow button on the shear cylinder cover.

**NEVER PLACE AN ANGLE BEYOND THE FRONT GUIDES.**

### Problems that may occur

The shear side hold-downs work on a pressure switch. When the foot pedal or electric length gauge is triggered the hold-downs will hold the material until a set pressure is built and then trigger the shearing action. Over the course of the machines life this switch will need to be adjusted. This pressure switch is located in the hydraulic section. It will be near the secondary manifold. This pressure switch is marked SP. It is preset to 40 mpa.

06/08/06  
11848-PULL-80X-2137

RYAN J. VORSTEG

COMEQ INC.  
[RYANV@COMEQ.COM](mailto:RYANV@COMEQ.COM)

PH: 410-933-8500 ex. 170  
FAX: 410-933-1600

NOTE: SUBJECT TO CHANGE WITHOUT NOTICE

### GEKA IRONWORKER MOTOR HORSEPOWERS AND AMP DRAW

| MODEL              | H.P. | 220 VOLTS | 440 VOLTS | MIN SERVICE 220V | MIN. SERVICE 440V |
|--------------------|------|-----------|-----------|------------------|-------------------|
| HYDRACROP 55A-AD   | 8.5  | 20        | 10        | 50               | 25                |
| HYDRACROP 55S-SD   | 8.5  | 20        | 10        | 50               | 25                |
| HYDRACROP 80A-AD   | 8.5  | 20        | 10        | 50               | 25                |
| HYDRACROP 80S-SD   | 12   | 32        | 17        | 80               | 40                |
| HYDRACROP 110A-AD  | 8.5  | 20        | 10        | 50               | 25                |
| HYDRACROP 110S-SD  | 12   | 32        | 17        | 80               | 40                |
| HYDRACROP 165S-SD  | 22   | 52        | 26        | 125              | 60                |
| HYDRACROP 220S-SD  | 22   | 52        | 26        | 125              | 60                |
| MICROCROP          | 4.5  | 16        | 8         | 40               | 20                |
| MINICROP           | 4.5  | 16        | 8         | 40               | 20                |
| P.P. 50            | 8.5  | 20        | 10        | 50               | 25                |
| PUMA 55 E-500/750  | 8.5  | 20        | 10        | 50               | 25                |
| PUMA 80 E-500/750  | 12   | 32        | 17        | 80               | 40                |
| PUMA 110 E-500/750 | 12   | 32        | 17        | 80               | 40                |
| PUMA 165 E-500/750 | 22   | 52        | 26        | 125              | 60                |
| PUMA 220 E-500/750 | 22   | 52        | 26        | 125              | 60                |
| BENDICROP          | 8.5  | 20        | 10        | 50               | 25                |
| MICRO SINGLE PHASE | 5.0  | 23        | N.A.      | 50               | N.A.              |

SUGGESTED SERVICE IS  
CALCULATED BY AMP RATING ON  
MOTOR TIMES 2.5 TO 3. THESE  
FIGURES ARE THERORETICAL  
AND FIGURED AT THE MACHINE.

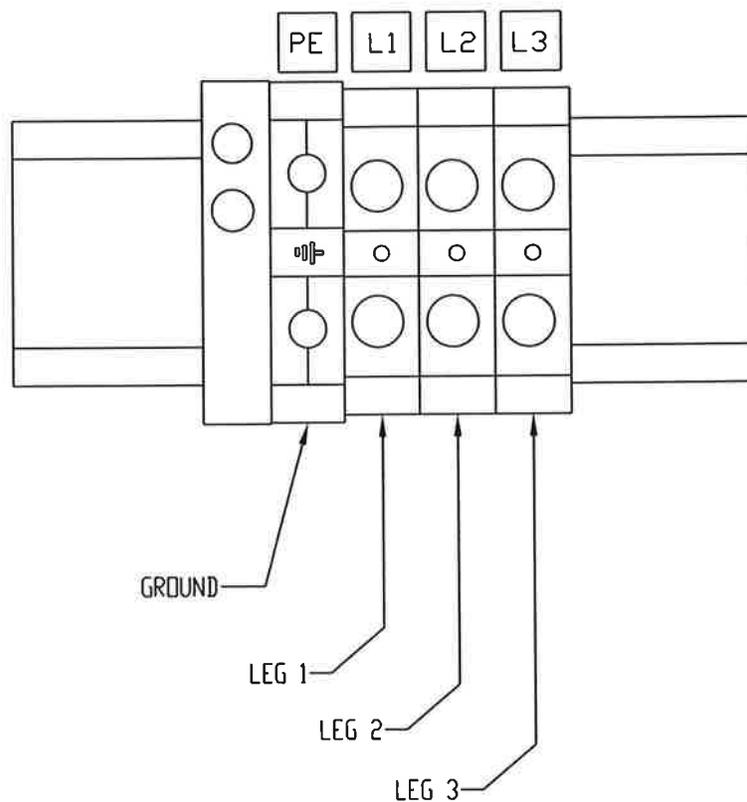
| DATE | HISTORY OR EXPLANATION OF REVISIONS | HARDNESS                                     |   | VARIANT | COMEQ INC.  |                    |                             |
|------|-------------------------------------|--|---|---------|--|--------------------|-----------------------------|
| G    |                                     | <input checked="" type="checkbox"/> MATERIAL |  =  |         | GEKA IRONWORKERS   |                    |                             |
| F    |                                     | 32-36RC                                      |  =  |         | AMP DRAWS  |                    |                             |
| E    |                                     | 36-40RC                                      |  =  |         | MAT:   | NO: XXXX SN: XXXXX | DRAFTER: RYAN J.VORSTEG     |
| D    |                                     | 40-44RC                                      |  =  |         | CD:  |                    | ENGINEER: RYAN J.VORSTEG    |
| C    |                                     | 48-52RC                                      |  =  |         | SCALE: 1:1   | DRG: 01/09/06      | NO: E-COM-0002              |
| B    |                                     | 52-54RC                                      |  =  |         | PAPER: 8.5X11"   | DATE: 03/31/06     | PART NO: 0.000.0.00.0000.00 |
| A    |                                     | 54-56RC                                      |   |         |  |                    |                             |
| XX   | 03/31/06                            | 5.5KW MOTORS ARE 8.5 HP. @ 60HZ              |   |         |  |                    |                             |



PART, SUBSYSTEM, OR SYSTEM ARE MANUFACTURED BY INDRAMATI GEKA S.A.  
THIS DRAWING IS A REPRESENTATION OF AN ACTUAL COMPONENT  
MANUFACTURED BY INDRAMATI GEKA S.A. INDRAMATI GEKA S.A. AND COMEQ  
INC. SHALL BE HELD RESPONSIBLE IF THE PARTS, SUBSYSTEM, OR SYSTEMS  
SPECIFICATIONS ARE CHANGED BY ANYWAY. THIS DRAWING IS A REPRESENTATION  
OF SO SHOWN PART, SUBSYSTEM, OR SYSTEM. THIS DRAWING IS THE  
PROPERTY OF INDRAMATI GEKA S.A. AND COMEQ INC.

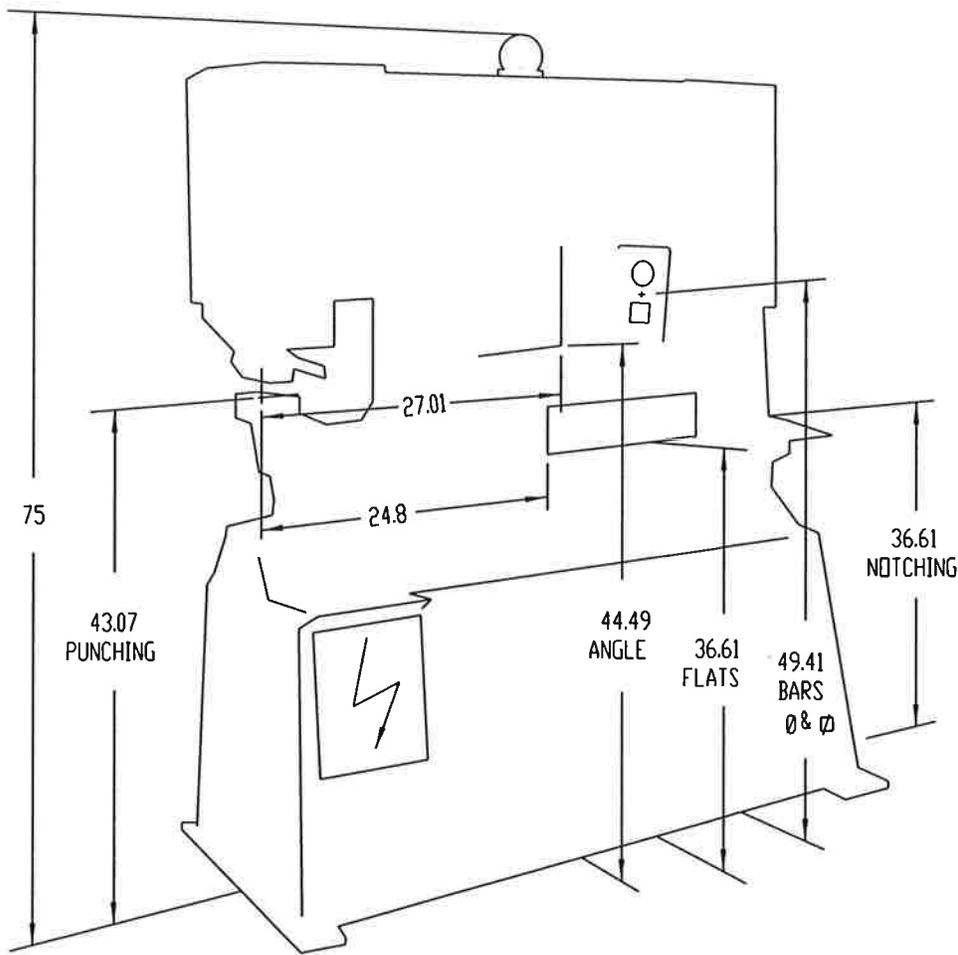
# INCOMING POWER CONNECTION

MACHINE  
ELECTRICAL BOX  
BOTTOM LEFT  
HAND CORNER

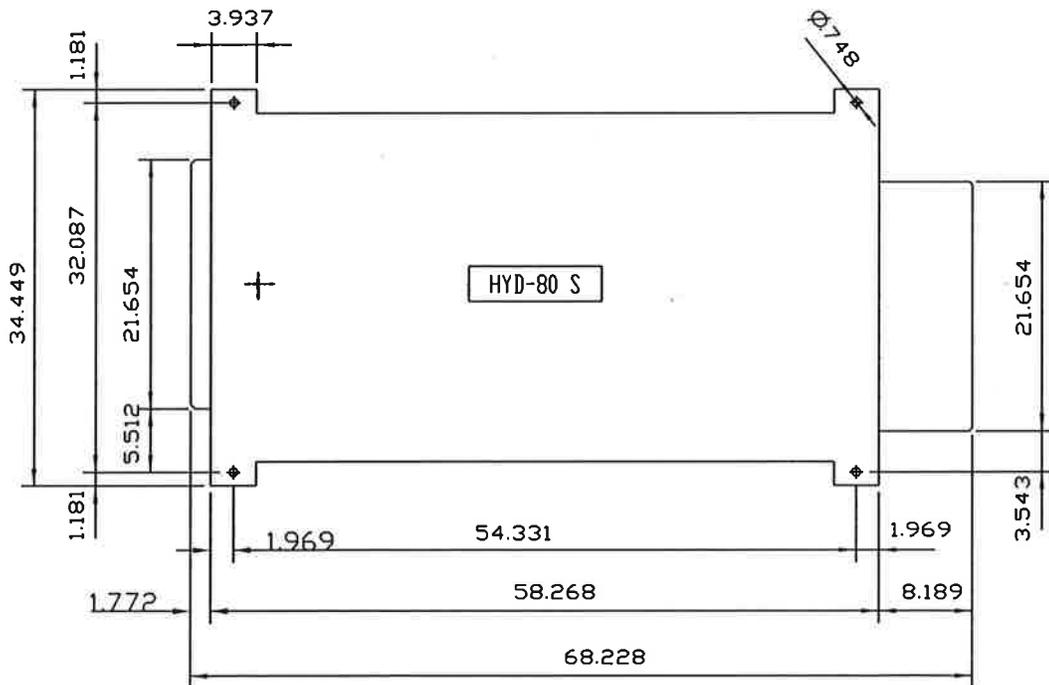


IF THERE IS A HIGH LEG PRESENT INSURE IT IS  
PLACED IN THE TERMINAL MARKED L2. PREMATURE  
FAILURE OF THE TRANSFORMER IS POSSIBLE.

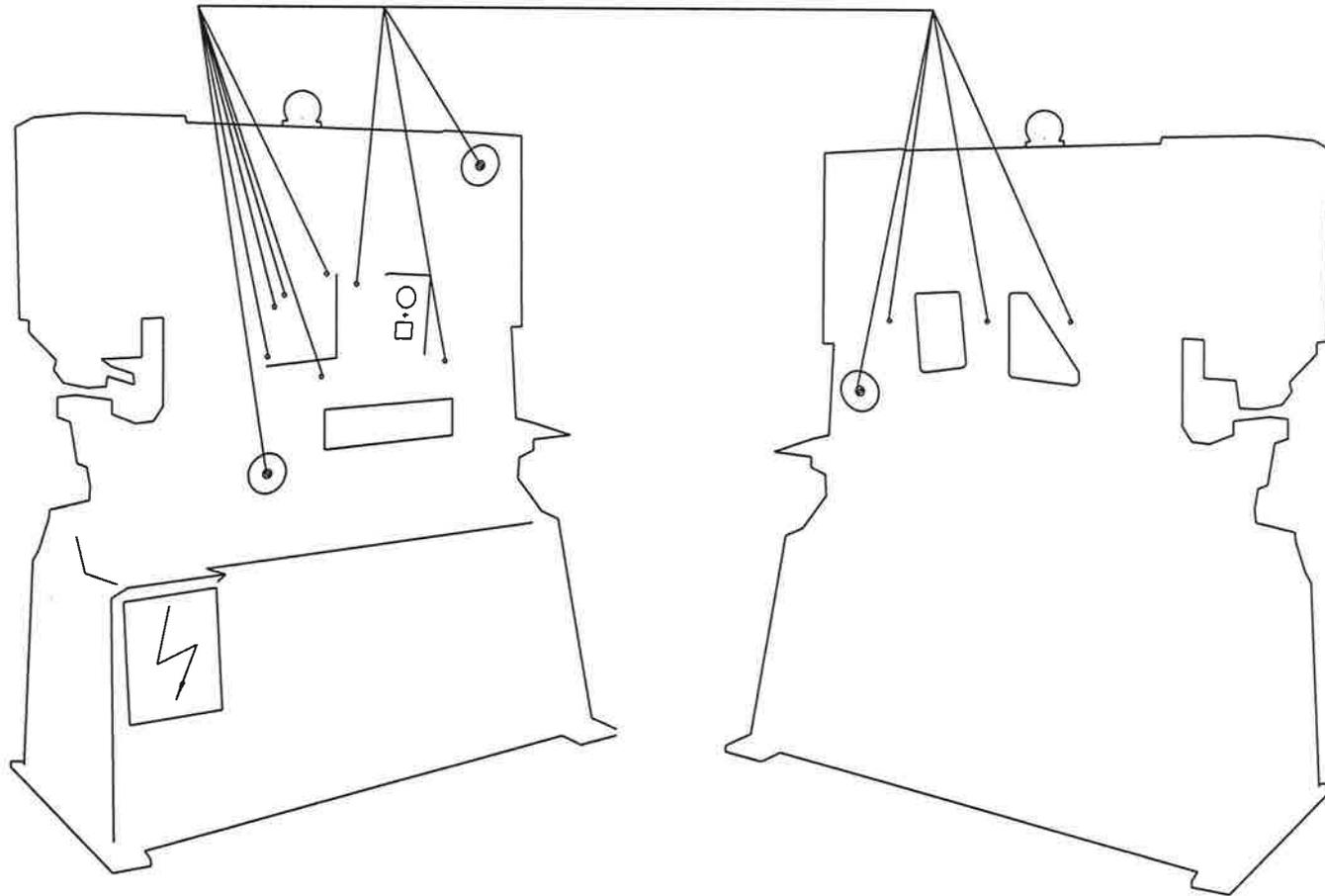
AN OPENING IS PROVIDED AT THE BOTTOM OF THE  
ELECTRICAL BOX FOR FEEDING OF POWER.



1.688 KG  
 3725 LBS



# GREASE POINTS



USE MID GRADE BEARING GREASE

| HARDNESS   |       |
|------------|-------|
| ☒ MATERIAL | ▽ = ✓ |
| 32-36RC    | ▽ = ✓ |
| 36-40RC    | ▽ = ✓ |
| 40-44RC    | ▽ = ✓ |
| 48-52RC    | ▽ = ✓ |
| 52-54RC    | ▽ = ✓ |
| 54-56RC    | ▽ = ✓ |
| 56-60RC    | ▽ = ✓ |



PART, SUBSYSTEM, OR SYSTEM ARE MANUFACTURED BY INNOVATION GEKA S.A.  
THIS DRAWING IS A REPRESENTATION OF AN ACTUAL COMPONENT  
MANUFACTURED BY INNOVATION GEKA S.A. INNOVATION GEKA S.A. AND COMEQ  
INC. SHALL BE HELD RESPONSIBLE IF THE PARTS, SUBSYSTEM, OR SYSTEMS  
DIMENSIONS ARE CHANGED IN ANYWAY. THIS DRAWING IS A REPRESENTATION  
OF 3D SOLID PART/SUBSYSTEM OR SYSTEM THIS DRAWING IS THE  
PROPERTY OF INNOVATION GEKA S.A. AND COMEQ INC.

### REVISIONS

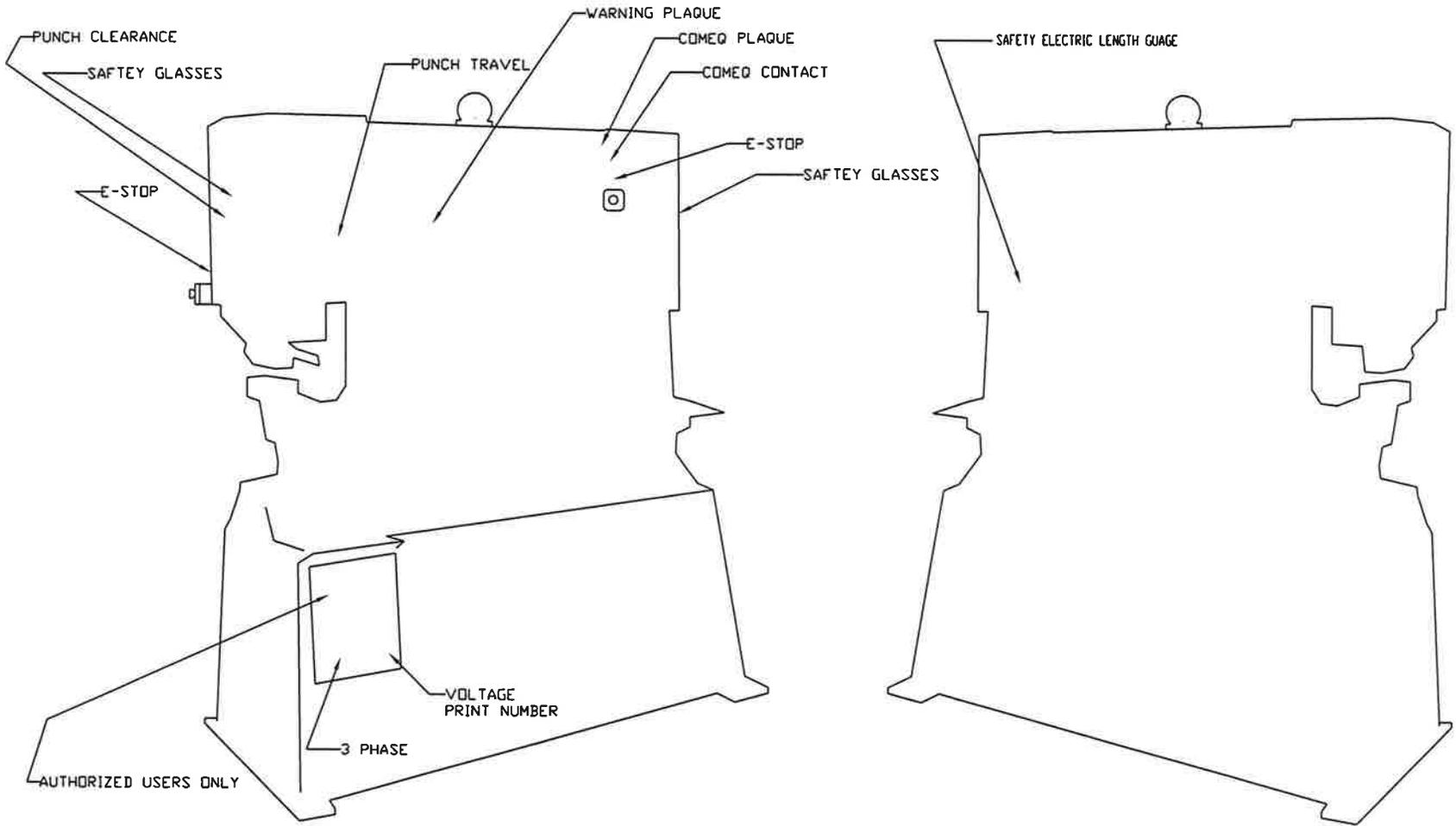
| DATE | DESCRIPTION |
|------|-------------|
|      |             |
|      |             |
|      |             |

**COMEQ INC.** ⚡

HYDRACROP SERIES GREASE POINTS

### VARIANT

|                    |                |                      |                            |
|--------------------|----------------|----------------------|----------------------------|
| COMEQ.0000.0000.00 | MAT:           | SUB: XXXX.XXXXX.XXXX | DRAFTER: RYAN J.VORSTEG    |
| COMEQ.0000.0000.00 | SCALE: 1:1     | REF: XXXX.XXXXX.XXXX | ENGINEER: RYAN J.VORSTEG   |
| COMEQ.0000.0000.00 | FORMAT: DWG    | DRG: XX-XX-XX        | PART NO: 0000.0000.0000.00 |
| COMEQ.0000.0000.00 | PAPER: 8.5X11" | DATE: 09-07-04       | COMEQ NO: G-H-GP           |

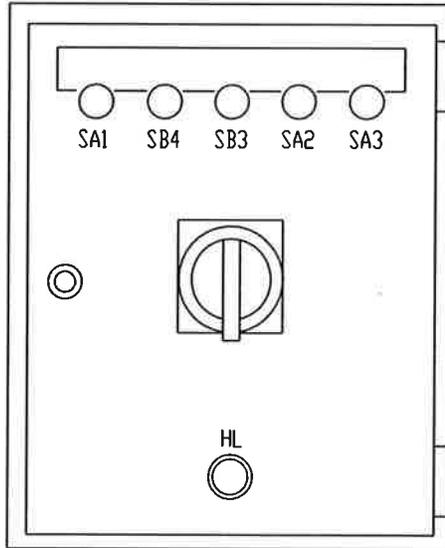
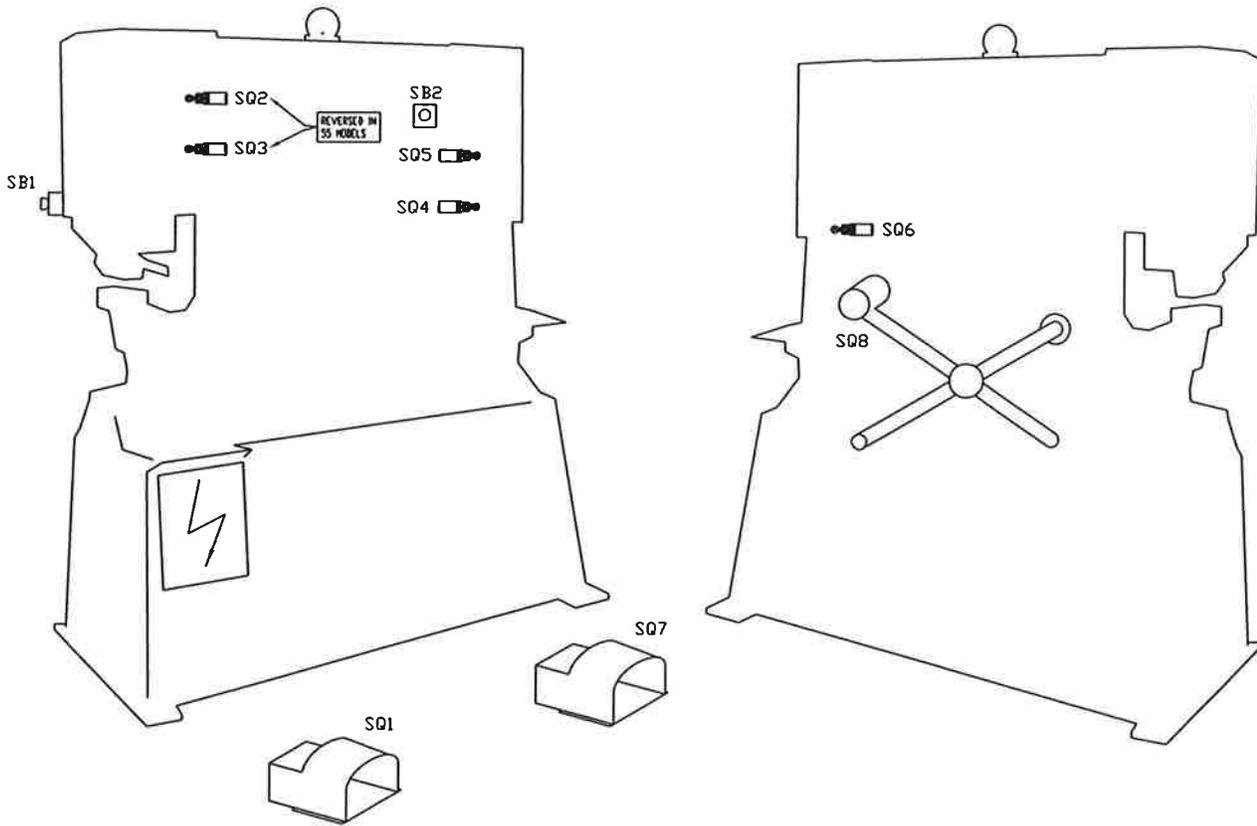


| HARDNESS   |       |
|------------|-------|
| X MATERIAL | ▽ = ✓ |
| 32-36RC    | ▽ = ✓ |
| 36-40RC    | ▽ = ✓ |
| 40-44RC    | ▽ = ✓ |
| 48-52RC    | ▽ = ✓ |
| 52-54RC    | ▽ = ✓ |
| 54-56RC    | ▽ = ✓ |
| 56-60RC    | ▽ = ✓ |

**GEKA**

PARTS, SUBSYSTEMS, OR SYSTEMS ARE MANUFACTURED BY INDRAMITA GEEA S.A.  
THIS DRAWING IS A REPRESENTATION OF AN ACTUAL COMPONENT  
MANUFACTURED BY INDRAMITA GEEA S.A. INDRAMITA GEEA S.A. AND COMEQ INC. SHALL BE HELD RESPONSIBLE IF THE PARTS, SUBSYSTEMS, OR SYSTEMS DIMENSIONS ARE CHANGED IN ANYWAY. THIS DRAWING IS A REPRESENTATION OF 10 DIMEN PARTS, SUBSYSTEMS, OR SYSTEMS THIS DRAWING IS THE PROPERTY OF INDRAMITA GEEA S.A. AND COMEQ INC.

