ROUNDO

IMPORTANT!

This is the operators manual for your ROUNDO Bending Machine. Please be sure to read and follow all instructions before using the machine!

WARNING!

Always disconnect the power supply before servicing or repairing the machine!
Always make sure that the hydraulic pressure is turned off before making any repairs or maintenance!

Mach. type R-5-S

Capacity 45-50 cu^3

Mach. no. 874015

Delivered 1987

TABLE OF CONTENTS

Spare parts information of standard components

Description	Make	Part no.	Sheet
Directional Valve	Parker	D3W	189 A+B
Directional Valve	Parker	RM3	184 A+B
Directional Valve	Parker	CPOM3	182 A+B
Hydraulic Motor	SAI	MTCP 1000	140
Hydraulic Pump	Atos	PFE	423A-C
Hydraulic Pump	Lamborghini		139
Pilot Check Valve	Hawe	RH	143
Pilot Check Valve	Parker	CPOM	105
Pilot Check Valve	Parker	D1VW	180A-C
Ventil	Hawe	SE3	407A-C
Machine R-5-S	Roundo		206
Machine Turning Cyl.	Roundo		207
Hydraulic Guide Roll	Roundo		205

A.1 TRANSPORTATION

The machine has got a rather low centre of gravity, and under normal circumstances there is no risk of capsizing during transportation. However, the machine must be carefully anchored.

A.2 LIFTING OF THE MACHINE

Lifting of the machine is done by an overhead crane,
using schackles at the lifting points indicated by the drawing.

Make sure that the machine is well balanced during the lifting.
Please study drawings I-4.9884, I-4.9417 or I-4.9416 depending on machine type, showing the lifting priciples.

A.3 LEVELLING OF THE MACHINE

The machine must be placed on an even/levelled concrete floor, on a foundation or into a pit.
Please see valid foundation drawing for this machine.

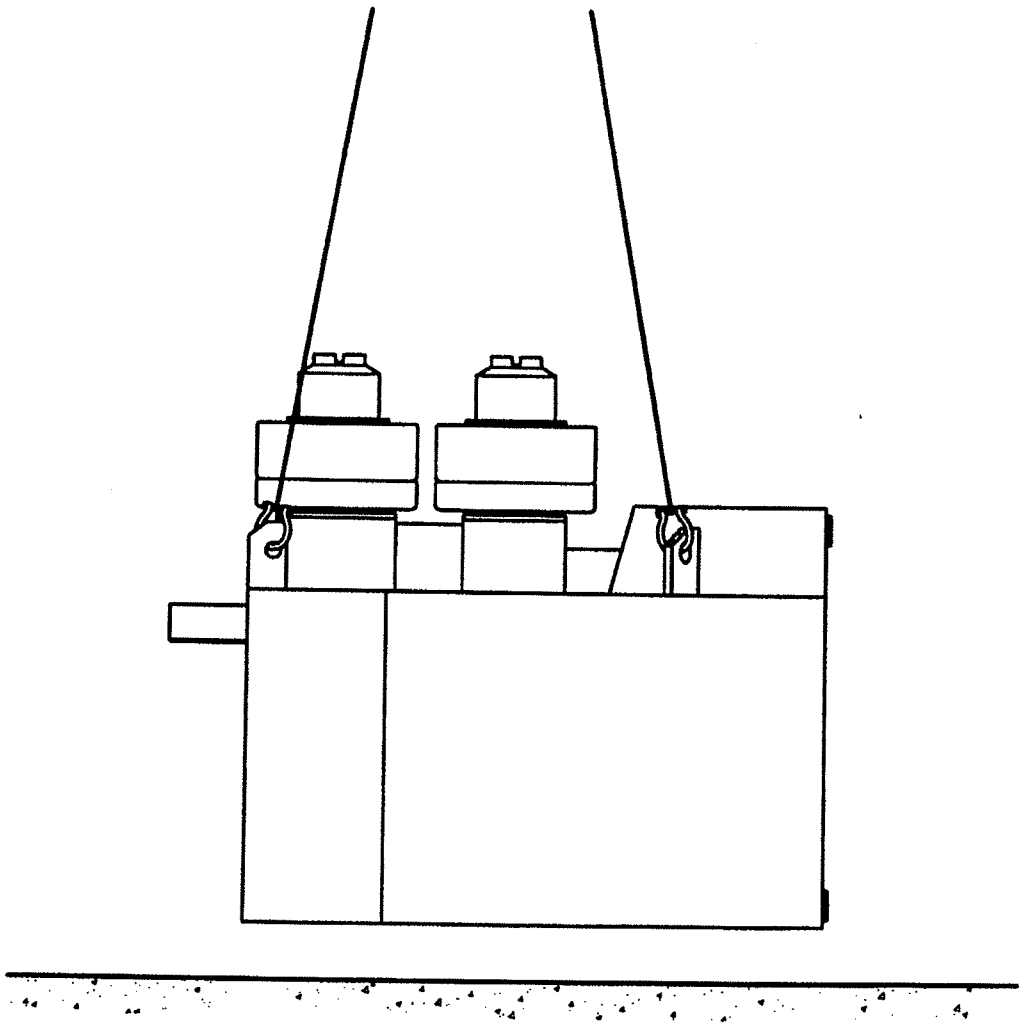
Level the machine in both directions using a water level.

It is most important that the machine is erected without any wryness. It means less if the machine leans somewhat.

A.4 LIFTING OF THE ROLLS

- Rolls for smaller machines may be lifted by hand.
- Rolls for larger machines, have threaded holes to accept eye bolts. Use minimum two (2) bolts/roll and lift with schackles, using a crane.

Lifting points of the machine (4x)



ROUNDO	Lifting instructions R-5 - R-15-S	I-4.9416

A.5 ELECTRICAL INSTALLATION

Electrical installation should only be done by authorized personnel.

The machine is delivered with a complete electric equipment except for the main switch between the net and the cubicle. Machines delivered to countries requiring CE-marking or to countries where local electrical standard requires it are equipped with a main switch. (It is also available to others as an option.)

Connect the correct 3-phase voltage to the power lines L1, L2, L3 and the earthing in accordance with the valid wiring diagram.

Check carefully that the machine is connected to the correct tension! The voltage is marked inside the main electrical cubicle and on the electric motor(s).

IF WRONG TENSION IS CONNECTED,
THE MACHINE WILL BE DAMAGED

A.6 STARTING UP

1. Check that there are no obstacles in the machine.

2. Check the hydraulic oil level in the tank through the level glass.

3. Start the electric pump motor by pressing the start button and CHECK IMMEDIATELY that it is rotating in the correct direction, indicated by a yellow/black arrow on the electric motor (➔). If the direction of rotation is wrong, two of the incoming phases of the power line shall be switched.

Running the pump in the wrong direction will damage the pump!

If the machine should not start when pressing the start button any of the emergency stop buttons can be activated (release it). Further, any of the fuses can be cleared (reset or change them) or any of the overload relays on the contactors are released (check and reset). Finally, the main power switch (option) is turned off (turn it on).

4. After having started the machine, let the motor/pump run for 5-10 minutes without operating the machine.

5. Start the roll rotation forward and reverse and regulate the lower rolls up and down a couple of times.

6. Lubricate the machine (see Lubrication instruction).

A.7 MAINTENANCE

- Before opening the Electrical cubicle, make sure that the power is turned off.

- Disconnect the power before any maintenance is done to the machine.

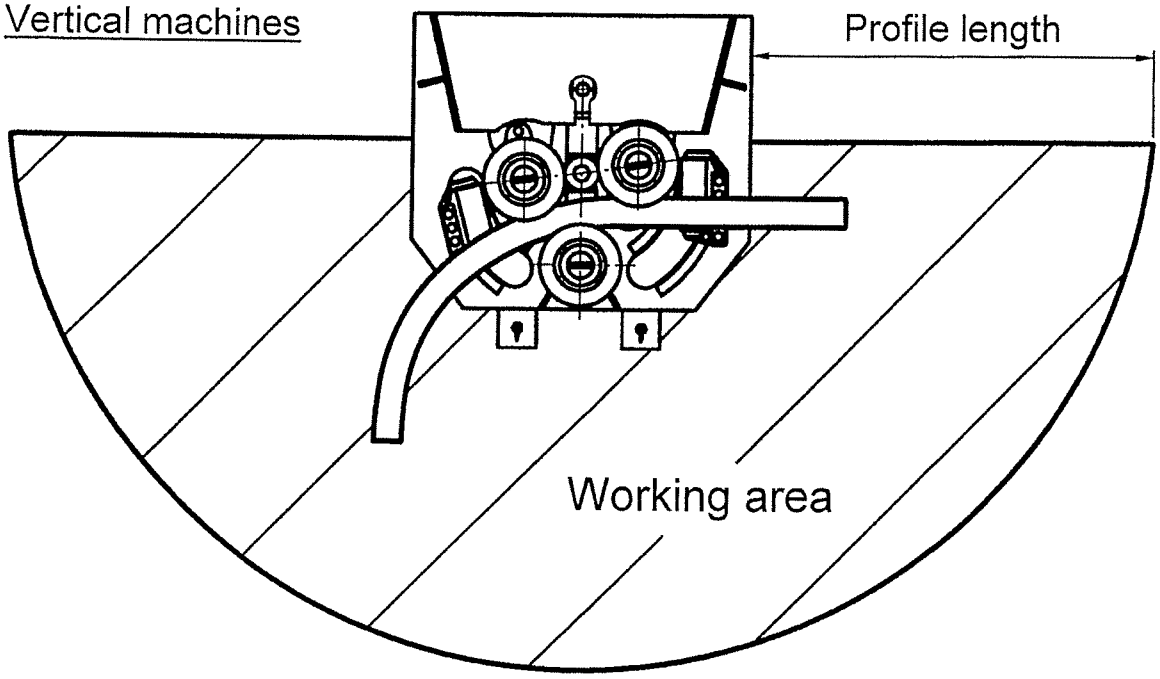
- Make sure that the Electrical cubicle door is closed before connecting the power again.

- All covers that have been removed in order to maintain the machine, must be replaced before the machine is being operated again!

A.8 WORKING AREA

The operator must be aware of the working area of the machine. Study drawing I-4.9415 for this purpose.

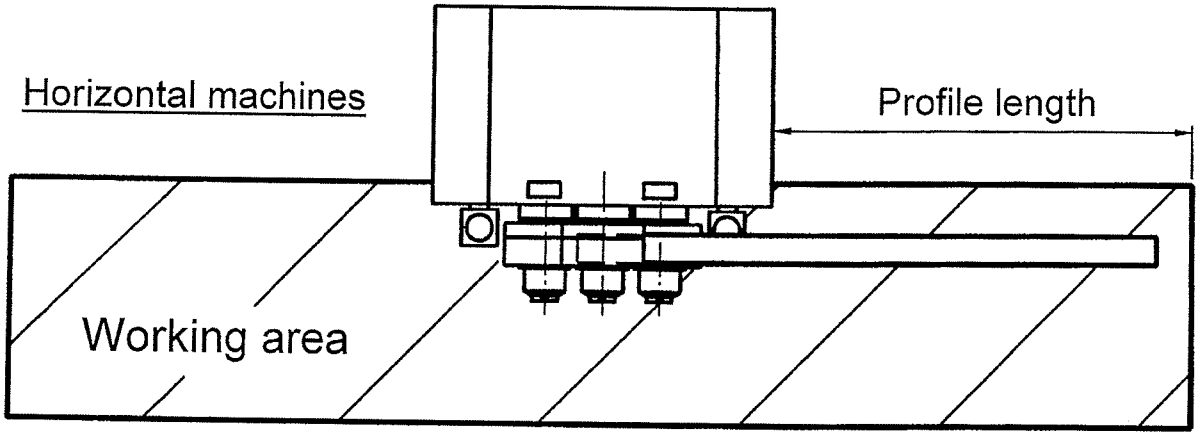
Vertical machines



WARNING !

No persons must be within the working area shown.
No fixed objects, walls, columns etc. must be within the working area.

Horizontal machines



ROUNDO	Working area R-machines	I-4.9415

A.9 NOISE LEVEL MEASUREMENT

Type of machine: R-5-S **Machine number:** 874015

Result of test

☒ Indicated noise level is inferior to 70 dB(A).

☐ Indicated noise level is 77 dB(A).

Running conditions

The noise level test has been carried out at no-load running and at max. rate of rotation.

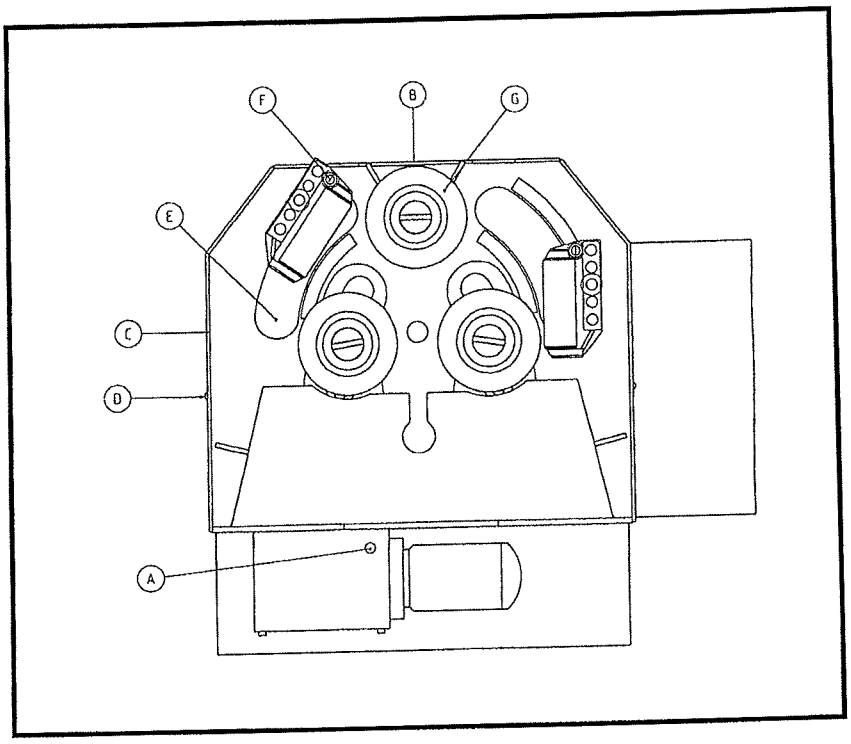
Used method

The noise levels have been measured from the different working positions in equivalent noise level dB(A).

Used instrument

The instrument used for above test, is Brüel & Kjaer, type 2225.

LUBRICATING INSTRUCTION R-5-S - R-7-S



A. **Hydraulic tank:** Check the oil level in the tank every day.
Change oil and filter after 2000 working hours or once a year.
Oil quality: BP Energol HLP 46/Shell Tellus 46

B. **Slip clutch:** Lubricate twice a month via cover.
Lubricant: Molykote BR 2.

C. **Gears:** Lubricate once a month via covers by application.
Lubricant: Shell Malleus GL 95 / Texaco Texclad 2 / Esso Surett fluid 4K.

D. **Swinging arms/ Central shaft:** Lubricate once a month via nipples.
Lubricant: BP Energrease LS-EP2 / Shell Alvania EP 2.

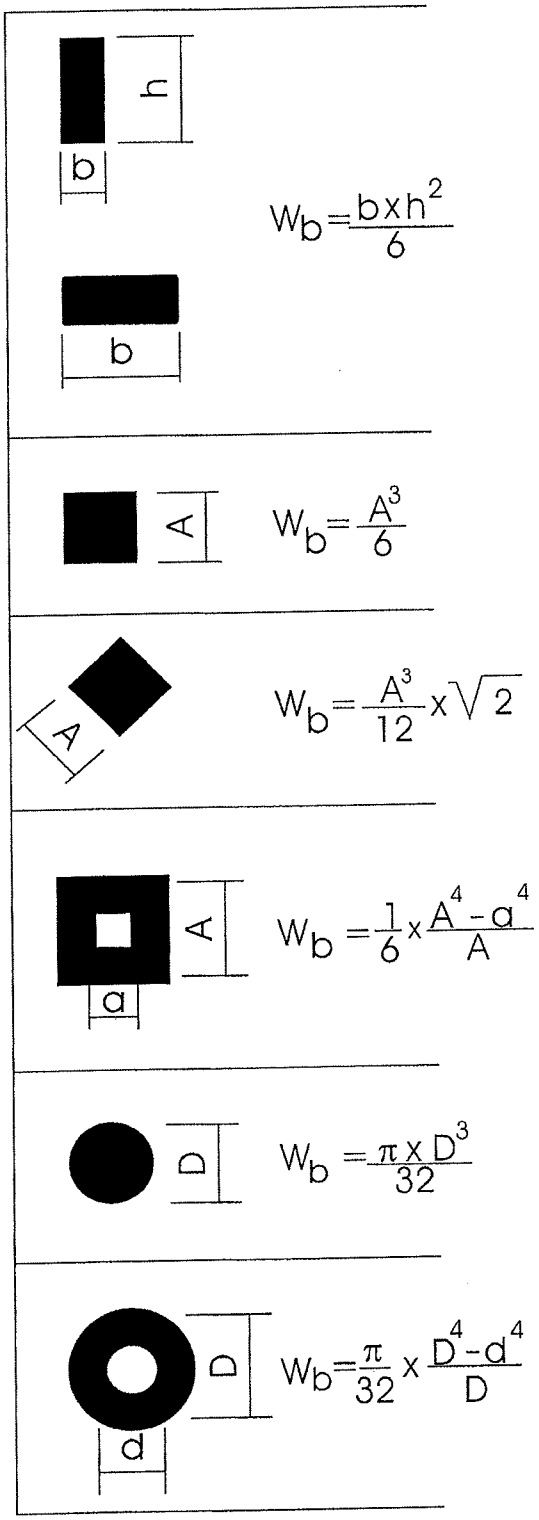
E. **Lifting/Turning shafts guide roll units - Swinging arms:**
Lubricate once a week. Two nipples each side (swinging arms).
Lubricant: BP Energrease LS-EP2 / Shell Alvania EP 2.

F. **Small guide rolls:** 2+2 units. Lubricate once a week (1 nipples).
Lubricant: BP Energrease LS-EP2 / Shell Alvania EP 2.

G. **Ball bearings/Roller bearings:** Are greased at factory and need normally no service during the first 5-7 years. After this period the bearings must be repacked with grease. Repacking is made via the covers.
Lubricant: BP Energrease LS-EP2 / Shell Alvania EP 2.

LUBRICANTS EQUAL TO THE ABOVE RECOMMENDED CAN ALSO BE USED!

CALCULATING
THE CAPACITY OF THE MACHINE



The capacity of a bending machine is given by the elastic section modules (cm^3).