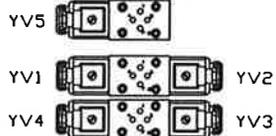
| REVISIONS  |                | COMEQ INC.               |                            |
|------------|----------------|--------------------------|----------------------------|
|            |                | STANDARD SAFETY STICKERS |                            |
| VARIANT    |                |                          |                            |
| 0000000000 | MAT:           | SUB: XXXX.XXXX.XXXX      | DRAFTER: RYAN J.VORSTEG    |
| 0000000000 | SCALE: 1:1     | REF: XXXX.XXXX.XXXX      | ENGINEER: RYAN J.VORSTEG   |
| 0000000000 | FORMAT: DWG    | DRG: XX-XX-XX            | PART NO: 0000.0000.0000.00 |
| 0000000000 | PAPER: 8.5X11" | DATE: 09-07-04           | COMEQ NO: G-SSS-01         |



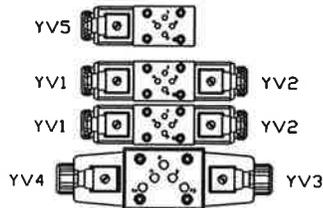
HYD55/80/110A-AD



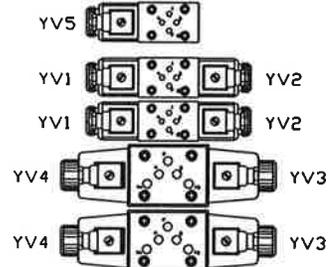
HYD55S-SD

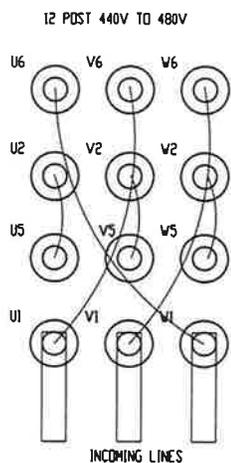
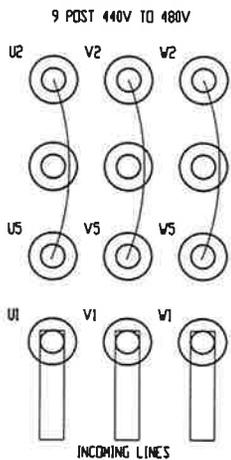
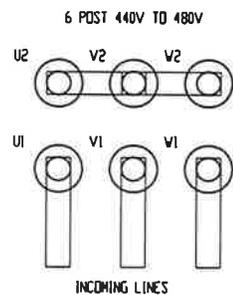
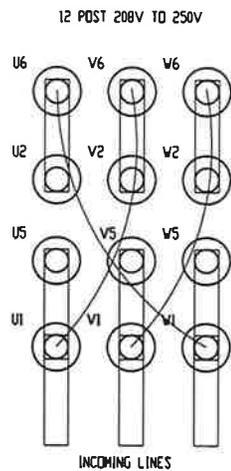
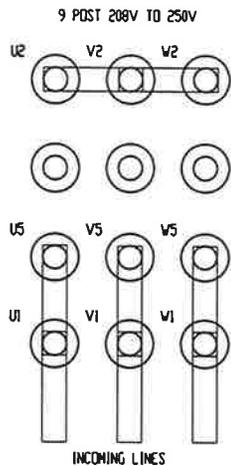
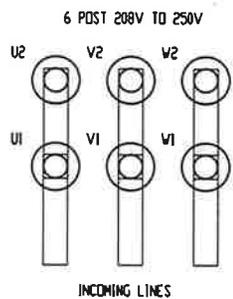


HYD80/110S-SD

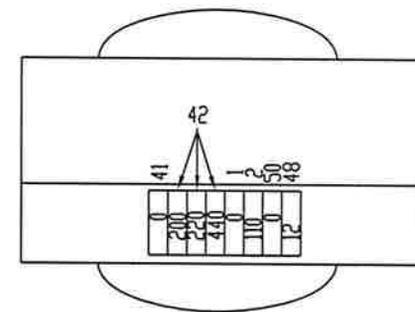


HYD165/220S-SD



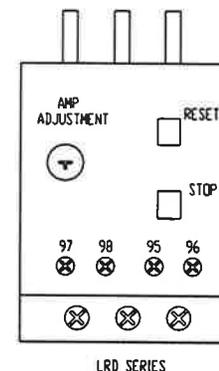
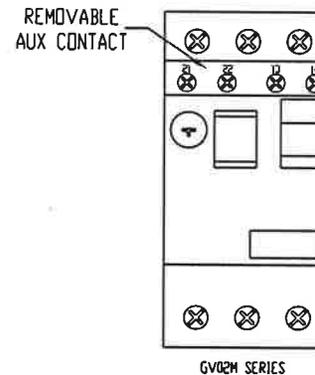


### TRANSFORMER



MOVE WIRE 42 TO CLOSEST INCOMING VOLTAGE

CNC MACHINE WILL HAVE MORE THAN ONE TRANSFORMER



| OVERLOAD INFORMATION |            |                  |                  |
|----------------------|------------|------------------|------------------|
| MACHINE MODEL        | MOTOR K.W. | SETTING AT 220 V | SETTING AT 440 V |
| HYDRACROP 55A/AB     | 5.5 K.W.   | 18 AMP           | 12 AMP           |
| HYDRACROP 55S/SD     | 5.5 K.W.   | 18 AMP           | 12 AMP           |
| HYDRACROP 88A/AB     | 5.5 K.W.   | 18 AMP           | 12 AMP           |
| HYDRACROP 88S/SD     | 9.2 K.W.   | 32 AMP           | 17 AMP           |
| HYDRACROP 110A/AB    | 5.5 K.W.   | 18 AMP           | 12 AMP           |
| HYDRACROP 110S/SD    | 9.2 K.W.   | 32 AMP           | 17 AMP           |
| HYDRACROP 165S/SD    | 15 K.W.    | 52 AMP           | 25 AMP           |
| HYDRACROP 220S/SD    | 15 K.W.    | 52 AMP           | 25 AMP           |
| BENDICROP            | 5.5 K.W.   | 18 AMP           | 12 AMP           |
| MICROCROP            | 3 K.W.     | 12 AMP           | 6 AMP            |
| MINICROP             | 3 K.W.     | 12 AMP           | 6 AMP            |
| MULTICROP            | 3 K.W.     | 12 AMP           | 6 AMP            |
| PUMA 55              | 5.5 K.W.   | 18 AMP           | 12 AMP           |
| PUMA 80              | 9.2 K.W.   | 32 AMP           | 17 AMP           |
| PUMA 110             | 9.2 K.W.   | 32 AMP           | 17 AMP           |
| PUMA 165             | 15 K.W.    | 52 AMP           | 25 AMP           |
| PUMA 220             | 15 K.W.    | 52 AMP           | 25 AMP           |

| DATE | HISTORY OR EXPLANATION OF REVISIONS | HARDNESS   |        |
|------|-------------------------------------|------------|--------|
| G    |                                     | ✗ MATERIAL | ∩ = ✓  |
| F    |                                     | 32-36RC    | ∇ = ✓  |
| E    |                                     | 36-40RC    | ∩ = ✓  |
| D    |                                     | 40-44RC    | ∇ = ✓  |
| C    |                                     | 48-52RC    | ∩ = AB |
| B    |                                     | 52-54RC    | ∇ = ✓  |
| A    |                                     | 54-56RC    | ∩ = ✓  |
| XX   |                                     | 56-60RC    |        |

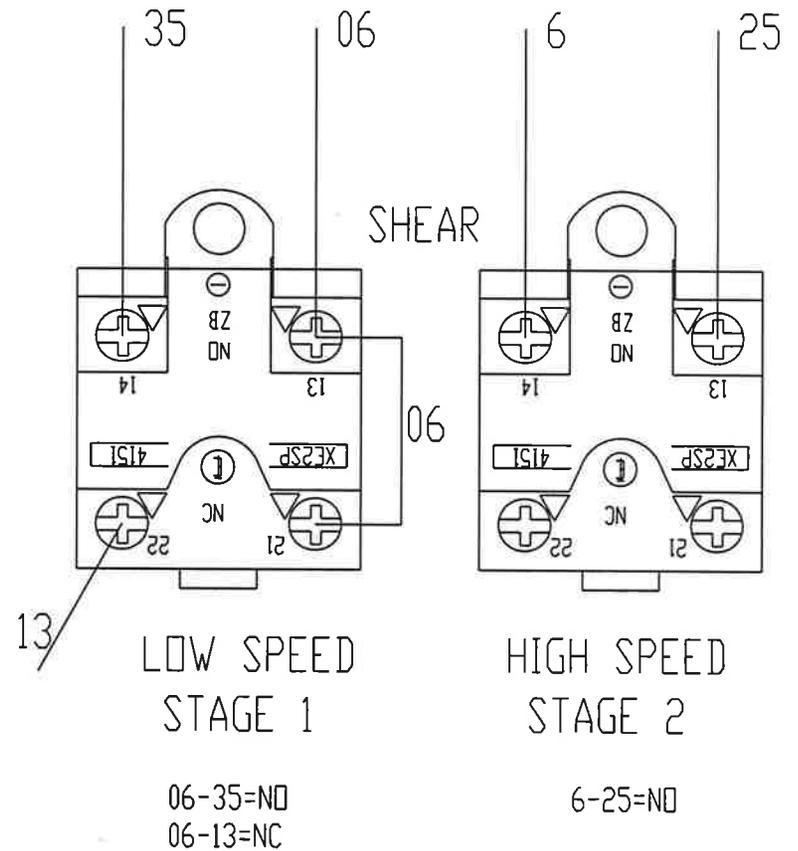
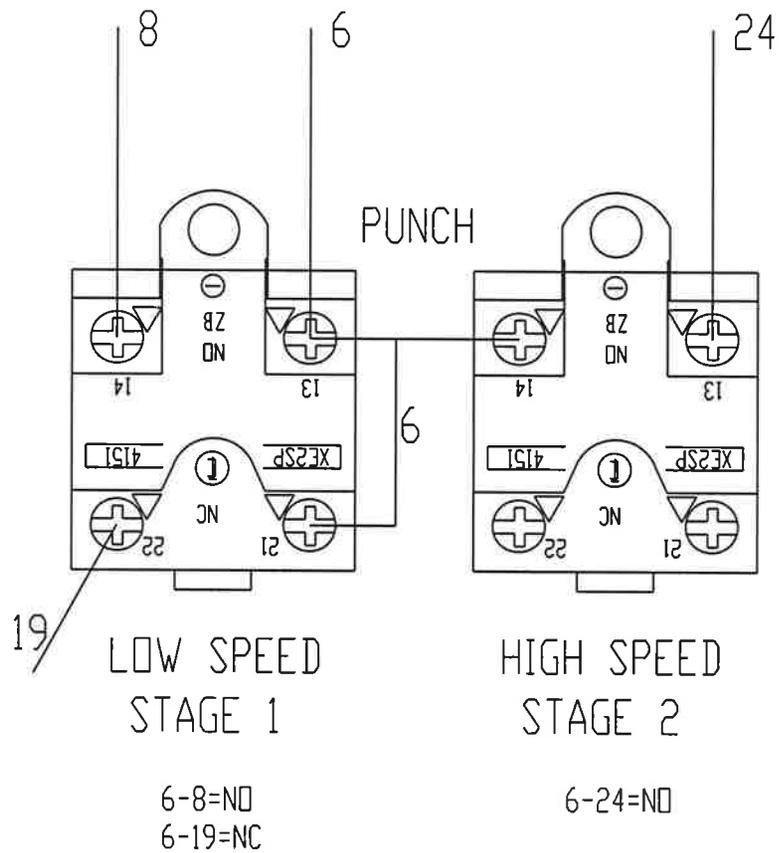
**GEKA**

PART, SUBSYSTEM, OR SYSTEM ARE MANUFACTURED BY INDRAMENSA GEKA S.A. THIS DRAWING IS A REPRESENTATION OF AN ACTUAL COMPONENT MANUFACTURED BY INDRAMENSA GEKA S.A. INDRAMENSA GEKA S.A. DOES NOT HOLD ANY RIGHTS IN THE PATENT, SUBSYSTEM, OR SYSTEMS INCLUDING ARE CHANGED BY ANYWAY. THIS DRAWING IS A REPRESENTATION OF SO SHOWN PART, SUBSYSTEM, OR SYSTEM THIS DRAWING IS THE PROPERTY OF INDRAMENSA GEKA S.A. AND COMEQ INC.

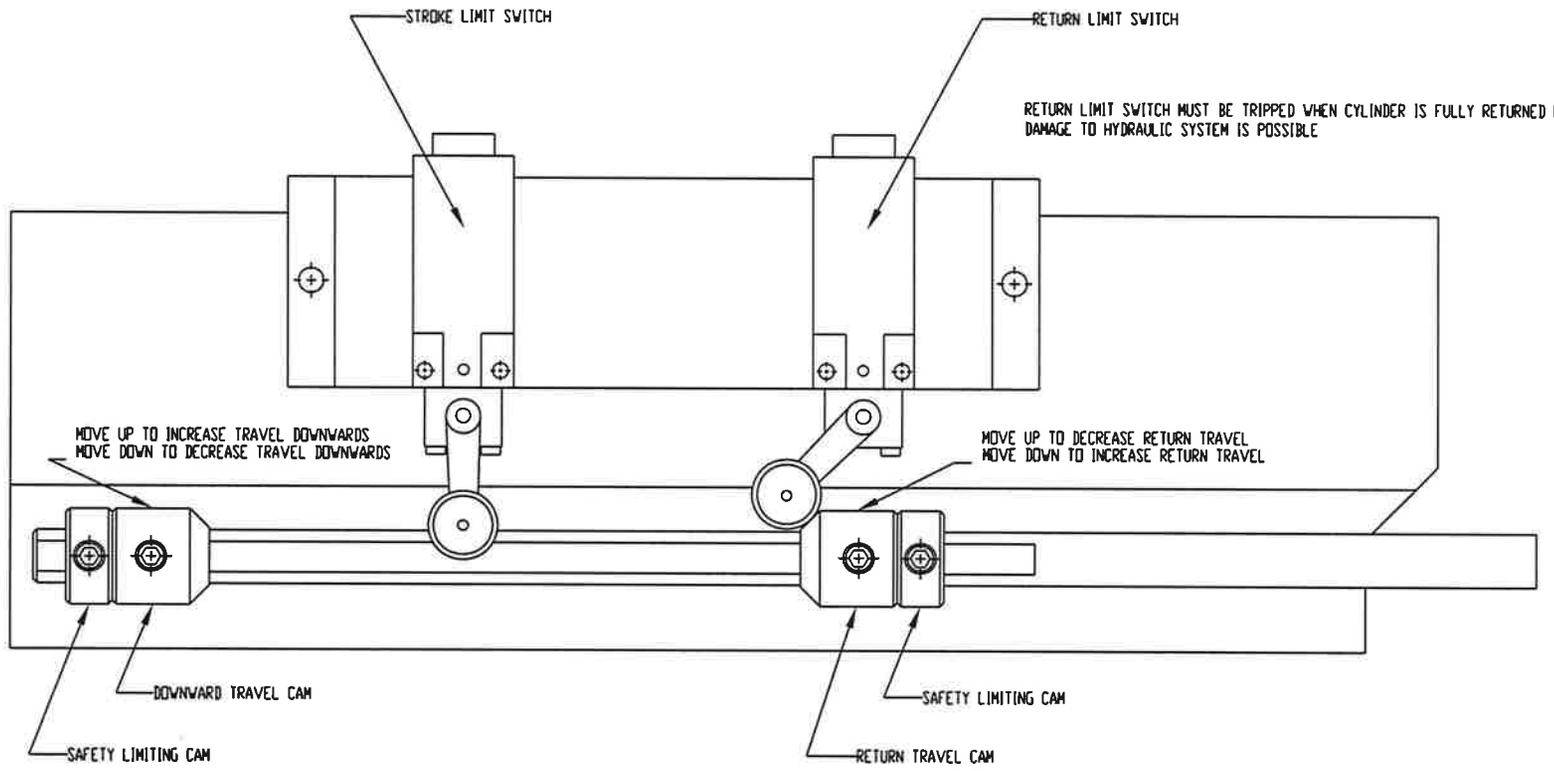
**COMEQ INC.**

GEKA VOLTAGE INFORMATION

| VARIANT | HAT: COMH      | MD: XXXXXX     | SN: XXXXXX | DRAFTER: RYAN JVDORSTEG     |
|---------|----------------|----------------|------------|-----------------------------|
|         | MDP: NA        | CD:            |            | ENGINEER: RYAN JVDORSTEG    |
|         | SCALE: NA      | DRG: XX-XX-XX  |            | MD: E-VOLTAGE-02            |
|         | PAPER: 8.5X11" | DATE: 11/04/05 |            | PART NO: 0.000.0.00.0000.00 |



| DATE | HISTORY OR EXPLANATION OF REVISIONS | HARDNESS | NO. OF REVISIONS | GEKA   | VARIANT        | DATE                           |
|------|-------------------------------------|----------|------------------|--|----------------|--------------------------------|
| G    |                                     | MATERIAL | ✓                | <p>PART, SUB-SYSTEM, OR SYSTEM ARE DESIGNED BY INGOMBSA GEGA S.A. OR COMEQ, INC. THIS DRAWING IS A REPRESENTATION OF AN ACTUAL COMPONENT MANUFACTURED BY INGOMBSA GEGA S.A. OR COMEQ, INC. OR ONE OF ITS VENDORS. INGOMBSA GEGA S.A. AND COMEQ, INC. SHALL BE HELD RESPONSIBLE IF THE PARTS, SUBSYSTEMS, OR SYSTEMS MANUFACTURED AND CHECKED BY ANYONE THIS DRAWING IS A REPRESENTATION OF 3D SHOWN PART, SUBSYSTEM, OR SYSTEM THIS DRAWING IS THE PROPERTY OF INGOMBSA GEGA S.A. AND COMEQ, INC. AND IS NOT TO BE REPLICATED WITH WRITTEN PERMISSION.</p> | COMEQ INC.     | HYDRACROP 'S' FOOTPEDAL WIRING |
| F    |                                     | 32-36RC  | ✓                |  | COMEQ INC.     | DATE: 03/22/06                 |
| E    |                                     | 36-40RC  | ✓                |  | COMEQ INC.     | SCALE: 1:1                     |
| D    |                                     | 40-44RC  | ✓                |  | COMEQ INC.     | PAPER: 85X11"                  |
| C    |                                     | 48-52RC  | ✓                |  | COMEQ INC.     | DATE: 03/22/06                 |
| B    |                                     | 52-54RC  | ✓                |  | COMEQ INC.     | DATE: 03/22/06                 |
| A    |                                     | 54-56RC  | ✓                | COMEQ INC.   | DATE: 03/22/06 |                                |
| XX   |                                     | 56-60RC  | ✓                | COMEQ INC.   | DATE: 03/22/06 |                                |



DO NOT MOVE SAFETY LIMITING CAMS UNLESS TOLD TO DO SO BY COMEQ OR GEKA TECH.

| HARDNESS |         |     |
|----------|---------|-----|
| 32-36RC  | ▽       | = ✓ |
| 36-40RC  | ▽▽      | = ✓ |
| 40-44RC  | ▽▽▽     | = ✓ |
| 48-52RC  | ▽▽▽▽    | = ✓ |
| 52-54RC  | ▽▽▽▽▽   | = ✓ |
| 54-56RC  | ▽▽▽▽▽▽  | = ✓ |
| 56-60RC  | ▽▽▽▽▽▽▽ | = ✓ |

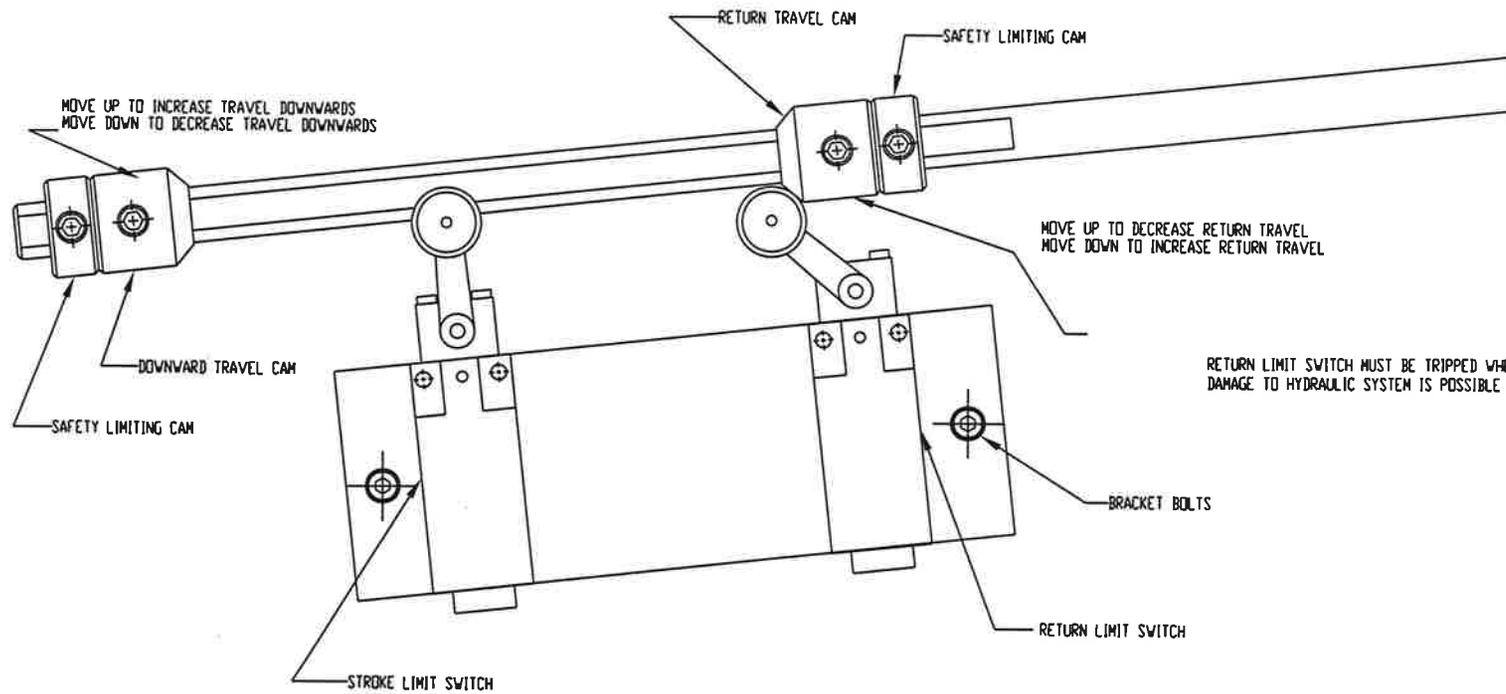
**GEKA**

PART, SUBSYSTEM, OR SYSTEM ARE MANUFACTURED BY INQUINORSA GEKA S.A.  
THIS DRAWING IS A REPRESENTATION OF AN ACTUAL COMPONENT  
MANUFACTURED BY INQUINORSA GEKA S.A. INQUINORSA GEKA S.A. NOT COMEQ  
INC. SHALL BE HELD RESPONSIBLE IF THE PARTS, SUBSYSTEM, OR SYSTEMS  
INDICATED ARE CHANGED IN ANYWAY. THIS DRAWING IS A REPRESENTATION  
OF 3D SHOW PART, SUBSYSTEM, OR SYSTEM. THIS DRAWING IS THE  
PROPERTY OF INQUINORSA GEKA S.A. AND COMEQ INC.

| REVISIONS  |                |                 |                            |
|------------|----------------|-----------------|----------------------------|
|            |                |                 |                            |
|            |                |                 |                            |
| VARIANT    |                |                 |                            |
| 0000000000 | MAT:           | SUB: XXXXXXXXXX | DRAFTER: RYAN J.VORSTEG    |
| 0000000000 | SCALE: 1:1     | REF: XXXXXXXXXX | ENGINEER: RYAN J.VORSTEG   |
| 0000000000 | FORMAT: DWG    | DRG: XX-XX-XX   | PART NO: 0000.0000.0000.00 |
| 0000000000 | PAPER: 8.5X11" | DATE: 09-07-04  | COMEQ NO: H110-LSSU-P      |

**COMEQ INC.**

HYDRACROP 80-110-165-220 PUNCH LIMIT SETUP



DO NOT MOVE SAFETY LIMITING CAMS UNLESS TOLD TO DO SO BY COMEQ OR GEKA TECH

| HARDNESS |       |
|----------|-------|
| 32-36RC  | ▽ = √ |
| 36-40RC  | ▽ = √ |
| 40-44RC  | ▽ = √ |
| 48-52RC  | ▽ = √ |
| 52-54RC  | ▽ = √ |
| 54-56RC  | ▽ = √ |
| 56-60RC  | ▽ = √ |

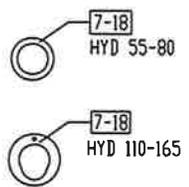
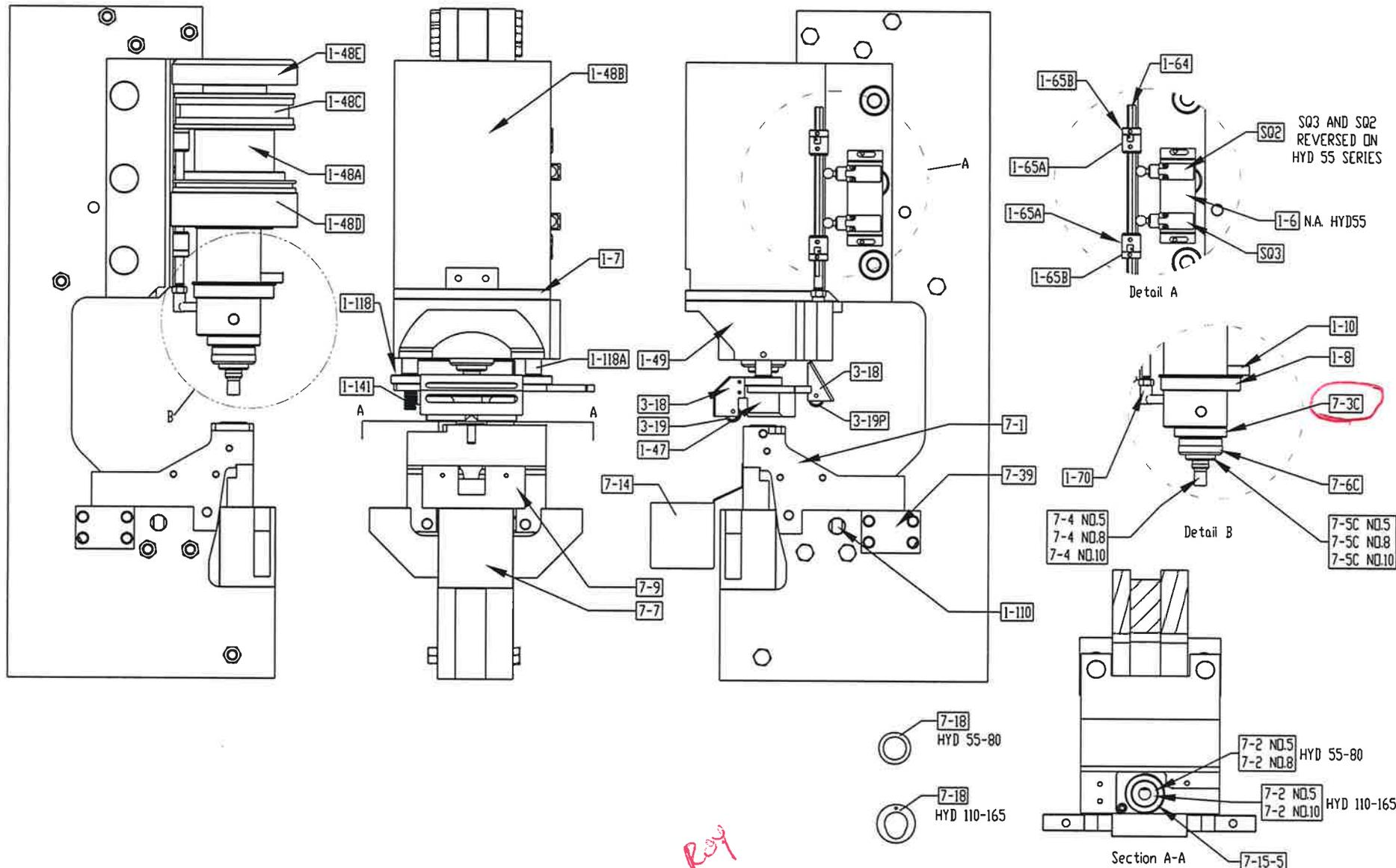
|       |
|-------|
| ▽ = √ |
| ▽ = √ |
| ▽ = √ |
| ▽ = √ |
| ▽ = √ |
| ▽ = √ |
| ▽ = √ |

**GEKA**

PARTS, SUBSYSTEMS, OR SYSTEMS ARE MANUFACTURED BY INDRAMIRA GEKA SA. THIS DRAWING IS A REPRESENTATION OF AN ACTUAL COMPONENT MANUFACTURED BY INDRAMIRA GEKA SA. INDRAMIRA GEKA SA AND COMEQ INC. SHALL BE HELD RESPONSIBLE IF THE PARTS, SUBSYSTEMS, OR SYSTEMS DIMENSIONS ARE CHANGED IN ANYWAY. THIS DRAWING IS A REPRESENTATION OF 3D SHOWN PARTS, SUBSYSTEMS, OR SYSTEMS. THIS DRAWING IS THE PROPERTY OF INDRAMIRA GEKA SA. AND COMEQ INC.

| REVISIONS |
|-----------|
|           |
|           |
|           |
|           |

|  |                |                 |                            |
|--|----------------|-----------------|----------------------------|
| <b>COMEQ INC.</b>                                    |                |                 |                            |
| HYDRACROP SERIES NOTCHER CYLINDER LIMIT SWITCH SETUP |                |                 |                            |
| VARIANT  |                |                 |                            |
| COMEQ/INDRAMIRA                                      | MAT:           | SUB: XXXXXXXXXX | DRAFTER: RYAN JVDORSTEG    |
| COMEQ/INDRAMIRA                                      | SCALE: 1:1     | REF: XXXXXXXXXX | ENGINEER: RYAN JVDORSTEG   |
| COMEQ/INDRAMIRA                                      | FORMAT: DWG    | DRG: XX-XX-XX   | PART NO: 0000.0000.0000.00 |
| COMEQ/INDRAMIRA                                      | PAPER: 8.5X11" | DATE: 09-07-04  | COMEQ NO: H-N-LSSU-S       |

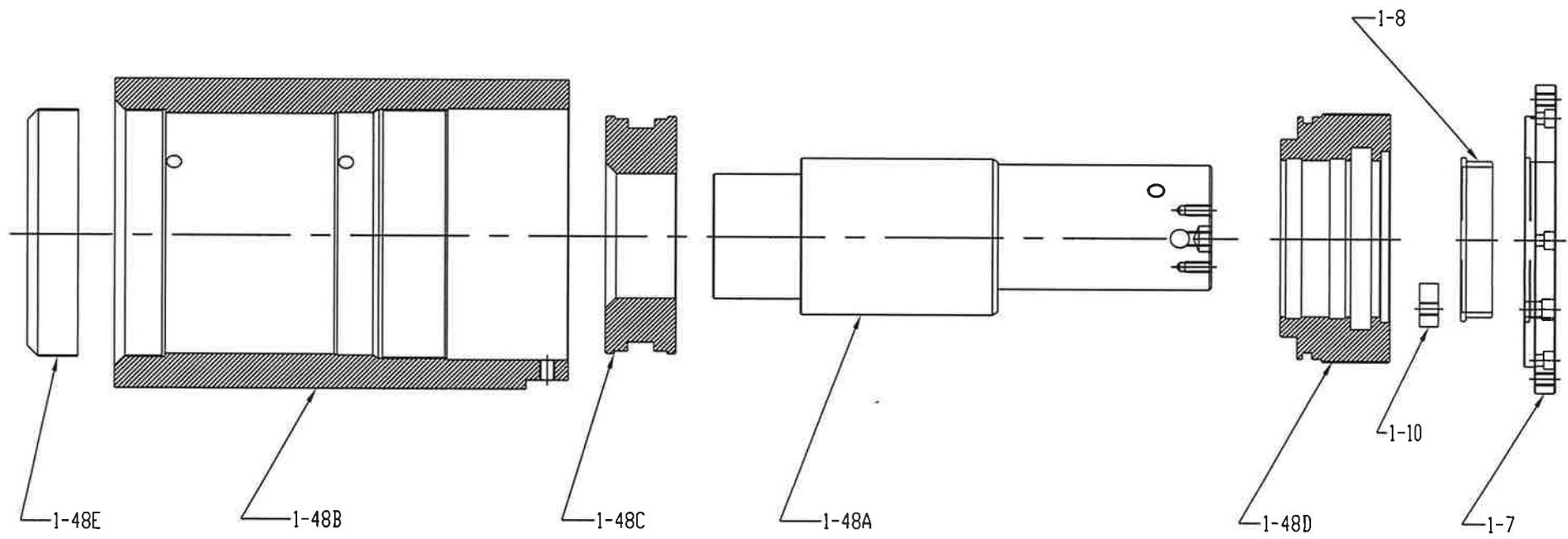


| DATE | HISTORY OR EXPLANATION OF REVISIONS | HARDNESS |       |
|------|-------------------------------------|----------|-------|
| G    |                                     | MATERIAL | ∩ = ✓ |
| F    |                                     | 32-36RC  | ∇ = ✓ |
| E    |                                     | 36-40RC  | ∩ = ✓ |
| D    |                                     | 40-44RC  | ∇ = ✓ |
| C    |                                     | 48-52RC  | ∩ = ✓ |
| B    |                                     | 52-54RC  | ∇ = ✓ |
| A    |                                     | 54-56RC  | ∩ = ✓ |
| XX   |                                     | 56-60RC  | ∇ = ✓ |

**GEKA**

PART, SUBSYSTEM OR SYSTEM ARE MANUFACTURED BY INNOVATION GEKA S.A. THIS DRAWING IS A REPRESENTATION OF AN ACTING COMPONENT MANUFACTURED BY INNOVATION GEKA S.A. INNOVATION GEKA S.A. AND COMEQ INC. SHALL BE HELD RESPONSIBLE OF THE PARTS, SUBSYSTEM OR SYSTEMS DIMENSIONS ARE CHANGED BY ANYWAY. THIS DRAWING IS A REPRESENTATION OF SO SHOWN PART, SUBSYSTEM OR SYSTEM THIS DRAWING IS THE PROPERTY OF INNOVATION GEKA S.A. AND COMEQ INC.

| VARIANT                                   |                | COMEQ INC. |                             |
|---|----------------|------------|-----------------------------|
| HYDRACROP SERIES PUNCHING PARTS REFERENCE |                |            |                             |
| MAT:                                      | MD: XXXXXX     | SN: XXXXX  | DRAWER: RYAN J.VORSTEG      |
| NOP: IEA                                  | CO:            |            | ENGINEER: RYAN J.VORSTEG    |
| SCALE: 1:1                                | ORG: XX-XX-XX  |            | NO: HXXX-7PL-MAN            |
| PAPER: 85X11"                             | DATE: 11/17/05 |            | PART NO: 0.000.0.00.0000.00 |



| HARDNESS |          |
|----------|----------|
| ×        | MATERIAL |
|          | 32-36RC  |
|          | 36-40RC  |
|          | 40-44RC  |
|          | 48-52RC  |
|          | 52-54RC  |
|          | 54-56RC  |
|          | 56-60RC  |

**GEKA**

PART/SUBSYSTEM OF SYSTEM ARE MANUFACTURED BY INDRAMATI GESA SA. THIS DRAWING IS A REPRESENTATION OF AN ACTUAL COMPONENT MANUFACTURED BY INDRAMATI GESA SA. INDRAMATI GESA SA AND COMEQ INC. SHALL BE HELD RESPONSIBLE IF THE PARTS, SUBSYSTEM, OR SYSTEMS DIMENSIONS ARE CHANGED IN ANYWAY. THIS DRAWING IS A REPRESENTATION OF SO SHOWN PART/SUBSYSTEM OF SYSTEM. THIS DRAWING IS THE PROPERTY OF INDRAMATI GESA SA. AND COMEQ INC.

| REVISIONS |  |  |
|-----------|--|--|
|           |  |  |
|           |  |  |
| VARIANT   |  |  |
|           |  |  |
|           |  |  |

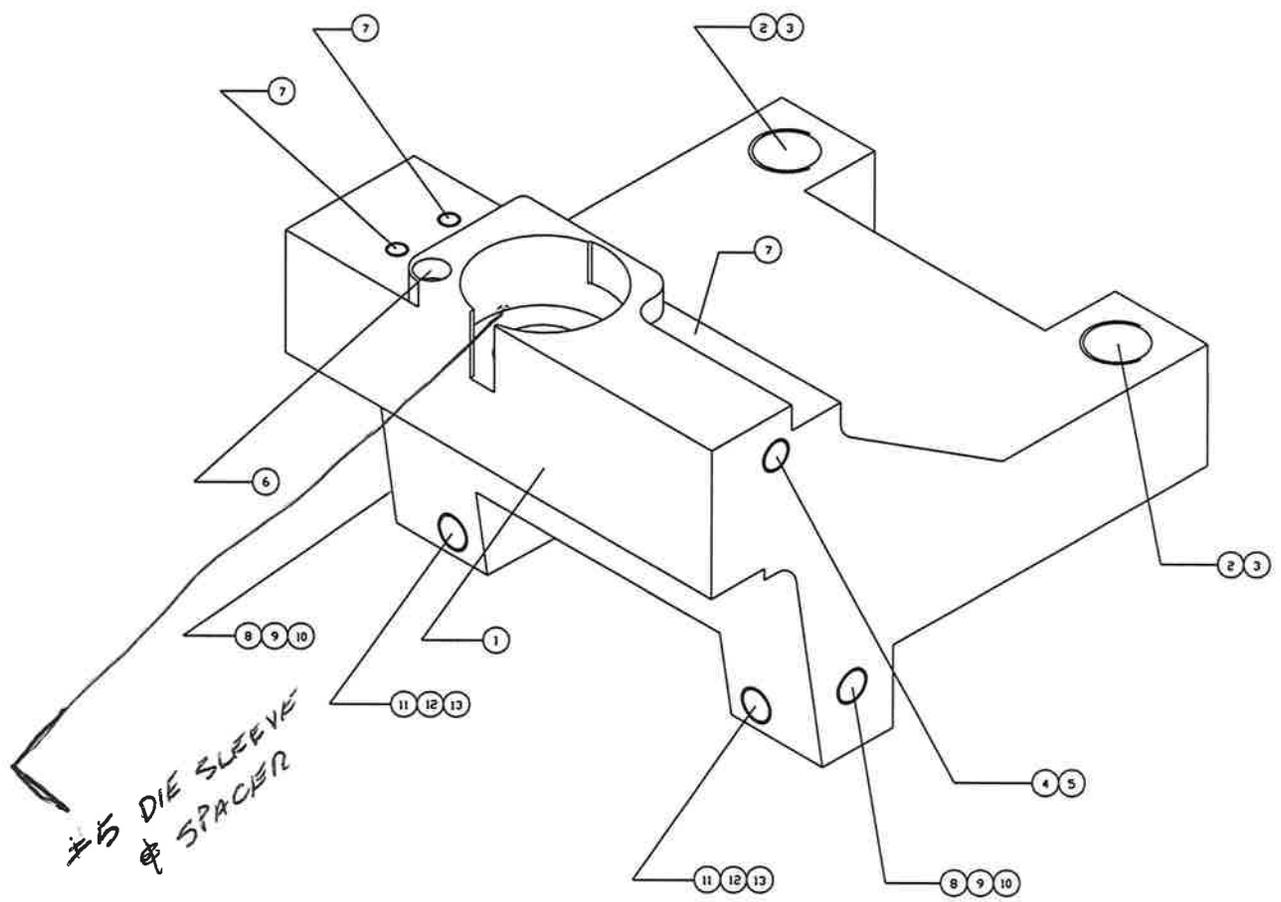
**COMEQ INC.**

HYDRACROP SERIES PUNCHING CYLINDER PART LIST

|                |                     |                            |
|----------------|---------------------|----------------------------|
| MAT:           | SUB: XXXX.XXXX.XXXX | DRAFTER: RYAN J.VORSTEG    |
| SCALE: 1:1     | REF: XXXX.XXXX.XXXX | ENGINEER: RYAN J.VORSTEG   |
| FORMAT: DWG    | DRG: XX-XX-XX       | PART NO: 0000.0000.0000.00 |
| PAPER: 8.5X11" | DATE: 09-07-04      | COMEQ NO: H-N-1-48-PL      |



| HYDRACROP 110A/S-SD |        |                         |           |
|---------------------|--------|-------------------------|-----------|
| POSITION            | QUANT. | DESCRIPTION             | REFERENCE |
| 13                  | 4      | M18 FLAT WASHER         | FABORY    |
| 12                  | 6      | M18 NUT                 | FABORY    |
| 11                  | 2      | M18 X 130 SOCKET STUD   | FABORY    |
| 10                  | 2      | M18 FLAT WASHER         | FABORY    |
| 9                   | 2      | M18 NUT                 | FABORY    |
| 8                   | 2      | M18 X 100 HEX HEAD      | FABORY    |
| 7                   | 3      | M10 X 20 SOCKET BOLT    | FABORY    |
| 6                   | 1      | M10 X 80 SOCKET BOLT    | FABORY    |
| 5                   | 1      | M14 NUT                 | FABORY    |
| 4                   | 1      | M14 X 140 HEX HEAD BOLT | FABORY    |
| 3                   | 2      | M33 THICK WASHER        | FABORY    |
| 2                   | 2      | M33 X 150 HEX BOLT      | FABORY    |
| 1                   | 1      | STANDARD DIE BLOCK      | GEKA 7-1  |
| HYDRACROP 80A/S-SD  |        |                         |           |
| POSITION            | QUANT. | DESCRIPTION             | REFERENCE |
| 13                  | 4      | M16 FLAT WASHER         | FABORY    |
| 12                  | 6      | M16 NUT                 | FABORY    |
| 11                  | 2      | M16 X 120 SOCKET STUD   | FABORY    |
| 10                  | 2      | M16 FLAT WASHER         | FABORY    |
| 9                   | 2      | M16 NUT                 | FABORY    |
| 8                   | 2      | M16 X 70 HEX HEAD       | FABORY    |
| 7                   | 3      | M10 X 20 SOCKET BOLT    | FABORY    |
| 6                   | 1      | M10 X 80 SOCKET BOLT    | FABORY    |
| 5                   | 1      | M14 NUT                 | FABORY    |
| 4                   | 1      | M14 X 120 HEX HEAD BOLT | FABORY    |
| 3                   | 2      | M27 THICK WASHER        | FABORY    |
| 2                   | 2      | M27 X 100 HEX BOLT      | FABORY    |
| 1                   | 1      | STANDARD DIE BLOCK      | GEKA 7-1  |
| HYDRACROP 55A/S-SD  |        |                         |           |
| POSITION            | QUANT. | DESCRIPTION             | REFERENCE |
| 13                  | 4      | M14 FLAT WASHER         | FABORY    |
| 12                  | 6      | M14 NUT                 | FABORY    |
| 11                  | 2      | M14 X 100 SOCKET STUD   | FABORY    |
| 10                  | 2      | M16 FLAT WASHER         | FABORY    |
| 9                   | 2      | M16 NUT                 | FABORY    |
| 8                   | 2      | M16 X 70 HEX HEAD       | FABORY    |
| 7                   | 3      | M10 X 20 SOCKET BOLT    | FABORY    |
| 6                   | 1      | M10 X 80 SOCKET BOLT    | FABORY    |
| 5                   | 1      | M12 NUT                 | FABORY    |
| 4                   | 1      | M12 X 100 HEX HEAD BOLT | FABORY    |
| 3                   | 2      | M24 THICK WASHER        | FABORY    |
| 2                   | 2      | M24 X 100 HEX BOLT      | FABORY    |
| 1                   | 1      | STANDARD DIE BLOCK      | GEKA 7-1  |



7-1-8  
896

804

| HARDNESS   | SYMBOL              |
|------------|---------------------|
| X MATERIAL | [Symbol] = [Symbol] |
| 32-36RC    | [Symbol] = [Symbol] |
| 36-40RC    | [Symbol] = [Symbol] |
| 40-44RC    | [Symbol] = [Symbol] |
| 48-52RC    | [Symbol] = [Symbol] |
| 52-54RC    | [Symbol] = [Symbol] |
| 54-56RC    | [Symbol] = [Symbol] |
| 56-60RC    | [Symbol] = [Symbol] |

**GEKA**

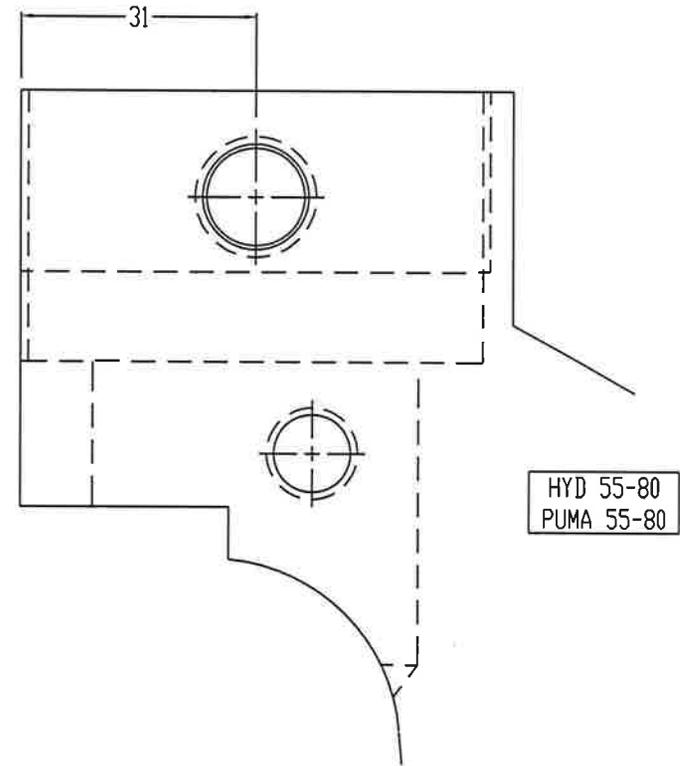
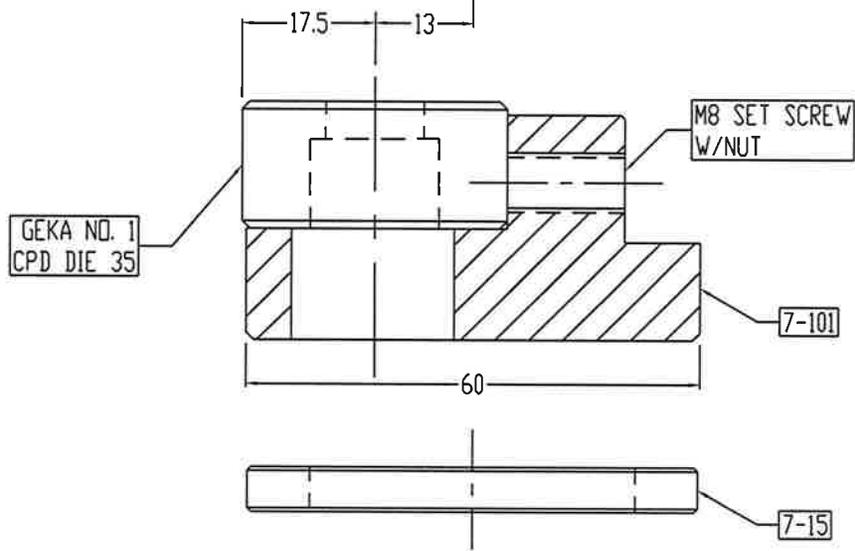
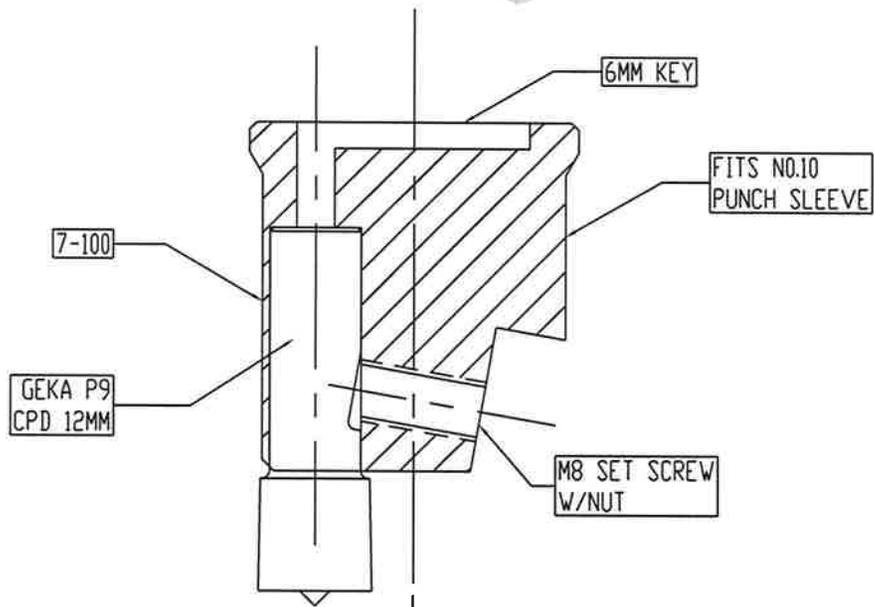
PART, SUBSYSTEM, OR SYSTEM ARE MANUFACTURED BY INNOVATION GEKA S.A. THIS DRAWING IS A REPRESENTATION OF AN ACTING COMPONENT MANUFACTURED BY INNOVATION GEKA S.A. INNOVATION GEKA S.A. AND COMEQ INC. SHALL BE HELD RESPONSIBLE IF THE PARTS, SUBSYSTEM, OR SYSTEMS DIMENSIONS ARE CHANGED BY ANYONE. THIS DRAWING IS A REPRESENTATION OF 3D CAD PART, SUBSYSTEM, OR SYSTEM THIS DRAWING IS THE PROPERTY OF INNOVATION GEKA S.A. AND COMEQ INC.

| REVISIONS |               |                     |                            |
|-----------|---------------|---------------------|----------------------------|
| VARIANT   |               |                     |                            |
| DATE      | SCALE: 1:1    | SUB: XXXX.XXXX.XXXX | ENGINEER: RYAN J.VORSTIEG  |
| DATE      | FORMAT: DWG   | DRG: XX-XX-XX       | PART NO: 0000.0000.0000.00 |
| DATE      | PAPER: B5X11" | DATE: 09-07-04      | CDMED NO: H-7-1-HV         |

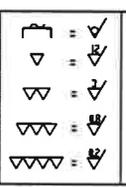
**COMEQ INC.**

HYDRACROP SERIES PUNCHING DIE BLOCK HARDWARE

30 TONS MAX  
 MAX MATERIAL THICKNESS = 1/4"  
 MAX PUNCH 3/4"



| DATE | HISTORY OR EXPLANATION OF REVISIONS | HARDNESS   |
|------|-------------------------------------|------------|
| H    |                                     | ✗ MATERIAL |
| G    |                                     | 32-36RC    |
| F    |                                     | 36-40RC    |
| E    |                                     | 40-44RC    |
| D    |                                     | 48-52RC    |
| C    |                                     | 52-54RC    |
| B    |                                     | 54-56RC    |
| A    |                                     | 56-60RC    |

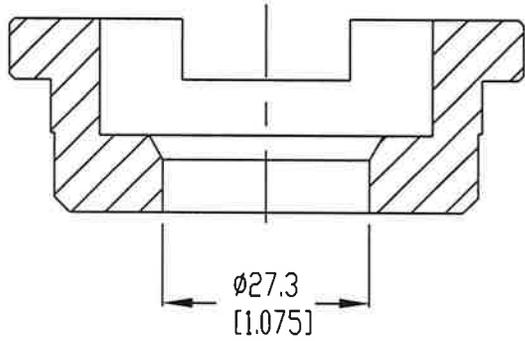


**GEKA** 

PART, SUBSYSTEM OR SYSTEM ARE MANUFACTURED BY INNOVATIONA GEKA S.A. THIS DRAWING IS A REPRESENTATION OF AN ACTUAL EQUIPMENT MANUFACTURED BY INNOVATIONA GEKA S.A. INNOVATIONA GEKA S.A. HEREBY CERTAINS INC. SHALL BE HELD RESPONSIBLE IF THE PARTS, SUBSYSTEM OR SYSTEMS DIMENSIONS ARE CHANGED IN ANYWAY. THIS DRAWING IS A REPRESENTATION OF SO SHOWN PART, SUBSYSTEM OR SYSTEM THIS DRAWING IS THE PROPERTY OF INNOVATIONA GEKA S.A. AND COMEQ INC.

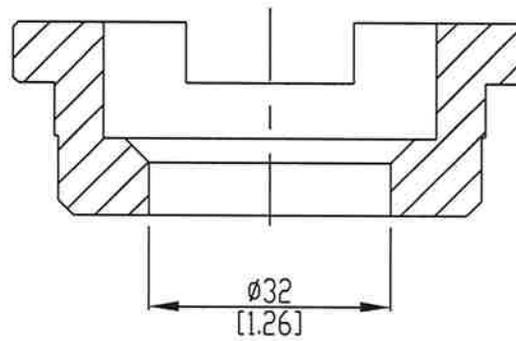
| VARIANT       |                | COMEQ INC.  |                             |
|---------------|----------------|--|-----------------------------|
| Q000.A0000000 |                | HYDRACROP 55-80 PUMA 55-80   |                             |
| Q000.A0000000 |                | UNIT 7-EXE OFFSET PUNCH ATTACHMENT PART LIST   |                             |
| Q000.A0000000 | MAT: VARIOUS   | MO: XXXXXX   | SN:XXXXX                    |
| Q000.A0000000 | NCP: TEA       | CO:  | ENGINEER: RYAN J.VORSTEG    |
| Q000.A0000000 | SCALE: 1:1     | DRG: XX-XX-XX  | FILE NO: UNIT7EXE-5580PL    |
| Q000.A0000000 | PAPER: 8.5X11" | DATE: 06-27-05   | PART NO: 0.000.0.00.0000.00 |

7-5C  
GEKA NO 5  
CPD FIG. 16  
CST FIG. 221



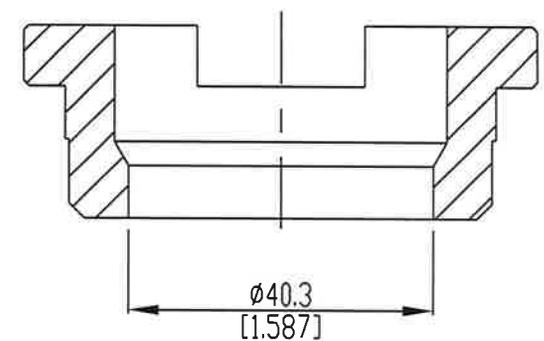
| SHAPE     | MAX DIM         |
|-----------|-----------------|
| ROUND     | 1.075"          |
| SQUARE    | 0.750"          |
| OBLONG    | 1.062" X 0.812" |
| RECTANGLE | 1" X 0.375"     |
| HEX       | 0.921"          |
| TRIANGLE  | 0.806"          |
| PENTAGRAM | 0.972"          |

7-5C  
GEKA NO 8  
CPD FIG. 20  
CST FIG. 228S

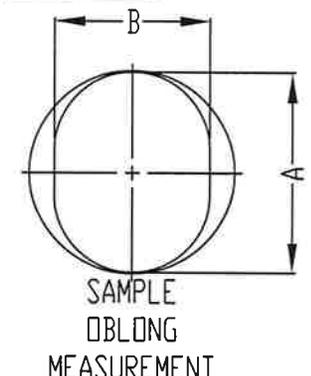
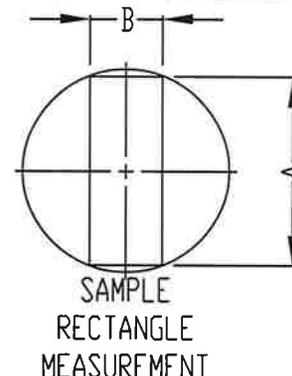
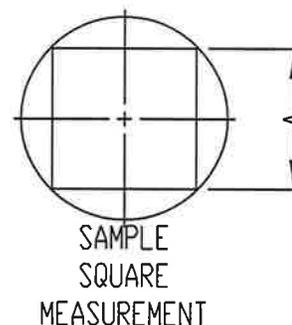
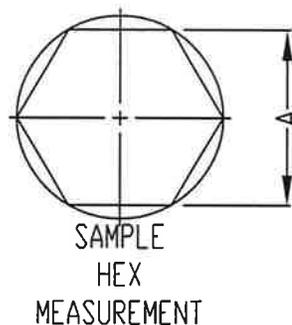
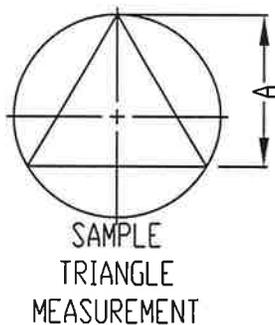
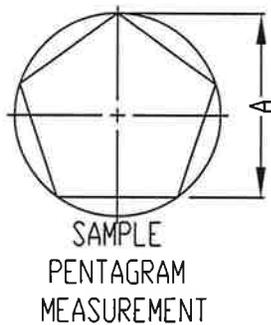


| SHAPE     | MAX DIM         |
|-----------|-----------------|
| ROUND     | 1.260"          |
| SQUARE    | 0.875"          |
| OBLONG    | 1.250" X 0.812" |
| RECTANGLE | 1.122" X 0.5"   |
| HEX       | 1.091"          |
| TRIANGLE  | 0.945"          |
| PENTAGRAM | 1.140"          |

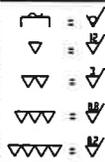
7-5C  
GEKA NO 10  
CPD FIG. 26  
CST FIG. 228



| SHAPE     | MAX DIM     |
|-----------|-------------|
| ROUND     | 1.587"      |
| SQUARE    | 1.122"      |
| OBLONG    | 1.562" X 1" |
| RECTANGLE | 1.5" X 0.5" |
| HEX       | 1.374"      |
| TRIANGLE  | 1.190"      |
| PENTAGRAM | 1.435"      |



| DATE | HISTORY OR EXPLANATION OF REVISIONS | HARDNESS |
|------|-------------------------------------|----------|
| G    |                                     | MATERIAL |
| F    |                                     | 32-36RC  |
| E    |                                     | 36-40RC  |
| D    |                                     | 40-44RC  |
| C    |                                     | 48-52RC  |
| B    |                                     | 52-54RC  |
| A    |                                     | 54-56RC  |
| XX   |                                     | 56-60RC  |



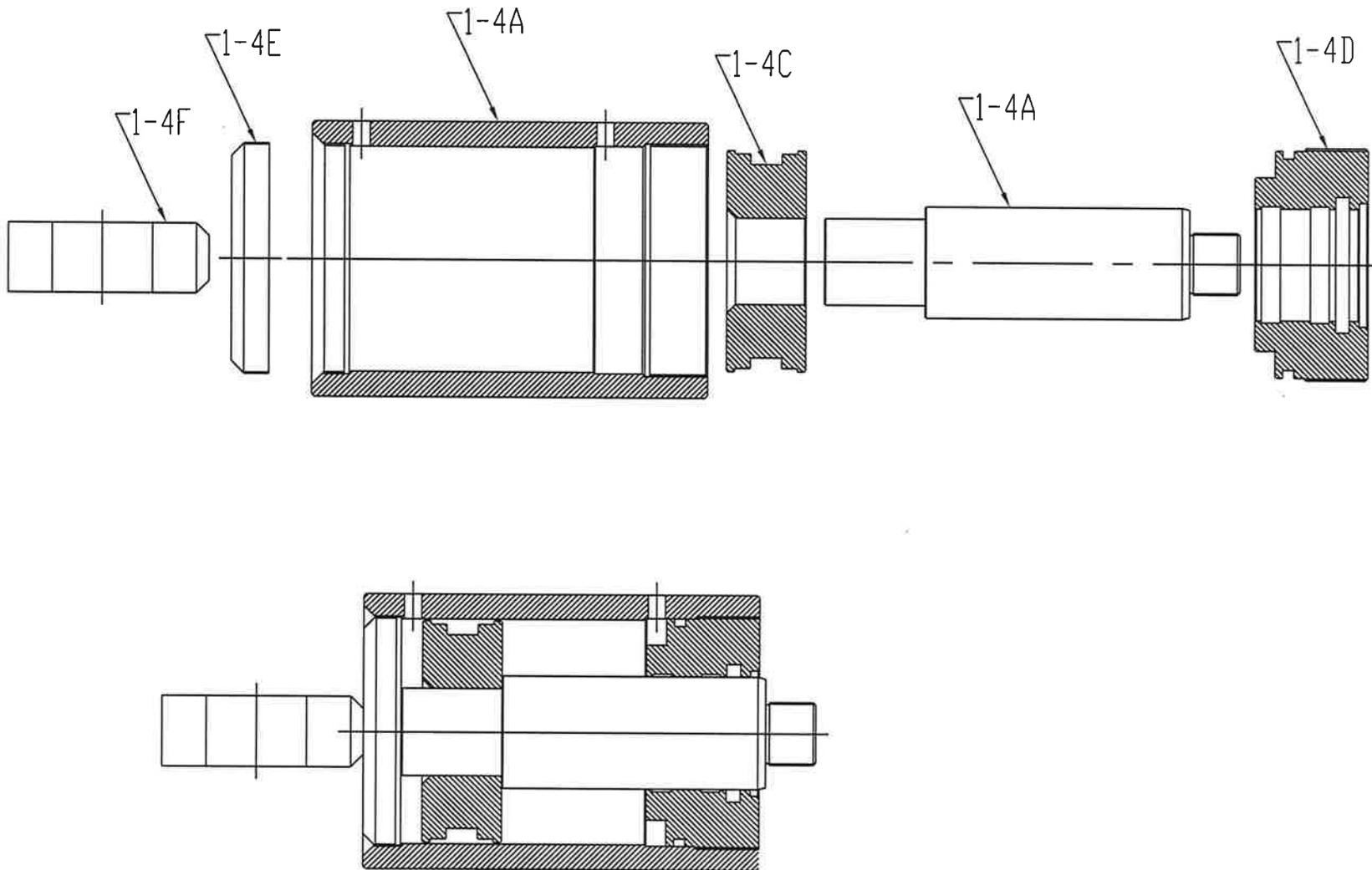
**GEKA**

PART, SUBSYSTEM, OR SYSTEM ARE MANUFACTURED BY INNOVEMIA GEKA S.A.  
THIS DRAWING IS A REPRESENTATION OF AN ACTUAL COMPONENT  
MANUFACTURED BY INNOVEMIA GEKA S.A. INNOVEMIA GEKA S.A. DOES NOT  
INC. SHALL BE HELD RESPONSIBLE IF THE PART, SUBSYSTEM, OR SYSTEM  
DIMENSIONS ARE CHANGED BY ANYWAY. THIS DRAWING IS A REPRESENTATION  
OF SO SHOW PART, SUBSYSTEM, OR SYSTEM. THIS DRAWING IS THE  
PROPERTY OF INNOVEMIA GEKA S.A. AND COPIED INC.