The figures on this page show the calculation formulae for the most commen profiles.

For rolled structual profiles such as L-, T-, U- and I-irons you will find the formulae in hand-books or the manufacturer's catalogues.

NOTE: For profiles with displaced centre of gracity the figures below are not valid.

MACHINE	MAX ELASTIC SECTION MODULUS	
R-1	4 cm^3	0,24 inc^3
R-2	7 cm^3	0,43 inc^3
R-3	14 cm^3	0,85 inc^3
R-3 S	18-25 cm^3	1,10-1,52 inc^3
R-4		
R-4-S	30-40 cm^3	1,80-2,44 inc^3
R-5		
R-5-S/R-52-S	45-50 cm^3	2,75-3,00 inc^3
R-6		
R-6-S/R-62-S	95-110 cm^3	5,80-6,70 inc^3
R-7		
R-7-S/R-72-S	180-320 cm^3	11,00-19,59 inc^3
R-8		
R-8-S	300-600 cm^3	18,30-36,60 inc^3
R-9		
R-9-S	400-700 cm^3	24,40-42,70 inc^3
R-10-S	600-1000 cm^3	36,60-61,00 inc^3
R-11-S	900-1500 cm^3	54,90-91,45 inc^3
R-13-S	1000-4700 cm^3	79,30-286,60 inc^3

For profiles wider than the standard rollers the figures above may not be valid as the forces are concentrated abnormally far from the bearings. Please contact us for information.
The capacity figures are valid for profiles with 26 TSI Tensile strength. For material with higher strength the capacity will decrease in propotion to the rupture limit of the material.

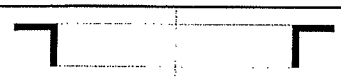
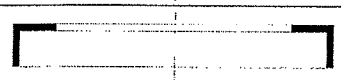
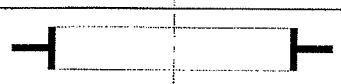
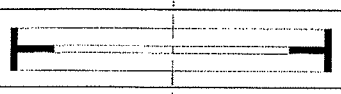
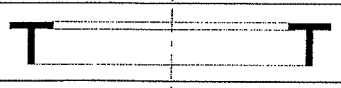
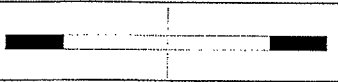
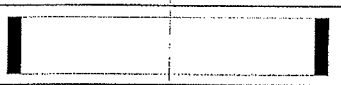
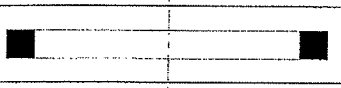
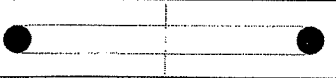
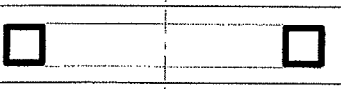
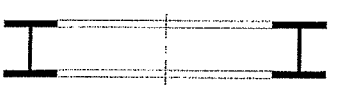
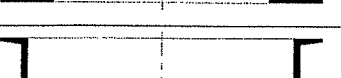
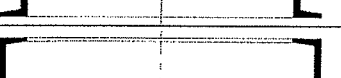
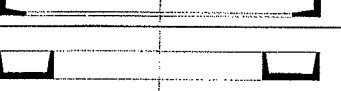
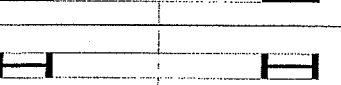
ROUNDO

99.01.15

Section Bending Machine

Capacity table

R-5-S/R-52-S

Section	With standard rolls	With special rolls
	Max. 5" x 5" x ½" To Ø 50" ① Min. 1¼" x 1¼" To Ø 24"	Min. 1" x 1" x 1/8" To Ø 13"
	Max. 4" x 4" x ½" To Ø 50" ① Min. 1¼" x 1¼" To Ø 30"	Min. 1" x 1" x 1/8" To Ø 16"
	Max. WT5 To Ø 45" ① Min. no limit To Ø 16"	Small sections To Ø 13"
	Max. WT5 To Ø 60" ① Min. no limit To Ø 16"	Small sections To Ø 13"
	Max. WT5 To Ø 40" ① Min. no limit To Ø 16"	Small sections To Ø 13"
	Max. 6" x 5/8" To Ø 50" ① Max. 5" x 1" To Ø 35" Min. 1¼" x ¼" To Ø 16"	Small sections To Ø 13"
	Max. 8" x 2" To Ø 40" ① Min. no limit To Ø 16"	Small sections To Ø 13"
	Max. 2¾" x 2¾" To Ø 32" ① Min. no limit To Ø 16"	Small sections To Ø 13"
	Small sections	Max. Ø 3½" To Ø 40" Min. no limit To Ø 13"
	Special rolls only	Max. 5" SCH40 To Ø 70" Min. no limit To Ø 13"
	Small sections	Max. 4" x 4" x ¼" ③
	Small sections	Max. W8 x 21 To Ø 40" ④ Min. no limit To Ø 16"
	Small sections	Max. W6 x 20 To Ø 40" Max. W5 x 19 To Ø 30" Min. no limit To Ø 16"
	Small sections	Max. C8 x 22.8 To Ø 30" ④ Min. no limit To Ø 16"
	Small sections	Max. C8 x 22,8 To Ø 35" ④
	Special rolls only	Max. C5 x 9 To Ø 300" ⑤ Min. C3 To Ø 80"
	Special rolls only	Max. S5 x 10 To Ø 100" ⑤ Min. no limit To Ø 40"
	Special rolls only	Max. W4 x 13 To Ø 80" ⑤

Quality of material : A-36

All data are valid for mild steel with yield point 270 N/mm²

Max. section modules : 3-5 inch³ depending on bending diameter.

Diameter of standard rolls : 15,2"

Diameter of top shaft/lower shafts : 5,5" / 4,72"

Motor output : 11 kW

① Indicated diameters are valid for max. secton in one or few passes. Smaller sections can be bent to smaller diameters.

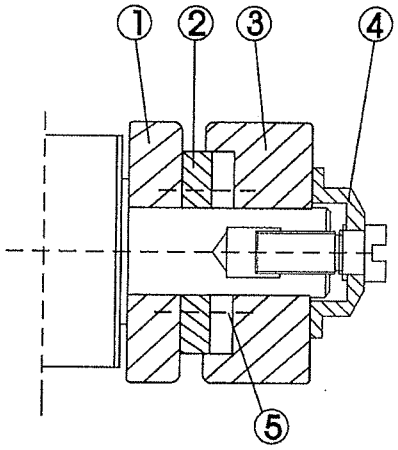
③ Smallest bending diameter depends on grade of deformation that can be accepted.

④ Machine with extended shafts allows wider sections than specified.

⑤ Only with special equipment.

STANDARD ROLLS R-4 → R-7-S

Fig. 1



1. Small standard roll
2. Driving roll
3. Big standard roll
4. Roll holder
5. Screw for driving roll
6. Spacing ring for bending angle leg in

Roller combination 5 and 6 are used by bending of angle with flange inwards

Fig. 2

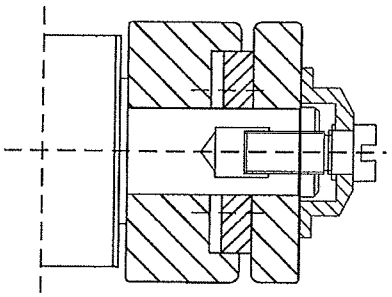


Fig. 3

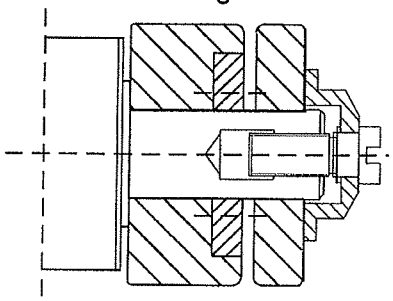


Fig. 5

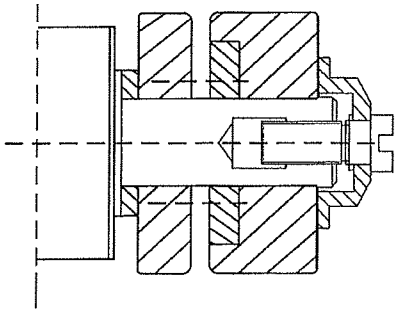


Fig. 4

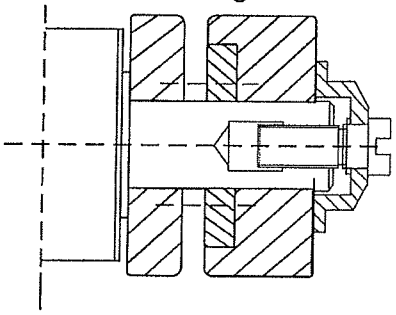
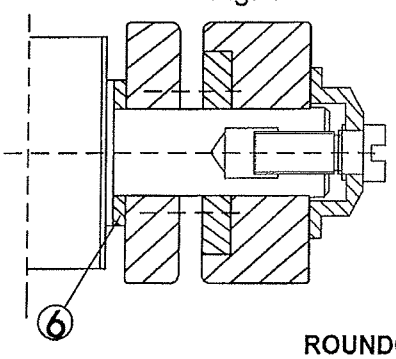
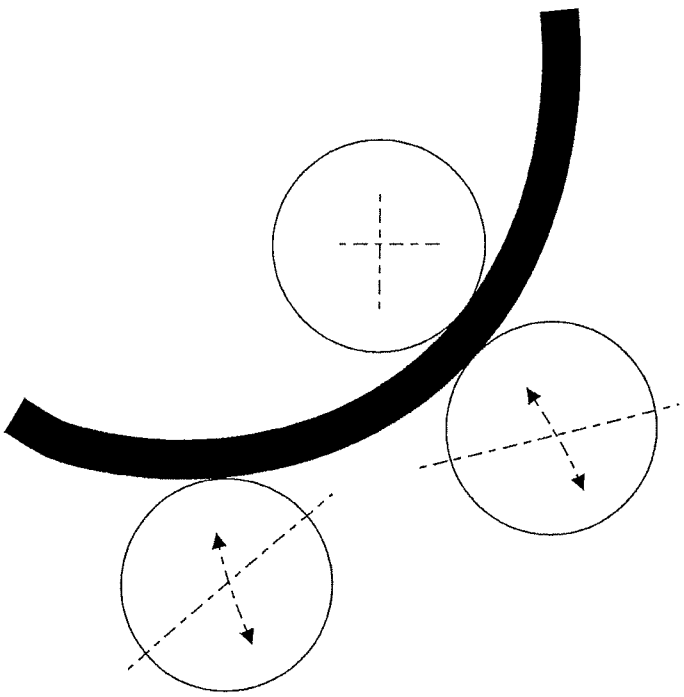


Fig. 6

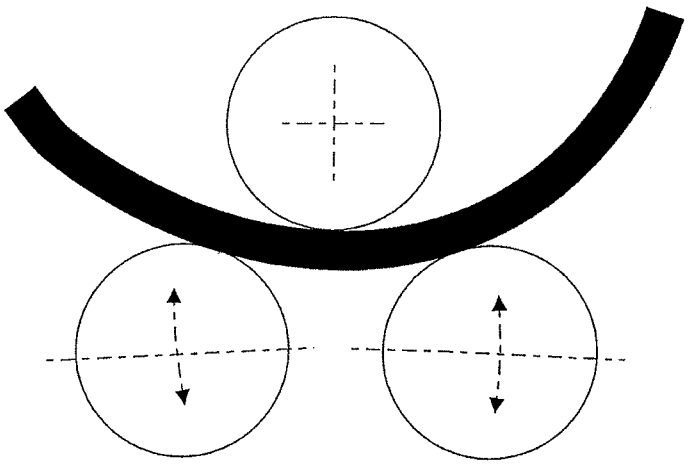


NOMENCLATURE FOR DIFFERENT BENDING OPERATIONS

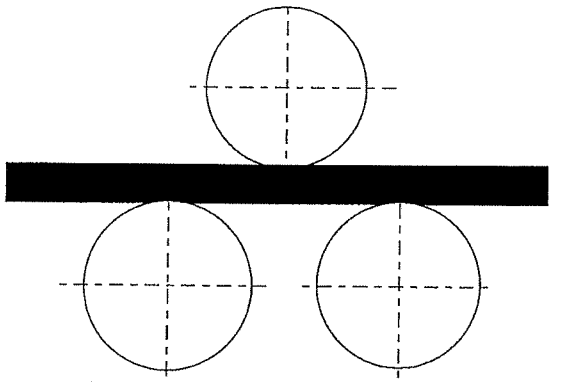
ASYMMETRICAL BENDING



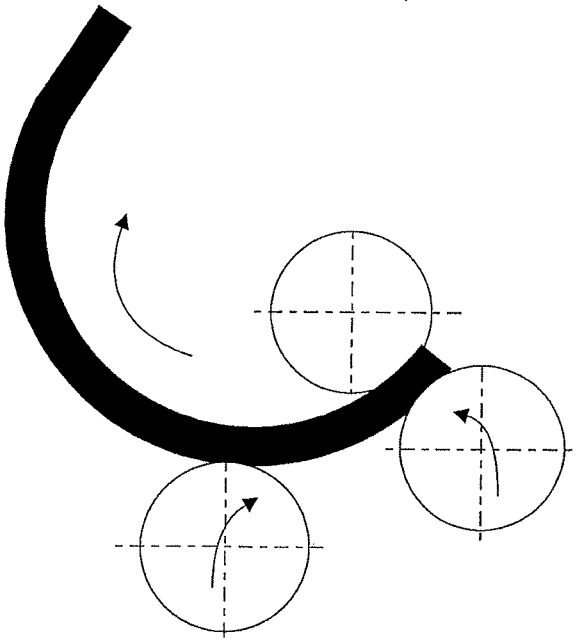
SYMMETRICAL BENDING



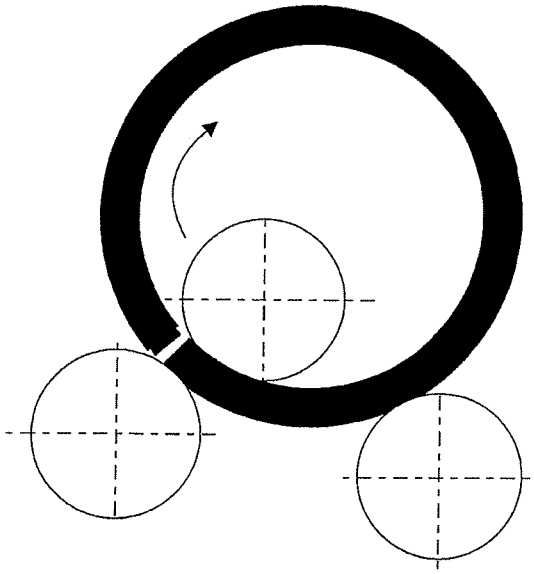
PREBENDING AND BENDING



Adjust the distance between the rollers. Lower one of the bottom rollers and raise the other.



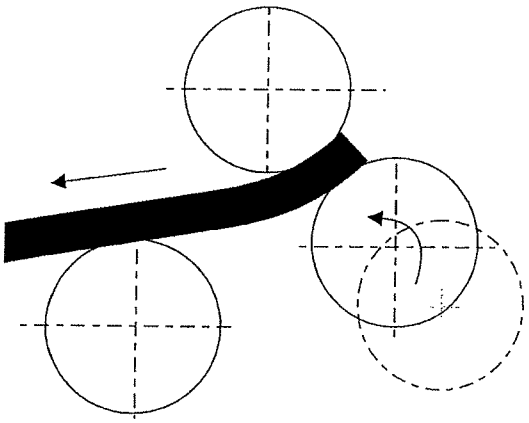
Round to actual diameter. If the profile is run through the machine repeatedly the bending should always be performed in the same direction.



The prebending radius depends on the distance between the upper and one of the lower rollers. By running the piece of work back and forth several times the prebending will increase.

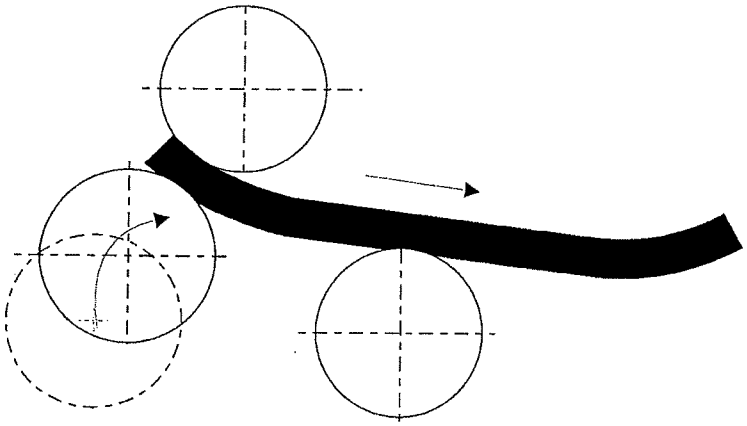
NOTE! A straight part of about 1-2 times the height of the profile will always remain.

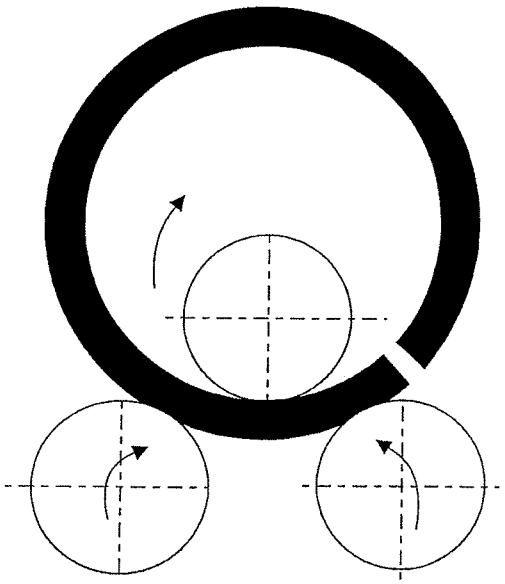
PREBENDING AND BENDING



Lower one of the bottom rollers as far as possible and raise the other one until the correct bending radius is obtained.
In the case of a small radius the first mentioned bottom roller has to be raised a little, in order to obtain the desired radius.

Run the material out of the machine in the direction shown on the figure.
(Valid for both figures beside).





Let the bottom rollers touch the profile at the prebent part according to the two figures above.

Adjust the rollers a little.

Run the material in direction of the arrow.

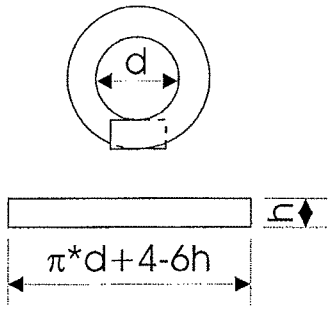
If a too big radius is obtained the rollers should be further adjusted.