**COMEQ INC.**

HYDRACROP/PUMA 55-80-110  
PUNCH CLAMP SLEEVE INFORMATION

MAT: XXXXXX S#XXXXX  
NIP: ICD: ENGINEER: RYAN J.VORSTEG  
SCALE: 1:1 DRG: XX-XX-XX INQ: 1-HXXX-7-5C  
PAPER: 8.5X11" DATE: 10/27/05 PART NO: 0.000.0.00.0000.00



| HARDNESS   |   |      |
|------------|---|------|
| X MATERIAL | ▽ | = ✓  |
| 32-36RC    | ▽ | = 32 |
| 36-40RC    | ▽ | = 36 |
| 40-44RC    | ▽ | = 40 |
| 48-52RC    | ▽ | = 48 |
| 52-54RC    | ▽ | = 52 |
| 54-56RC    | ▽ | = 54 |
| 56-60RC    | ▽ | = 56 |



PART, SUBSYSTEM, OR SYSTEM ARE MANUFACTURED BY INDRAMATI GEKA S.A.  
 THIS DRAWING IS A REPRESENTATION OF AN ACTUAL COMPONENT  
 MANUFACTURED BY INDRAMATI GEKA S.A. INDRAMATI GEKA S.A. AND COMEQ  
 INC. SHALL BE HELD RESPONSIBLE IF THE PART, SUBSYSTEM, OR SYSTEM  
 DIMENSIONS ARE CHANGED IN ANYWAY. THIS DRAWING IS A REPRESENTATION  
 OF 3D INCAD PART, SUBSYSTEM, OR SYSTEM. THIS DRAWING IS THE  
 PROPERTY OF INDRAMATI GEKA S.A. AND COMEQ INC.

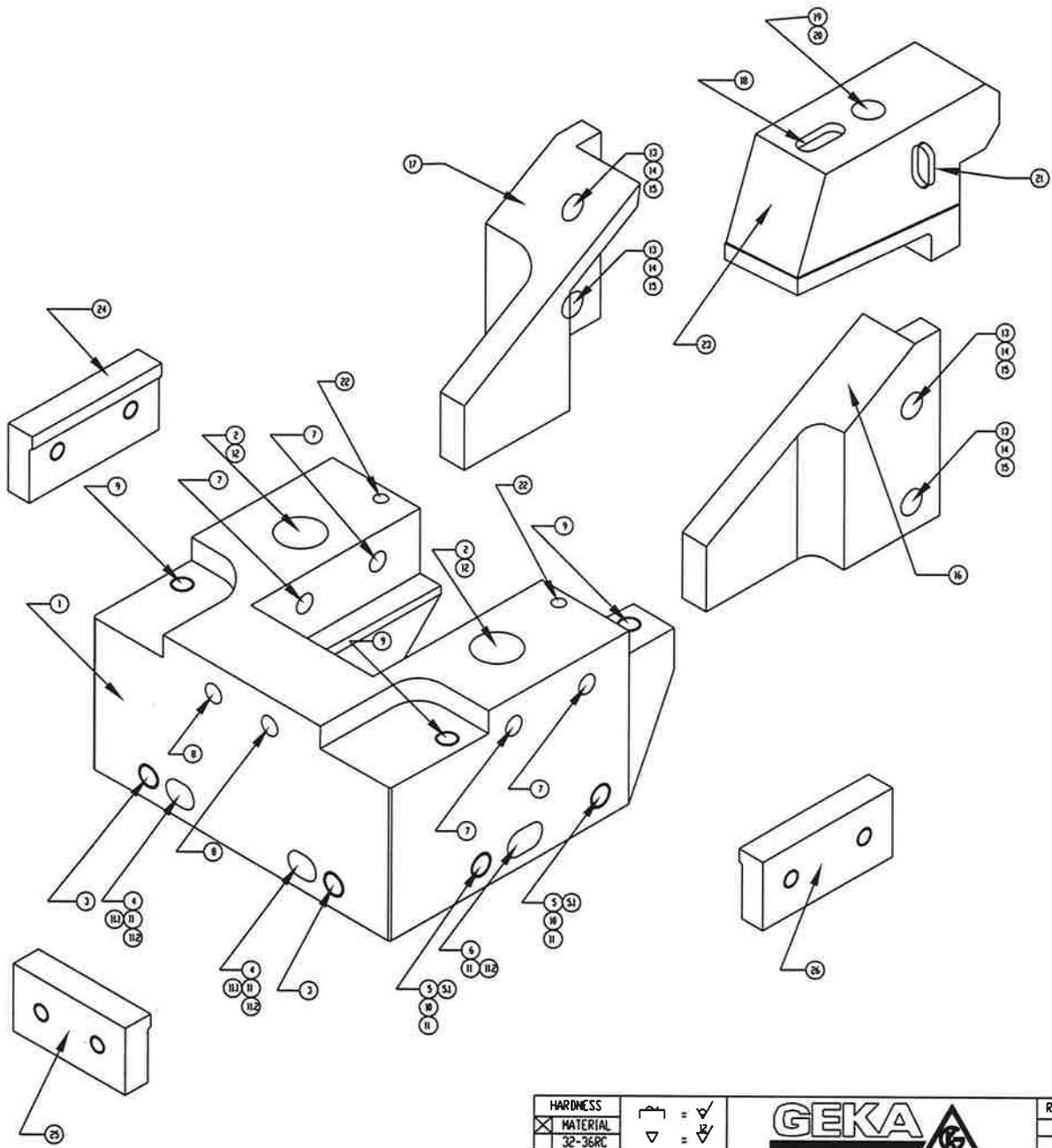
REVISIONS

| VARIANT |
|---------|
|         |
|         |
|         |
|         |

COMEQ INC. ⚡

HYDRACRDP SERIES NOTCHER CYLINDER PARTS LIST

|  |                |                     |                            |
|--|----------------|---------------------|----------------------------|
|  | MAT:           | SUB: XXXX.XXXX.XXXX | DRAFTER: RYAN JVDORSTEG    |
|  | SCALE: 1:1     | REF: XXXX.XXXX.XXXX | ENGINEER: RYAN JVDORSTEG   |
|  | FORMAT: DWG    | ORG: XX-XX-XX       | PART NO: 0000.0000.0000.00 |
|  | PAPER: 8.5X11" | DATE: 09-07-04      | COMEQ NO: H-N-1-4-PL       |



| HARDNESS |   |     |
|----------|---|-----|
| 32-36RC  | ▽ | = ∇ |
| 36-40RC  | ▽ | = ∇ |
| 40-44RC  | ▽ | = ∇ |
| 48-52RC  | ▽ | = ∇ |
| 52-54RC  | ▽ | = ∇ |
| 54-56RC  | ▽ | = ∇ |
| 56-60RC  | ▽ | = ∇ |

**GEKA**

PART, SUBSYSTEM, OR SYSTEM ARE MANUFACTURED BY MAGGIORANA GEKA S.A.  
THIS DRAWING IS A REPRESENTATION OF AN ACTUAL COMPONENT  
MANUFACTURED BY MAGGIORANA GEKA S.A. MAGGIORANA GEKA S.A. NOR COMEQ  
INC. SHALL BE HELD RESPONSIBLE IF THE PARTS, SUBSYSTEM, OR SYSTEMS  
DIMENSIONS ARE CHANGED BY ANYWAY. THIS DRAWING IS A REPRESENTATION  
OF 3D DIMEN PART, SUBSYSTEM, OR SYSTEM. THIS DRAWING IS THE  
PROPERTY OF MAGGIORANA GEKA S.A. AND COMEQ INC.

| REVISIONS |                | COMEQ INC.                         |                            |
|-----------|----------------|------------------------------------|----------------------------|
|           |                | HYDRACROP NOTCHER SECTION HARDWARE |                            |
| VARIANT   |                |                                    |                            |
| NO. REV.  | MAT:           | SUB: XXXX.XXXX.XXXX                | DRAFTER: RYAN_IVORSTEG     |
| NO. REV.  | SCALE: 1:1     | REF: XXXX.XXXX.XXXX                | ENGINEER: RYAN_IVORSTEG    |
| NO. REV.  | FORMAT: DWG    | DRG: XX-XX-XX                      | PART NO: 0000.0000.0000.00 |
| NO. REV.  | PAPER: 8.5X11" | DATE: 09-07-04                     | COMEQ NO: H-N-U9-HV-01     |

**COMEQ INC.**  
 STANDARD NOTCHER HARDWARE HARDWARE  
 PAGE 2

DATE: 09-07-04  
 CODED NO: H-N-05-NV-02

DRAWN BY: RYAN J. VORSTEG  
 ENGINEER: RYAN J. VORSTEG  
 PART NO: 0000.0000.0000.00

FORM: IJG  
 PAPER: 8.5X11

**REVISIONS**

| NO. | DESCRIPTION | DATE |
|-----|-------------|------|
|     |             |      |
|     |             |      |
|     |             |      |
|     |             |      |

**VARIANTS**

| NO. | DESCRIPTION |
|-----|-------------|
|     |             |
|     |             |

**GEKA**  
 MANUFACTURED BY GEKA INC. IN MICHIGAN, U.S.A.  
 GEKA IS A REGISTERED TRADEMARK OF GEKA INC. IN MICHIGAN, U.S.A.  
 GEKA IS A REGISTERED TRADEMARK OF GEKA INC. IN MICHIGAN, U.S.A.  
 GEKA IS A REGISTERED TRADEMARK OF GEKA INC. IN MICHIGAN, U.S.A.  
 GEKA IS A REGISTERED TRADEMARK OF GEKA INC. IN MICHIGAN, U.S.A.

**HARDNESS**

| MATERIAL | HARDNESS |
|----------|----------|
| 32-36RC  |          |
| 36-40RC  |          |
| 40-44RC  |          |
| 48-52RC  |          |
| 52-56RC  |          |
| 54-58RC  |          |
| 56-59RC  |          |

= 15°  
 = 30°  
 = 45°  
 = 60°  
 = 75°  
 = 90°

**PARTS LEGEND HYDRACROP 55**

| POSITION | QUANT. | DESCRIPTION           | REFERENCE | POSITION | QUANT. | DESCRIPTION              | REFERENCE |
|----------|--------|-----------------------|-----------|----------|--------|--------------------------|-----------|
| 14       | 4      | M10 LOCK WASHER       | FABORY    | 29       | 1      |                          |           |
| 13       | 4      | M10 X 25 HEX          | FABORY    | 28       | 1      |                          |           |
| 12       | 2      | M12 HEAVY FLAT WASHER | FABORY    | 27       | 1      |                          |           |
| 11.1     | 2      | M12 FLAT WASHER       | FABORY    | 26       | 1      | 9-2A NOTCHING SIDE BLADE | GEKA      |
| 11       | 6      | M14 FLAT WASHER       | FABORY    | 25       | 1      | 9-2 NOTCHING FRONT BLADE | GEKA      |
| 10       | 4      | M14 NUT               | FABORY    | 24       | 1      | 9-2A NOTCHING SIDE BLADE | GEKA      |
| 9        | 1      | NA.                   | FABORY    | 23       | 1      | 9-3 NOTCHING UPPER BLADE | GEKA      |
| 8        | 4      | M10 X 45 HEX          | FABORY    | 22       | 2      | M8 X 30 ROLL PIN         | FABORY    |
| 7        | 2      | M10 X 50 HEX          | FABORY    | 21       | 1      | NA.                      |           |
| 6        | 4      | M14 X 45 HEX          | FABORY    | 20       | 1      | M12 LOCK WASHER          | FABORY    |
| 5        | 2      | M14 X 45 HEX          | FABORY    | 19       | 1      | M12 X 40 SOCKET          | FABORY    |
| 4        | 2      | M12 X 60 HEX          | FABORY    | 18       | 1      | NA.                      |           |
| 3        | 2      | M14 X 40 SET SCREW    | FABORY    | 17       | 1      | 3-48 NOTCHING STOP       | GEKA      |
| 2        | 2      | M12 X 70 SOCKET       | FABORY    | 16       | 1      | 3-47 NOTCHING STOP       | GEKA      |
| 1        | 1      | NOTCHING DIE BLOCK    | GEKA      | 15       | 4      | M10 FLAT WASHER          | FABORY    |

**PARTS LEGEND HYDRACROP 80**

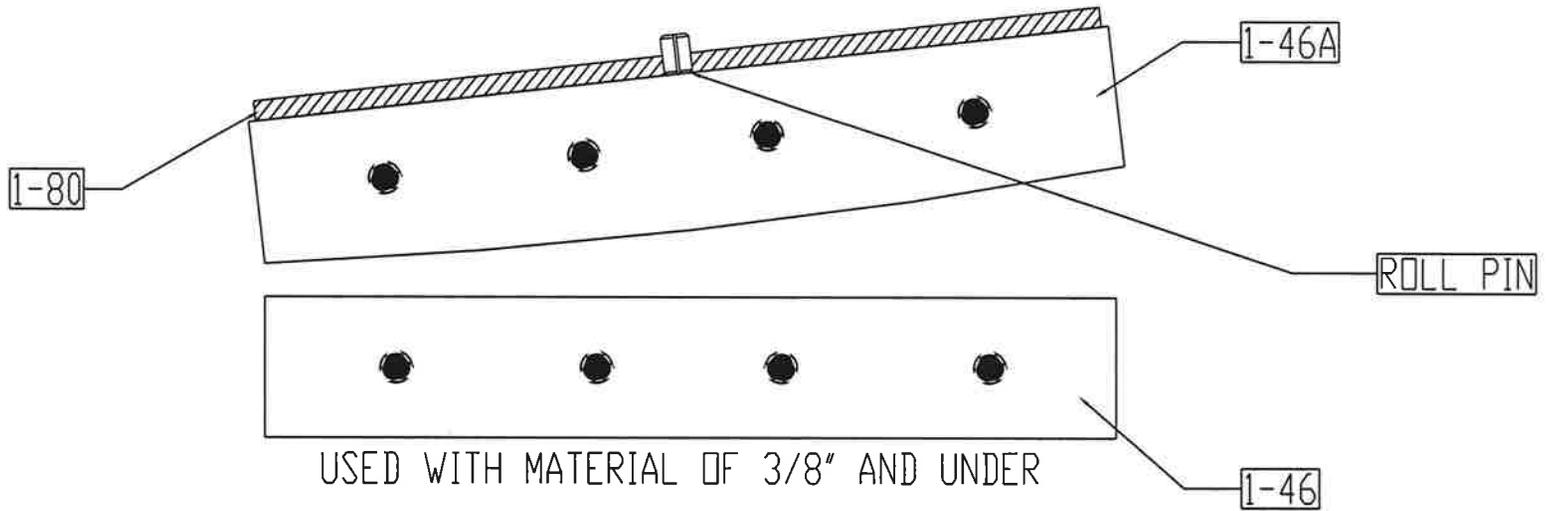
| POSITION | QUANT. | DESCRIPTION           | REFERENCE | POSITION | QUANT. | DESCRIPTION              | REFERENCE |
|----------|--------|-----------------------|-----------|----------|--------|--------------------------|-----------|
| 14       | 4      | M14 LOCK WASHER       |           | 29       | 1      |                          |           |
| 13       | 4      | M14 X 35 HEX          |           | 28       | 1      |                          |           |
| 12       | 2      | M12 HEAVY FLAT WASHER | FABORY    | 27       | 1      |                          |           |
| 11       | 6      | M14 FLAT WASHER       | FABORY    | 26       | 1      | 9-2A NOTCHING SIDE BLADE | GEKA      |
| 10       | 4      | M14 NUT               | FABORY    | 25       | 1      | 9-2 NOTCHING FRONT BLADE | GEKA      |
| 9        | 3      | M12 X 20 SOCKET       | FABORY    | 24       | 1      | 9-21 NOTCHING SIDE BLADE | GEKA      |
| 8        | 2      | M10 X 65 HEX          | FABORY    | 23       | 1      | 9-3 NOTCHING UPPER BLADE | GEKA      |
| 7        | 4      | M10 X 75 HEX          | FABORY    | 22       | 2      | M8 X 30 ROLL PIN         | FABORY    |
| 6        | 2      | M14 X 40 HEX          | FABORY    | 21       | 1      | M12 X 8 X 25 KEYSTOCK    | FABORY    |
| 5.1      | 2      | M14 X 60 HEX          | FABORY    | 20       | 1      | M16 LOCK WASHER          | FABORY    |
| 5        | 4      | M14 X 50 HEX          | FABORY    | 19       | 1      | M16 X 70 SOCKET          | FABORY    |
| 4        | 2      | M14 X 70 HEX          | FABORY    | 18       | 1      | M12 X 10 X 30 KEY STOCK  | FABORY    |
| 3        | 2      | M14 X 50 SET SCREW    | FABORY    | 17       | 1      | 3-48 NOTCHING STOP       | GEKA      |
| 2        | 2      | M12 X 90 SOCKET       | FABORY    | 16       | 1      | 3-47 NOTCHING STOP       | GEKA      |
| 1        | 1      | NOTCHING DIE BLOCK    | GEKA      | 15       | 4      | M14 FLAT WASHER          | FABORY    |

**PARTS LEGEND HYDRACROP 110**

| POSITION | QUANT. | DESCRIPTION           | REFERENCE | POSITION | QUANT. | DESCRIPTION              | REFERENCE |
|----------|--------|-----------------------|-----------|----------|--------|--------------------------|-----------|
| 15       | 4      | M14 FLAT WASHER       | FABORY    | 30       | 1      |                          |           |
| 14       | 4      | M14 LOCK WASHER       | FABORY    | 29       | 1      |                          |           |
| 13       | 4      | M14 X 35 HEX          | FABORY    | 28       | 1      |                          |           |
| 12       | 2      | M12 HEAVY FLAT WASHER | FABORY    | 27       | 1      |                          |           |
| 11       | 6      | M14 FLAT WASHER       | FABORY    | 26       | 1      | 9-2A NOTCHING SIDE BLADE | GEKA      |
| 10       | 4      | M14 NUT               | FABORY    | 25       | 1      | 9-2 NOTCHING FRONT BLADE | GEKA      |
| 9        | 3      | M12 X 20 SOCKET       | FABORY    | 24       | 1      | 9-2A NOTCHING SIDE BLADE | GEKA      |
| 8        | 2      | M10 X 65 HEX          | FABORY    | 23       | 1      | 9-3 NOTCHING UPPER BLADE | GEKA      |
| 7        | 4      | M10 X 75 HEX          | FABORY    | 22       | 2      | M8 X 30 ROLL PIN         | FABORY    |
| 6        | 2      | M14 X 45 HEX          | FABORY    | 21       | 1      | M12 X 8 X 25 KEYSTOCK    | FABORY    |
| 5        | 4      | M14 X 50 HEX          | FABORY    | 20       | 1      | M16 LOCK WASHER          | FABORY    |
| 4        | 2      | M14 X 60 HEX          | FABORY    | 19       | 1      | M16 X 70 SOCKET          | FABORY    |
| 3        | 2      | M14 X 50 SET SCREW    | FABORY    | 18       | 1      | M12 X 10 X 30 KEY STOCK  | FABORY    |
| 2        | 2      | M12 X 90 SOCKET       | FABORY    | 17       | 1      | 3-48 NOTCHING STOP       | GEKA      |
| 1        | 1      | NOTCHING DIE BLOCK    | GEKA      | 16       | 1      | 3-47 NOTCHING STOP       | GEKA      |

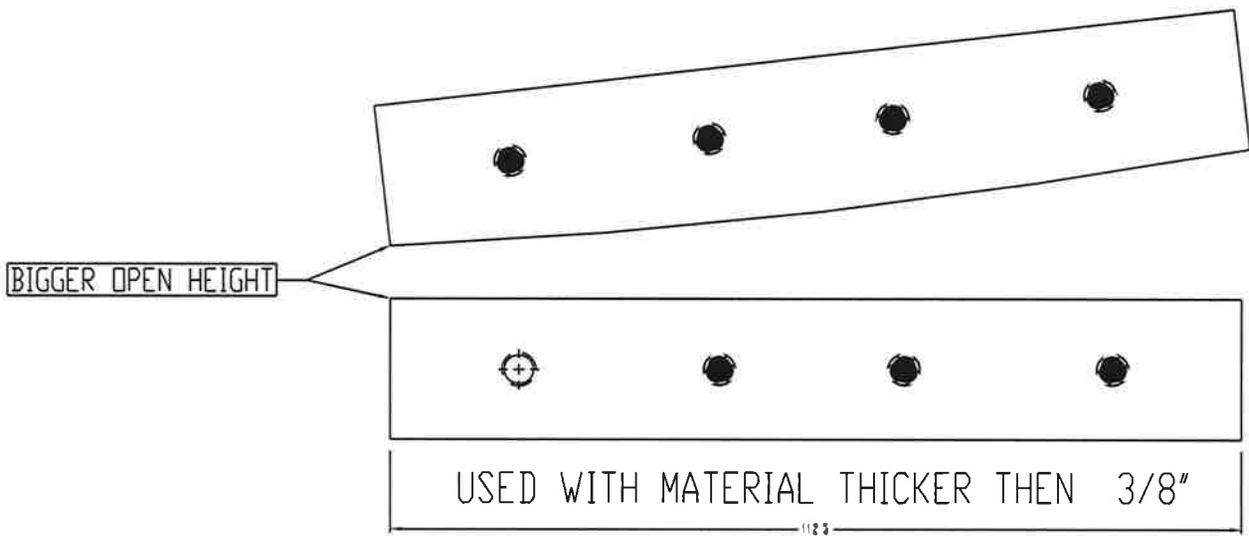
**PARTS LEGEND HYDRACROP 165 220**

| POSITION | QUANT. | DESCRIPTION           | REFERENCE | POSITION | QUANT. | DESCRIPTION              | REFERENCE |
|----------|--------|-----------------------|-----------|----------|--------|--------------------------|-----------|
| 14       | 4      | M14 LOCK WASHER       |           | 29       | 1      |                          |           |
| 13       | 4      | M14 X 35 HEX          |           | 28       | 1      |                          |           |
| 12       | 2      | M12 HEAVY FLAT WASHER |           | 27       | 1      |                          |           |
| 11.2     | 4      | M16 FLAT WASHER       |           | 26       | 1      | 9-2A NOTCHING SIDE BLADE | GEKA      |
| 11       | 4      | M14 FLAT WASHER       |           | 25       | 1      | 9-2 NOTCHING FRONT BLADE | GEKA      |
| 10       | 4      | M14 NUT               |           | 24       | 1      | 9-2A NOTCHING SIDE BLADE | GEKA      |
| 9        | 3      | M12 X 20 SOCKET       |           | 23       | 1      | 9-3 NOTCHING UPPER BLADE | GEKA      |
| 8        | 4      | M10 X 75 HEX          |           | 22       | 2      | M8 X 30 ROLL PIN         | FABORY    |
| 7        | 2      | M10 X 85 HEX          |           | 21       | 1      | M12 X 9 X 25 KEYSTOCK    | FABORY    |
| 6        | 2      | M16 X 45 HEX          |           | 20       | 1      | M16 LOCK WASHER          | FABORY    |
| 5        | 4      | M14 X 50 HEX          |           | 19       | 1      | M16 X 70 SOCKET          | FABORY    |
| 4        | 2      | M16 X 75 HEX          |           | 18       | 1      | M12 X 9 X 30 KEY STOCK   | FABORY    |
| 3        | 2      | M16 X 60 SET SCREW    |           | 17       | 1      | 3-48 NOTCHING STOP       | GEKA      |
| 2        | 2      | M12 X 120 SOCKET      |           | 16       | 1      | 3-47 NOTCHING STOP       | GEKA      |
| 1        | 1      | NOTCHING DIE BLOCK    | GEKA      | 15       | 4      | M14 FLAT WASHER          | FABORY    |



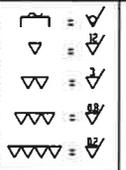
USED WITH MATERIAL OF 3/8" AND UNDER

WHEN REMOVING [1-80] AND REINSTALLING THE UPPER BLADE MAKE SURE IT SEATS ALL THE WAY AGAINST THE MOVING BLADE HOLDER OR DAMAGE MAY OCCUR TO THE MACHINE.



USED WITH MATERIAL THICKER THEN 3/8"

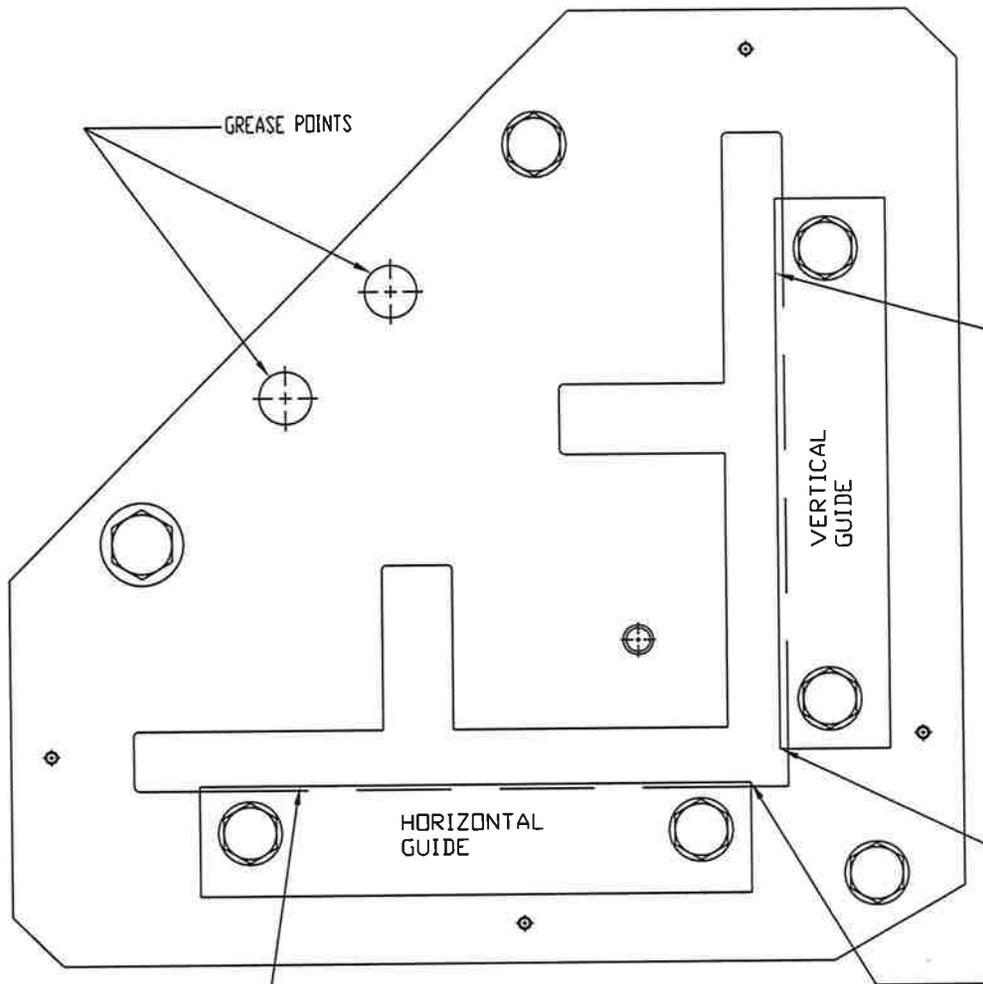
| DATE | HISTORY OR EXPLANATION OF REVISIONS | HARDNESS |
|------|-------------------------------------|----------|
| G    |                                     | 32-36RC  |
| F    |                                     | 36-40RC  |
| E    |                                     | 40-44RC  |
| D    |                                     | 48-52RC  |
| C    |                                     | 52-54RC  |
| B    |                                     | 54-56RC  |
| A    |                                     | 56-60RC  |
| XX   |                                     |          |



**GEKA**

PART, SUBSYSTEM OR SYSTEM ARE MANUFACTURED BY INNOVIMEX GEKA S.A. THIS DRAWING IS A REPRESENTATION OF AN ACTUAL COMPONENT MANUFACTURED BY INNOVIMEX GEKA S.A. INNOVIMEX GEKA S.A. AND COMEQ INC. SHALL BE HELD RESPONSIBLE IF THE PARTS, SUBSYSTEM OR SYSTEMS DIMENSIONS ARE CHANGED IN ANYWAY. THIS DRAWING IS A REPRESENTATION OF SO SHOW PART, SUBSYSTEM OR SYSTEM. THIS DRAWING IS THE PROPERTY OF INNOVIMEX GEKA S.A. AND COMEQ INC.

| VARIANT                                     |                | COMEQ INC. |                             |
|---|----------------|------------|-----------------------------|
| HYDRACROP 80<br>REMOVAL OF BLADE SUPPLEMENT |                |            |                             |
| MAT:  | NO: XXXXXX     | SN: XXXXX  | DRAFTER: RYAN J. VORSTEG    |
| NDP: 1EA                                    | CD:            |            | ENGINEER: RYAN J. VORSTEG   |
| SCALE: 1:1                                  | DRG: XX-XX-XX  |            | NO: 1-H80-1-46CUCH-01       |
| PAPER: 8.5X11"                              | DATE: 11/18/05 |            | PART NO: 0.000.0.00.0000.00 |



GREASE POINTS

ADJUST THIS GUIDE LEFT TO RIGHT TO GIVE HORIZONTAL LEG OF ANGLE 90° CUTS.

VERTICAL GUIDE

HORIZONTAL GUIDE

ADJUST THIS GUIDE UP OR DOWN TO GIVE VERTICAL LEG OF ANGLE 90° CUTS.

INSURE GUIDES ARE LEVEL WITH ANGLE BLADES

| HARDNESS |   |   |
|----------|---|---|
| 32-36RC  | ▽ | ▽ |
| 36-40RC  | ▽ | ▽ |
| 40-44RC  | ▽ | ▽ |
| 48-52RC  | ▽ | ▽ |
| 52-54RC  | ▽ | ▽ |
| 54-56RC  | ▽ | ▽ |
| 56-60RC  | ▽ | ▽ |



PART, SUBSYSTEM, OR SYSTEM ARE MANUFACTURED BY INQUINERA GEKA S.A. THIS DRAWING IS A REPRESENTATION OF AN ACTUAL COMPONENT MANUFACTURED BY INQUINERA GEKA S.A. INQUINERA GEKA S.A. NOR COMEQ INC. SHALL BE HELD RESPONSIBLE IF THE PARTS, SUBSYSTEMS, OR SYSTEMS DIMENSIONS ARE CHANGED IN ANYWAY. THIS DRAWING IS A REPRESENTATION OF 50 MILLION PARTS/SUBSYSTEMS OR SYSTEMS THIS DRAWING IS THE PROPERTY OF INQUINERA GEKA S.A. AND COMEQ INC.

REVISIONS

| VARIANT | MAT:           | SUB: XXXX.XXXX.XXXX | DRAFTER: RYAN J.VORSTEG    |
|---------|----------------|---------------------|----------------------------|
|         | SCALE: 1:1     | REF: XXXX.XXXX.XXXX | ENGINEER: RYAN J.VORSTEG   |
|         | FORMAT: DWG    | DRG: XX-XX-XX       | PART NO: 0000.0000.0000.00 |
|         | PAPER: 8.5X11" | DATE: 09-13-04      | COMEQ NO: IN-4-S-HTAD      |

COMEQ INC.

ADJUSTMENT OF GUIDES FOR ANGLE SECTION FOR HYDRACROP SERIES IRONWORKERS

ATTACHED DOCUMENTS

- SPECIFIC OR GENERIC MACHINE CATALOGUE
- DIES AND PUNCHES CATALOGUE
- ATTACHMENTS CATALOGUE
- MAIN COMPONENTS LIST (4 VIEWS)
- PARTS LIST OF ELECTRIC STOP
- INSPECTION AND CHECK-UP CARD
- FOUNDATION PLAN
- WIRING DIAGRAM
- LIST OF CONTROLS
- HYDRAULIC DIAGRAM
- PARTS LIST OF HYDRAULIC UNIT
- GREASING POINT PLAN
  
- APPENDIX - DIRECTIONS FOR USE OF ATTACHMENTS ON GEKA MACHINES

DATE OF ISSUE:1994-12-30

DATE OF LAST REVISION:1994-12-30

EQUIPMENT:

- NAME: Universal Shearing and Punching Machine.
- MARK: GEKA
- MODEL: HYDRACROP- *803*
- SERIAL NUMBER: *141824*

MAKER:

MAQUINARIA GEKA S.A., POL.IND. UGALDETXO S/N, OIARTZUN (SPAIN) -  
TEL. +34-43-490034 - FAX +34-43-491237 - TELEX

DISTRIBUTOR:



SECTION 0:PRELIMINARIES

SECTION 1:DESCRIPTION

- 1.1. GENERAL FEATURES
- 1.2. GLOSSARY

SECTION 2:INSTALLATION

- 2.1. PREREQUISITES
- 2.2. TRANSPORT AND UNPACKING
- 2.3. INSTALLATION LAYOUT
- 2.4. INSTALLATION INSTRUCTIONS

SECTION 3:OPERATION AND SETTINGS

- 3.1. OPERATING PRINCIPLE
  - 3.1.1. CONTROL ELEMENTS
- 3.2. DESCRIPTION OF EACH WORKSTATION FUNCTION
  - 3.2.1. PUNCHING
  - 3.2.2. FLATS AND PLATES SHEARING
  - 3.2.3. ANGLE IRON SHEARING
  - 3.2.4. ROUND AND SQUARE BAR CROPPING
  - 3.2.5. NOTCHING
- 3.3. SETTINGS AND TOOL CENTRING
- 3.4. START-UP

SECTION 4:MAINTENANCE

- 4.1. MAINTENANCE OPERATIONS
- 4.2. LUBRICATION AND CLEANING

SECTION 5:PARTS LIST

SECTION 6:TROUBLES AND REMEDIES

SECTION 7:SAFETIES

## SECTION 0 - PRELIMINARIES

This INSTRUCTION MANUAL aims at giving GEKA machine's users a clear and efficient document for an easy installation, start-up, operation, maintenance and repair of the machine, as well as a source of information on the machine safeties.

For this purpose, two identical copies of this Manual, in your language, have been supplied with the machine: one of them should be accessible to the machine operator, while the second one is to be kept by the Production Manager. In any case, the operator and the Production Manager shall be responsible for the safe upkeep of their respective copy.

This document has been prepared with reference to the following standards:

- \* UNE 66-100-81 (Technical Principles for Preparing Technical Manuals of Industrial Equipment);
- \* UNE-EN 292-2 (Basic Concepts and General Principles of Design and Engineering);
- \* Real Decree-Law No. 1435/1992 of 27th November, 1992 which enforces the applicable provisions of the EEC Council's Directive No. 89/392/EEC.

In addition, we received advice from both INVEMA (Machine-Tool Industrial Research and Development Association) and A.F.M. (Spanish Association of Machine-Tool Manufacturers).

You are kindly requested to read this Manual carefully for a safe operation and proper use of the machine which was built, like its accessories, with the desire of supplying you with an equipment of optimum price-quality ratio. In this respect, if you should however detect any fault or wantage of the machine, please feel free to advise us, indicating your suggestions of improvement.

While reading this document, you will come across the following abbreviation and symbol:

- \* (acc.drwg) - according to drawing. The drawing reference used in all the documents.
- \* [ ] - control elements.

All the operations described in this INSTRUCTION MANUAL must be performed by an authorized and qualified personnel having been trained to operate the machine.

Training with regard to this INSTRUCTION MANUAL is your right, as an operator of the machine. Do exercise it !



If you should not receive a proper training, do not hesitate to contact your supplier or the manufacturer.

On the other hand, we shall be grateful to you for reporting, to your Distributor/Supplier, any error, omission and/or lack of clarity you may encounter in this Manual.

Finally, we wish to thank you once more for your attention and reading this Manual, as a prerequisite to ensure the good running of the machine, which, eventually, shall result in maintaining excellent maker-user relations. THANK YOU.

All the characteristics specified in this INSTRUCTION MANUAL and its ANNEXES concern material with a resistance of 45 kg/mm<sup>2</sup> and standard GEKA machines.

MAQUINARIA GEKA S.A. reserves the right to modify any item of this Instruction Manual without prior notice.

**GEKA** 



## SECTION 1 - DESCRIPTION

We refer you to the four enclosed pictures showing the machine you have just acquired, or any representative of its family, both with and without front and rear guards. These pictures shall be the graphic support for this INSTRUCTION MANUAL and are called 'MAIN COMPONENTS LIST'.

The red-coloured figures at the end of the signalling arrows represent the technical reference of the component (acc.drwg), allowing you to trace its name and the quantity of same on each machine.

Your machine has been designed to operate, preferably, in forge mills, sheet metal shops, structural engineering workshops, etc. and, generally, in any industry in the line of metal (normally unalloyed iron) processing, in need for punching, cutting and forming equipment. However, this machine has multiple applications which shall depend on its adaptation to the specific industrial activity. The standard machine is prepared to process metal parts preferably over 3 mm in thickness.

### 1.1. GENERAL FEATURES

All GEKA HYDRACROP machines present the following features:

- \* Sandwich-type, monobloc frame structure.
- \* Electric foot-operation.
- \* Five working stations and two adjustable-stroke cylinder hydraulic drive: one of the cylinders (1/48 acc.drwg) actuates the punching equipment, while the other one (1/4 acc.drwg) actuates the tool-holder (1/18 acc.drwg) that moves reciprocatively through all the other working stations.
- \* Colours: beige RAL 1015 (other, exceptionally upon request) and orange RAL 1007 for working areas.

The working stations available on your machine can be seen on the relevant CATALOGUE and are briefly described below:

- Punch (See CATALOGUE): Working station for making holes in the material by pressing a punch (7/4 acc.drwg) into a die (7/2 acc.drwg).
- Angles Shear (See CATALOGUE): Working station for cutting angle sections of different sizes, through the compensated movement of the rotary blade (15/5 acc.drwg) over two stationary blades (15/3 and 15/4 acc.drwg).

**GEKA** 

- Flats Shear (See CATALOGUE): Working station for cutting flats by operating two blades: a stationary one (1/46 acc.drwg) and a movable one (1/46A acc.drwg).
  
- Round and Square Bars Cropper (See CATALOGUE): Working station for shearing solid round and square bars in various sizes.
  
- Notcher (See CATALOGUE): Working station for removing ("biting") material from the workpiece starting from one end of same (sometimes referred to as 'dinking die').

## 1.2. GLOSSARY - MAIN COMPONENTS

\* FRAME (See CATALOGUE): Part of the machine supporting all the working stations. It is welded onto the BED. The cylinders are secured to this frame which houses the tool-holder.

\* BED (See CATALOGUE) (1/87 acc.drwg) : Bottom part of the machine supporting the frame. It houses the hydraulic unit which is accessible after opening the guard(s) (1/91 - 1/91A acc.drwg).

\* CYLINDER OR PISTON (See CATALOGUE) (1/4-1/48 acc.drwg): The machine component that applies a force to the material. It is the double-acting type and basically consists in four elements: jacket, piston, seals and guide.

Concerning the HYDRACROP series, it is essential to differentiate at all times the punch cylinder (1/48 acc.drwg) from the notcher cylinder (1/4 acc.drwg).

\* TOOLHOLDER (See CATALOGUE) (1/18 acc.drwg): The cast steel arbor that slides in the middle of the frame under the action of a cylinder (1/4 acc.drwg) and carries the movable cutting and notching tools.

\* ELECTRIC OR CONTROL CABINET (See CATALOGUE): a chest that accommodates most of the electric components of the machine (fuses, relays, transformer, contactor, etc.). The cabinet or control panel is permanently accessible and is mounted on the front of the bed.

\* HYDRAULIC UNIT (See CATALOGUE): Its function is to control the movement of the cylinders according to the actuation of the pedal.

The pump driving motor and the electrovalves that 'dispense' the oil delivered by the pump are mounted on the oil tank.

The reference of the hydraulic unit of your machine is indicated on the INSPECTION AND CONTROL CARD.

\* PEDAL (See CATALOGUE): The actuator switch controlling the up and down movements of the cutter cylinders, and hence tools of the machine. There are two types of pedals: single and double, which are described in section 3.1.1. CONTROL ELEMENTS.

\* PUNCH (See CATALOGUE) (7/4 acc.drwg): Treated steel tool designed to pierce holes (to punch). It can be of any shape. As standard, round, square, rectangular and oblong shapes are available.

\* DIE (See CATALOGUE) (7/2 acc.drwg): Fixed treated steel tool placed in a horizontal plane with respect to the punch, at a given distance called clearance or gap.



\* BLADES OR KNIVES (See CATALOGUE): Treated steel tools for cutting sections. According to the shape of same, there are four types available:

- Angle shear knives: see assembly drawing No. 15
- Flat shear knives: (1/46A + 1/46 acc.drwg)
- Bar cropper blades: (1/43 acc.drwg)
- Notcher blades: see assembly drawing No. 9

## SECTION 2 - INSTALLATION

### 2.1. PREREQUISITES

Prior to installing any **GEKA HYDRACROP** machine, make sure that the following minimum infrastructure and location requirements are fulfilled:

- + The machine will be installed in a moisture-free, ventilated roofed area, at a room temperature varying from 0° to 35° C and will not be subject to weathering.
- + The floor is made of concrete and levelled.
- + The machine will be placed outside access and traffic zones.
- + The machine will be placed away from any wall and there will be a sufficient clearance for the feeding and discharge of workpieces. The risks for any person passing by and/or standing at either side of the machine shall be calculated at all times.
- + Anchoring the machine into the floor is recommendable in all cases and is imperative for all machines equipped with such attachments as feeders, copying tables, PAXY systems, etc.  
For anchoring the machine into the floor, use the holes drilled in the machine bed, which become apparent after removing the packing skids.
- + The electric cables (3 leads + earth) to the control cabinet will be laid in underground or overhead protective cableways and their section will be appropriate for the installed power (see CATALOGUE/FOUNDATION DRAWING). Check that the mains voltage coincides with the motor, transformer and wiring voltage requirements.

The power supply and electrical installation shall comply with the electric safety regulations in force and the voltage range shall be the rated voltage  $\pm 5 \%$ .

### 2.2. TRANSPORT AND UNPACKING

Lifting and carrying the machine must ALWAYS be made by HANGING same from the eyebolt(s) (1/94 acc.drwg) provided for this purpose at the top of the machine.

The machine weight is indicated on the transport instruction label stuck on the outside of the packing material. If missing or when in doubt, please refer to the CATALOGUE or contact your distributor or the manufacturer.

Never lift the machine holding it by the bed (1/87 acc.drwg) only, since you would then run the risk of its overturning.



For its transport from the factory, the machine is supported by two skids (wood planks) which should not be used as a permanent base for the machine, since they could cause injuries to anybody stumbling on same. The skids should therefore be removed while the machine is hanging from the crane, at an adequate height from the floor.

After placing the machine on the floor, proceed as follows:

+ Cut the packing ropes and remove the plastic film protecting the machine during its transport.

+ Next, remove the paper or cardboard packages which are leaning against the machine and contain accessories, pedals and tools placed in that position for easier transport. Unpack these components and keep them in a safe place.

### 2.3. INSTALLATION LAYOUT

Refer to the INSTALLATION LAYOUT of your machine, which is attached hereto and shows the dimensional characteristics of the specific model you have acquired.

### 2.4. INSTALLATION INSTRUCTIONS

Installing the machine shall be made, complying with the instructions and verifications detailed below:

+ Verify if the machine bed is perfectly flat on the floor, i.e. it is not rocking. Otherwise, level and wedge the machine appropriately.

+ Mount the different attachments previously unpacked, following the instructions given in the relevant ATTACHMENT INSTRUCTION APPENDIX.

+ The punching and notching worktable as well as the electric stop are very usual (and recommended) attachments. Installing them is, therefore, described below:

The tables are supplied pre-mounted from factory and the straightedges only should be mounted on site, proceeding as follows:

1.- Install the (long) cross straightedge (43/2 - 9/4 acc. drwg), placing it on the worktable and pushing it, by both ends simultaneously, into the gap of the workstation and then lock it with the relevant attaching flanges.

2.- The (short) longitudinal straightedge (43/3 - 9/12 acc. drwg) is mounted on the cross straightedge (43/2 - 9/4 acc. drwg). In all cases, verify that it is secured in place.



Installing the electric stop should be made following the procedure described below:

1.- Place the longitudinal stop bar (6/1 acc.drwg) with the millimeter rule upwards; tighten securely the Allen screws ("A") in the threaded holes provided for in the punch-holder rotation bolt area (1/11 acc.drwg) at the back of the machine.

2.- Slide the crankpin (6/2 acc.drwg) fixed to the cross bar (6/5 acc.drwg) along the longitudinal stop bar (6/1 acc.drwg) and lock it using the lower clamping lever.

3.- Connect to the socket outlet provided for this purpose at the rear of the machine, verifying that all parts are fixed properly.

The adjusting procedure for this accessory is described in paragraph 3.3.G. - ADJUSTMENT OF ELECTRIC STOP.

+ The pedal protection casing is fitted with a knobbed rod for easier transportation. Tighten the nuts at the threaded end.

+ The magnetic lamp must obligatorily be plugged in the 12 V socket provided for this purpose at the top rear guard of the machine.

+ Clean the machine thoroughly, remove all grease from the notcher and lubricate the machine (See 4.2 - LUBRICATION AND CLEANING).

+ Check the oil level. The machine is dispatched from factory with the oil tank filled up to the appropriate level. (See 4.1.A. - MAINTENANCE OPERATIONS: OIL).

+ Make sure the voltage of the motor, the motor wiring and the connections to the transformer is the same as the mains voltage.

+ Proceed with wiring the machine, as follows:

1. Open the machine bed guard and the electric cabinet.

2. Introduce the power cable in the hole at the bottom of the electric cabinet.

3. Connect the power cable wires to the terminals as indicated below:

- . Earth terminal ----> ground wire  
(green-yellow) (green-yellow)
- . R terminal -----> PHASE conductor
- . S terminal -----> PHASE conductor
- . T terminal -----> PHASE conductor



4. Close the machine bed guard and the electric cabinet door.

5. Make sure the emergency stop pushbuttons (red mushroom-headed button on yellow base) are not locked up, by turning them anti-clockwise until the mushroom head is totally clear at the top of the yellow base.

6. Remove the punch. To do so, retract the punch stripper (1/47 acc. drwg), pushing downwards with a 180° turn; then using the spanner supplied with the machine, slightly undo the nut (7/6 acc.drwg), turn the bayonet-socket (7/5 acc.drwg) which can then be taken out together with the punch.

7. Turn the main switch [A] clockwise (45°), the white power-on indicator [50] on the control panel must turn on. (See paragraph 3.1.1. - CONTROL ELEMENTS).

8. Electric wiring shall be considered to be completed, after checking the motor direction of rotation, in accordance with paragraph 3.3.4. - START-UP.

**WARNING !**

The machine is now ready to work, but **DO NOT** put it in operation without reading first Section 3 completely: OPERATION (3.1/2), SETTINGS (3.3) and START-UP (3.4) and, above all, understanding perfectly the content of Section 7 - SAFETIES.

## SECTION 3 - OPERATION AND SETTINGS

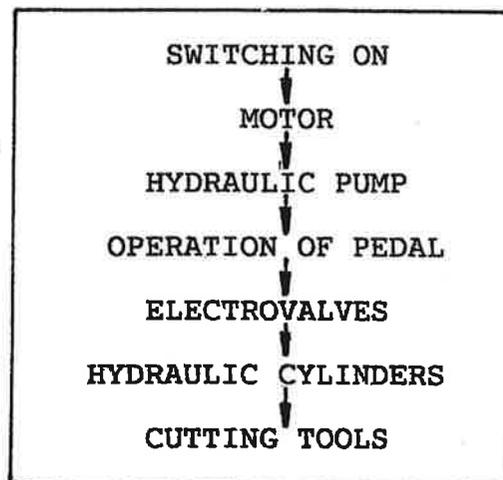
### 3.1. OPERATING PRINCIPLE

Assuming you are familiar with the definitions of the components set forth in paragraph 1.2 - GLOSSARY, we shall now explain how those elements actuate in order that the machine can operate.

By pressing the green pushbutton, you make the main switch that starts up the motor and, then, when you apply on the pedal(s), the electric control, depending on its selectors, generates the commands to the electrovalves of the hydraulic unit for distributing the oil delivered by the pump to the cylinders.

The cylinders, in their turn, transmit the motion to the punching head and the shearing knife-holder, complete with their cutting tools. The fixed knives or blades as well as the cylinders are mounted on the machine frame.

Schematically, the operating sequence can be established as follows:



Below is a guiding list of materials classified by their nature:

\* HYDRAULIC ELEMENTS (Refer to PARTS LIST OF HYDRAULIC UNIT)

- HYDRAULIC UNIT:      Electrovalves  
                            Safety valve  
                            Block  
                            Pump  
                            Oil tank
- CYLINDER(S):         Guide  
                            Rod  
                            Piston  
                            Seals (gasket, retainers, O-rings)

\* HYDRAULIC HOSES  
\* ELECTRIC ELEMENTS (Refer to LIST OF CONTROLS)

- ELECTRIC CABINET: Transformer  
Relays  
Switches
- LIMIT SWITCHES
- EMERGENCY STOP PUSHBUTTONS
- ELECTRIC FOOT-CONTROLS (PEDALS)
- MOTOR

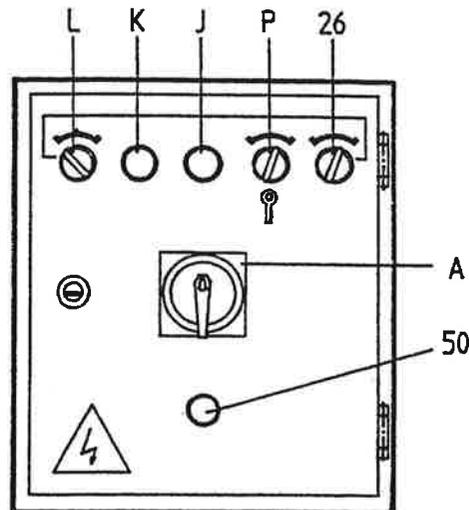
\* MECHANICAL ELEMENTS

- ALL OTHER PARTS, NOT LISTED ABOVE.

### 3.1.1. CONTROLS

The next table will enable you to determine which controls are available on your machine. These controls are individually described hereafter.

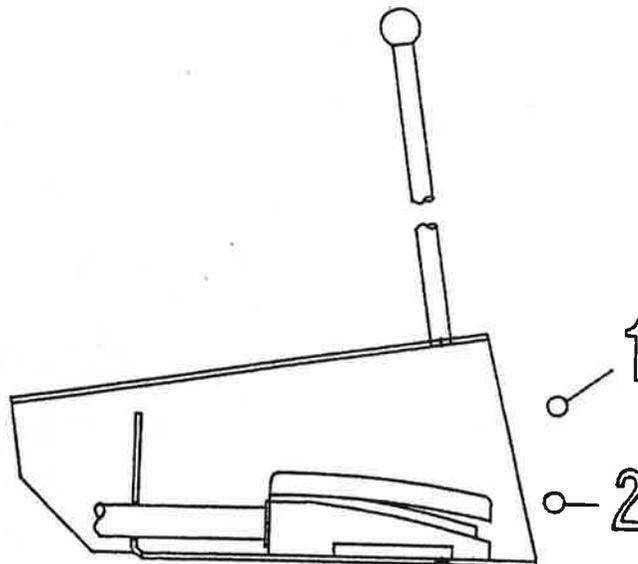
| <u>MACHINE</u>   | <u>CONTROLS</u>               |
|------------------|-------------------------------|
| HYDRACORP "A"    | 1-L-A-K-J-23-24-26-P-50- 6(*) |
| HYDRACOPR "S-SD" | 2-L-A-K-J-23-24-26-P-50- 6(*) |



\* THE ELECTRIC STOP [6] is supplied as an optional accessory, although it is highly recommended.

#### [1] SIMPLE PEDAL

As can be seen on the illustration, it has two operating positions:

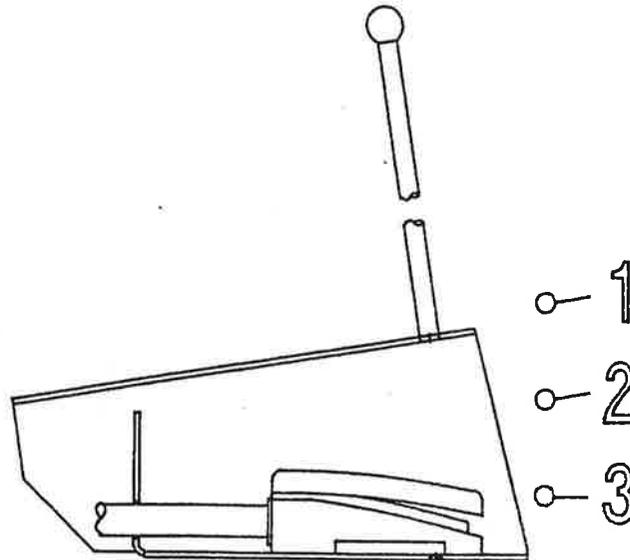


**GEKA** 

1. STOP. When the pedal is in this position, the punch-head rises up to the up-stroke limit switch which is then activated and no electric impulse is sent.
2. RUN. With the pedal in this position, the punch-head moves down, allowing the process to be carried out.

[2 ]DOUBLE PEDAL

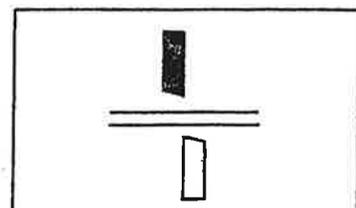
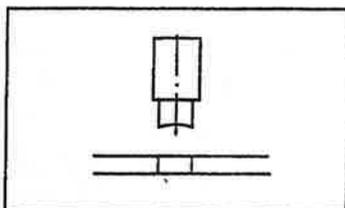
As can be seen on the illustration, it has three operating positions:



1. STOP. When the pedal is in this position, the punch-head rises up to the up-stroke limit switch which is then activated and no electric impulse is sent.
2. INCHING. With the pedal in this intermediate position, the punch-head is lowered at low speed (jogged).
3. RUN. With the pedal in this position, full pressure is applied to the punch-head that moves down at full speed, allowing the process to be carried out.

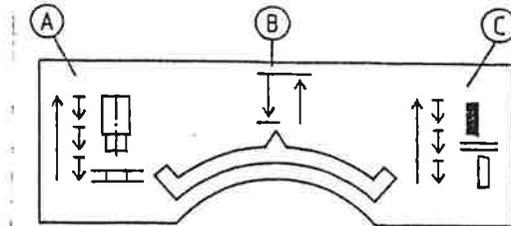
Passing directly from STOP (1) to RUN (3) is possible.

The HYDRACROP A-S-SD models are supplied with a punch control pedal whose cable comes out near the electric cabinet and a shear control pedal whose cable entry is in the notcher area. Each pedal is identified by means of the relevant symbol.



**GEKA** 

## [L] APPROACH MODE SELECTOR



It operates as follows:

+ Left position (A). The automatic return of the punch assembly to the top position is inhibited. The tool remains where it is when the pedal is released. It is recommended to place the selector in this position for easier centering of the workpiece and adjusting/centering the tools.

+ Right position (C). It has the same function as position (A), except that it concerns the workstations associated with the knife-holder (1/18) acc.drwg), i.e. flat and angle shears, round and square bar cropper and notcher.

+ In order to work on all stations at the same time, the selector has to be in the central position (B) which enables the automatic return of the tool to its upper position when the pedal is released.

In relation to the above, mind that the machines are provided with TWO LIMIT SWITCHES controlling the stroke of the cylinder. Therefore, in spite of this selector being in either the "PUNCH APPROACH" (A) or "PLATE APPROACH" (C) position, when the bottom limit switch is activated, the headstock will rise to the stop of the top limit switch, as the pedal is released.

When working in the "APPROACH MODE" (PLATE or PUNCH), the pressure in the other workstations IS NOT NECESSARILY THE FULL PRESSURE, BUT CAN BE THAT APPLIED TO THE WORKSTATION OPERATING IN THE APPROACH MODE.

### [A] MAIN SWITCH

Power ON/OFF switch. With the switch in the "0" position, no power is supplied to the machine; with the switch in the "I" position, the machine is power-supplied and the white pilot lamp [50] turns on, indicating that condition.

### [K] GREEN PUSHBUTTON

Machine start pushbutton. The motor gets started with no pressure build-up in the hydraulic group. The machine waits for the relevant electric signal from pedal [1][2] or electric stop [6], in order to start working.

### [J] RED PUSHBUTTON

Machine stop pushbutton. The machine continues to be power-supplied, although the motor stops.

### [23] EMERGENCY STOP(S)

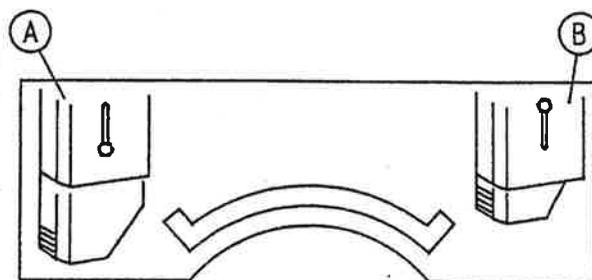
Red (mushroom-headed) pushbutton on yellow base, in visible areas of the machine. When operated, the machine instantly stops working and the button remains interlocked. In order to restart the machine, it is necessary to unlock the emergency stop button (by rotating the mushroom head) and to press the green start pushbutton [K].