DIFFERENT BENDING METHODS

Bending method 1. Fig.1

For heavy profiles the ring is cut off after the bending or when bent to a certain degree.

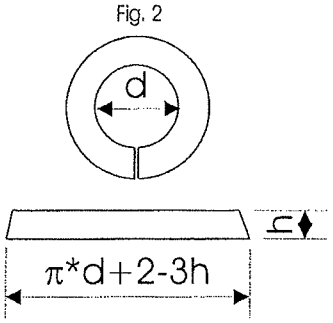
Fig. 1



Bending method 2 Fig.2

For small or medium size profiles and for bending one single piece.
The profile must be cut off at an angle before bending.
The bending of the ends is accomplished by an asymmetrical adjustment (see pages 7,8,9)

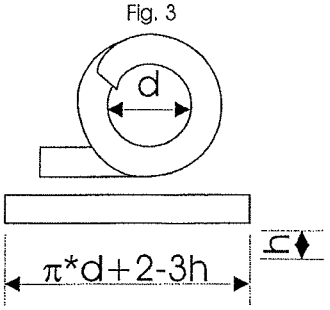
Fig. 2



Bending method 3. Fig.3

Spiral bending useful for all sizes of profiles provided that the diameter is big enough to allow the bending in one single operation.

Fig. 3



By production in series a new piece of profile should be welded to the end of the one already bent, before this runs in to the machine.

Fig. 4-5-6

When bending a profile the material outside the neutral axis will undergo a tension and the material inside a compression.
This means a change of the cross-section h_1 gets smaller than h and that b_1 gets bigger than b.
This is true for all kinds of profiles, especially flatbar on edge.

Fig.4

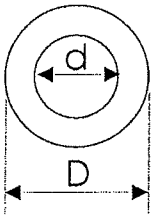


Fig.5

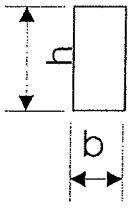
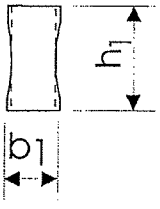
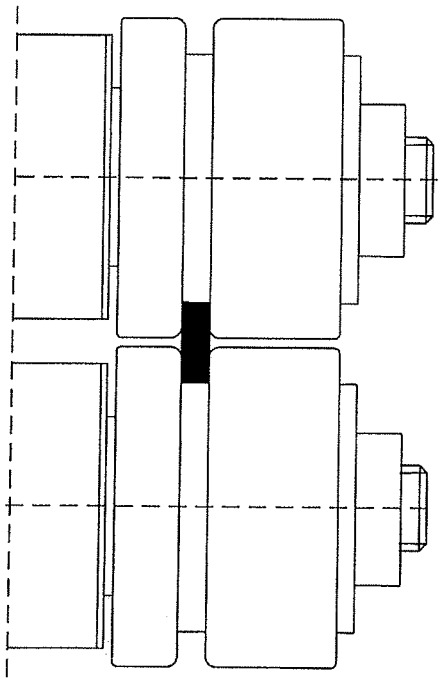


Fig.6



FLAT IRON ON EDGE AND SQUARE IRON

Fig 1



Generally

Symmetrical profile = easily bent. A good prebending is obtained by bending asymmetrically. A certain change of the cross-section is unavoidable due to shrinkage resp elongation caused by the pressure of the rollers.
The deformation will be smaller if the profile is bent in one or few operations.
If the profile is run through the machine many times it is necessary to increase the play between the narrow and the broad rollers during the bending process.
If heavy profiles have to be bent to small diameters, the profiles or rollers should be smeared with fat or thick oil.
NOTE: Do not smear the driving rolls.

It is important that the profile is properly guided by the rollers. At least 2/3 of the profile should be guided.
See combinations below. The smallest diameters to which a flat iron can be is ordinarily 10 times the height of the profile but due to the adjusting-, drive-, and roller system of the ROUNDO-machines a diameters of 5-6 times the height of the profile can be obtained.

Normally the relation height/width of profile should not exceed 8:1. In the case of big radius said relation may be greater.
In order to bent to smaller diameters than the bending rollers, special rollers have to be used. Please contact us for information.
NOTE: The slip coupling should be set lose = easy to slip.

Fig 2

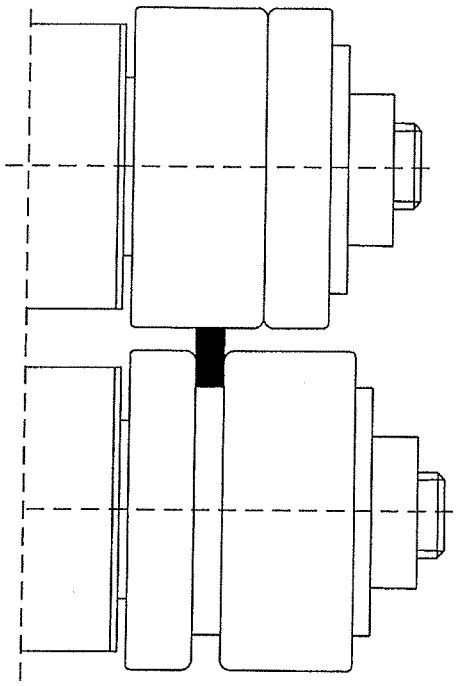


Fig 1

Roller combination 6:1 on both upper and lower shafts.
Profiles with high elastic section modules (cm^3) and big height.
Bending method 1 or 2. Not spiral bending. At the start of the bending procedure the play between the bending rollers should be at least 0,5 mm. Should the profile be bent to a small diameter the play in question should be increased during the bending operation.
Eventual smearing (see "Generally" above).

Fig 2

Roller combination 2 alternatively 3 on the upper shaft and combination 1 on the lower shafts.
Profiles with high elastic section modules (cm^3) and small height.
Bending method 1 or 2. No spiral bending.
Small square irons are also bent with this roller combination.

FLAT IRON ON EDGE AND SQUARE IRON

Fig. 1

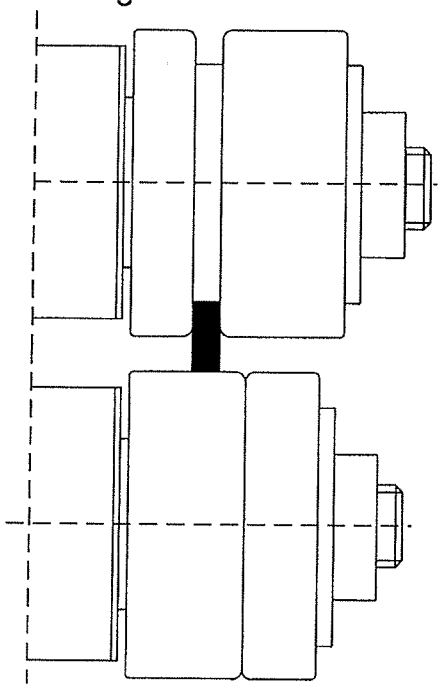


Fig. 1

Roller combination 6:1 on the upper shaft and 6:2 alt. 6:3 on the lower ones. Profiles with small section height. Bending method 1 or 2. No spiral bending.

Fig. 2

Roller combination 6:2 on both upper and lower shafts. Profiles with large section height.
Bending method 11:3. Spiral bending. As the narrow roller is mounted at the very end of the shafts the spiral bending is facilitated.

NOTE: With this roller combination the forces are applied far from the bearings. The machine should be loaded only to max 75% of its capacity.

Fig. 3

Roller combination 6:1 on the upper shaft and 6:2 on the lower.
Profiles with small section height.
For the rest as fig. 2.

Fig. 2

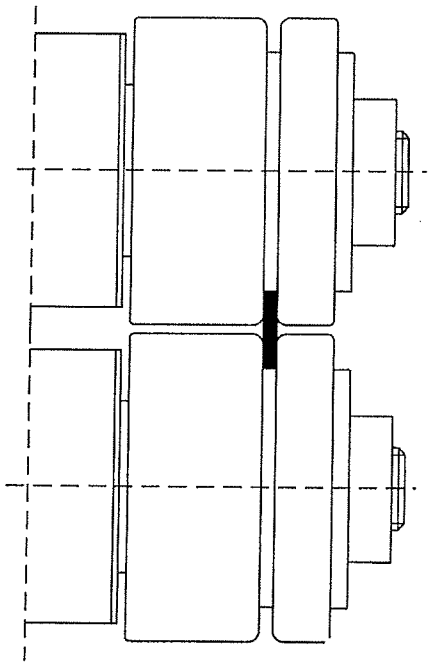
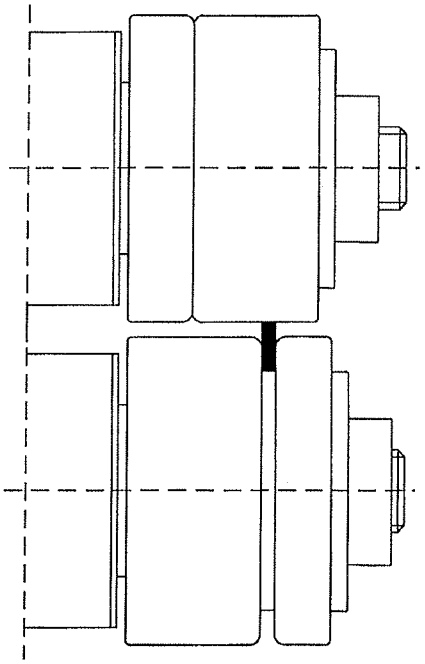


Fig.3



FLAT IRON ON FLAT AND SQUARE IRON

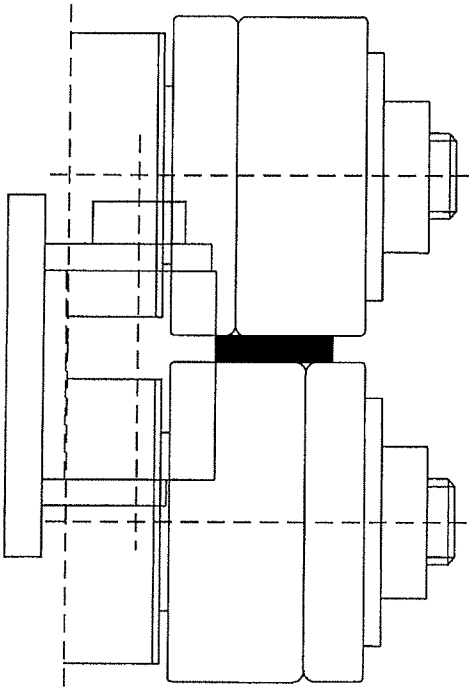


Fig. 1

Roller combination optional. Bend asymmetrically with little pressure force between upper and one of the lower rollers. If the material is pinched with too high pressure, it will become squeezed at the lower side, due to some deflection of the bending shafts. The bending result might then be that the material will warp somewhat. Adjust the guiding rolls to the same distance from the machine in order to keep the profile at right to the bending shafts. A small profile with little bending resistance will have a tendency to slip (but not with 3 driven rollers) as the friction for feeding is small. This slipping may be eliminated by increasing the pressure of the rollers. The profile can be bent to a diameter a little bigger than the rollers.
The slip coupling adjusted rather tight.

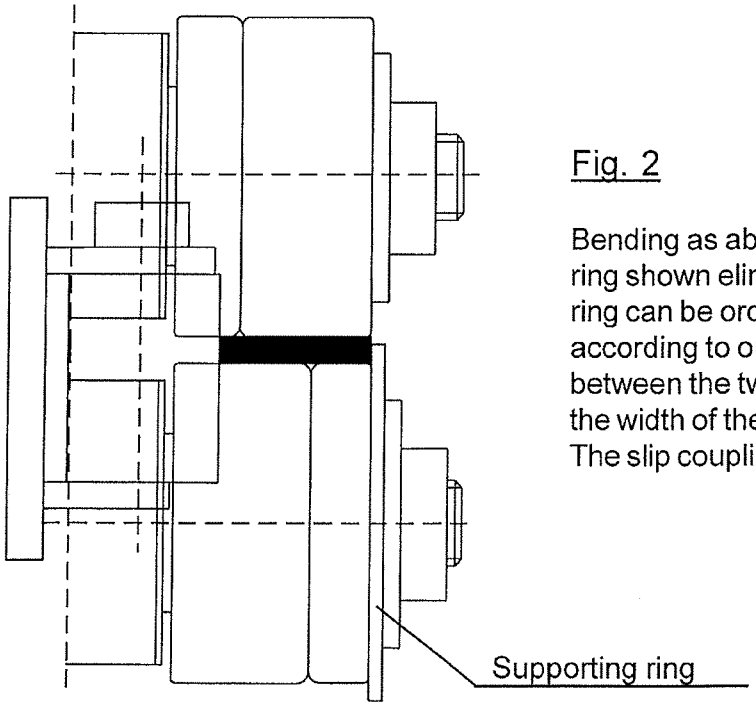
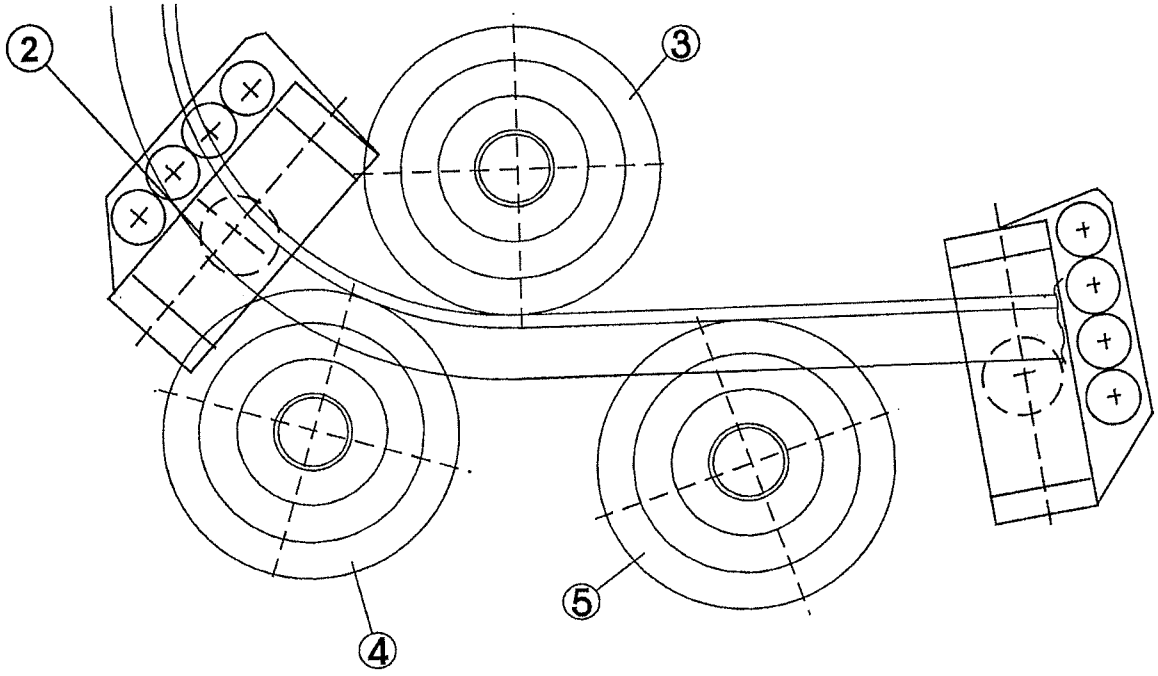


Fig. 2

Bending as above, Fig. 1. The additional supporting ring shown eliminates partly the risk of warping. This ring can be ordered from us or be manufactured according to our instructions. The ring is placed between the two standard rollers in a position to suit the width of the profile.
The slip coupling adjusted rather tight.

BENDING OF ANGLE IRON WITH THE FLANGE OUTWARDS R-2-S → R-7-S

Fig 1



1. The big guiding roll
2. The small guiding roll
3. Upper main roller
4. Left main roller
5. Right main roller

Fig 2

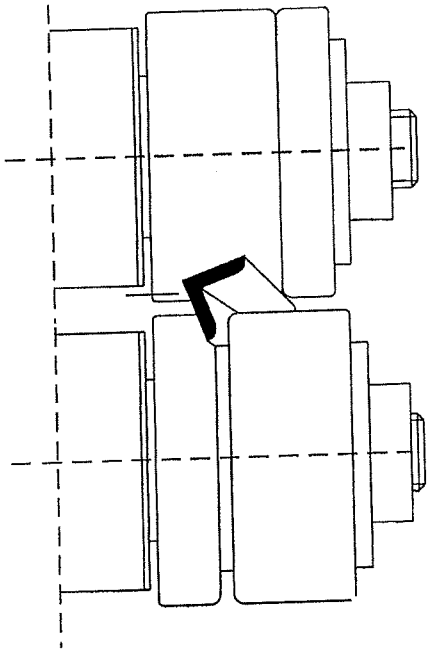
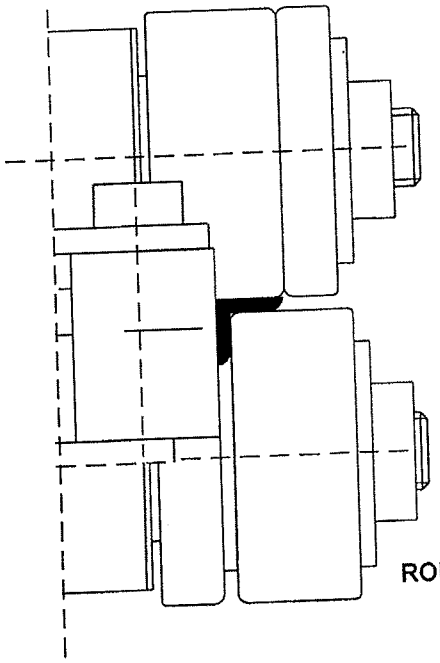
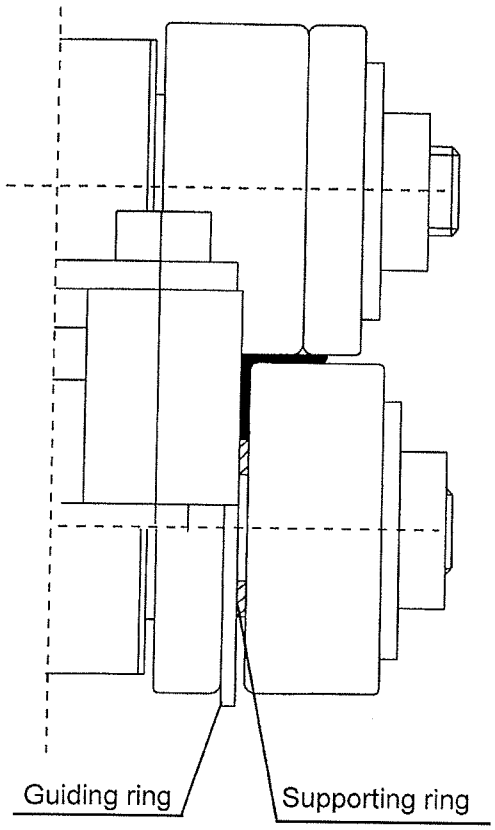


Fig 3



BENDING OF ANGLE IRON WITH THE FLANGE OUTWARDS R-2-S →R-7-S



Generally

The centre of gravity for L-iron is located outside the material which fact usually makes the profile warp.
As regards the ROUNDO-machines this warping is eliminated by means of the guiding rolls fig. 14:1.
Fig. 14:2 shows how the profile leaves the machine if guiding rolls are not used. As shown, the profile has tendency to twist in direction of the machine. In order to avoid this a force directed outwards has to be applied by means of the big guiding roll (1), wich is adjustable by hydraulic cylinders.
The force from the guiding roll should not be so great as to cause deformation and an outward twist of the profile.