### [24] LIMIT SWITCHES

Switches adapted to control the stroke (travel) of the piston(s). Paragraph 3.3.A - SETTINGS: PUNCH-TO-DIE DISTANCE/SETTING OF LIMIT SWITCHES gives full details on such switches. We urge you to read said paragraph carefully, because correct setting is one of the most important elements for optimizing your job.

### [P] NOTCHER GUARD SAFETY LATCHKEY

It aims at protecting the operator or third persons against the potential risk of injury that may arise from working with the protective sliding guard of the notcher (1/54 acc.drwg) lifted.

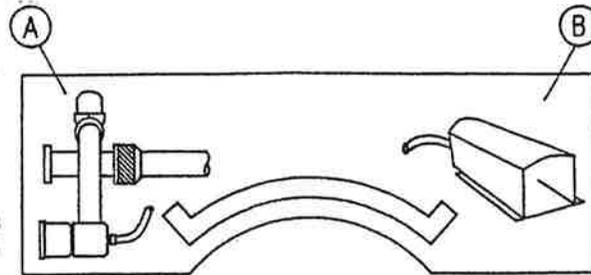


Left turn position (A). (The key is removed and kept by the shop leader). The machine can work only if the sliding guard of the notcher (1/54 acc.drwg) is closed.

Right turn position (B). (The key is inserted into the key switch, by authorization of the shop leader). This position is provided for exceptional use, when it is absolutely necessary to lift the sliding guard of the notcher (1/54 acc.drwg) in order to do the job. On completion of the operation, the key must be given back to the shop leader.

For further details on this item, refer to Section 3.2.5 - NOTCHING.

## [26] ELECTRIC STOP / PEDAL SELECTOR



It is designed to unify the electric control of the machine, so that:

When in left position (A), the machine is actuated through the electric stop only.

When in right position (B), the machine is actuated through the pedal only.

If latchkey [P] is in the (B) position, the electric stop will not actuate at all, even though the sliding guard of the notcher (1/54 acc.drwg) were closed.

## [50] WHITE PILOT LAMP

It indicates that the machine is power-supplied (refer to "[A] -Main Switch").

## [6] ELECTRIC STOP

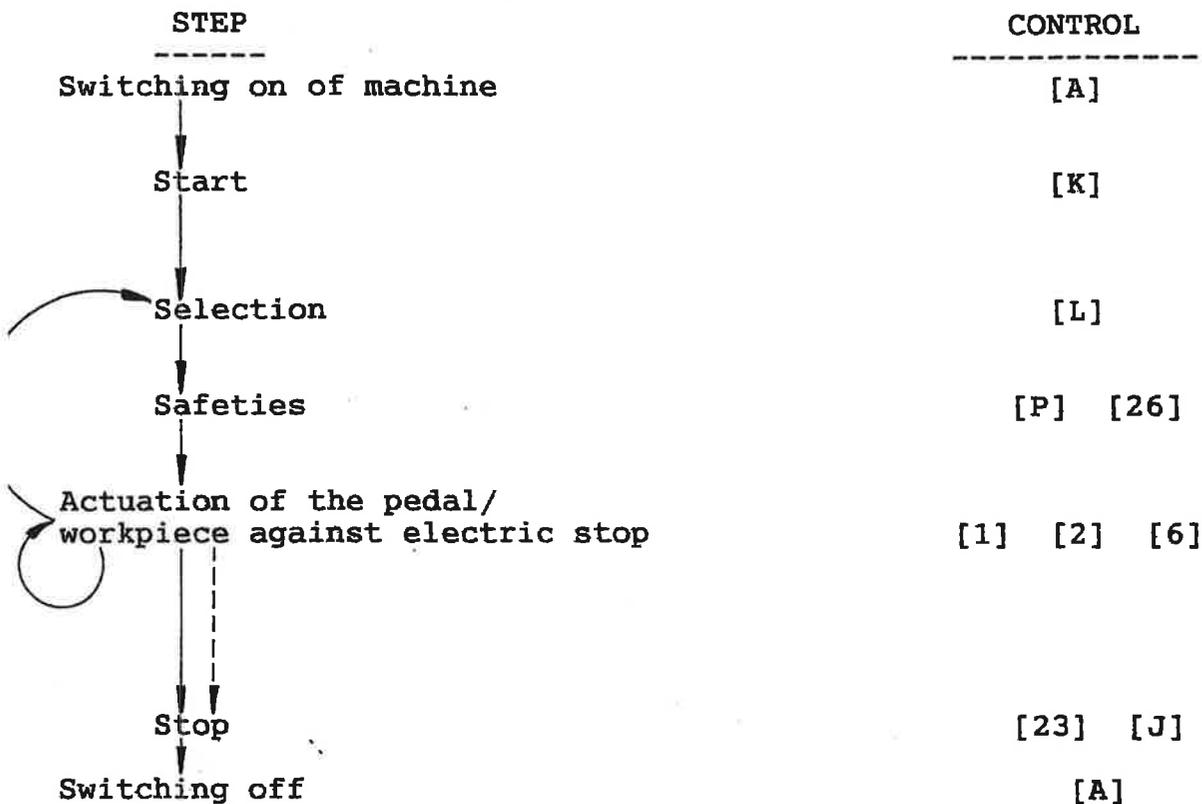
It becomes a control when the ELECTRIC STOP/PEDAL SELECTOR [26] is in the (A) left position and the workpiece presses against (hits) the electric stop end (6/8 acc.drwg). On receiving the electric impulse, the notching head moves to the lower limit switch, thus performing the job, and then returns to the upper position, thus completing the process cycle.

Never generate the electric impulse manually, as this might endanger the safety of any operator at the other side of the machine, who would not expect the machine start-up.

Before proceeding with any setting or maintenance operation of the machine, turn it off and place the pedals [1] [2] behind same, making sure that nobody will use them.

Paragraph 3.2.2 - "DESCRIPTION OF EACH WORKSTATION FUNCTION: FLAT SHEARING" provides further information about this accessory.

Schematically and by way of summary, the operative steps sequence would be as follows:



### 3.2. DESCRIPTION OF EACH WORKSTATION FUNCTION

#### GENERAL PRELIMINARIES

Please read and take note of the warning/instruction plates affixed to the machine. Follow those instructions exactly and do not remove the plates for no reason whatsoever.

Remember that the nameplate ratings for all workstations are maximum values which are valid for any material with a resistance up to 45 kg/mm<sup>2</sup>. When processing material with greater resistances, the maximum thickness of that material should be calculated according to the following equation:

$$\text{NEW MAX. THICK.} = \text{THICK. FOR 45 kg/mm}^2 \times \frac{45}{\text{NEW MATERIAL RESIST. (*)}}$$

(\*) THE MATERIAL RESISTANCE HAS TO BE CONFIRMED/CERTIFIED BY THE SUPPLIER.

By way of an illustration and application of the a.m. equation, the machine capacity (NEW THICKNESS) for stainless steel of 75 kg/mm<sup>2</sup> resistance (NEW MATERIAL RESISTANCE) would be equal to 60% of the nameplate rating (60% being obtained from the quotient: 45/75 = 0.6).

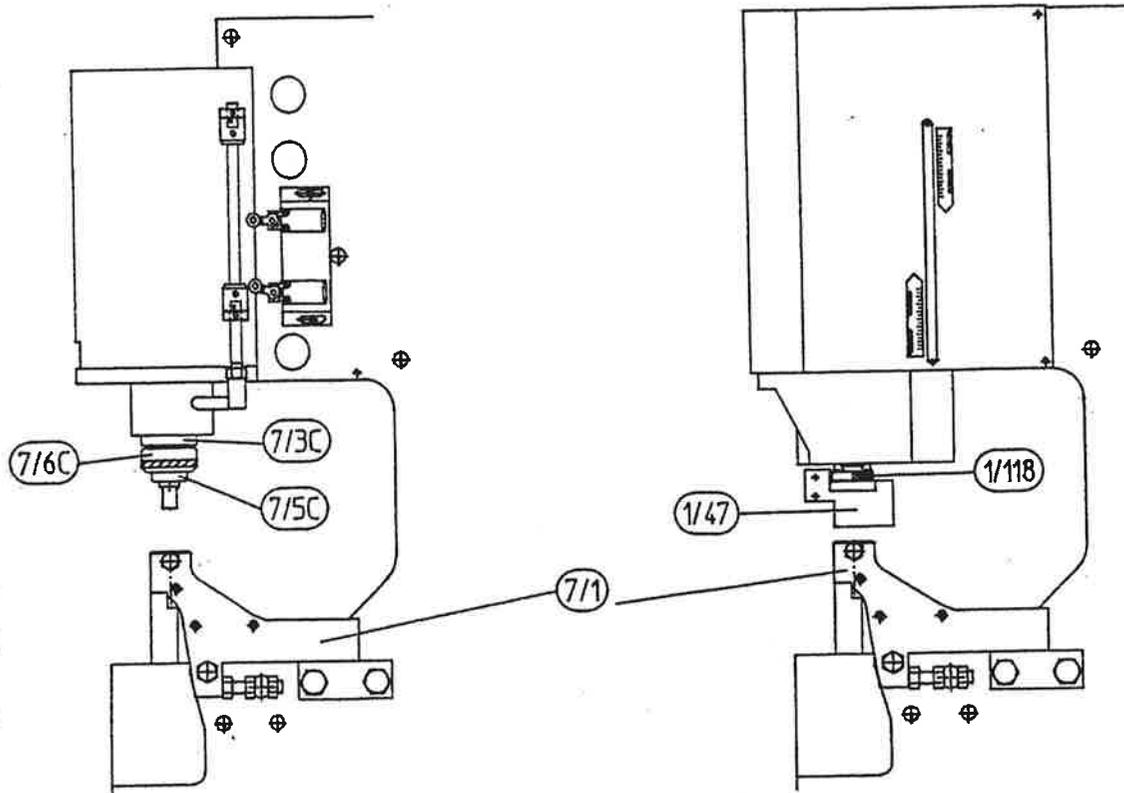
For any subject related to the use and optimization of the cylinder stroke, refer to paragraph 3.3.A - PUNCH-TO-DIE DISTANCE/SETTING OF LIMIT SWITCHES.

Take good note of our recommendations about SAFETY in Section 7 and care for your health at all times (that's a value we can neither sell you nor replace !).

You are kindly requested to wear goggles, gloves, a safety cap, an apron in order to protect your body and, specially, your eyes, face, head, hands and arms.

## DESCRIPTION OF EACH WORKSTATION FUNCTION

### 3.2.1 .PUNCHING



+ Before starting punching, the two requisites described below must be complied with, namely:

#### 1-- FIRST REQUISITE (THICKNESS CONTROL)

In order to determine the MAXIMUM ADMISSIBLE THICKNESS for all sorts of materials, use the following equation:

$$\text{MAX. THICK. (mm)} = \text{PUNCH DIA. (mm)} \times \frac{45}{\text{MATERIAL RESIST. (*) (kg/mm}^2\text{)}}$$

(\*) THE MATERIAL RESISTANCE HAS TO BE CONFIRMED/CERTIFIED BY THE SUPPLIER.

When the RESISTANCE OF THE MATERIAL TO BE PUNCHED (kg/mm<sup>2</sup>) is equal to 45 kg/mm<sup>2</sup>, then the MAXIMUM ADMISSIBLE THICKNESS IS EQUAL TO THE PUNCH DIAMETER. As a result, never try to punch a hole in a plate whose thickness is greater than the punch diameter ("needle effect"--risk of punch breakage). For example, DO NOT TRY to punch a 10 mm dia. hole in a plate 11 mm in thickness.

As for shaped punches, the PUNCH DIAMETER value is derived from the smallest side of the design. EXAMPLE 1-1:

**GEKA**

Can a 4 mm dia. hole be punched in a 3 mm thick stainless steel plate with a resistance of 70 kg/mm<sup>2</sup> ?

$$\text{MAX. ADMISSIBLE THICKNESS} = 4 \times \frac{45}{70} = 2.57 \text{ mm}$$

Hence, IT CANNOT, the maximum admissible thickness under the mentioned conditions being 2.57 mm (which is less than 3 mm) and, the punch running the risk of shattering.

-----

EXAMPLE 1-2:

Can you punch a 10 mm dia. hole in a 5 mm thick steel plate with a resistance of 60 kg/mm<sup>2</sup> ?

$$\text{MAX. ADMISSIBLE THICKNESS} = 10 \times \frac{45}{60} = 7.50 \text{ mm}$$

Hence, YOU CAN since the maximum punchable thickness under the mentioned conditions is 7.50 mm (which is more than 5 mm).

-----

EXAMPLE 1-3:

Can 20x5 mm square holes be punched in 4 mm thick stainless steel plates with a resistance of 45 kg/mm<sup>2</sup> ?

$$\text{MAX. ADMISSIBLE THICKNESS} = 5 \times \frac{45}{45} = 5 \text{ mm}$$

Hence, THEY CAN, the thickness of the plate to be punched (4 mm) being inferior to the maximum admissible thickness (5 mm).

2-- SECOND REQUISITE (CONTROL OF TONS REQUIRED)

In order to determine the number of TONS REQUIRED, whatever the type of material, use the following equation:

$$\text{TONS REQUIRED} = \frac{\text{DIA. (mm)} \times 3.1416 \times \text{THICK. (mm)} \times \text{MAT. RESIST. (*) klg/mm}^2}{1000}$$

(\*) THE MATERIAL RESISTANCE HAS TO BE CONFIRMED/CERTIFIED BY THE SUPPLIER.

If the TONS REQUIRED calculated according to the specified



equation are not available at the PUNCHING STATION of your machine (Refer to MACHINE CATALOGUE), REFRAIN FROM DOING THE JOB CONCERNED.

For punches of any shape, but round, the product of DIAMETER (mm) x 3.1416 in the equation should be replaced by the perimeter.

EXAMPLE 2-1:

What is the punching force required to punch a 23 mm diameter hole in a 17 mm thick material with a resistance of 45 kg/mm<sup>2</sup> ?

$$\frac{23 \times 3.1416 \times 17 \times 45}{1000} = 55.276 \text{ MT required}$$

EXAMPLE 2-2:

What is the punching force you need in order to punch a 23 mm dia. hole in a 12 mm thick stainless steel plate of 70 kg/mm<sup>2</sup> ?

$$\frac{23 \times 3.1416 \times 12 \times 70}{1000} = 60.69 \text{ MT required}$$

EXAMPLE 2-3:

What is the punching force required to punch a 12 mm dia. hole in a 17 mm thick material with a resistance of 45 kg/mm<sup>2</sup> ?

THIS JOB CANNOT BE DONE. REMEMBER THAT, FOR ANY MATERIAL WITH A RESISTANCE FROM 45 KG/MM<sup>2</sup> UPWARDS, THE THICKNESS MUST BE EQUAL TO OR LESS THAN THE PUNCH DIAMETER. (Refer to FIRST REQUISITE - THICKNESS CONTROL.)

EXAMPLE 2-4:

What is the punching force you need in order to punch a 28x10 mm oblong hole in a 3 mm thick material with a resistance of 60 kg/mm<sup>2</sup> ?

Perimeter of the oblong hole = 2(a-b) + (3.1416 x b) = 36 + 31.41 = 67.41

where (axb) = (28x10) ----> a=28 ; b=10.

$$\frac{67.41 \times 3 \times 60}{1000} = 12.13 \text{ MT required.}$$



\* Check with the supplier if the material is suitable for your punching conditions.

\* When punching, always use the punch stripper (1/47 acc.drwg) correctly mounted on its supports (1/118 acc.drwg) and levelled as far as possible. Otherwise, you would run the risk of the punch breaking when being removed from the workpiece.  
(SEE PLATE NUMBER 6 SECTION 7 -SAFETIES)

\* As an accident-preventive measure, enclose the punch peripherally by lowering the punch stripper (1/47 acc.drwg) to a distance of 1 mm from the workpiece, using, to this end, its supports (1/118 acc.drwg).

\* Do not use the punching station to make holes bit by bit; always punch the hole through at once.

\* For easier working and SAFETY's sake, we recommend to use the worktable in the punching station. The relevant instructions are included at the end of this section.

\* Check the down-stroke of the punch for correct length, making sure that the punch body will interfere with neither the die nor the workpiece. In any case, verify if the punch path is free from obstacles.

\* For punching angle sections near the leg, use eccentric punches and dies. In this event, the maximum punchable thickness is equal to half the diameter of the hole to be made.

\* Small angle sections may, sometimes, be punched with the legs "upwards". In this event, insert the section through the rear vertical opening in the punch stripper (1/47 acc.drwg) and verify clearance at nut (7/6C acc.drwg) and socket (7/5C acc.drwg).

\* When punching small parts with areas smaller than the area of the punch stripper (1/47 acc.drwg) complete with its guards and rolls (3/19 - 3/19P acc.drwg), do not position them with your fingers, but use the positioning rods or any appropriate tool (except your hands !).

\* Lubrifying the punch will contribute to a longer service life and easier operation. For this purpose, any type of oil can be used. However, always lube with a direct-pump oilcan to preserve your hands.

\* In order to change the punch-die assembly, proceed as follows, using the special 'C'-spanner supplied in the toolkit.

0. Stop the machine by pressing the red pushbutton [J].

1. Conceal the punch stripper-protection (1/47 acc.drwg) by pushing it downwards and turning to 180 degrees.



2. Remove the punch. To do so:

- ease the punch fixing nut (7/6C acc.drwg),
- detach the bayonet socket (7/5C acc.drwg) by turning the nut 1/4 of a turn anti-clockwise, the punch then coming off.

3. Remove the die. To do so:

- Undo the die lockscrew from the die-holder (7/1 acc. drwg) and remove the die.

4. Clean the punch and die seats. Verify if the key and all residues of the last punch used have been removed from the punch base (7/3C acc.drwg).

5. Choose the new punch and die. Verify if the cutting face of the punch can enter the die with some play.

Check the punch for proper working condition, i.e. the entire cutting edge must be sharp-edged and free from roundness and notches. Furthermore, verify if the cutting-edge diameter is greater than the diameter of any part of the punch that will possibly penetrate into the workpiece.

6. Put the new die in place with the cutting edge upwards and push it downwards until it perfectly fits in the seat (7/1 acc. drwg). Then, fix it by tightening the lockscrew against the external groove of the die.

7. Replace the punch, proceeding in the inverse order of its dismantling (steps 2-1-0).

When the shape of the cutting tool is not round, but square, rectangular, oblong, etc., make sure that the punch and die assembly positions are identical. On the other hand, insert the punch head positioning key into the punch keyway and into the punch-holder (7/3C acc.drwg). Before tightening the nut (7/6C acc.drwg) securely, verify if the punch head is fully seated on the punch-holder (7/3 acc. drwg) by correctly placing the key inside same. Prevent the punch from rotating when tightening the nut (7/6C acc.drwg) and make sure that its positioning coincides exactly with that of the die.

8. Verify the punch-die alignment each time you change the tool and make sure both components remain aligned throughout the punching process, by checking them for correct centering at regular intervals. When working under hard conditions (hard material, small diameter, great thickness), increase the number of verifications. (Refer to paragraph 3.3.B - PUNCH-TO- DIE CLEARANCE AND ALIGNMENT.)

(SEE PLATE NUMBER 3 SECTION 7-SAFETIES)



\* **Directions for use of the worktable**

Place the part to be punched against the cross straightedge (43/2 acc.drwg) and the longitudinal straightedge (43/3 acc.drwg), both having been previously positioned by cross-reference to the millimeter rules and secured by their respective blocking levers.

The coordinates are read on the front of cross straightedge (43/2 acc.drwg) and 0|0 side of longitudinal straightedge (43/3 acc.drwg).

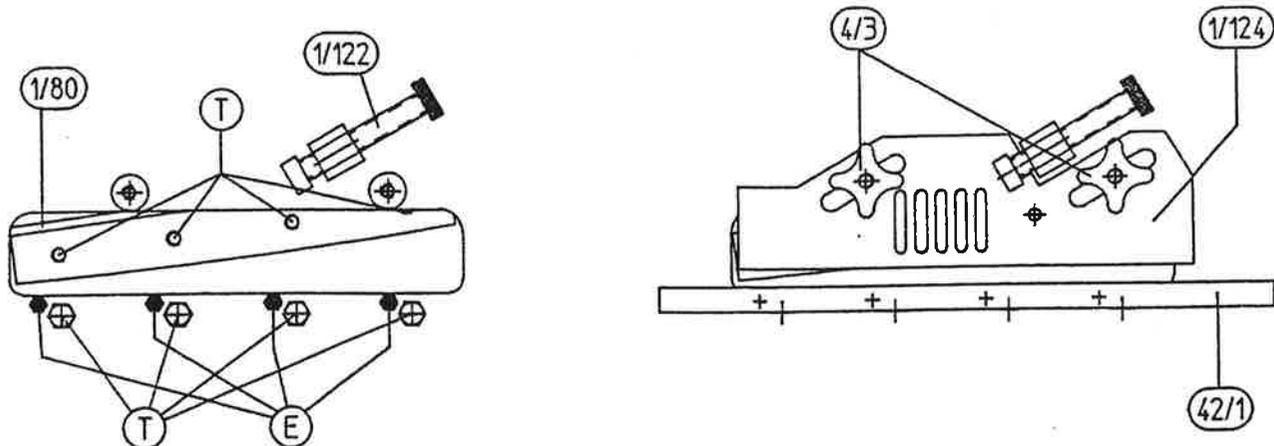
The drop (tracing) worktable (43/51 acc.drwg) can be concealed by releasing the clamping levers located under same and removing the table fixing bar (43/53 acc.drwg). It is necessary to drop the table in order to punch holes in the leg of an angle.

**\*OPERATION - PLACE THE WORKPIECE IN THE PUNCHING STATION FOLLOWING THE DIRECTIONS FOR USE OF THE WORKTABLE OR PLACE THE PREVIOUSLY TRACED WORKPIECE ENSURING THAT THE MARK COINCIDES WITH THE PUNCH POINTER.**

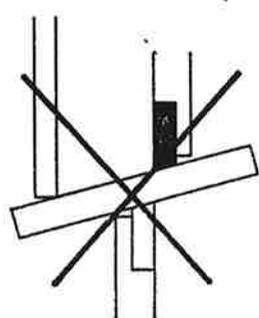
**ACTUATE THE CONTROLS DESCRIBED AT THE BEGINNING OF THIS SECTION (3.1.1), TAKING INTO ACCOUNT OUR INSTRUCTIONS FOR:**



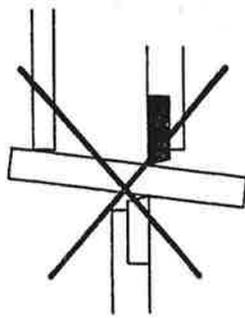
### 3.2.2 .FLATS AND PLATES SHEARING



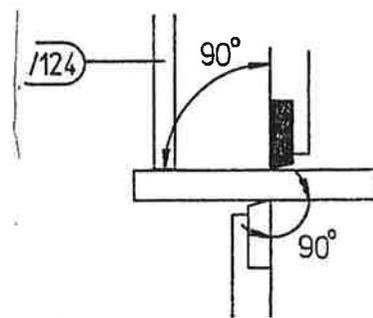
\* When cutting flats, always use the flat stop (1/124 acc. drwg) which shall be adjusted proceeding as follows:  
(SEE PLATE NUMBER 4 SECTION 7 -SAFETIES)



WRONG



WRONG



RIGHT

1. Undo the fixing butterfly nuts (4/3 acc.drwg).
2. Raise or lower the stop (1/124 acc.drwg) by turning the thumbscrew (1/122 acc.drwg) until the entire bearing face of same leans against the workpiece.
3. When this is achieved, slightly lift the stop (1/124 acc. drwg) (1 mm) to allow introducing the workpiece and tighten the fixing butterfly nuts. The guide need not be adjusted while processing always the same material width. Any abuse of or failing to use this stop may cause serious damages. Therefore, we urge you to use it properly.

\* The upper face of the flats support table (42/1 acc.drwg) has guide marks for miter-cuts. Besides, it is recommended to use the guide bars (42/2 acc.drwg) in order to "emprison" the workpiece, in such a way that same is held down by the stop (1/124 acc.drwg) and laterally by the guide bars (42/2 acc.drwg).

**GEKA**

\* For correct sizing of the material to be cut, we recommend the use of the electric stop described, as to its operation, at the end of this section.

\* The number of cutting edges of each blade is specified in the table below:

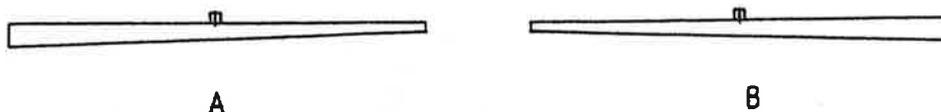
| MACHINE       | NUMBER OF CUTTING EDGES       |                                 |
|---------------|-------------------------------|---------------------------------|
|               | TOP BLADE<br>(1/46A acc.drwg) | BOTTOM BLADE<br>(1/46 acc.drwg) |
| HYDRACROP 50  | 2                             | 4                               |
| HYDRACROP 70  | 2                             | 4                               |
| HYDRACROP 100 | 1                             | 4                               |
| HYDRACROP 150 | 2                             | 4                               |

\* For good quality cutting and a longer service life of both machine and tools, a correct use of the wedges and positioning of the blades is required.

HYDRACROP 50-70-150 models are supplied, from factory, with an insert on the top blade. This insert (1/80 acc.drwg) is used for cutting flats less than 13 mm in thickness.

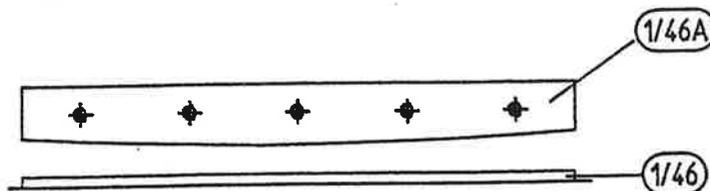
Prior to cutting flats over 13 mm in thickness, it is necessary to dismount the top blade (1/46A acc.drwg) and to remove the insert (1/80 acc.drwg).

On HYDRACROP 100 machines, the top blade (1/46A acc.drwg) is provided with a wedge (1/80 acc.drwg) which should be mounted in either position, as follows:



- Position (A), for cutting plates less than 13 mm in thickness.
- Position (B), for cutting plates over 13 mm in thickness.

- On this model, the top blade (1/46A acc.drwg) can be mounted in one position only, as illustrated below:



**GEKA**

\* In order to replace the flat shear blades, proceed as follows:

0. Stop the machine by pressing the red pushbutton [J] when the tool-holder operating cylinder is at the highest point of its travel.

1. Remove the BOTTOM BLADE (1/46 acc.drwg). To do so:

- Unscrew the fixing butterfly nuts of the stop (1/124 acc.drwg) and take it out.

- Undo the hex-headed screws DIN 933 (T) only, with their respective washers, which hold down the blade. These screws are at the same level as the plate support table (42/1 acc.drwg) (which can be removed, if necessary).

2. Remove the TOP BLADE (1/46A acc.drwg). To do so:

- Lift the rear guard (3/4 acc.drwg) of the flat shear.

- Undo the hex-headed screws DIN 933 (T) only, with their respective washers and remove the blade.

3. Clean the housings thoroughly and proceed the other way round in order to install new blades or to change the cutting edge of the existing ones.

4. Check the clearance, adjust stud bolts DIN 913 (E) if necessary and tighten them securely. (Refer to Paragraph 3.3.C - CLEARANCE BETWEEN FLAT SHEAR BLADES...).

5. Replace the stop (1/124 acc.drwg) and tighten the butterfly nuts (4/3 acc.drwg).

**DO NOT START THE MACHINE UNLESS YOU ARE QUITE SURE THE BLADES ARE CORRECTLY MOUNTED.**

The operation of the electric stop is identical at all cutting stations. To work with the electric stop, proceed as follows:

0. Adjust the electric stop following the instructions under paragraph 3.3.G - ADJUSTMENT OF ELECTRIC STOP.

1. Bring the end of the cross stop bar face to face with the cutting station to be used, by actuating the clamping levers of the crankpin (6/2 acc.drwg). Make sure that the bar end in contact with the workpiece is slightly inclined to allow free falling of the cuttings.

2. Select the desired cutting length, which shall be given by the intersecting point of the adjustable thumbscrew (6/3 acc.drwg) and the millimeter rule.

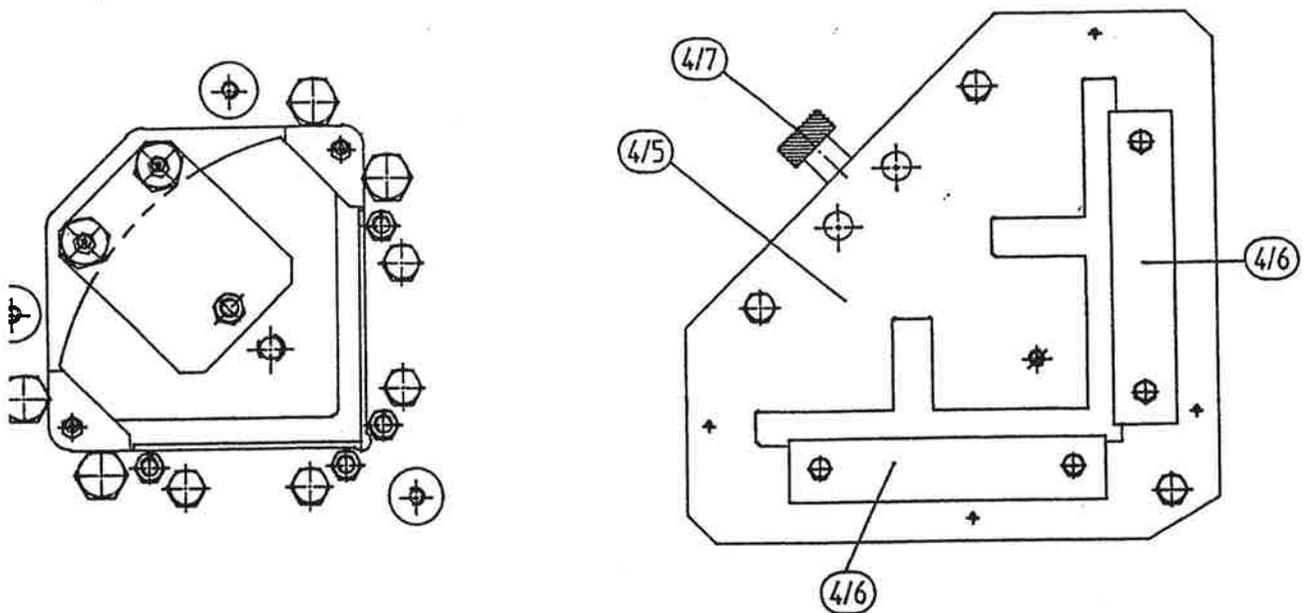
3. Put selector [26] in position (A).