NOTE: The guiding rolls have to be adjustment carefully.
Roll combination: Top shaft 6:2 or 6:3, Bottom shaft 6:4

Bending

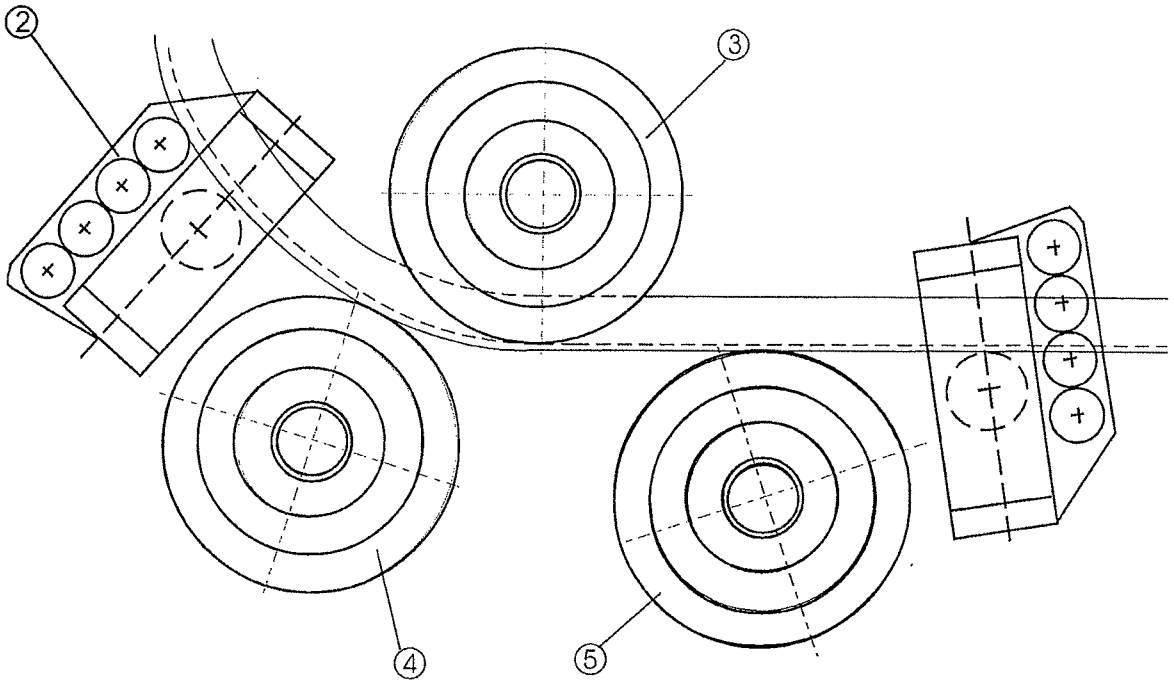
The best bending result is obtained by symmetrical adjustment of the bending rolls (see page 7).
The adjusting of the guiding rolls depends on both the size of the profile and the desired bending diameter.
This is valid also for small diameters.
Prebending is done with asymmetrical bending.
For small profiles a supporting ring as shown may be of advantage. By bending small profiles spiral bending is suitable. As the guiding rolls cannot guide the profile out to the very end a certain piece should be cut off after bending.

The slip coupling adjusted tight.

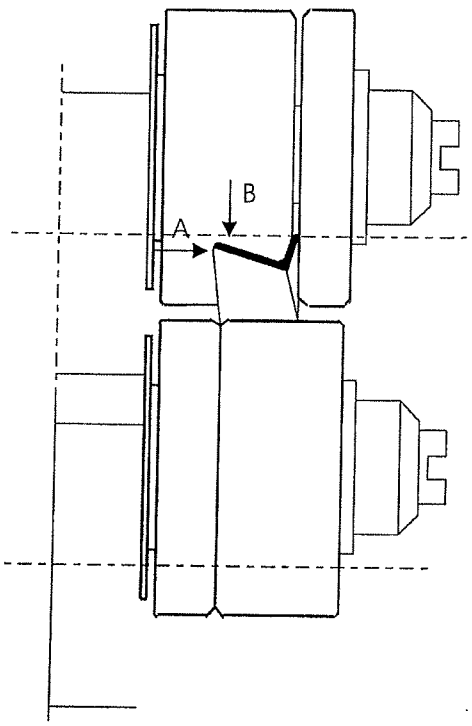
Roll combination: Top shaft 6:2 alt. 6:3, bottom shaft 6:4.

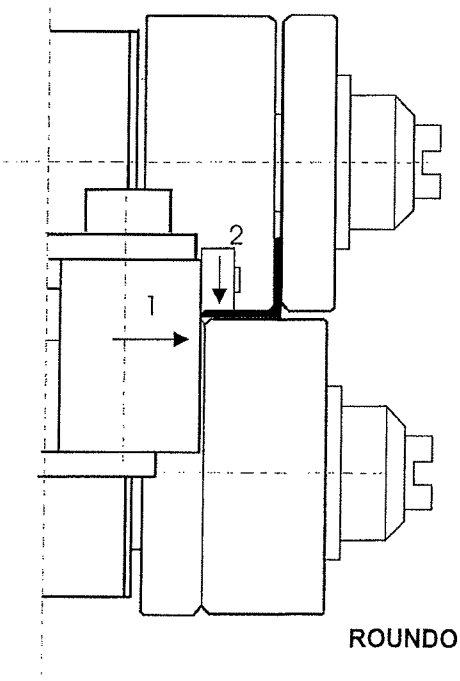
Supporting ring and guiding ring are not standard equipment.

BENDING OF ANGLE IRON
WITH THE FLANGE INWARDS R-2-S → R-7-S

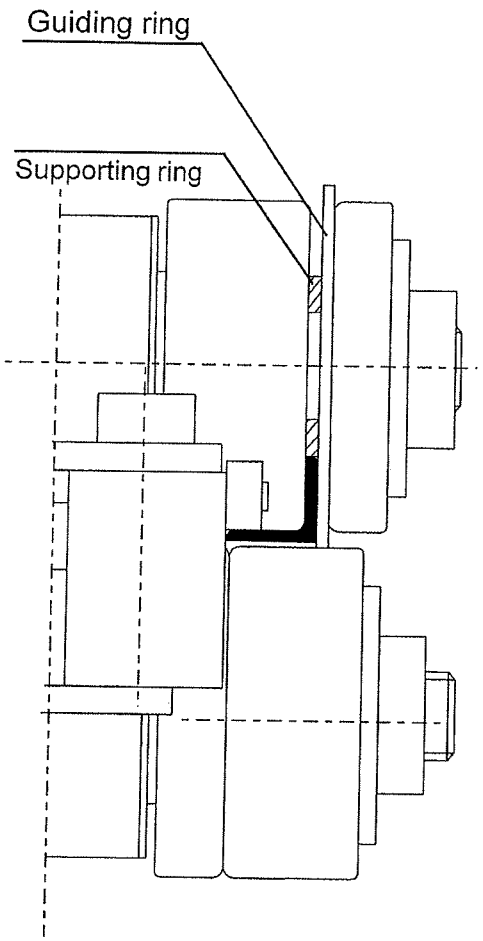


1. The big guiding roll
2. The small guiding roll
3. Upper main roller
4. Left main roller
5. Right main roller





BENDING OF ANGLE IRON WITH THE FLANGE INWARDS R-2-S → R-7-S



Generally

About the same procedure as for angle iron with the flange outside. As shown on fig. 16:2 the profile turns in two directions. Therefore the guiding forces must be applied by means of both the big (1) and the small (2) guiding rolls.
The roll (2) is adjusted by turning the total guide roll. After every adjustment of the bending rolls a small adjustment of the position of the roll (2) may be necessary.
As the material will be compressed inside the neutral axis the profile cannot be bent to such small diameters as some other profiles can. Calculate with a min. diameter of about 10-14 times the profile height.

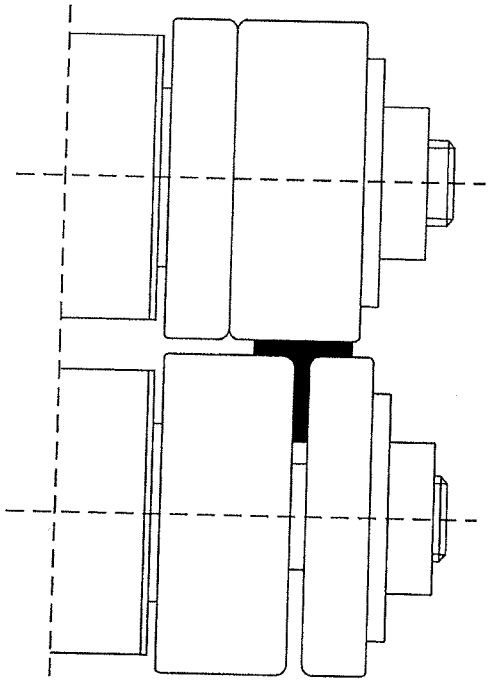
NOTE! If the guiding roll is put in a sharp angle upwards and the rolls are adjusted up against it, the guiding roll can run against the upper roll.

Bending

Symmetrical adjustment.
Start the bending with one end of the profile at the big guiding roll.
Adjust the lower bending roll and feed the profile until the bent part is at the same level as the small guiding roll.
Adjust the small roll afterwards in such a way that it straightens out the profile.
The big roll should touch one flange of the profile and direct it out from the machine.
If the small roll is adjusted too much the profile will turn inwards.
Run the profile so that the other end stops right at the middle of the big guiding roll and repeat the operation at this side.
Run in the opposite direction.
The first adjusted guiding unit will then be in the correct position. Alternate in this way the bending procedure until the desired diameter or radius is obtained.
It is advantageous to use guiding and supporting rolls.
As a rule the profile cannot be bent out to the very end.
Thus a certain piece may have to be cut off.
Small profiles can with advantage be spiral bent.
Slip clutch adjusted tight.
Roll combination on top shaft depending on angle size, 6:3 - 6:6, bottom shaft 6:1 or 6:4.
Guiding and supporting rings are not standard equipment.

BENDING OF T-IRON WITH THE FLANGE OUTWARDS AND INWARDS

Fig 1

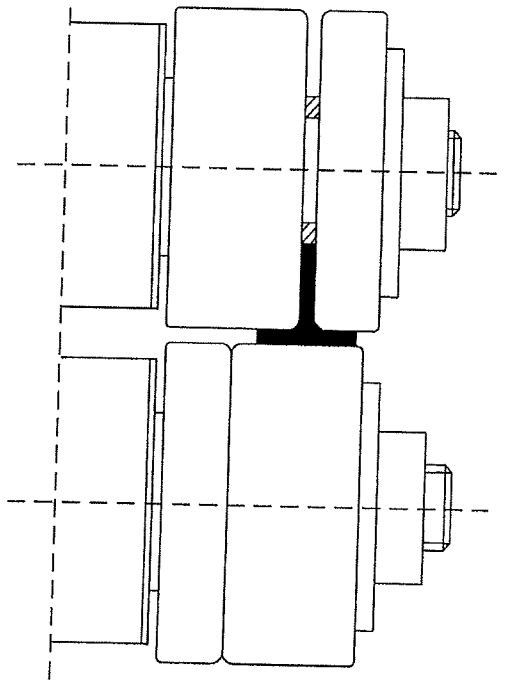


T-iron with flange outwards

Roller combination 1 alt. 2 for the upper roller.
Combination 3 for the lower ones.
Asymmetrical bending.
Do not press too hard with the lower roller located closest to the upper one as this may result in warping due to a rolling out of the inner edge.

Slip clutch adjusted tight.

Fig.2

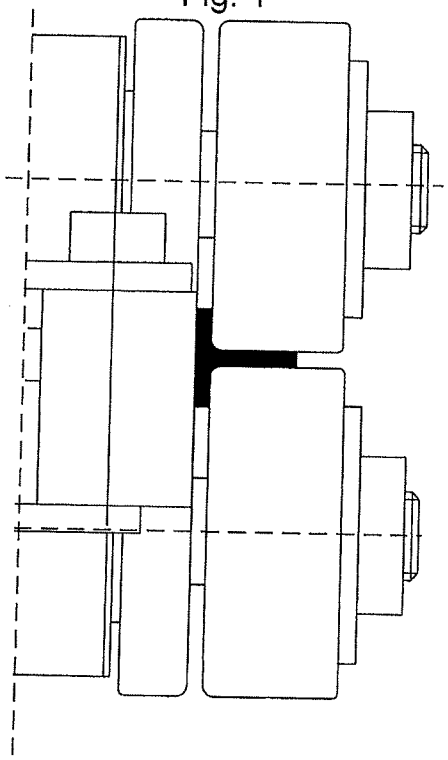


T-iron with the flange inwards

Roller combination 3 for the upper roller and 1 alt. 4 for the lower ones.
Bending as above. The min diameter for this profile is about 10-12 times the section height.
The result will be further improved if a driving ring (see fig. 2) is used. This ring should be set in a positon to guide both web and flange.
One ring for each profile is required.
Bending to a large diameter is easily done without such a ring.
The slip cloupling should be adjusted tight.
This is especially important in the case of bending to a small diameter.

BENDING OF T-IRON WITH THE FLANGE OUTWARDS AND INWARDS AND BENDING OF SMALL ROUND PROFILES

Fig. 1

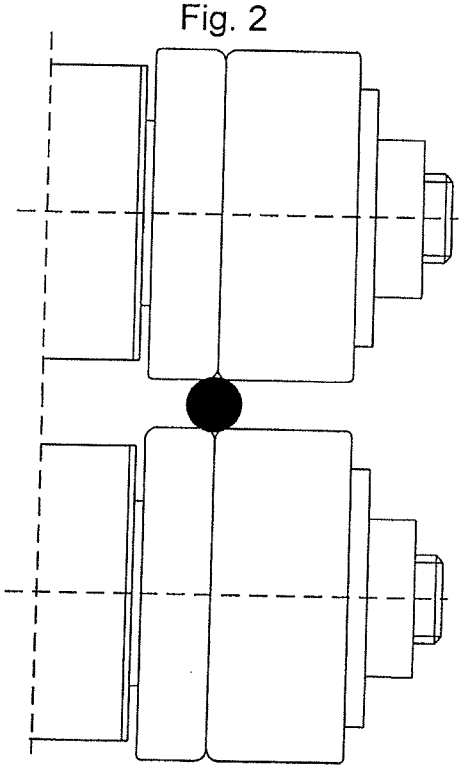


T-iron with flange outwards/inwards

Roller combination 4 for both upper and lower rollers
Symmetrical bending.
The profile has a tendency to turn inwards to the machine, which is compensated by adjusted the guiding rolls.

Slip clutch adjusted tight.

Fig. 2

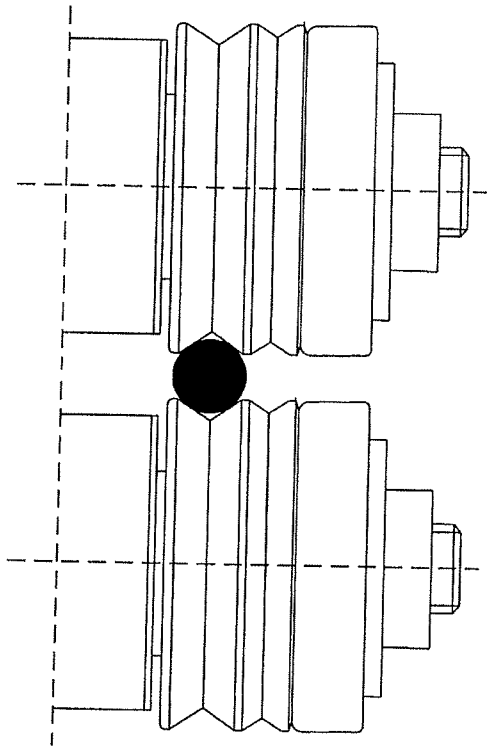


Small round profiles

Roller combination 1 alt. 4 for both upper and lower rollers. The figure shows bending of a small profile.
For bending big profiles special rollers must be used. As the profile is not supported in a V- or half- circular groove it will be slightly deformed.

Slip clutch adjusted lose.

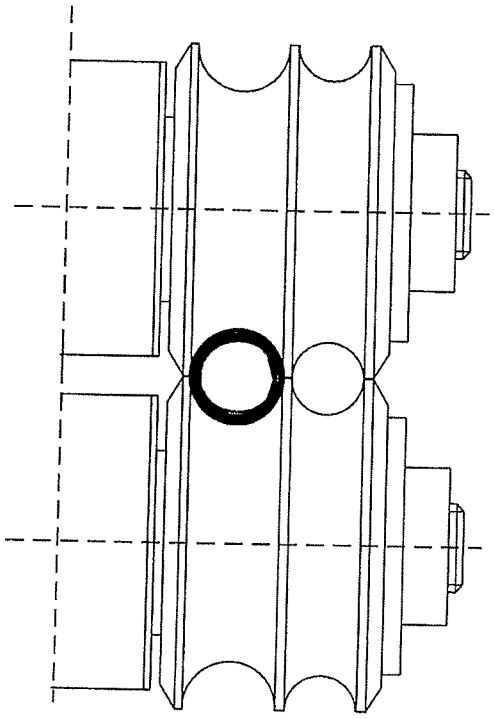
BENDING OF ROUND PROFILES AND PIPES



Round profile

Special rollers with one or more grooves can be obtained.
Bend symmetrically. Min bending diameter about 4-6 times the diameter of the profile.
By production in series spiral bending is advantageous.

Slip clutch adjusted lose.

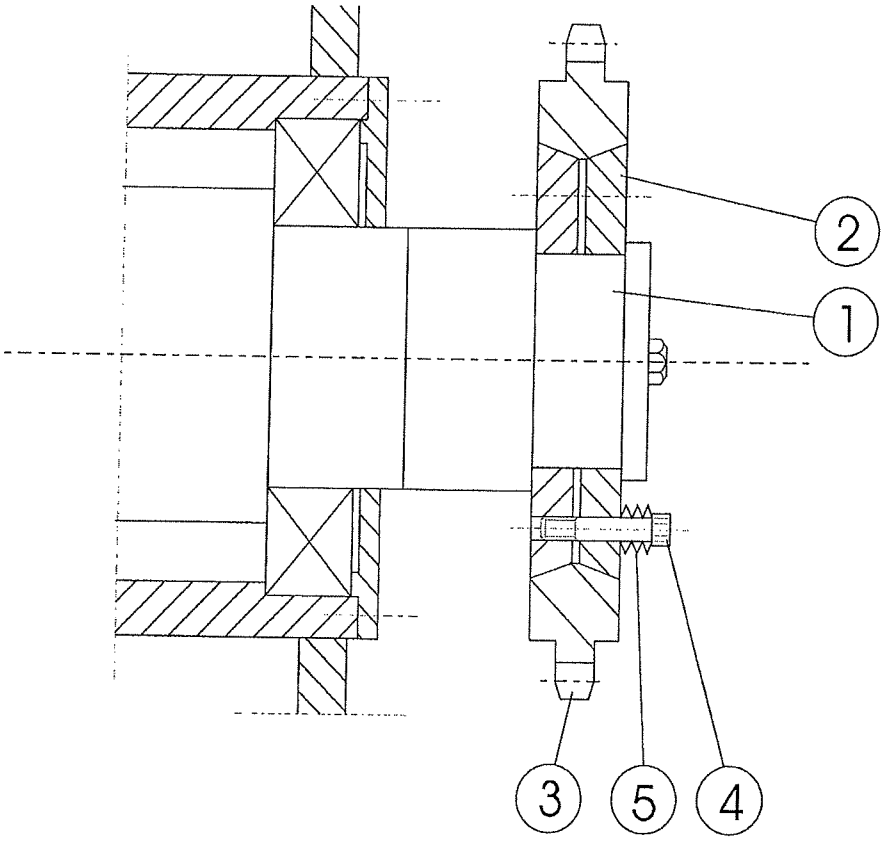


Pipe

Special rollers for different sizes.
Asymmetrical bending.
Min bending diameter about 8-10 times the pipe diameter. A certain oval deformation is caused by stretching resp. compression on the sides of the neutral axis.
This deformation depends on the wall thichness of the pipe as well as the bending diameter desired.
Excellent for spiral bending.
With special equipment a fixed pitch can be obtained.

Slip coupling adjusted tight.

SLIP CLUTCH R-4 → R-5-S



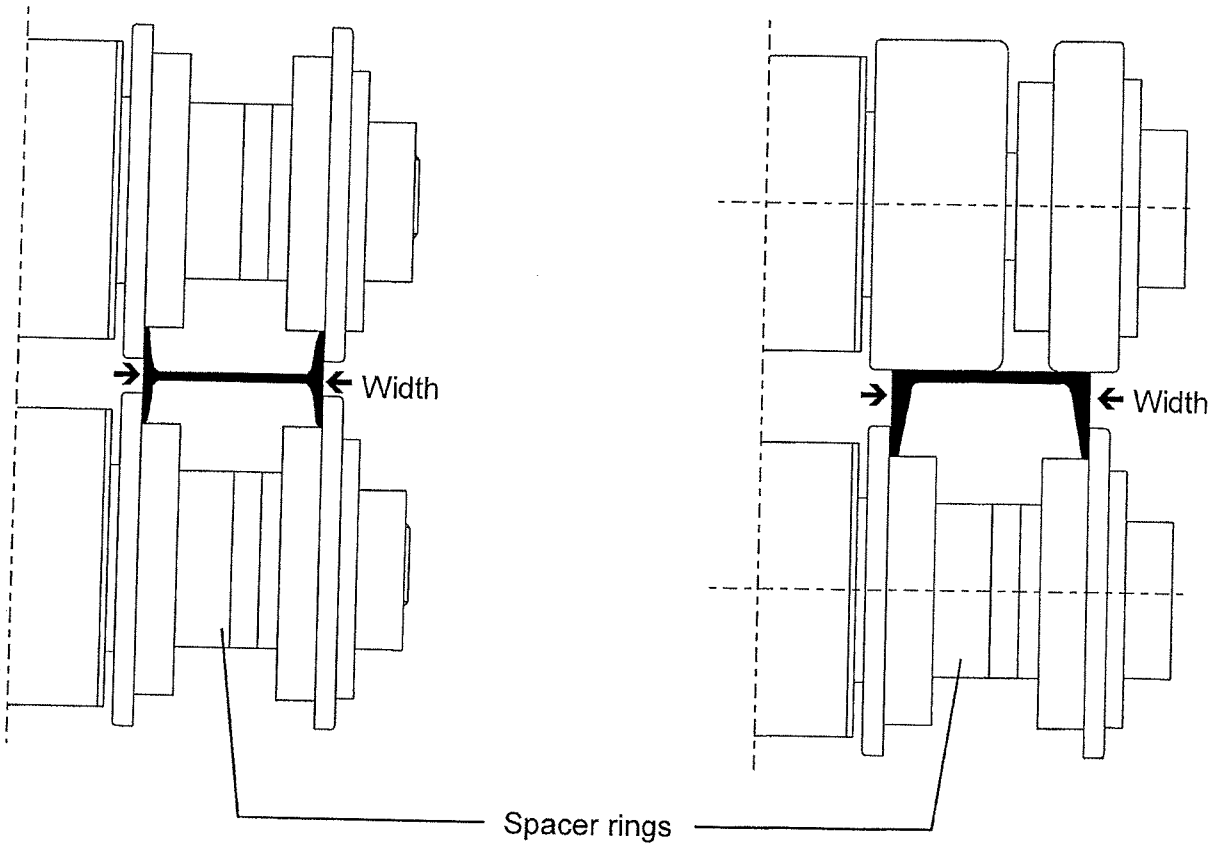
1. Upper shaft
2. Cone
3. Sprocket
4. Adjusting screw
5. Cup spring

Adjustment of the slip clutch

Adjust slip clutch from the opening in the cover plate.Adjust the power transmission via the slip clutch by tightening or loosening the adjusting screws. At the factory the slip clutch is set for a low power transmission.

NOTE: Do not tighten the slip clutch more than necessary. Follow the recommendations given under bending instructions for each type of profile.

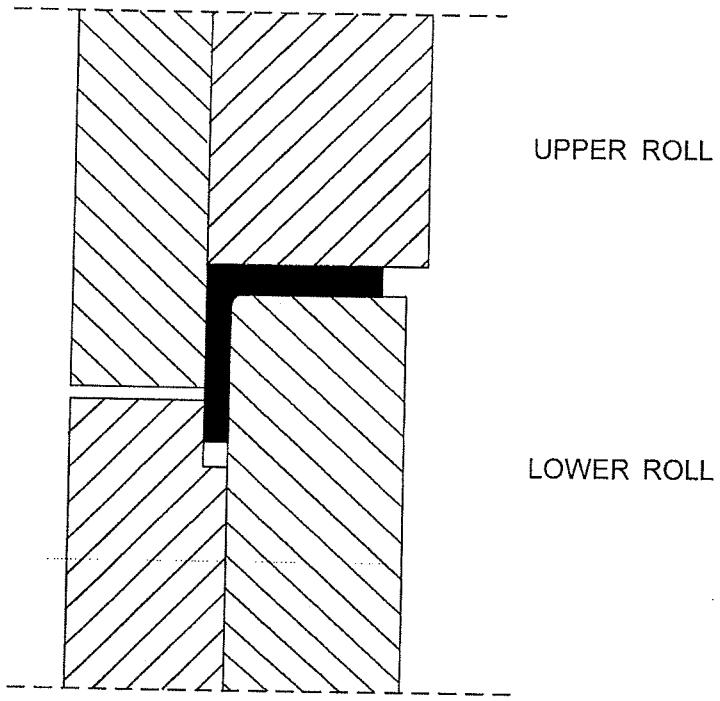
BENDING ROLLS FOR I/BARS AND CHANNELS
R-5/R-5-S/R-52-S



I-BARS / CHANNELS

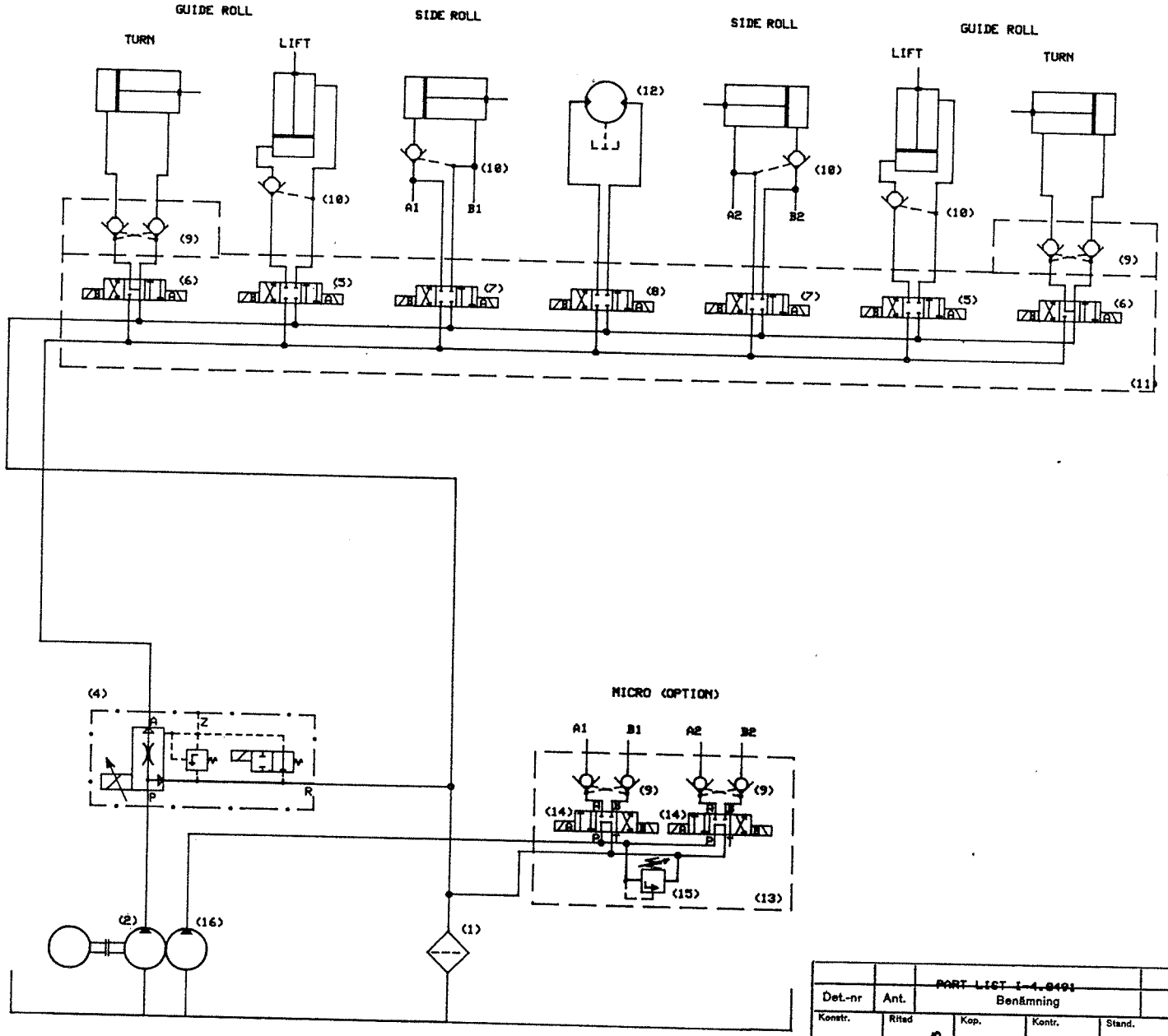
Profile	Spacer rings
3"	---
3.5"	1
4"	2
4.5"	1+2
5"	3
5.5"	1+3
6"	2+3
6.5"	1+1+3
7"	3+3
7.5"	1+3+3
8"	2+3+3

BENDING OF ANGLE IRON TO SMALL DIAMETERS WITH THE FLANGE OUTWARDS



Bending of angle iron to small diameters with the flange outwards

The bending has to be in a spiral. A whole length of angle iron is fed into the machine and than the spiral can be bent to rings. The rollers are mounted as shown above and the profile is placed in the lower rollers. The lower roller at the outgoing side is regulated completely up to the upper roll with the profile between. The lower roller at the ingoing side is regulated up until you have got the right diameter. The guiding roll at the ingoing side is to be used, but for the outgoing side no guiding is required normally.
Above rolls are not standard equipment.



Det.-nr	Ant.	PART LIST I-4.8491 Benämning	Material	Mod.-nr Ämne Dimension	Anm.
Konstr.	Ritad	Kop. Kontr. Stand.	Godk.	Skala	Ersätter / Ersatt av
ROUNDO		HYDRAULIC DIAGRAM R5-S			Dat. 86 12 15
					Ritn.-nr I-3.8411

Nr	Ant	Ändring och/eller medd.-nr	Datum	Inf.	Godk.	Nr	Ant	Ändring och/eller medd.-nr	Datum	Inf.	Godk.

Océ 7363-43

SMS 687 1.11

571 994

SUPER IMPERIAL 20

ITEM No.	QTY	DESCRIPTION	MANUFACT	PART No.
POS.	ANT.	BENÄMNING	FABRIKAT	TYPBETECKNING
16	1	Pump	Lamborghini	HLPD 0505 D
15	1	Relief	Parker H.	736259
14	2	Directional valve	"-	D1VW8CP
13	1	Manifold	"-	HFDK 60199
12	1	Motor	SAI	MTCP 1000
11	1	Manifold	Parker H.	HFDK 60533
10	4	Over center	Hawe	RH2
9	4	"-	Parker H.	CPOM 2 D
8	1	Directional valve	"-	D3W-1-C-Px5060+BK310
7	2	"-	"-	D1VW-1-C-P+BK300
6	2	"-	"-	D1VW-4-C-P+BK300
5	2	"-	"-	D1VW-1-C-P+BK301
4	1	Proportional valve	Hawe	SE3-3/S-WS2-0-W110-G24
2	1	Pump	Atos	PFEXA-31028
1	1	Filter	Parker H.	12PS 10CN 15

Sign: CL Dat: 860811

ROUNDO

HYDRAULIC PART LIST

R-5-S

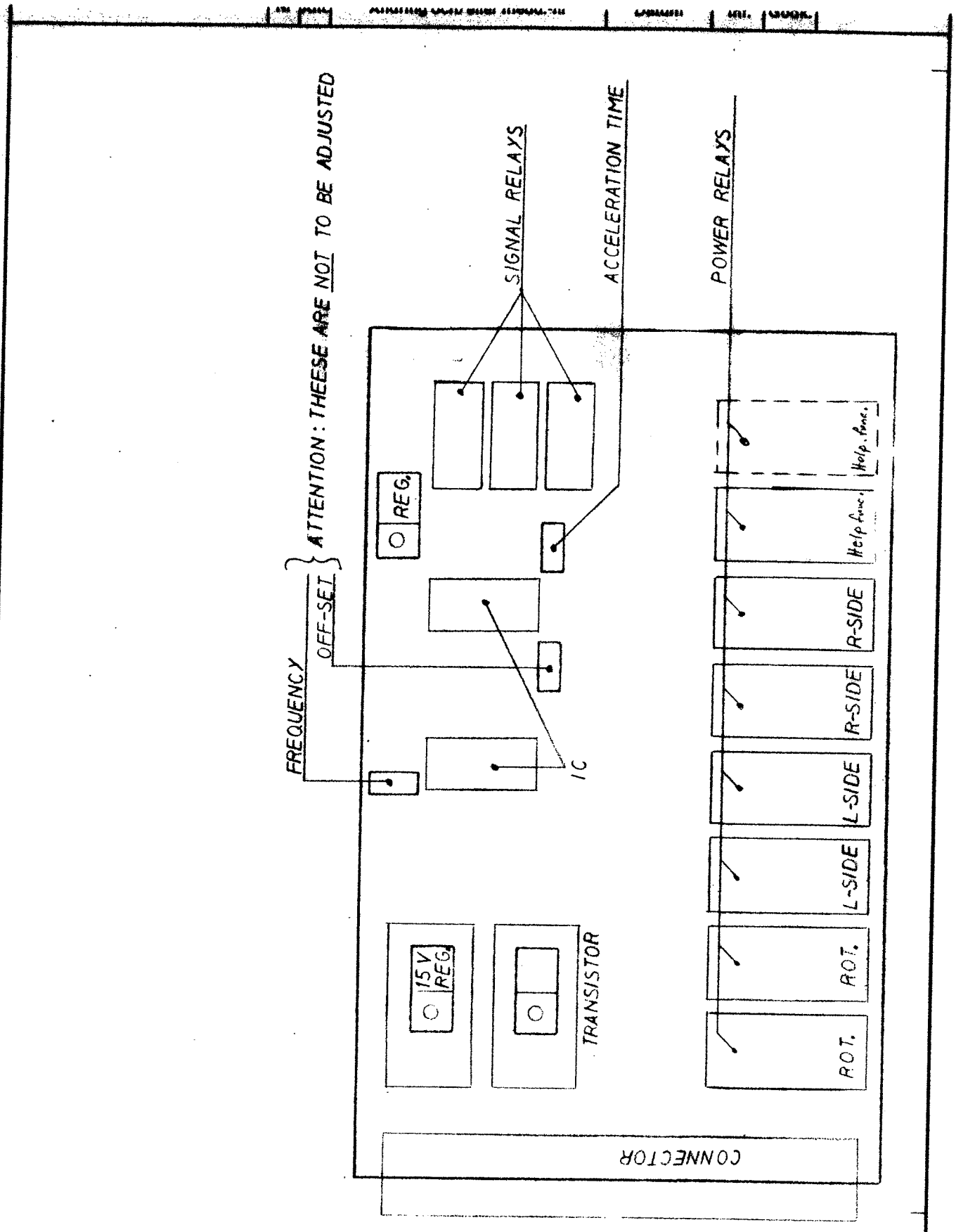
Ersätter: Ersatt av:

Ritn.nr: I-4.8491

N	1	Emergency stop	Siemens	3SB1000-4LB20
B	1	Start/Stop	Siemens	3SB1000-0CB01
D	1	Rectifier bridge	Fagor	FB2502
K	1	Capacitor		4700μF/25V
F2	1	Fuse		5x20 mm 2A
F1	1	"-		"-
TR1	1	Transformer	Tramo	380/110 150VA
TR2	1	"-	"-	380/18 50VA
TR3	1	"-	"-	380/110 20VA
C1	1	Contactor	Siemens	3TB43/4617-0AF0+3UA52/5800-2C
M	1	Motor	"-	1LA5163-4AA2/71

ITEM No.	QTY	DESCRIPTION	MANUFACT	PART No.
POS:	ANT.	BENÄMNING	FABRIKAT	TYPBETECKNING

Sign: CL	Dat: 861215	ELECTRICAL PART LIST	Ersätter:	Ersatt av:
ROUNDO		R-5-S	Ritn.nr: I-4.8492	



Det.-nr	Ant.	Benämning	Material	Mod.-nr Ämne Dimension	Anm.
Konstr.	Ritad	Kop.	Kontr.	Stand.	Godk.	Skala	Ersätter	Ersatt av
		ELECTRONIC CONTROL			Det.
		82 05 05 A			Rltn.-nr

PARKER

DIRECTIONAL CONTROL VALVE
TYPE: D3W C

189 A

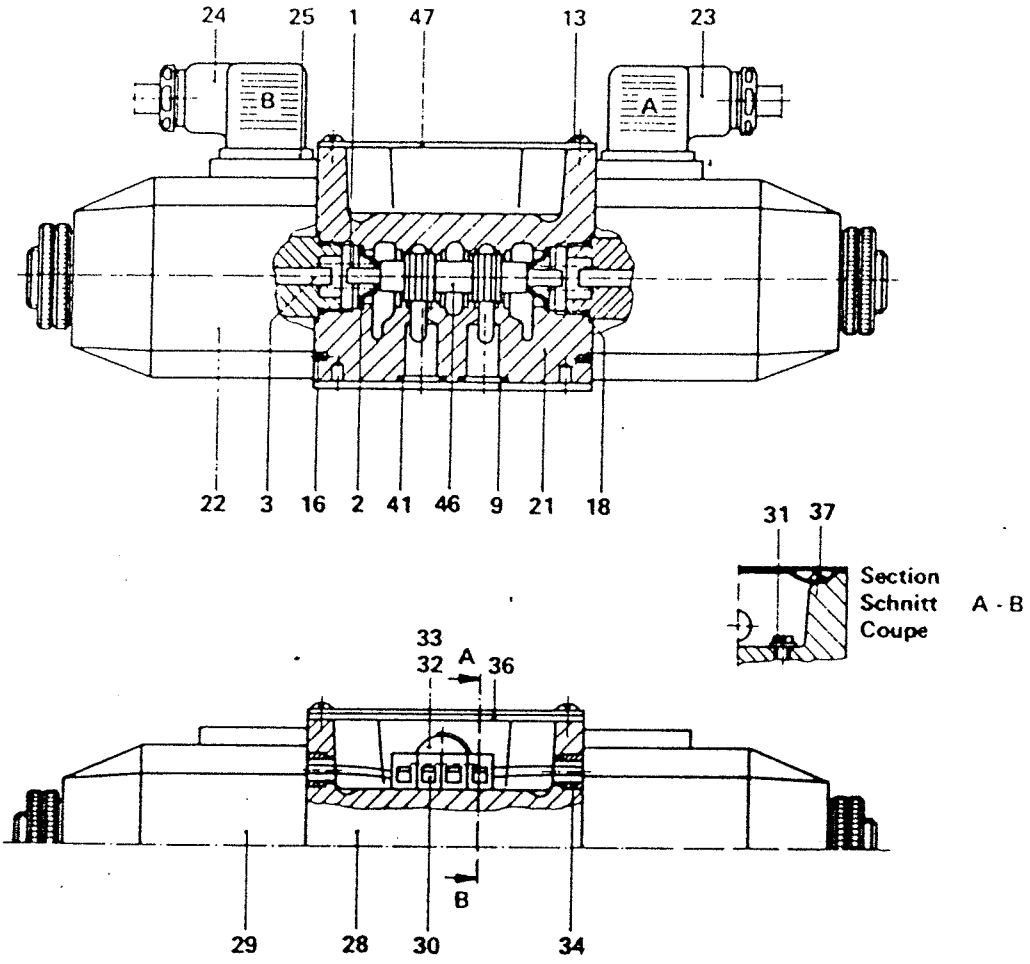
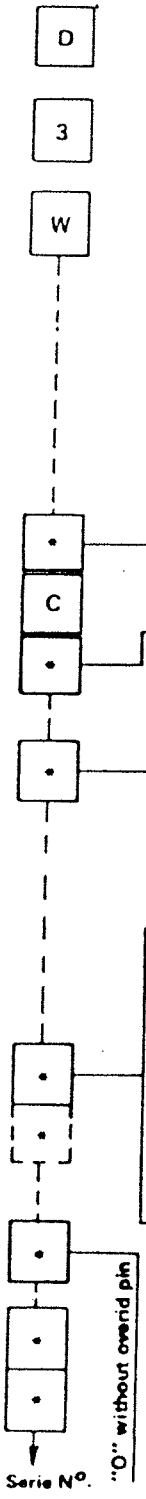


Table 2
Tabelle 2

	SPOOL KOLBEN TIROIR	PART Nº. TEIL NR. PIECE Nº.		SPOOL KOLBEN TIROIR	PART Nº. TEIL NR. PIECE Nº.
1		691869	8		691908
2		691873	10		691891
3		691875	11		691872
4		691870	14		691874
5		691876	15		691875
6		691877	16		691876
7		691874			

DIRECTIONAL CONTROL VALVE

PARKER **TYPE: D3W 3** **189 B**



ITEM	QTY.	PART / ITEM N°.	DESCRIPTION
1	2	691649	Spring
2	2	691881	Center washer
3	2	691887	Push rod
4			
5			
6			
7			
8			
9	1	679192	Shipping plate
10			
11			
12			
13	4	655948	Screw
16	2	7346-3x6	Roll pin DIN 7346
18	2	3-910-V709-9	O-Ring
46	1		Spool (see table 2)
-			Standard
1	1	678444	Conduit Box
5	2	700864	Signal light, Hirschmann plug
5	1	691347	Signal light, without Hirschmann plug
41	5	2-014-N552-9	O-Ring, Buna N
41	5	2-014-V709-9	O-Ring, Viton
21	1	701967	Valve body
22	2		Solenoid (see table 1)
23	1	931470-106	Hirschmann plug, grey A
24	1	931470-100	Hirschmann plug, black B
25	2	731531-002	Gasket
28	1	701968	Valve body
29	2		Solenoid (see table 1)
30	1	2740.2	Connector
31	1	85-M4x6-MS	Grond screw
32	1	46320-761/6K	Pipe plug
33	1	R1/2-8,159D	Cable clamp
34	2	691523	Isolating sleeve
36	1	701761	Gasket
37	1	1476-3x6-4D	Drive screw
47	1	701671	Nameplate

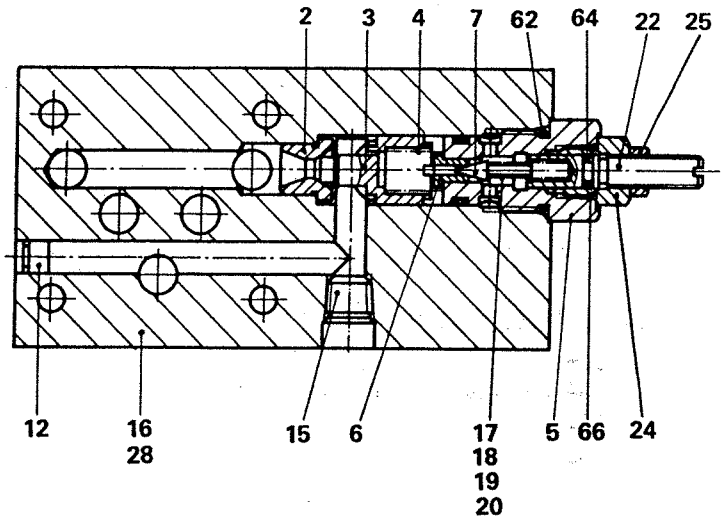
Parts List
Stückliste
Listes des pièces détachées

RM 3 * * * 11

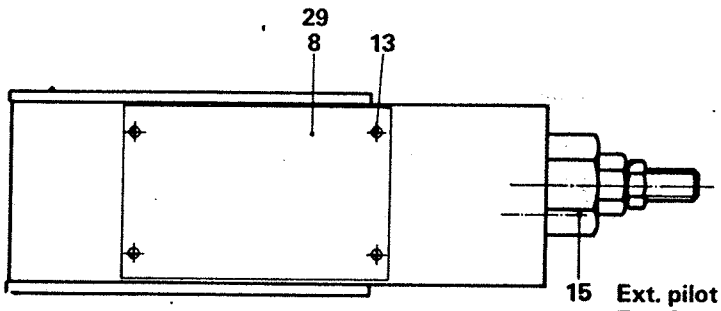
Manapak Relief Valve
Druckbegrenzungsventil
Limiteur de Pression Manapak

184A

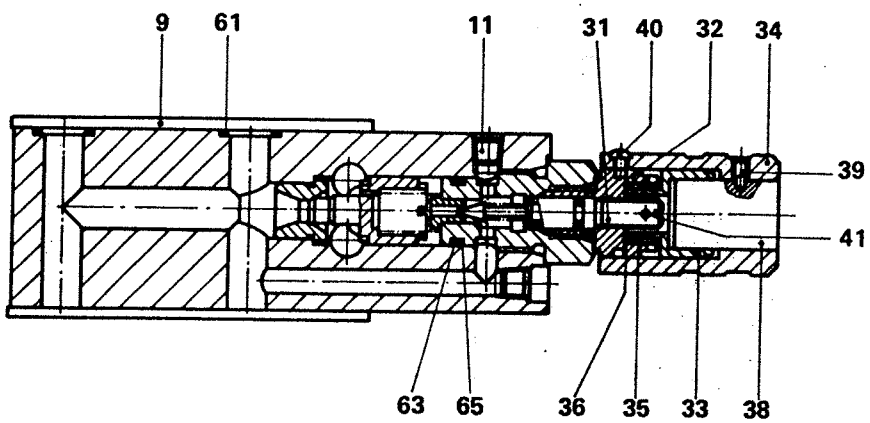
No.: E-PC-RM 3-1-5-GB,D,F/11/80



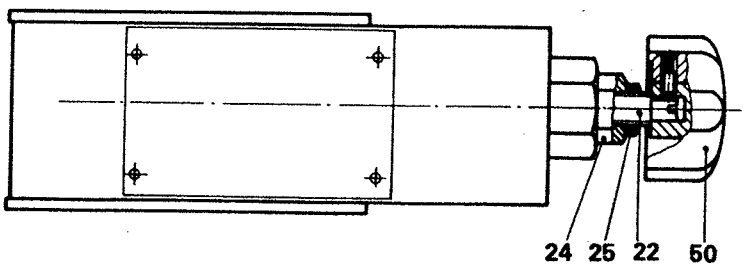
Standard - Model
Slotted screw lock nut
Standard - Ausführung
Stellschraube mit Kontermutter
Modèle - Standard
Vis de réglage avec Contre - écrou



Ext. pilot
Ext. Steueranschluß
Pilotage externe



Model with DIN lock 'L'
Ausführung mit DIN-Schloß 'L'
Modèle avec Verrou 'L'



Model with Plastic knop 'O'
Ausführung mit Plastikknopf 'O'
Modèle avec Bouton 'O'

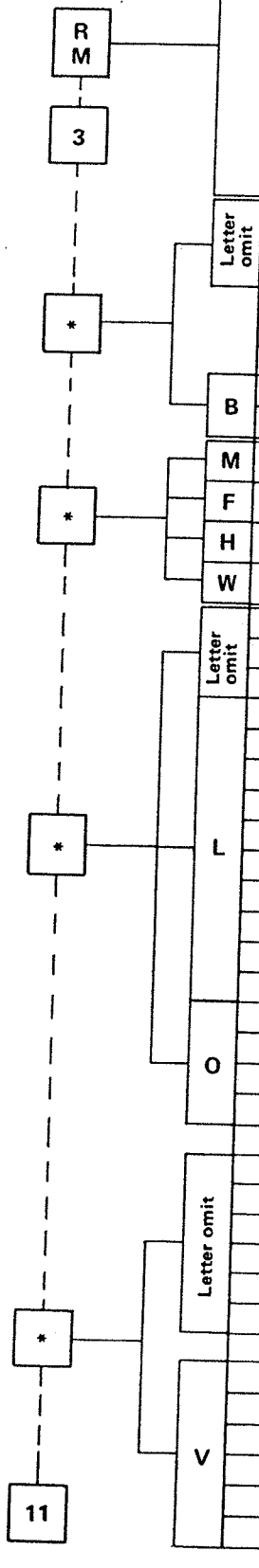
Parts List
Stückliste
Listes des pièces détachées

RM 3 * * * 11

184B

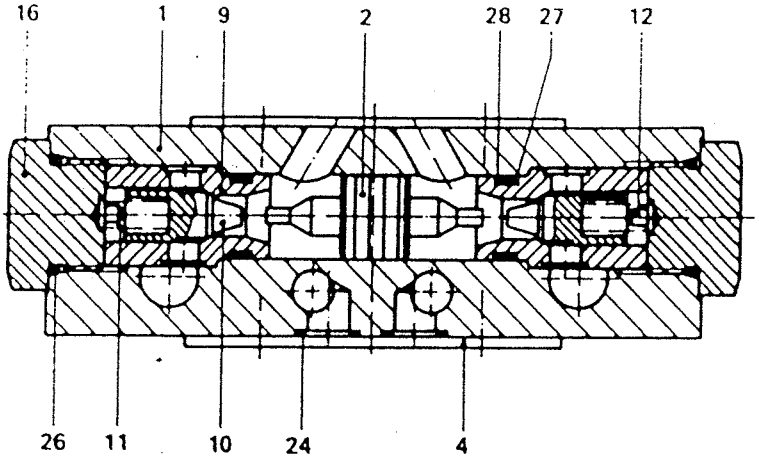
Manapak Relief Valve
Druckbegrenzungsventil
Limiteur de Pression Manapak

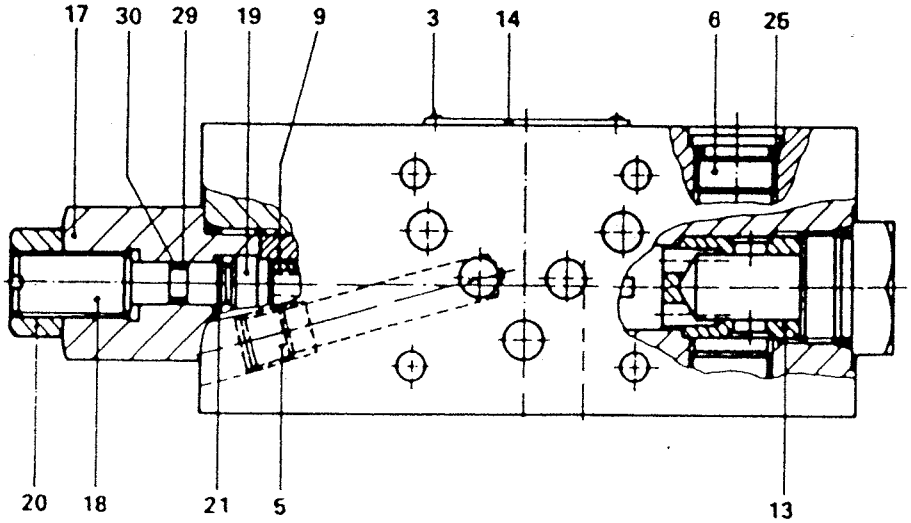
No.: E-PC-RM 3-1-5-GB,D,F/11/80

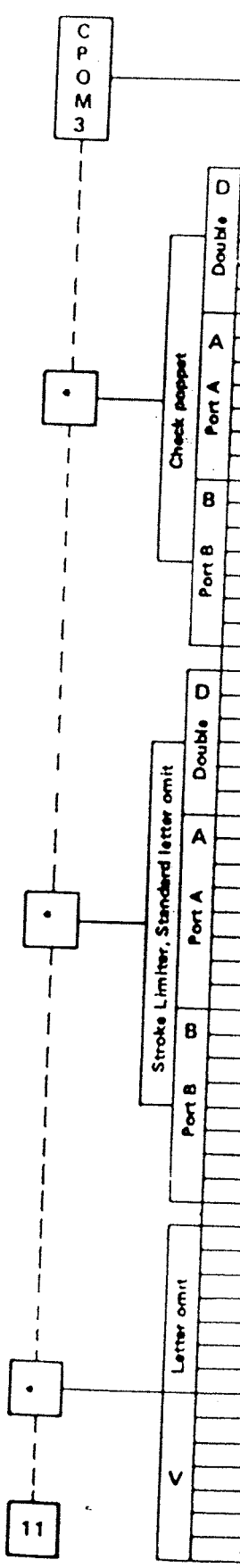


	ITEM	QTY.	PART / ITEM Nº.	DESCRIPTION
	2	1	701263	Poppet seat
	3	1	701242	Main poppet
	4	1	701265	Spring
	5	1	700459	Cartridge body
	6	1	701752	Pilot poppet seat
	7	1	562392	Pilot poppet
	9	2	679192	Shipping plate
	11	3	1/16-NPTF	Plug
	13	4	1131-0304	Chobert Rivet
	15	3	1/4-NPTF	Plug
Letter omit	16	1	58-D-332	Valve body Version P
	8	1	004831	Nameplate
	12	2	CK11-211HK100	Plug HK100
B	28	1	058382	Valve body Version B
	29	1	004877	Nameplate
M	17	1	678884	Spring p = 70 bar
F	18	1	678885	Spring p = 140 bar
H	19	1	582007	Spring p = 210 bar
W	20	1	700465	Spring p = 315 bar
Letter omit	22	1	700461	Follower
	24	1	700460	Retainer
	25	1	936,5/16-24-6S	Nut
L	31	1	700470	Follower
	32	1	700473	Retainer
	33	1	700472	Guide
	34	1	700469	Lock body
	35	1	700471	Spacer
	36	1	3-906-N674-7	O-Ring
	38	1	2H	Lock 2H
	39	1	915-M4x8-45H	Screw DIN 915
	40	1	922-M3x2,5x2-5S	Screw DIN 922
	41	1	7-A-186	Pin
O	50	1	670751	Knob
	22	1	700461	Follower
	24	1	700460	Retainer
	25	1	936,5/16-24-6S	Nut
Letter omit	61	5	2-014-N552-9	O-Ring, Buna N
	62	1	3-908-N552-9	O-Ring, Buna N
	63	1	2-014,1-N674-7	O-Ring, Buna N
	64	1	2-009-N552-9	O-Ring, Buna N
	65	1	8-014,1-N300-9	Back - up ring, Buna N
	66	1	3-905-N552-9	O-Ring, Buna N
V	61	5	2-014-V709-9	O-Ring, Viton
	62	1	3-908-V709-9	O-Ring, Viton
	63	1	2-014,1-V747-75	O-Ring, Viton
	64	1	2-009-V709-9	O-Ring, Viton
	65	1	8-014,1-V709-9	Back - up ring, Viton
	66	1	3-905-V709-9	O-Ring, Viton