4. Insert the workpiece until it hits the electric stop head, previously centred with respect to same. At that moment, the machine will start working, without need for applying on the pedal.

**\*OPERATION - INTRODUCE THE WORKPIECE LEANING ON THE SUPPORT TABLE (42/1 acc.drwg) INTO THE FLAT OR PLATE SHEARS, GUIDING SAME WITH THE STOP BARS (42/2 acc.drwg), EITHER UNTIL IT HITS THE ELECTRIC STOP OR UNTIL THE PRESET REFERENCE MARK IS REACHED. IN THIS LATTER CASE, HOLD THE WORKPIECE WITH THE GUIDE (1/124 acc.drwg) AND ACTUATE THE RELEVANT CONTROLS, AS DESCRIBED AND TAKING INTO ACCOUNT OUR INSTRUCTIONS AND RECOMMENDATIONS.**

### 3.2.3. ANGLE IRON SHEARING



\* As on all workstations, the use of the guide-stop (4/5 acc.drwg) together with the clamping bolt (4/7 acc.drwg) is essential for good performances. Proceed as follows:

Turn the knurled head clamping bolt (4/7 acc.drwg) associated with the guide-stop (4/5 acc.drwg) in order to block the angle iron. Then, slightly turn the bolt in the other direction, so that the workpiece will move freely. This setting shall be kept as long as angles of same thickness are processed.

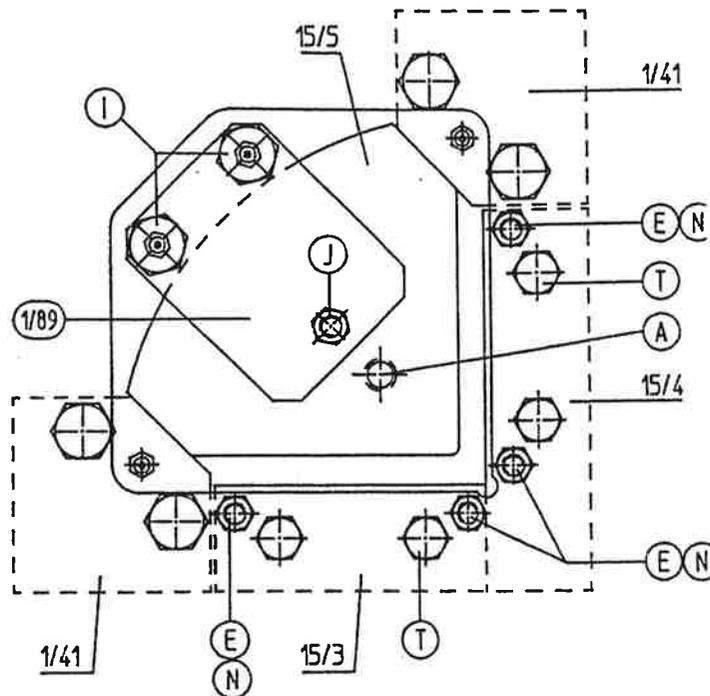
\* For correct sizing of the material to be sheared, we recommend the use of the electric stop whose operating principle is described at the end of paragraph 3.2.2. - FLATS AND PLATES SHEARING.

\* If the cut in the legs of the angle iron should not be at right angle ( $90^\circ$ ), correct it by using the horizontal and vertical guide bars (4/6 acc.drwg). The horizontal guide bar (4/6 acc. drwg) serves to correct the cutting angle of the vertical leg of the angle iron, whereas the vertical guide bar (4/6 acc.drwg) serves to correct the cutting angle of the horizontal leg of the angle section.

\* When cutting angles at  $45^\circ$ , it often happens that cuttings remain caught in the workstation. Never try to remove them with your hand, while the machine is in operation. Instead, introduce the workpiece at  $90^\circ$  or press the red button [J] in order to stop the machine and then remove the cuttings.

\* In order to change angle shear blades, proceed as follows:

0. Stop the machine by pressing the red pushbutton [J] when the notching punch (9/3 acc.drwg) is in its top position.



1. Undo the hex-head screw DIN 931/1 fixing the guide (4/5 acc.drwg) to the machine frame and remove said guide.

2. Take off the clamp (1/89 acc.drwg) in order to be able to remove the movable triangular blade (15/5 acc.drwg).

3. On all models, except HYDRACROP-50, introduce the extractor, supplied with the toolkit, in hole (A) and pull in order to remove the movable blade (15/5 acc.drwg).

4. Release the fixing screws DIN 931/1 (T) of the fixed blades (15/3 and 15/4 acc.drwg) and remove the blades. All four cutting edges of said blades can be used. To do so, interchange blade (15/3) and blade (15/4) and overturn them.

5. Clean all seating areas thoroughly and replace the blades, proceeding as follows:

- Install the fixed blades (15/3 and 15/4 acc.drwg), without driving the screws home.

- Put the movable blade (15/5) in its housing, replace clamp (1/89 acc.drwg) and tighten screws (I-J) securely. Then, slightly release central screw (J) and, with a thickness gauge, check if there is a small clearance between clamp (1/89 acc.drwg) and movable blade (15/5 acc.drwg).

**GEKA** 

- Adjust the play between movable and fixed blades, by lowering the movable triangular blade (15/5 acc.drwg) and acting on the stud bolts DIN 913 (E) and respective nuts (N). (Refer to paragraph 3.3.C - CLEARANCE BETWEEN FLAT SHEAR BLADES AND PLAY BETWEEN MOVABLE AND FIXED BLADES OF ANGLE SHEARS.)

DO NOT START THE MACHINE UNLESS YOU ARE QUITE SURE THE BLADES ARE CORRECTLY MOUNTED.

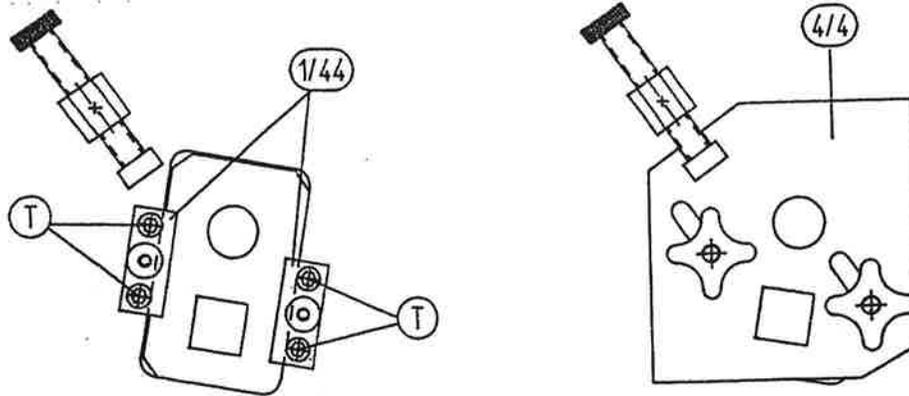
\*OPERATION - FOR CUTTING ANGLES AT 90°, INTRODUCE THE WORKPIECE PERPENDICULAR TO GUIDE (4/5 acc.drwg), FRONTALLY, SO THAT IT PASSES THROUGH THE MACHINE AND IS GUIDED BY CLAMPING BOLT (4/7 acc.drwg). ADJUST THE LENGTH EITHER BY USING THE ELECTRIC STOP OR PUSHING THE ANGLE TO THE PREDETERMINE REFERENCE MARK.

FOR OFF-CUTTING ANGLES AT 45°, INTRODUCE THE WORKPIECE INTO SLOTS "A" AND "B" (LATERAL AND TOP) IN GUIDE (4/5 acc.drwg) AND LET THE OPPOSITE END REST ON THE CUTTING EDGES OF THE FIXED BLADES (15/3 & 15/4 acc.drwg). IN THIS WAY, OFF-CUTTING CAN BE PERFORMED WITHOUT NEED FOR THE ANGLE TO BE GUIDED BY ITEM (4/7 acc.drwg).

IN ALL CASES, ACTUATE THE CONTROLS DESCRIBED AT THE BEGINNING OF THIS SECTION, FOLLOWING OUR INSTRUCTIONS AND RECOMMENDATIONS.

**GEKA** 

### 3.2.4. ROUND AND SQUARE BAR CROPPING



\* Always use stop-guide (4/4 acc.drwg) throughout the cropping process.

\* For almost distortion-free cuts, the openings in the blades must be well suited to the diameter/perimeter of the bar to be cropped.

\* For correct sizing of the bar to be cropped, we recommend you to use the electric stop, whose operating principle is described at the end of paragraph 3.2.2. - FLATS AND PLATES SHEARING.

\* By changing the blades and guides (1 complete set per size), the cropper can also be used to cut UNP/INP sections. All the explanations given herein also applies to the cutting of said sections.

\* In order to change the blades of round, square and other sections cropper, proceed as follows (referring to the MAIN COMPONENTS LIST):

First of all, make sure that both cropper blades are perfectly parallel. This condition is fulfilled when the notcher operating cylinder is at the highest point of its stroke. When the blades are in said position (i.e. when the front one only can be seen), proceed as follows:

0. Press the red pushbutton [J] in order to stop the machine.
1. Remove guide plate (4/4 acc.drwg). To do so, undo the wing screws fixing it to the machine frame (4/3 acc.drwg).
2. Back off the Allen screws DIN 912 (T) and take off the blade retaining blocks (1/44 acc.drwg).
3. Remove the first blade (1/43 acc.drwg).

4. Lift the rear guard and gently tap the back of the second (movable) blade (1/43) to push it out of the housing at the front of the machine.

5. Clean the seating areas thoroughly and replace the blades, inserting them from the front of the machine. Verify if the blades will not get stuck. To do so, secure the blade retaining blocks (1/44 acc.drwg) and, with a thickness gauge, check the clearance between those blocks (1/44 acc. drwg) and the front blade. Finally, replace the guide plate (4/4 acc.drwg).

**DO NOT START THE MACHINE UNLESS YOU ARE QUITE SURE THE BLADES ARE CORRECTLY MOUNTED.**

**WORKPIECE FEEDING PROCEDURE:**

1. Insert the bar or section in the corresponding opening in guide plate (4/4 acc.drwg).

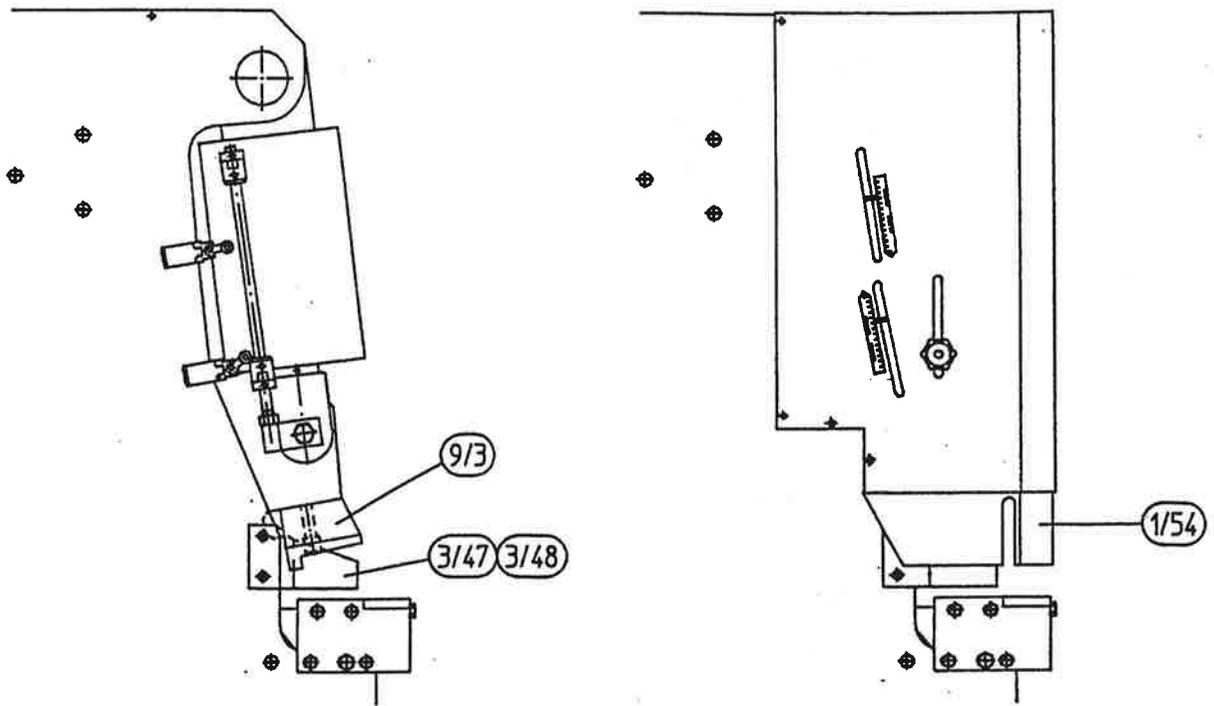
2. Hold the bar horizontally, loosen the wing nuts (4/3 acc. drwg), lower the guide plate (4/4 acc.drwg) down to the top surface of the bar, by turning the thumbscrew (1/122 acc. drwg).

3. Secure the wing nuts (4/3 acc.drwg) in order to maintain that position until the next change of bar/section type or size.

**\*OPERATION - POSITION THE BAR/SECTION EITHER BY USING THE ELECTRIC STOP (REFER TO APPENDIX - DIRECTIONS FOR USE OF ATTACHMENTS) OR AT THE PREDETERMINED REFERENCE MARK. ACTUATE THE CONTROLS DESCRIBED AT THE BEGINNING OF THIS SECTION, TAKING INTO ACCOUNT OUR INSTRUCTIONS AND RECOMMENDATIONS.**

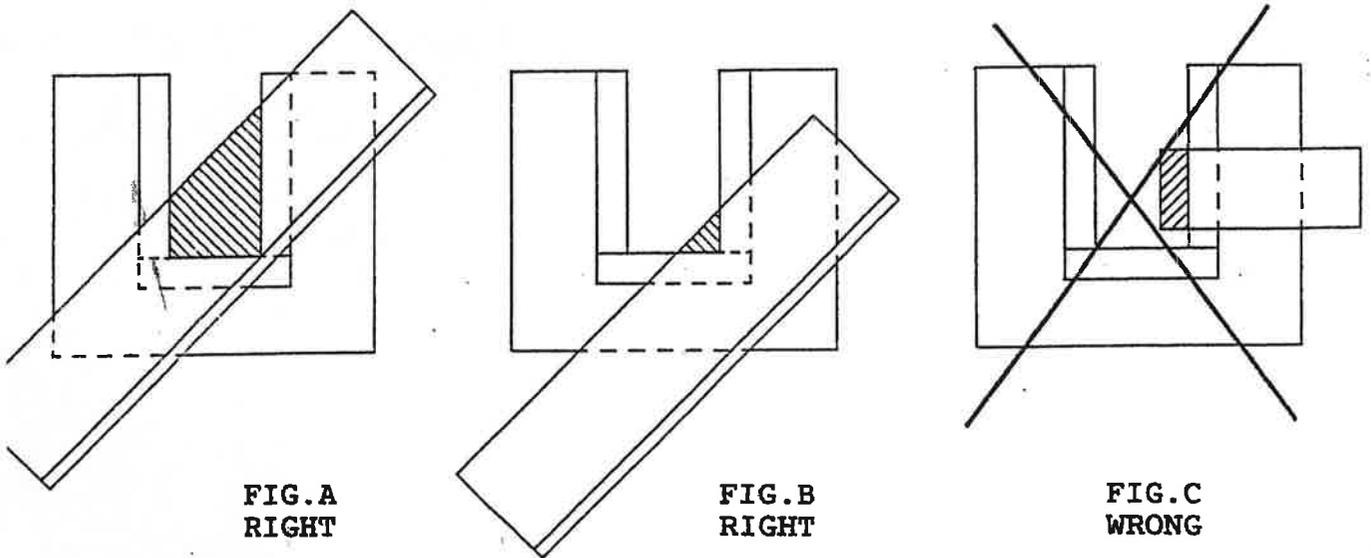


3.2.5 .NOTCHING



\* When working at this workstation, always mind that the workpiece should never be supported by one blade only, as shown on Fig. C, because this would imply shearing and would have to be done on the relevant workstation. As a rule, when notching, always lean the workpiece against two (Fig. B) or three (Fig. A) bottom blades at a time.

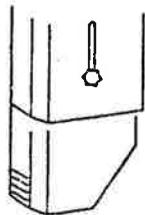
(SEE PLATE NUMBER 5 SECTION 7 -SAFETIES)



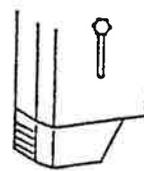
\* Always use the notching punch strippers (3/47 and 3/48 acc. drwg) for easier extraction of punch and workpiece.  
(SEE PLATE NUMBER 6 SECTION 7 -SAFETIES)

\* For easier working and SAFETY's sake, we recommend to use the worktable in the notching station. The relevant instructions are included at the end of this paragraph.

\* In any case, use the sliding protection guard (1/54 acc.drwg) provided at this workstation, making sure the lock of the latchkey, allowing to exceptionally inhibit this safety, is in position (A). (See instructions for use of latchkey [P] below.)



POSITION A - CLOSED



POSITION B - OPEN

When notching or working at this workstation in general, the sliding protection guard (1/54 acc.drwg) must be closed (Position A).

If for any reason, intentional or unintentional, the guard should get open (Position B), the machine would then stop working.

If there should be any good reason for operating the machine with the guard in the retracted position (B), then the following procedure would have to be applied:

1. Ask the shop leader for the latchkey. The latchkey must always be kept by the shop leader, away from the machine.
2. Under the responsibility of the shop leader and your own, as an authorized operator, insert the latchkey into the lock and turn it to position (B). As a result, the detector is inhibited.
3. Do the job that has been previously authorized.
4. Then, close the protection guard (1/54 acc.drwg).
5. Turn the latchkey [P] to position (A) again and remove the key. (As a result, the machine will operate only if the guard is closed.)
6. Give the key back to the shop leader. The key must not be left in the lock, except if absolutely necessary.

\* As indicated in the operating instructions of the flat shears, any abuse of this workstation may cause serious damages to the machine. \* In order to change the punch and blades, proceed as follows, after verifying if the notching punch is in its most retracted position.

0. Press the red pushbutton [J] in order to stop the machine.
1. Back off the fixing hex-head screws and remove the blades (9/2 acc.drwg) from the die-holder (9/1 acc.drwg).
2. Remove the guards, if necessary.
3. Back off the notching punch (9/3 acc.drwg) fixing screw at the bottom face of same.
4. Clean all seating areas thoroughly and replace the punch and blades, proceeding in the reverse order.

\* How to use the support table ?

Place the part to be notched against the cross straightedge (9/4 acc.drwg) and the longitudinal straightedge (9/12 acc.drwg), both having been previously positioned by cross-reference to the millimeter rules and secured by their respective clamping levers.

The coordinate read on the front of cross straightedge (9/4 acc.drwg) indicates the distance to the cutting edge of the blade on the front die-holder, while the coordinate read on the 0|0 side of longitudinal straightedge (9/12 acc. drwg) represents the distance to the centre of the notching punch.

For correct centering of the tool, refer to paragraph 3.3.D - CLEARANCE BETWEEN NOTCHING PUNCH AND BLADE DIE-HOLDER.

DO NOT START THE MACHINE UNLESS YOU ARE QUITE SURE THE BLADES ARE CORRECTLY MOUNTED.

**\*OPERATION - USING THE SUPPORT TABLE (REFER TO APPENDIX - DIRECTIONS FOR USE OF ATTACHMENTS) OR NOT, PLACE THE WORKPIECE IN THE NOTCHING WORKSTATION AND ACTUATE THE CONTROLS DESCRIBED AT THE BEGINNING OF THIS SECTION, TAKING INTO ACCOUNT OUR INSTRUCTIONS AND RECOMMENDATIONS.**



### 3.3 .SETTINGS

For maintaining the process parameters on and on, we recommend a series of settings as stated below. These adjustments should be made by an authorized and skilled personnel familiar with the operation of the machine, taking all necessary precautions, since guards and safeties are inhibited.

#### 3.3.A.- PUNCH-TO-DIE DISTANCE/SETTING OF LIMIT SWITCHES

At the punching workstation, the recommended punch-to-die distance is equal to the maximum punchable thickness specified for the machine plus 6 mm.

When punching large series, without changes in thickness, the limit of the punch up-stroke can be set at 3 mm above the workpiece/ripper (1/47 acc.drwg) contact level.

At the notching and other stations, a gap enabling the free introduction of the workpiece would be sufficient.

On the other hand, we recommend that, on its down-stroke, the punch would not go more than 1 mm in the die, after passing through the workpiece. This is intended to reduce possible serious damages in the event of faulty centering of punch and die.

The limit switches should interrupt the cylinder travel before an internal mechanical stop at either the upper end or the farthest lower end occurs.

The adjustment is achieved by means of the two stops (1/65-A acc. drwg) placed on each cylinder. These stops (1/65-A acc.drwg) can be released with a 4 mm Allen wrench. Take care not to remove the sealed capped backstops (1/65B acc.drwg) provided to impede overrunning the maximum allowable travel.

The function of each stop is specified in the following table:

| MACHINE                  | PUNCHING CYLINDER              |                                |
|--------------------------|--------------------------------|--------------------------------|
|                          | THE UPPER STOP<br>CONTROLS THE | THE LOWER STOP<br>CONTROLS THE |
| HYDRACORP 50             | UP-STROKE                      | DOWN-STROKE                    |
| HYDRACROP 70-100-150-200 | DOWN-STROKE                    | UP-STROKE                      |



NOTCHING CYLINDER

MACHINE

THE UPPER STOP  
CONTROLS THE

THE LOWER STOP  
CONTROLS THE

HYDRACROP 50-70-100-150-200

DOWN-STROKE

UP-STROKE



### 3.3.B. PUNCH-TO-DIE CLEARANCE - HOW TO CENTER THEM ?

For a given punch and its corresponding die, the clearance is fixed.

Acceptable quality punching can be achieved, when the punch-to-die clearance is approximately 1/10 of the plate thickness.

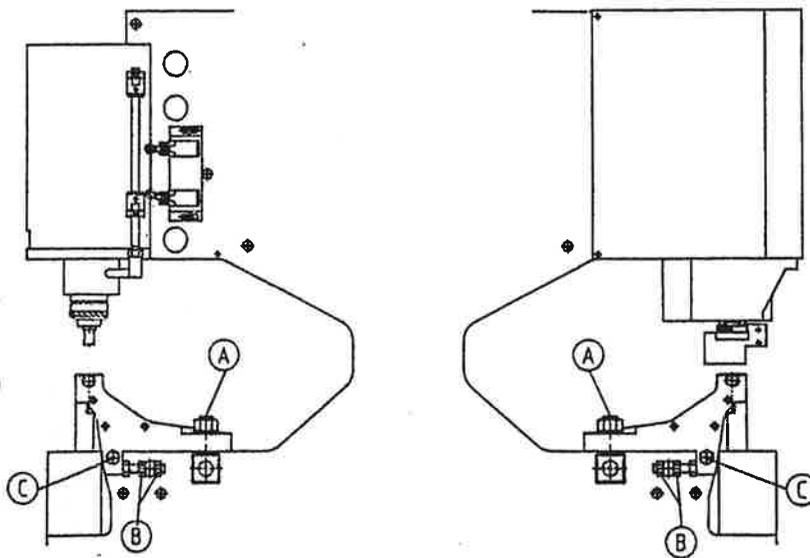
Clearance less than 0.5 mm are however not recommended. For workpieces from 3 to 5 mm in thickness, the recommended punch-to-die clearance is 0.5 mm; for all other thicknesses over 5 mm, the recommended clearance is as said above, i.e. abt. 1/10 of the plate thickness.

Always use genuine GEKA punches and dies. Refuse any imitations. For further information, refer to the attached PUNCH AND DIE CATALOGUE.

When ordering replacement parts, always quote the punch or die reference number or, if not available, the model of your machine, as well as the desired clearance, otherwise we shall consider that the clearance required is as per the catalogue specifications.

#### PUNCH AND DIE CENTERING PROCEDURE:

**WARNING ! BE VERY CAREFUL, BECAUSE YOU ARE WORKING WITHOUT SAFETY GUARDS. DO NOT PUT YOUR HANDS OR YOUR FACE IN OR NEAR THE PUNCHING AREA FOR NO REASON WHATSOEVER.**



1. With selector [L] in the PUNCH APPROACH position and the punch stripper (1/47 acc.drwg) concealed, apply on the pedal at very short intervals in order to lower the punch gradually until it is at a distance of 3 mm from the die. In this position, centering of both tools can be verified easily at first sight. If clearly unsatisfactory, proceed directly with point 3. If centering is found to be correct, proceed as said above in order to bring the punch nearer to the die, without touching it.

**GEKA**

2. Visually inspect the clearance for evenness all around the punch. If correct, let the punch get 1 mm in the die, as explained in paragraph 3.2.1 - DESCRIPTION OF EACH WORKSTATION FUNCTION: PUNCHING, and proceed with point 4.

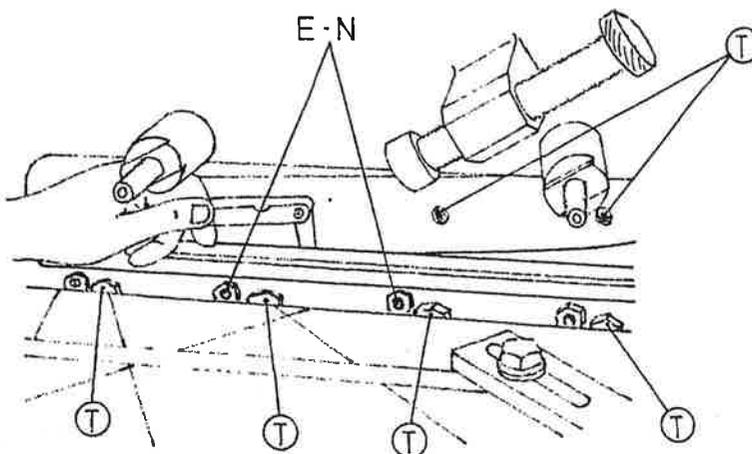
Otherwise, proceed as follows:

3. Stop the machine and slightly back off the screws or nuts marked (A). Consequently, the die-holder can be moved in order to be centered. To this end, remember that items (B) are used to move the die-holder (7/1 acc.drwg) for its centering parallel to the machine axis, while items (C) permit its centering perpendicular to the machine axis.

4. When punch and die are correctly centered, secure the fixing parts (A-B-C) in the reverse order.

Punch and die centering should be made at each tool change. Tool changing instructions are given in paragraph 3.2.1 - PUNCHING. (SEE PLATE NUMBER 3 SECTION 7 -SAFETIES)

### 3.3.C. CLEARANCE BETWEEN FLAT SHEAR BLADES AND PLAY BETWEEN MOVABLE AND FIXED BLADES OF ANGLE SHEARS



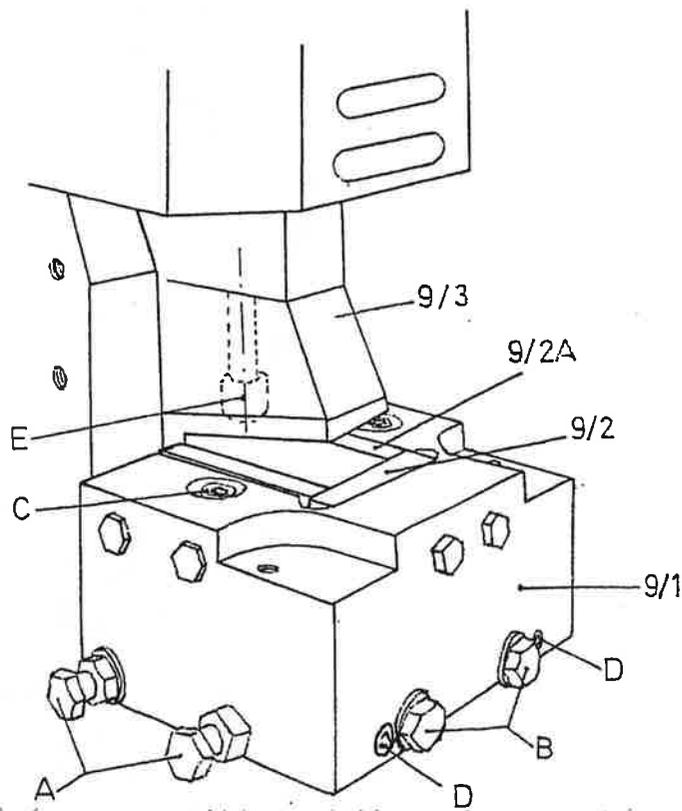
For material thickness over 4 mm, acceptable quality cutting is achieved with 0.3 mm blade clearance.