PARKER TYPE: CPOM 3







ITEM	QTY.	PART / ITEM Nº.	DESCRIPTION
1	1	58-D-317	Valve body
2	1	4-B-856	Piston
3	4	1131-0304	Rivet Chobert 2,4x4
4	2	679192	Shipping plate
5	2	1/4-NPTF	Plug
6	2	.108x8	Plug
9	2	58-B-321	Cartridge
10	2	58-B-320	Poppet
11	2	58-B-319	Spring
12	2	700662	Spring Guide
14	1	004837	Nameplate
16	2	58-A-322	Endcap
9	1	58-B-321	Cartridge
10	1	58-B-320	Poppet
11	1	58-B-319	Spring
12	1	700662	Spring Guide
13	1	4-B-823	Sleeve
14	1	004839	Nameplate
16	2	58-A-322	Endcap
9	1	58-B-321	Cartridge
10	1	58-B-320	Poppet
11	1	58-B-319	Spring
12	1	700662	Spring Guide
13	1	4-B-823	Sleeve
14	1	004835	Nameplate
16	2	58-A-322	Endcap
14	1	004878	Nameplate CPOM 3-DD
17	2	58-B-324	Body, Stroke lim.
18	2	58-A-325	Screw
19	2	58-A-323	Spacer
20	2	934-M16-8	Nut DIN 934
21	2	471-11x1	Snap Ring DIN 471
14	1	004879	Nameplate CPOM 3-DA
14	1	004881	Nameplate CPOM 3-AA
16	1	58-A-322	Endcap
17	1	58-B-324	Body - Stroke lim.
18	1	58-A-325	Screw
19	1	58-A-323	Spacer
20	1	934-M16-8	Nut DIN 934
21	1	471-11x1	Snap Ring DIN 471
14	1	004880	Nameplate CPOM 3-DB
14	1	004882	Nameplate CPOM 3-BB
16	1	58-A-322	Endcap
17	1	58-B-324	Body - Stroke lim.
18	1	58-A-325	Screw
19	1	58-A-323	Spacer
20	1	934-M16-8	Nut DIN 934
21	1	471-11x1	Snap Ring DIN 471
24	6	2-014-N552-9	O-Ring, Buna N
26	2	3-908-N552-9	O-Ring, Buna N
26	2	3-912-N552-9	O-Ring, Buna N
27	*	2-114-N674-7	O-Ring, Buna N
28	*	8-114-N300-9	Back - up washer, Buna N
29	*	2-011-N674-7	O-Ring, Buna N
30	*	8-011-N300-9	Back - up washer, Buna N
24	6	2-014-V709-9	O-Ring, Viton
26	2	3-908-V709-9	O-Ring, Viton
26	2	3-912-V709-9	O-Ring, Viton
27	*	2-114-V747-75	O-Ring, Viton
28	*	8-114-V709-9	Back - up washer, Viton
29	*	2-011-V747-75	O-Ring, Viton
30	*	8-011-V709-9	Back - up washer, Viton

Stroke Limiter, Item 29 and 30
Type D 2 Pieces
Type A or B 1 Piece

* Check poppet, Item 27, Item 28
Type D 2 Pieces 2 Pieces
Type A or B 1 Piece 4 Pieces

TAB. 2 PREMONTAGGIO ALBERI SHAFT SUBASSEMBLY

CODICE CODE NO.	POSIZIONE POS. NO.	CORSA STROKE mm.	ESTREMITA' DELL'ALBERO SHAFT END	CILINDRATA (cm^3) SIZE (cm^3) 800	1000	1200	1350	1500	1600	1800
0133100294	52 A/15/16/17/38/39/14/18	52	SCANALATO 56 UNI 221 SPLINED 56 UNI 221	•						
0134100294	52 B/15/16/17/38/39/14/18	64	SCANALATO 56 UNI 221 SPLINED 56 UNI 221		•					
0135100294	52 C/15/16/17/38/39/14/18	76	SCANALATO 56 UNI 221 SPLINED 56 UNI 221			•	•	•	•	•
0135131294	53/15/16/17/38/39/14/18	76	SCANALATO CAVO DIN 5482 INTERNAL SPLINED DIN 5482			•	•	•	•	•
0135180294	56/15/16/17/38/39/14/18	76	CON CHIAVETTA UNI 6607/69 PARALL KEYED UNI 6607/69			•	•	•	•	•

TAB. 3 ACCOPPIAMENTI CYLINDER SUBASSEMBLY

CODICE CODE NO.	POSIZIONE POS. NO.	DIA mm.	DESCRIZIONE FEATURES	CILINDRATA (cm^3) SIZE (cm^3) 800	1000	1200	1350	1500	1600	1800
0134100186	19 A/20	63	PISTONE + CILINDRO PISTON + CYLINDER	•	•	•				
0134100686	19 A/21 A/22 A/23 A	63	PISTONE + CILINDRO CON TENUTA PISTON + CYLINDER + SEALS	•	•	•				
0134110686	19 B/21 B/22 B/ 23 B	67	PISTONE + CILINDRO CON TENUTA PISTON + CYLINDER + SEALS				•			
0134120686	19 C/21 c/22 C/23 C	72	PISTONE + CILINDRO CON TENUTA PISTON + CYLINDER + SEALS					•		
0134130686	19 D/21 D/22 D/23 D	74	PISTONE + CILINDRO CON TENUTA PISTON + CYLINDER + SEALS						•	
0134140686	19 E/21 E/22 E/ 23 E	78	PISTONE + CILINDRO CON TENUTA PISTON + CYLINDER + SEALS							•

TAB. 4 PREMONTAGGIO DISTRIBUTORE DISTRIBUTOR SUBASSEMBLY

CODICE CODE NO.	POSIZIONE POS. NO.	DESCRIZIONE FEATURES
0115100193	46/43/31/29 34/35/47/30/33	COPERCHIO DISTRIBUTORE ASSEMBLATO A PARTI FISSE DISTRIBUTOR COVER INCLUDING FIXED PARTS
0115102193	64 A/46/43/31/34 35/47/30/33	COP.DISTR.PER ATTACCHI SAE ASSEM.APARTI FISSE DISTR.COVER FOR SAE . .INCL.FIXED PARTS
0115110193	6/46/43/31/34/35 47/30/33	COPER.DISTR.PER CONTAGIRI ASSEMBLATO A PARTI FISSE DISTR.COVER FOR TACHO DRIVE INCL.FIXED PARTS
0115112193	64 B/46/43/31/34 35/47/30/33	COP.DISTR.CONTAG.EATT.SAE ASSEMBL.A PARTI FISSE COP.DISTR.FOR SAE .AND TACHO DRIVE INC.FIX.PARTS
0115100197	32/49 A/44/48	DISTRIBUTORE ROTANTE E SUE PARTI ROTATING PARTS OF DISTRIBUTOR
0115102197	32/49 B/44/48	DISTRIB.ROTANTE CON BAFFI E SUE PARTI DISTRIB.AND ITS PARTS
0115100183	29/30/48/46/32/43/49 A 31/44/33/34/35/47	PREMONTAGGIO DEL DISTRIBUTORE COMPLETO ASSEMPLY OF DISTRIBUTOR
0115102183	29/30/48/46/32/43/49 B 31/44/33/34/35/47	PREMONT.DISTRIBUT.CON ROTANTE CON BAFFI ASSEMBLY OF DISTR.WITH CENTERED CLEFT DIST.
0115110183	6/30/48/46/32/33/43/49 A 31/44/33/34/35/47	PREMONT.DISTRIB.PER CONTAGIRI ASSEMBLY OF DISTRIB.FOR TACHO DRIVE
0115112183	6/30/48/46/32/33/43/49 B 31/44/33/34/35/47	PREMONT.DISTRIB.PER CONTAGIRI, ROTANTE CON BAFFI ASSEMBLY OF DISTRIB.FOR TACHO DRIVE WITH CENTERED CL.DIS.
0115122183	64 A/30/48/46/32/43/47 49 B/31/44/33/34/35	PREM.DISTR.ATT.SAE CON DISTRIB. CON BAFFI ASS.OF DISTR.FOR SAE ATT.WITH CENTERED CL.DIST.
0115132183	64 B/30/48/46/32/43/47 49 B/31/44/33/34/35	PREM.DIS.PER ATT.SAE CON CONTAG.E DISTR.CON BAFFI ASS.OF DIS.FOR SAE ATT.TACHO DR.WITH CENT.CL.DIS.

TAB. 5 PREMONTAGGIO COLLARETTO CYL. SEAL SUBASSEMBLY

CODICE CODE NO.	POSIZIONE POS. NO.	DESCRIZIONE FEATURES
0010312202	25 26	COLLARETTO CON GUARNIZIONE OR RING SEAL + O RING (MATERIAL: PTFE 3)

PREMONTAGGIO SUPP. CONTAGIRI TACHO DRIVE SUBASSEMBLY

CODICE CODE NO.	POSIZIONE POS. NO.	DESCRIZIONE FEATURES
0115100390	7 4 8 5 60 9 3 10 1 2	SUPP.CONTAG.COMPL.DI PINVIC AD ANC DRIVE CONN.SUPP.BODY, DRIVE PIN,
0115120290	60 9 3 10 1 2 4 5	SUPP.CONTAGIPI SENZA PINVIC AD ANC PARTS AS ABOVE MENTIONED, EXCEPT THE DRIVE CONNECTOR

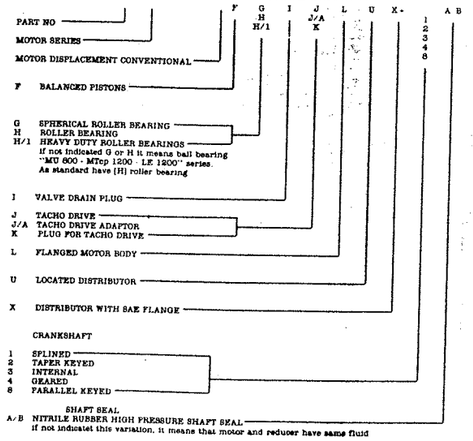
VARIANTI VARIATIONS

VARIANTE VARIATION	POSIZIONE DELLE PARTI CHE COSTITUISCONO LA VARIANTE POS. NO. OF THE PARTS REFERRING TO THE VARIATION
H/I	13 B
J	1 2 3 4 5 6 7 8 9 10
J/A	1 2 3 4 5 6 9 10
K	6 55 B 57 58
1	62 A - 62 B - 62 C
2	66
3	63
4	
U	67 P 49 P

ELENCO CILINDRATE SIZES

	MTCP 800	MTCP 1000	MTCP 1200	MTCP 1350	MTCP 1500	MTCP 1600	MTCP 1800
CILINDRO./GIRO DISPL. .....cm^3	810	997	1184	1339	1538	1634	1814
DIAMETRO PISTONE PISTON DIA.....mm.	63	63	63	67	72	74	78
CORSA PISTONE PISTON STROKE..mm.	52	64	76	76	76	76	76

SYMBOLS USED TO DESCRIBE MOTORS



IMPORTANTE

NEL PASSARE ORDINAZIONI PER PARTI DI RICAMBIO FAVORITE FORNIRCI LE SEGUENTI INDICAZIONI:

1° - TIPO E CILINDRATA DEL MOTORE
2° - NUMERO DI MATRICOLA DEL MOTORE
3° - NUMERO DI POSIZIONE DELLE SINGOLE PARTI, OPPURE NUMERO DI CODICE COME DA TAB.1

IMPORTANT

WHEN ORDERING SPARE PARTS PLEASE PROVIDE THE FOLLOWING INDICATIONS:

1° - MOTOR TYPE AND DISPLACEMENT
2° - MOTOR SERIAL NUMBER
3° - PART NUMBER AS SHOW IN THE EXPLODED VIEW, OR CODE NUMBER AS SHOWN IN TAB.1.

MTcp 1200

U.P. SAI - MOD. 25/1000/11/85

SAI s.p.a. Via C. della Chiesa, 32 - 41100 MODENA (Italy) - Tel. (059) 330051 (5 linee) - Telex 510328 SAIMO

MTcp 1200

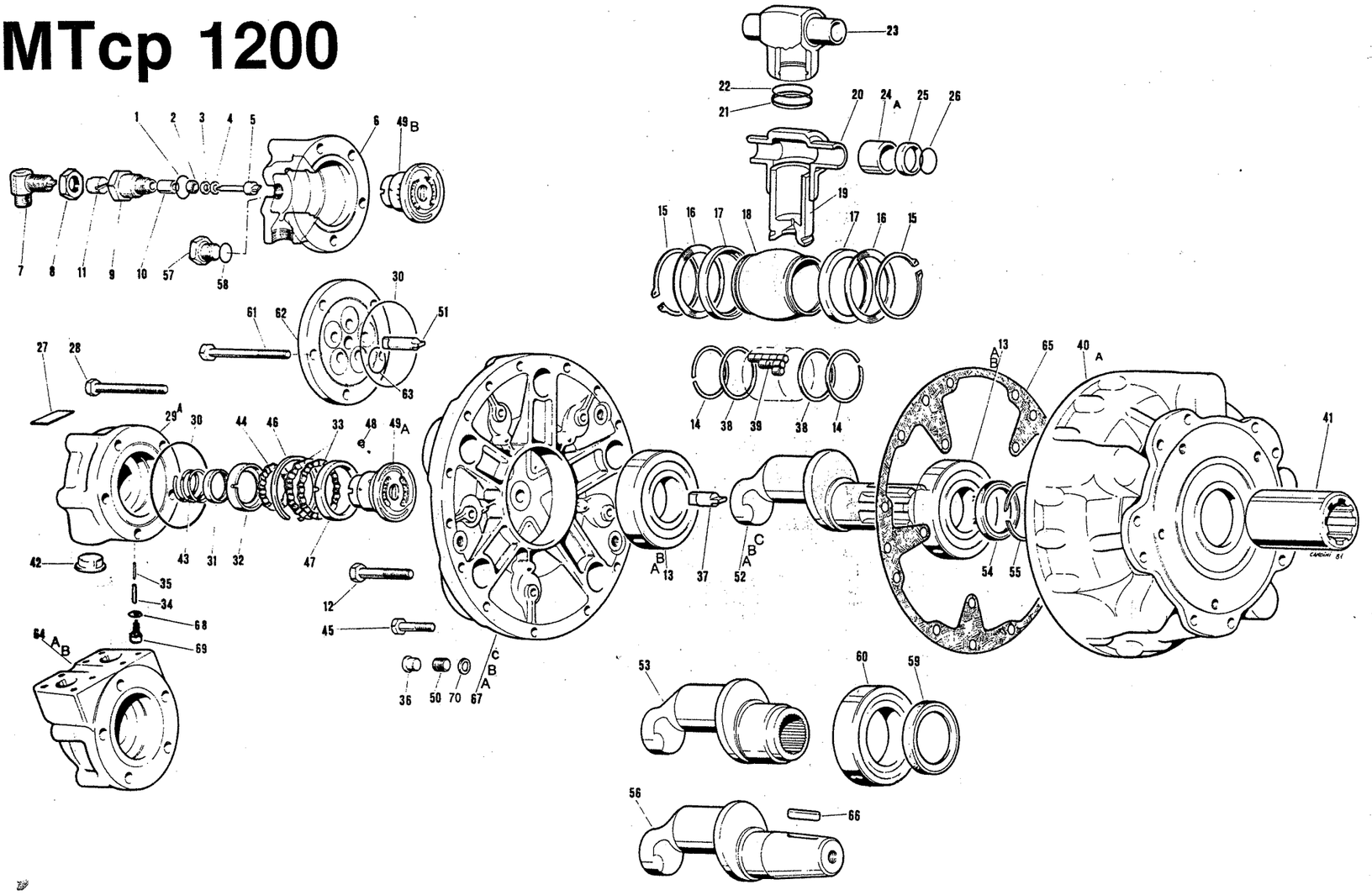
HYDRAULIC MOTORS

SPARE PARTS

SAI s.p.a.

8525

MTcp 1200



1 - MOTORI IDRAULICI SERIE MTcp 1200 - ELENCO DEI PARTICOLARI - HYDRAULIC MOTOR SERIES MTcp1200 - PARTS LIST

CODICE CODE NO.	DESCRIZIONE DESCRIPTION	Qt.	SPECIFICAZ.TECNICHE TECHN.SPECIFICATION
0010012171	GUARNIZIONE OR O-RING	1	Øc2,62 Øi23,47 mm.
0010012001	GUARNIZIONE SEAL	1	Ø 7x12x3 mm.
0106100127	RONDELLA WASHER	1	
0106100126	RONDELLA (VESPEL) SPACER	1	
0115100228	PERNETTO TRASCINAM.CONTAGIPI TACHO DRIVE PIN	1	
0115110103	COPERCHIO DISTRIBUTORE (CON FORO) DISTRIBUTOR COVER (BORED)	1	
0010005001	PINVIO AD ANGOLO PER CONTAGIPI TACHO DRIVING GEAR	1	
0010008010	DADO NUT	1	M 18x4,5 mm.
0106100225	SUPPORTO DEL RINVIO AD ANGOLO TACHO SUPPORT BODY	1	
0106100129	BOCCOLA BUSHING	1	
0106100130	GIUNTO A CROCE OLDHAM COUPLING	1	
0010025260	VITE CON TESTA ESAGONALE HX. HD. BOLT	10	M 14x1,5x65
0010007012	CUSCINETTO A RULLI CILINDRICI CYLINDRICAL ROLLER BEARING	2	Ø 65x140x33 mm. (NI 313)
0010007088	CUSCINETTO A RULLI CIL.A PIENC PIEM. HEAVY DUTY ROLLER BEARING	2	Ø 65x140x33 mm. (INA F63678)
0010001058	ANELLO DI SICUREZZA RETAINING RING	2	Ø 82,6x2,8x2 mm.
0010001015	ANELLO DI SICUREZZA RETAINING RING	2	Ø 90 UNI 3653
0115100220	MOLLA COMPENSAZIONE PISTONE PISTON COMPENSATING SPRING	2	
0115110211	ANELLO FITEGNO PISTONI PISTON RETAINING RING	2	
0115110210	SUPPORTO SFERICO SPHERICAL SUPPORT	1	
A 0134101106	PISTONE PISTON	5	Ø 63
B 0134110105	PISTONE PISTON	5	Ø 67
C 0134120106	PISTONE PISTON	5	Ø 72
D 0134130105	PISTONE PISTON	5	Ø 74
E 0134140106	PISTONE PISTON	5	Ø 78
0134101105	CILINDRO CYLINDER	5	Ø 63
A 0010038014	GUARNIZIONE AD ANELLO SEAL RING	5	Ø 63 mm.
B 0010038017	GUARNIZIONE AD ANELLO SEAL RING	5	Ø 67 mm.
C 0010038027	GUARNIZIONE AD ANELLO SEAL RING	5	Ø 72 mm.
D 0010038023	GUARNIZIONE AD ANELLO SEAL RING	5	Ø 74 mm.
E 0010038028	GUARNIZIONE AD ANELLO SEAL RING	5	Ø 78 mm.