The following steps are required in order to adjust the blade clearance:

1. Lower the (flat/angle) shear blades until the cutting edges meet.

2. Press the red pushbutton [J] in order to stop the machine and, then, remove the guide from the relevant workstation.
3. Slightly back off the hex-headed screws DIN 933 (T) fixing the blades.
4. Undo the hexagonal nuts (N) which lock the clearance setting Allen studbolts (E).
5. Tighten or loosen the Allen studbolts (E) according as the clearance must be decreased resp. increased. (See illustration on previous page.)
6. Retighten partly the hex-headed fixing screws DIN 933 (T) (refer to point 3) and, with a thickness gauge, verify if the clearance is correct.
7. Lock the hexagonal nuts (N) fixing the Allen studbolts (refer to point 4).
8. Tighten the hex-headed screws (T) securely (but without excess, to avoid any risk of blade breakage).
9. Check the clearance once more and, if correct, replace the guide removed at the beginning of the adjustment process.

3.3.D. CLEARANCE BETWEEN NOTCHING PUNCH AND BLADE DIE-HOLDER.



For any material thickness over 3 mm, acceptable quality notching can be achieved if the clearance between the punch (9/3 acc.drwg) and the front notching blade (9/2 acc.drwg) is 0.4 mm.

In order to readjust the clearance between punch (9/3 acc.drwg) and front blade (9/2 acc.drwg) and to center the tools, proceed as follows:

0. Press the red pushbutton [J] to stop the machine, when the cylinder is at the up-stroke end. Ask the shop leader for the safety latchkey [P] and lift the sliding guard (1/54 acc.drwg).
1. Check studbolt (E) for correct tightening, make sure the cutting edges are correctly positioned and verify if notching punch (9/3 acc.drwg) is perfectly blocked.
2. Turn latchkey lock [P] to the right position (B) and switch selector [L] to the right position (C). Press the machine start pushbutton [K] and, applying on the pedal at short intervals, lower the blade-holder until the punch is at a short distance from the cutting edges of the blades mounted on the die-holder.
3. Inspect the arrangement visually and, if satisfactory, continue lowering the punch, by jogging it very slowly, and verify visually the correct alignment of the tools, until the punch finally enters the die-holder (9/1 acc.drwg). Then, with thickness gauges, verify if the punch-to-blade clearance is evenly distributed laterally and the clearance between the punch and the front blade is equal to 0.4 mm.
4. If the die-holder should be offset (the punch colliding with the blades on the die-holder), stop the machine by pressing the red pushbutton [J] and slightly back off the hex-headed screws/studbolts marked (A-B-C-D) on the illustration on the previous page.  
As a result, the die-holder is released and can be centered.
5. Note that screws (A) are provided for lateral centering of die-base, while Allen screws/studbolts (B-D) serve to adjust the clearance between punch and front blade.  
Restart the machine as indicated in point 2 and move the die-holder (9/1 acc.drwg) as may be necessary for punch (9/3 acc.drwg) to get in.
6. Stop the machine by pressing the red pushbutton [J] and, verifying the clearance with thickness gauges, retighten screws (A) (side clearance) and, then, screws/studbolts (B-D) (front clearance). When the tool has been satisfactorily centered, simultaneously drive (C) home and tighten screws/studbolts (A-B-D) securely, taking care not to move the die-holder (9/1 acc.drwg) previously centered.
7. Close the sliding guard (1/54 acc.drwg), turn the latchkey [P] into position (A) and give the latchkey back to the shop leader.  
(SEE PLATE NUMBER 5 SECTION 7 -SAFETIES)

### 3.3.E. ADJUSTMENT OF BLADE-HOLDER

The blade-holder can be adjusted by means of the Allen studbolts situated on the machine frame, near the greasing points marked in red circles on both sides of the machine and shown on the GREASING POINT PLAN.

The factory-set play is 0.1 mm. If you should want to change this setting, you would be wise to contact your dealer and/or the manufacturer.

### 3.3.F. PRESSURE OF HYDRAULIC UNIT

See enclosed table.

| MACHINE FAMILY<br>===== | PRESSURE (BARS)<br>===== |
|-------------------------|--------------------------|
| HYDRACROP               | 250                      |

The pressure need not be readjusted, except if the machine capacity is not sufficient to do the jobs it is intended for according to the catalogue and/or nameplate specifications.

The pressure is adjusted by means of the safety valve of the hydraulic unit (refer to HYDRAULIC UNIT PARTS LIST) as follows:

1. Open the panel(s) (1/91 - 1/91A acc.drwg) of the machine bed (1/87 acc.drwg).
2. Open the pressure gauge cut-off valve (refer to HYDRAULIC UNIT PARTS LIST).
3. Press the red pushbutton [J] to stop the machine and, then, verify if the pressure gauge reading is 0 (zero).
4. Press the green start pushbutton [K] and lower the blade-holder (1/18 acc.drwg) or the punch (7/4 acc.drwg) until it gets stuck, unable to continue the operation. At that time, note the pressure gauge reading.
5. If the reading is inferior to the maximum pressure (according to table), remove the safety valve locknut and introduce the internal regulating stud, so that the pressure of the hydraulic unit can build up.  
On the contrary, if the hydraulic unit pressure should be reduced, the internal regulating stud would have to be taken out.
6. Check the hydraulic unit pressure again. It should now be equal to or slightly lower than that specified in the table.
7. Retighten the internal regulating stud fixing nut.
8. Close the pressure gauge cut-off valve, making sure the



pressure is correct.

9. Close the panel(s) of the machine bed.

### 3.3.G. ADJUSTMENT OF ELECTRIC STOP

Adjusting this accessory shall be made in accordance with the following procedure (refer to PARTS LIST OF ELECTRIC STOP):

1. Insert plug ("N") in the socket provided for this purpose at the back of the machine and turn selector [26] into position (A).
2. Start the machine and feed the workpiece to be cut at any size you require.
3. Stop the machine and measure the length of the cutting.
4. The measurement might be different from the value initially set by means of the millimeter rule. In order to take up the difference, ease the thumbscrew (6/3 acc.drwg) and slide it to the adequate reading. Then, block the studbolt ("D") of the thumbscrew. As a result, the electric stop has been adapted to the workstation concerned.

If any additional guide bar (6/1A acc.drwg) need be assembled, align it properly, using the extension module coupling bolt (6/1D acc.drwg) which has various threads that have to be combined in order to obtain a perfect alignment of the millimeter rule. When such alignment is obtained, block the assembly by means of the Allen stud bolt ("P").

When using one or more extension modules, it is necessary to provide them with a support (stand) in order to prevent those modules from "sagging", which would have a negative effect on their support on the machine.

### 3.4. GETTING STARTED

Machine wiring has been made following the instructions under Section 2.4 - INSTALLATION INSTRUCTIONS and should be checked before starting-up the machine, proceeding as follows:

0. The machine is power-supplied (as prepared in accordance with Section 2 - INSTALLATION).
1. Turn the PUNCH-PLATE selector [M], if any, on the electric cabinet into 'PUNCH' position.
2. Turn the approach selector [L] on the electric cabinet into position 0 (zero).
3. Apply the punching pedal full on.



4. Press the green pushbutton [K] and verify if the machine starts.

4-YES, IT DOES. If the punch-holder (7/3 acc.drwg) moves, the direction of rotation of the motor is right and, hence, the machine is ready to operate.

4-NO, IT DOES NOT. If no movement of the machine takes place, CAUTION: Release the pedal immediately in order not to damage the hydraulic pump and stop the machine by pressing the red STOP pushbutton [J]. In this event, the direction of rotation of the motor is wrong and must be inverted, proceeding as follows:

4-NO-A: Switch off the machine, by turning the main switch [A] on the electric cabinet until the white pilot lamp [50] turns off.

4-NO-B: Interrupt the power supply so that the machine feeder is not live.

4-NO-C: Open the electric panel.

4-NO-D: Invert cables at terminals R and T. Consequently, the connections will result in:

- \* Earth terminal - unchanged (green/yellow wire)
- \* Terminal R - PHASE conductor (formerly connected to T)
- \* Terminal S - PHASE conductor (unchanged)
- \* Terminal T - PHASE conductor (formerly connected to R).

4-NO-E: Close the electric panel and repeat steps 0-1-2-3-4. The direction of rotation of the motor must now be correct (4-YES). Otherwise, refer to Section 6 - TROUBLES AND REMEDIES.

## SECTION 4 - MAINTENANCE

ALL THE OPERATIONS DESCRIBED IN THIS SECTION MUST BE PERFORMED WITH THE MACHINE AT REST AND POWER OFF.

ALL THE INTERVENTIONS REFERRED TO HEREIN MUST BE PERFORMED BY A DULY AUTHORIZED AND QUALIFIED PERSONNEL FAMILIAR WITH THE OPERATION OF THE MACHINE.

### 4.1. MAINTENANCE OPERATIONS

The maintenance operations recommended by the machine manufacturer are described below:

#### 4.1.A. Oil

By means of the external oil sight of the tank, check if the oil level is appropriate.

Change hydraulic oil every 3000 working hours, proceeding as follows:

- Stop the machine by pressing the red pushbutton [J]; turn main switch [A] off and remove the panel(s) from the machine bed in order to reach the hydraulic unit.

- Remove the filling plug from the hydraulic oil tank and empty the tank with a suction pump. If you should not have such a pump, undo the draining plug at the bottom of the tank and remove the waste oil. Then, replace the draining plug.

- Fill the tank with hydraulic oil ISO TR3498-HM46 until a sufficient level is reached. Refer to the tank capacity table.

| <u>MACHINE</u>  | <u>TANK CAPACITY</u> |
|-----------------|----------------------|
| HYDRACROP - 50  | 80 l                 |
| HYDRACROP - 70  | 100 l                |
| HYDRACROP - 100 | 100 l                |
| HYDRACROP - 150 | 200 l                |
| HYDRACROP - 200 | 200 l                |

- Replace the filling plug and the panel(s) of the machine bed.



#### 4.1.B. Inlet Strainer

The inlet strainer [J or D] (refer to PARTS LIST OF HYDRAULIC UNIT) should be changed every 1000 working hours, proceeding as follows:

- Stop the machine by pressing the red pushbutton [J], turn main switch [A] off and remove the panel(s) from the machine bed in order to reach the hydraulic unit.

- If you have a HYD 70S/SD or HYD 100S/SD machine equipped with a VICKERS hydraulic unit, open the hatch on the top cover. If you have any other model, unlock and slightly lift the top cover of the oil tank at one side.

- Unscrew the inlet strainer and replace it by a new one according to the following table:

| MODEL   | FLOW RATE | THREAD | SIEVE    |
|---|-----------|--------|----------|
| VICKERS (HYD 50S/SD, HYD 70A/N,<br>HINE HYD 100A/N) | 35        | 3/4"   | 90µ      |
| VICKERS (HYD 70S/SD, HYD 100S/SD)<br>HINE           | 65        | 1"     | 90µ      |
| VICKERS (HYD 150 - HYD 200)                         | 130       |        | 1½" 90µ  |
| REXROTH<br>GOIMENDI                                 | 100       |        | 1½" 125µ |

- Close the hatch or cover of the tank.

- Replace the panel(s) of the machine bed.

#### 4.1.C. Wear Parts

##### - TOOLS

- \* Punching Head:
  - (7/4 acc.drwg) Punch.
  - (7/2 acc.drwg) Die.
  - (7/3C acc.drwg) Punch-holder/punch-base.
  - (7/5C acc.drwg) Bayonet socket.
  - (7/6C acc.drwg) Punch fixing nut.
  - (1/47 acc.drwg) Punch stripper.
  
- \* Cutting knives or blades:
  - (1/46) Flat shear knives.
  - (15/ ) Angle shear knives.
  - (1/43) Round and square bar cropper blades.
  - (9/ ) Notcher blades.



It is recommended to inspect all wear parts frequently. More particularly:

- Flat, angle and round and square bar knives and blades shall be subjected to a visual inspection every 8 working hours in order to detect any wear of their cutting edge and, if necessary, they shall be changed in accordance with the instructions under paragraph 3.2 - DESCRIPTION OF EACH WORKSTATION OPERATING PRINCIPLE.

- Check punch (7/4 acc.drwg) and die (7/2 acc.drwg) for correct centering, making sure the setting remains unchanged throughout the punching process. If any unusual wear should be noticed, replace the component. Pay especial attention to this point when punching hard materials or thick workpieces.

- Check parts (7/3C, 7/5C, 7/6C and 1/47 acc.drwg), i.e. the punching head, for proper working conditions and, if necessary, replace them. Verify especially if (i) the punch stripper (1/47 acc. drwg) is levelled and crack-free and (ii) the punch bearing surface of punch-holder (7/3C acc.drwg) is smooth and the keyway in good condition.

#### 4.1.D. : Safety Guards

Before starting working, inspect all safety guards and stops visually for correct positioning. If in doubt, refer to Section 7 - SAFETIES and check all and any items described in same.

ALWAYS USE PERSONAL AND MACHINE PROTECTIONS WHEN WORKING. THESE ARE YOUR BEST ACCIDENT PREVENTION WEAPONS.

#### 4.2. LUBRICATION AND CLEANING

Every 40 working hours, lubricate with abundant grease all greasing points marked in red circles on both sides of the machine and shown on the GREASING POINT PLAN (See attached documents).

To do so, refill with grease ISO TR3498-XCCHB2, using the grease gun supplied with the machine.

Cleaning the outside of the machine and coating the bare parts of the machine with rust-preventive fluids are always profitable practices whose periodicity is, of course, dependent upon the machine user's goodwill.



## SECTION 5 - PARTS LIST

The MAIN PARTS LIST (four views of the machine) is attached hereto, as an APPENDIX to this Instruction Manual and clearly identify all the machine components. Pictures of the hydraulic unit (HYDRAULIC PARTS LIST) and electric cabinet (CONTROL PARTS LIST) are also enclosed.

When ordering or asking for information about any part, please quote the reference number (acc.drwg in this MANUAL) indicated on the illustration, as well as the model / version and serial number of your machine, as stated on the nameplate.

Referring to the said documents will obviate possible confusions and errors when placing enquiries or orders for replacement parts. Please, consult them !



## SECTION 6 - TROUBLES AND REMEDIES

This Section describes the most frequent troubles you can face as well as the way to repair them.

Unless otherwise specified, all the actions described below must be carried out with the machine completely stopped and power off.

ALL THE INTERVENTIONS REFERRED TO HEREIN MUST BE PERFORMED BY A DULY AUTHORIZED AND QUALIFIED PERSONNEL FAMILIAR WITH THE OPERATION OF THE MACHINE.

### \* TROUBLE # 1 - THE MOTOR DOES NOT START

#### POSSIBLE CAUSES:

- CAUSE A: Emergency stop interlocked.
- CAUSE B: Tripping of thermorelay.
- CAUSE C: Fuse blown.
- CAUSE D: Control panel not closed properly.

#### REMEDIES:

- REMEDY 1-A: Check and release the emergency stops.
- REMEDY 1-B: Reset the thermorelay and wait for a few seconds, before restarting.
- REMEDY 1-C: Check the fuses and replace the faulty one by a new one of same amperage.
- REMEDY 1-D: In fact, the machine has not been set in motion. Close the control panel and turn the main switch on again.

\* TROUBLE # 2 - THE MACHINE IS NOT POWER SUPPLIED WHEN THE MAIN SWITCH IS TURNED ON. THE "POWER ON" WHITE PILOT LAMP DOES NOT TURN ON.

#### POSSIBLE CAUSES:

- CAUSE A: The mains voltage is cut off.
- CAUSE B: The transformer output fuse is blown.
- CAUSE C: The cabinet is not closed properly.
- CAUSE D: The "POWER ON" lamp is burnt out.

#### REMEDIES:

- REMEDY 2-A: Check the circuit-breaker and electric installation of the workshop.
- REMEDY 2-B: Check the fuses and replace the faulty one by a new one of same amperage.
- REMEDY 2-C: Close the electric cabinet correctly.
- REMEDY 2-D: Change the bulb.



**\* TROUBLE # 3 - THE MOTOR STARTS, BUT PRESSURE DOES NOT BUILD UP IN THE MACHINE**

**POSSIBLE CAUSES:**

- CAUSE A: Direction of rotation of the motor inverted.
- CAUSE B: Safety valve deregulated.
- CAUSE C: Failing hydraulic pump.
- CAUSE D: The slide of the electrically-operated valve does not operate.
- CAUSE E: Piston seal damaged.
- CAUSE F: The pedal does not work properly.
- CAUSE G: The pedal-machine electric cable is damaged.
- CAUSE H: Limit switch out of adjustment.
- CAUSE I: Oil level too low.
- CAUSE J: Motor-pump coupling broken.

**REMEDIES:**

REMEDY 3-A: Proceed as indicated in paragraph 3.4 - START-UP.

REMEDY 3-B: Readjust the safety valve.

REMEDY 3-C: Replace the pump.

REMEDY 3-D: Energize the electrically operated valve as indicated in the diagnostic test at the end of this section. Should the problem persist, change the electro-valve.

REMEDY 3-E: Remove the cylinder and replace the seal(s) where appropriate. For this purpose, contact servicemen familiar with hydraulic problems.

REMEDY 3-F: Check its connection; visually inspect the interior and replace the internal microswitch if the problem persists.

REMEDY 3-G: Restore the connection in the damaged area and protect with insulating tape.

REMEDY 3-H: Re-adjust the limit-switch in accordance with the recommendation in paragraph 3.3 - SETTINGS.

REMEDY 3-I: Add oil to reach the required level, as indicated in paragraph 4.1.A - MAINTENANCE OPERATIONS: OIL.

REMEDY 3-J: Replace the coupling. To do so, it is necessary to unfasten the motor flange and/or feet.

**\* TROUBLE # 4 - TWO-PHASE STARTING**

**POSSIBLE CAUSES:**

CAUSE A: Faulty wiring.

**REMEDIES:**

REMEDY 4-A: Check wiring and correct according to the instructions given in Section 2 - INSTALLATION.



\* TROUBLE # 5 - THE MOTOR STARTS, THE PRESSURE BUILDS UP TO 250 OR 180 BARS (ACC. TO MODELS) AND THE MOTOR STOPS AFTER A FEW SECONDS DUE TO THE TRIPPING OF THE THERMORELAY

POSSIBLE CAUSES:

CAUSE A: Limit switch out of adjustment.

REMEDIES:

REMEDY 5-A: Readjust, by sliding the stop through the rod until making the limit switch.

\* TROUBLE # 6 - THE MOTOR STARTS AND STOPS AFTER A FEW MINUTES

POSSIBLE CAUSES:

CAUSE A: Limit-switch out of adjustment, it sticks at the top level of the stroke.

REMEDIES:

REMEDY 6-A: Readjust, by sliding the stop through the rod until making the limit switch.

\* TROUBLE # 7 - UNCLEAN CUT

POSSIBLE CAUSES:

CAUSE A: Cutting tools with excessive play or dull-edged.

REMEDIES:

REMEDY 7-A: Adjust the play as indicated in paragraph 3.3 - SETTINGS or change the cutting tool (paragraph 3.2 - DESCRIPTION OF EACH WORKSTATION OPERATING PRINCIPLE).

\* TROUBLE # 8 - ANGLE-CUTTING IS NOT SQUARE

POSSIBLE CAUSES:

CAUSE A: Wrong guide position.

REMEDIES:

REMEDY 8-A: Adjust the inlet angle by means of guide (4/5 acc.dwg) and adjusters (4/2 acc.dwg), following the instructions in paragrah 3.2.3. ANGLE SHEAR.

**GEKA** 

**\* TROUBLE # 9 - INSUFFICIENT WINDOW OPENING**

**POSSIBLE CAUSES:**

**CAUSE A:** Stroke-end stop out of adjustment.

**REMEDIES:**

**REMEDY 9-A:** Relocate the top stroke-end stop.

**\* TROUBLE # 10 - THE HYDRAULIC GROUP VIBRATES ABNORMALLY DURING THE CYLINDER BACK MOTION**

**POSSIBLE CAUSES:**

**CAUSE A:** Transformer voltage failure (+/- 5 %).

**REMEDIES:**

**REMEDY 10-A:** Check the line or install a special transformer that will compensate for the line failures.

**\* TROUBLE # 11 - (On models with DOUBLE PEDAL) - FAULTY SLOW SPEED (LOW PRESSURE) AND FAST SPEED (FULL LOAD) OPERATION**

**POSSIBLE CAUSES:**

**CAUSE A:** The internal microswitch of pedal [2] has moved.

**REMEDIES:**

**REMEDY 11-A:** Check the inside of the pedal and adjust the microswitch.

**\* TROUBLE # 12 - (On models with work area lighting) - THE LAMP BURNS OUT WHEN TURNED ON.**

**POSSIBLE CAUSES:**

**CAUSE A:** The lamp is connected to the mains instead of the machine outlet (12 V).

**REMEDIES:**

**REMEDY 12-A:** Change the lamp and connect correctly.

-----

If the trouble still exists, carry out the following diagnostic test (not applicable to troubles # 1 and 2), proceeding as follows:

- 1 - Start the machine.
- 2 - Remove the panel(s) of the machine bed (1/91 - /91A acc.drwg).
- 3 - Refer to the HYDRAULIC UNIT PARTS LIST and energize the electically operated valve, using a screwdriver or similar tool and pushing the ends (black cap) of the sides of the electrovalve. In this way, the slide inside the valve will move. As a rule, if the machine works, the failure is of electric origin; if it does not, the failure is hydraulic.

Contact the maintenance technician of the company that supplied the machine to you, stating the following:

- MODEL OF THE MACHINE
- SERIAL NUMBER
- HYDRAULIC GROUP DATA
- RESULT OF DIAGNOSTIC TEST (electric or hydraulic failure).



## SECTION 7 - SAFETIES

Throughout the preceding sections, advices, instructions and warnings have been given in order to ensure a perfectly safe operation of the machine, under both correct use and foreseeable malfunction conditions.

This section is meant to summarize, without limitation, the vital safety recommendations:

- The machine must exclusively be operated by duly authorized, qualified and trained persons, under the responsibility of the Company's Management. This imply they have read and understood the INSTRUCTION MANUAL, complete with its APPENDICES. In addition, they must be familiar with the jobs to be performed on the machine equipped with both its standard and optional attachments.

- Never leave the machine switched on and unattended. Always turn the main switch [A] off when completing the job.

- Do not remove or damage the warning plates affixed to the machine. Those plates concern:

- 1-GENERAL USE PLATE
- 2-MACHINE RATINGS PLATE
- 3-CENTERING PUNCH STATION PLATE.
- 4-FLAT SHEAR STOP PLATE.
- 5-CENTERING & USING NOTCHING STATION PLATE.
- 6-STOPS & SAFETY GUARDS PLATE.
- 7-"CE" MARK.

Should any of these plates be missing or damaged, feel free to advise us; it will be replaced free of charge for you.

- Yellow/orange-painted areas are potential danger areas.

- In order to protect the operators of our machines, all workstations are fitted with guards and protections, as described hereafter. Said guards and protections must be kept in good order at all times; they should never be removed while the machine is operating and the machine should never be put in operation, without all protections being in place.

\* PUNCH Safety Guard (Refer to PARTS LIST)

The PUNCHING workstation is provided with front and rear guards (3/17-3/18 acc.drwg) mounted on rolls (3/19 acc.drwg).

In addition, mind the following safety instructions:

1. Check thickness for punchability, against the 'MAXIMUM THICKNESS' equation.
2. Ask your supplier to confirm the resistance of the material to be punched.



1- MACHINE TO BE OPERATED BY AUTHORIZED, QUALIFIED AND WELL TRAINED PERSONNEL, ONLY. FIRST READ AND MAKE SURE YOU UNDERSTAND THE INSTRUCTION MANUAL.

BEFORE ACTUATING ANY CONTROL, VERIFY IF THE JOB CAN BE DONE CORRECTLY.

2- PROCEED WITH MAINTENANCE OPERATIONS, PERIODICALLY, IN ACCORDANCE WITH THE INSTRUCTIONS OF THIS MANUAL.

3- BEFORE CHANGING ANY TOOL OR SERVING THE MACHINE, SWITCH OFF THE MACHINE AND WAIT UNTIL IT HAS STOPPED COMPLETELY.

4- AFTER CHANGING ANY TOOL, CENTER IT AS EXPLAINED IN THIS INSTRUCTION MANUAL.

5- DO NOT PUT YOUR FINGERS UNDER ANY STOP OR GUARD.

6- DO NOT REMOVE OR MODIFY THE PROTECTION GUARD / SAFETY DEVICES.

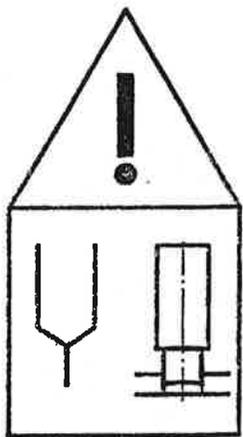
7- USE EVERY PROTECTION AT WORK GARMENT AND EQUIPMENT.

8- DO NOT REMOVE OR DAMAGE THIS WARNING PLATE.

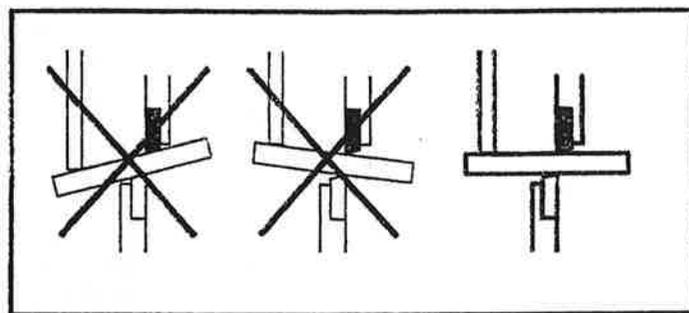
MACINARIA GEKA S.A.  
 POLIGONO IND. USALDETXXO s/n  
 20180 OYARZUN I GUPUZCOA I  
 ESPAÑA

1

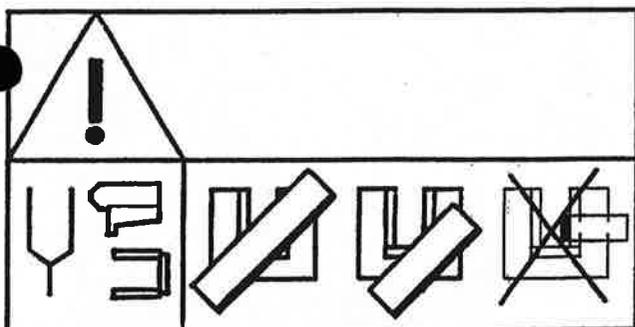
2



3



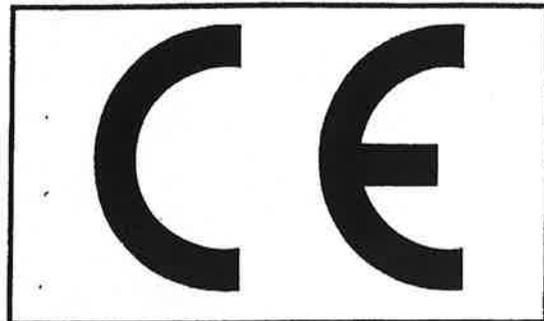
4



5

WHEN WORKING ON THIS STATION, ALWAYS USE THE GUIDE STOPS AND GUARDS.

6



7

3. Enclose the punch area as much as you can.
4. Use the punching table.
5. Never put your finger under the stripper.
6. Frequently check tool for correct centering.
7. Always punch holes through at once (not bit by bit).
8. Consult the punch maker about any risk of breaking/shattering, before starting any job.
9. Take all injury preventive measures.

\* FLAT SHEAR Safety Guard (Refer to PARTS LIST)

- Front guard: composed of guide (1/124 acc.drwg) and grating around same (3/14 acc.drwg).
- Rear guard, i.e. plate with inclined plane impeding its opening (3/4 acc.drwg).

\* ANGLE SHEAR Safety Guard (Refer to PARTS LIST).

- Front guard: composed of oversized guide (4/5 acc.drwg) and grating around same (3/8-3/15 acc.drwg).
- Rear guard, i.e. plate with inclined plane impeding its opening (3/2 acc.drwg).

\* ROUND & SQUARE BAR CROPPER Safety Guard (Refer to PARTS LIST).

- Front guard: overdimensioned guide protected by the other workstations or gratings around its perimeter (3/13-3/14 acc.drwg).
- Rear guard, i.e. plate with inclined plane impeding its opening (3/3 acc.drwg).

\* NOTCHER Safety Guard (Refer to PARTS LIST).

- Sliding guide (1/54 acc.drwg) fixed by means of bakelite thumbscrews and safety latchkey [P].

In addition, remember the following:

- 1- Always work with the safety sliding guard lowered.
- 2- Use the notching support table.
- 3- Do not put your hands in the notching area for no reason whatsoever.
- 4- Frequently verify if the tool components are correctly aligned.
- 5- Take all injury preventive measures.
- 6- Use protective screens when doing special jobs or for special applications.



The cylinders and hoses are protected against possible damages due to burst or leakage, by means of safety guards. DO NOT REMOVE THESE GUARDS.

For your own security, comply with all Hygiene and Safety at Work Regulations and, particularly, those relating to using injury preventive means.

You are kindly requested to wear goggles, gloves, a safety cap, an apron in order to protect your body and, specially, your eyes, face, head, arms and hands.

**GEKA** 

NOISE LEVEL

In compliance with Section 1.7.4-f) of APPENDIX #1 to the Real Decree-Law No. 1435/1992 of 27 November 1992, following the EEC Directive 89/392/EEC, we hereby declare that the continuous-service equivalent A-weighted sound pressure of GEKA machines is less than 70 dBA and the maximum instantaneous C-weighted sound pressure does not exceed 130 dB.

**GEKA** 