PART. NO.	CODICE CODE NO.	DESCRIZIONE DESCRIPTION	Qt.	SPECIFICAZ.TECNICHE TECHN.SPECIFICATION
22.A	0010012040	GUARNIZIONE OR O-RING	5	Øc2,62 Øi64,70 mm.
22.B	0010012219	GUARNIZIONE OR O-RING	5	Øc2,62 Øi69,52 mm.
22.C	0010012064	GUARNIZIONE OR O-RING	5	Øc2,62 Øi75,87 mm.
22.D	0010012064	GUARNIZIONE OR O-RING	5	Øc2,62 Øi75,87 mm.
22.E	0010012235	GUARNIZIONE OR O-RING	5	Øc3,53 Øi82,22 mm.
23.A	0134102105	CILINDRO CON GUARNIZIONE CYLINDER WITH SEAL RING	5	Ø 63 mm.
23.B	0134110105	CILINDRO CON GUARNIZIONE CYLINDER WITH SEAL RING	5	Ø 67 mm.
23.C	0134120105	CILINDRO CON GUARNIZIONE CYLINDER WITH SEAL RING	5	Ø 72 mm.
23.D	0134130105	CILINDRO CON GUARNIZIONE CYLINDER WITH SEAL RING	5	Ø 74 mm.
23.E	0134140105	CILINDRO CON GUARNIZIONE CYLINDER WITH SEAL RING	5	Ø 78 mm.
24	0115105212	BOCCOLA IN BRONZO BRONZE BUSHING	10	
24.A	0115105212	BOCCOLA (BRONZO) (FOR MTcp 1500 BUSHING (MTcp 1600 - MTcp 1800)	10	
25	001001220 2	COLLARETTO (PTFE 3) SEAL (PTFE 3)	10	Ø 38x46x5 mm.
26	0010012137	GUARNIZIONE OR O-RING	10	Øc2,62 Øi39,34 mm.
27	0013225100	TARGHETTA LABEL	1	
28	0010025091	VITE CON TESTA ESAGONALE HX. HD. BOLT	5	M 14x1,5x100 UNI 5738
29	0115100103	COPERCHIO DEL DISTPIBUTORE DISTRIBUTOR COVER	1	
29.A	0115105103	COPERCHIO DISTRIBUTORE DISTRIBUTOR COVER	1	
30	0010012078	GUARNIZIONE OR O-RING	1	Øc3,53 Øi123,40 mm.
31	0115100116	ANELLO POSTER.DEL DISTPIBUTORE REAR DISTRIBUTOR RING	1	
32	0115100114	ANELLO INTERM.DEL DISTRIBUTORE INTERM.DISTRIBUTOR RING	1	
33	0115100113	MOLLA ANTERIORE DEL DISTRIBUT FRONT DISTRIBUTOR SPRING	2	
34	0010022009	SPINA ELASTICA DOWEL PIN	1	Ø 4x12 mm. DIN 1481
35	0010022017	SPINA ELASTICA DOWEL PIN	1	Ø 2,5x12 mm. DIN 1481
36	0010023009	TAPPO IN PLASTICA PLASTIC PLUG	1	Ø 20 mm.
37	0115100109	PERNO DI TRASCINAMENTO DRIVE PIN	1	
38	0010018037	ANELLO DI SPALLAMENTO SPACING WASHER	2	Ø 68x80x1 mm.
39	0010020047	RULLINO POLLER	150	Ø 7,5x11 mm.
40	0134102201	CORPO MOTORE MOTOR BODY	1	
40.A	0134115201	CORPO MOTORE (PER/FOR MTcp 1500 MOTOR BODY MTcp 1600 - MTcp 1800)	1	
41	0115100119	MANICOTTO SPLINED ADAPTOR	1	56 UNI 221
42	0010023011	TAPPO IN PLASTICA PLASTIC PLUG	2	Ø 32 mm.
43	0115100117	MOLLA POSTEPIORE DEL DISTRIBUT REAP DISTPIBUTOP SPPING	1	

PART. NO.	CODICE CODE NO.	DESCRIZIONE DESCRIPTION	Qt.	SPECIFICAZ.TECNICHE TECHN.SPECIFICATION
44	0115100115	MOLLA INTEPMEDIA DEL DISTPIBUTOPE INTEPM.DISTPIPUTOP SPPING	1	
45	0010025090	VITE CON TESTA ESAGONALE HX. HD. POLT	10	M 14x1,5x55 UNI 5738
46	0010001089	ANELLO DI SICUPEZZA RETAINING	1	Ø 90x1,5 mm.
47	0115100108	ANELLO ANTEPIOPE DEL DISTPIBUTOPE FRONT DISTPIBUTOR PING	1	
48	0913100021	PERNETTO PIN	1	
49.A	0115100107	DISTPIBUTORE POTANTE POTAPY DISTPIBUTOR	1	
49.B	0115120107	DISTPIB.POTANTE CON BAFFI DI CENTP. CENTEPED CLEFT POTAPY DISTP.	1	SOLO CON PIASTPA INT.62 SUITABLE ONLY FLANG C.62
50	0010024067	TAPPO CONICO TAPER PLUG	2	1/2"
51	0115110109	PEPNO DI TRASCINAMENTO DRIVE PIN	1	
52.A	0133100204	ALBEPO (c= 52 mm.) CRANKSHAFT (c= 52 mm.)	1	56 UNI 221
52.B	0134100204	ALBERO (c= 64 mm.) CRANKSHAFT (c= 64 mm.)	1	56 UNI 221
52.C	0135100204	ALPEPO (c= 76 mm.) CRANKSHAFT (c= 76 mm.)	1	56 UNI 221
53	0135130204	ALBEPO (c=76 mm.) SCANALATO CAVO CRANKSHAFT (c=76mm.)INTERNAL SPLINED	1	A 5550 DIN 5482
54	0010002033	ANELLO DI TENUTA (7 BAR) OIL SEAL (7 BAR)	1	Ø 65x90x10 mm.
55	0010001089	ANELLO DI SICUPEZZA RETAINING RING	1	Ø 90x1,5 mm.
56	0135180204	ALBEPO (c=76 mm.) CON CHIAVETTA KEYEDSHAFT (c=76 mm.)	1	UNI 6607/69
57	0106100122	TAPPO PEP COPEPCHIO DISTPIBUTOPE DISTRIBUTOP CASE PLUG	1	
58	0010012171	GUARNIZIONE OR O-RING	1	Øc2,62 Øi23,47
59	0010002038	ANELLO DI TENUTA (7 BAR) OIL SEAL (7 BAR)	1	Ø 60x80x7 mm.
60	0010007067	CUSCINETTO A RULLI CILINDRICI CYLINDRICAL ROLLEP BEAPING	1	Ø 80x140x33 mm. (NS2216)
61	0010025263	VITE CON TESTA ESAGONALE HX. HD. POLT	5	M 14x1,5x110 UNI 5738
62	0115100250	PIASTRA INTEPMEDIA FLANGE CENTRAL	1	
63	0010012224	GUARNIZIONE OR O-RING	5	Øc2,62 Øi121,89 mm.
64.A	0115102103	COP.DEL DISTPIB.PEP ATTACCO SAE DISTPIBUTOR COVER FOR SAE FLANGES	1	
64.B	0115112103	COP.DISTPIB.PER ATT.SAE (CON FORO) DISTRIB.COVER FOR SAE PORTS	1	
65	0115100218	GUARNIZIONE GASKET	1	
66	0010004005	CHIAVETTA KEY	1	Ø 20x12x70 UNI 6606
67.A	0134101202	COPEPCHIO MOTOPE MOTOR COVER	1	
67.B	0134102202	COPEPCHIO MOTOPE MOTOP COVER	1	SOLO CON DISTRIB.POTANTE 49B SUITABLE ONLY FOR ROT DIST.49B
67.C	0134115202	COPERCHIO MOTORE (PER/FOR MTcp 1500 MOTOR COVER MTcp 1600 - MTcp 1800)	1	
68	0010018032	RONDELLA WASHER	1	
69	0010325271	VITE BOLT	1	
70	0010018022	RONDELLA WASHER	2	Ø 21,5x27

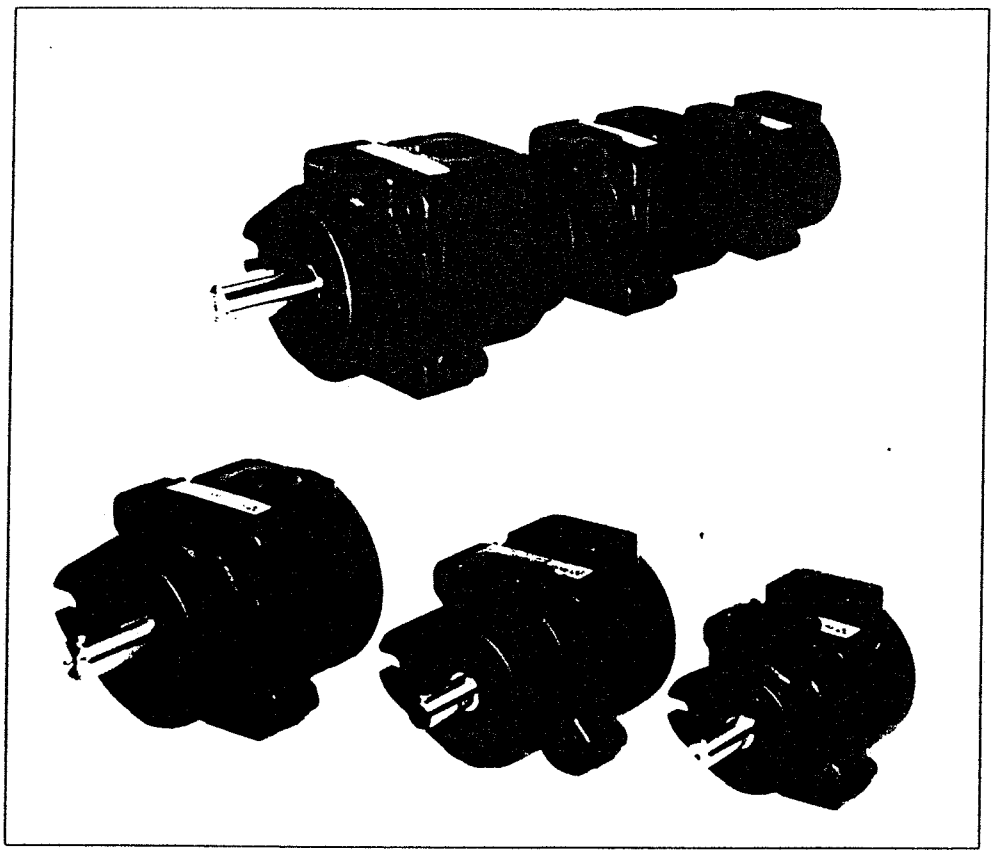
Segue nel retro • **P.T.O.**

Atos oleodinamica spa
I 21018 Sesto Calende/Italy
Via alla Piana, 57 - ☎ (0)331-922078
telex 332471 - telefax (0)331-920005

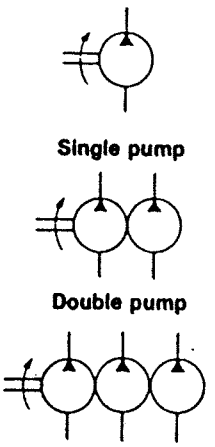
CA-VERKEN·TERLING |||| Table 1005-5/E
CA-Verken AB Box 118, 57600 Sävsjö. Telefon 0382-11620
AB Gustaf Terling · Göteborg Box 1013, 43600 Askim. Telefon 031-28 98 40
AB Gustaf Terling · Stockholm Box 32, 121 21 Johanneshov. Telefon 08-81 05 60
AB Gustaf Terling · Ödåkra Brittsommargatan 6, 260 35 Ödåkra. Telefon 042-20 53 44

HYDRAULIC VANE PUMPS Type PFE

pat. pend.

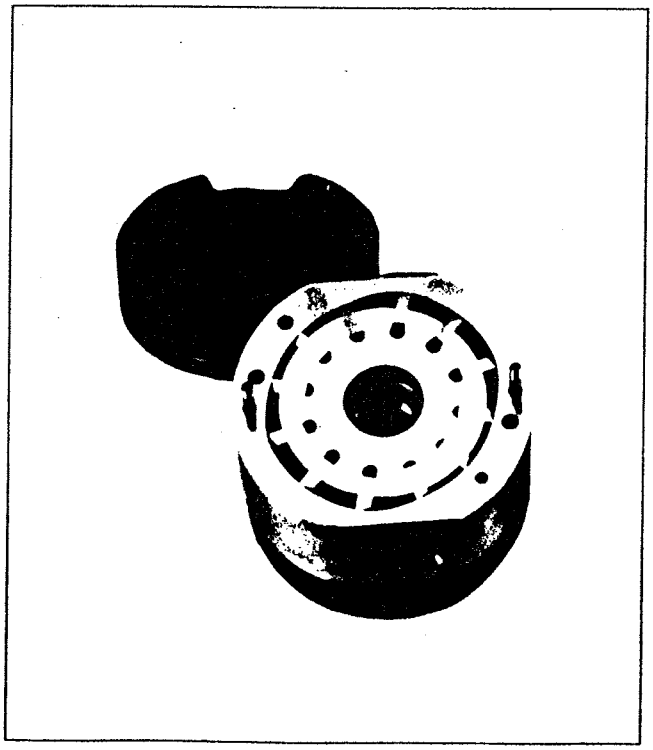


Hydraulic symbols



New fixed displacement vane pumps - cartridge design with integral hydraulic balancing - for high pressures operation and long service life - low noise levels - available as single, multiple or through-shaft configuration - mounting according to SAE and ISO standards - suitable for usage with antiwear hydraulic oils or synthetic fluids having similar lubricating characteristics - easy installation as inlet and outlet ports can be assembled in any of four relative positions - easy maintenance as pumping cartridge can be replaced in a few minutes.

PUMPING CARTRIDGE



MAIN CHARACTERISTICS

Model	Displacement cm^3/rev	Maximum pressure (*) bar	Speed range min/max rpm
PFE - 31016	16,5	210 (3000 psi)	600-2500
PFE - 31022	21,6		
PFE - 31028	28,1		
PFE - 31036	35,6		
PFE - 31044	43,7		
PFE - 41045	45,0	210 (3000 psi)	600-2200
PFE - 41056	55,8		
PFE - 41070	69,9		
PFE - 41085	85,3		
PFE - 51090	90,0	210 (3000 psi)	600-2000
PFE - 51110	109,6		
PFE - 51129	129,2		
PFE - 51150	150,2		

(*) See notes [8] [9] [10] [11] [12]

OPERATING CHARACTERISTICS at 1500 rpm (*) with antiwear hydraulic oil at 24 cSt (3,5°E) and at 50°C (**)

Model	Displacement cm³/rev	7 bar (100 psi) l/min	kW	70 bar (1000 psi) l/min	kW	140 bar (2000 psi) l/min	kW	210 bar (3000 psi) l/min	kW	Port sizes Inlet	Outlet
PFE - 31016	16,5	23	0,5	21	3	19	5	16	6,5	1¼"	3/4"
PFE - 31022	21,6	30	0,6	28	4	26	7	23	10		
PFE - 31028	28,1	40	0,8	38	5,5	36	10	33	14		
PFE - 31036	35,6	51	1	49	7	46	12,5	43	18		
PFE - 31044	43,7	63	1,3	61	8	58	15,5	55	23		
PFE - 41045	45,0	64	1,3	62	8,5	60	16	57	23	1½"	1"
PFE - 41056	55,8	80	1,6	78	11	75	21	72	30		
PFE - 41070	69,9	101	2	98	13,5	95	26	91	37		
PFE - 41085	85,3	124	2,4	121	16	118	32	114	47		
PFE - 51090	90,0	128	2,7	124	17	119	33	114	47	2"	1¼"
PFE - 51110	109,6	157	3,2	152	21	147	40	141	58		
PFE - 51129	129,2	186	3,7	180	25	174	47	168	69		
PFE - 51150	150,2	217	4,2	211	29	204	55	197	80		

(*) Flow rate and power consumption are proportional to the revolution speed.
(**) See «main characteristics» for maximum pressure and speed limits.

MODEL CODE

PFE * — 31 036 / * / D 1 T 11 /*

- PFE: fixed displacement vane pump
- *: suffix used when multiple pumps or pumps with through-shafts are required
  - X2 / X3: multiple pump
  - XA / XB / XC / XO: pump with through-shaft
  - see notes 3 and 4
- 31: size convention
- 036: geometric displacement expressed in cm³/rev - see note 1
- *: If required, displacement(s) expressed in cm³/rev for the second (and third) element constituting a multiple pump type PFEX - see note 3
- D: direction of rotation (see note 2) D = clockwise S = counterclockwise
- 1: drive shaft
  1 = keyed, cylindrical (standard)
  2 = keyed, cylindrical: ISO/DIS 3019
  3 = keyed, cylindrical: high torques
  5 = splined shaft, single pump
  6 = splined shaft, double pump: see note 5
- T: ports orientation: T, standard U,V,W on request - see note 6
- 11: design number and special seals - see note 7
- /*

CARTRIDGE - MODEL CODE

SC — cartridge

PFE — 31036 / D 11/* — pump model code, indicating size, displacement, direction of rotation, design number and special seals (if needed)

NOTES ON MODEL CODE

[1] **Geometric displacement**
The actual flow-rates of the pumps are shown in the «operating characteristics». To change the displacement volume simply replace the cam ring of the pump.

[2] **Direction of rotation**
The PFE pumps are not reversible, and it is therefore necessary to specify the desired direction of rotation (as viewed at the shaft end). If the direction of rotation is not specified, clockwise rotation will be supplied. The direction of rotation can be changed by different assembly of the cartridge elements.

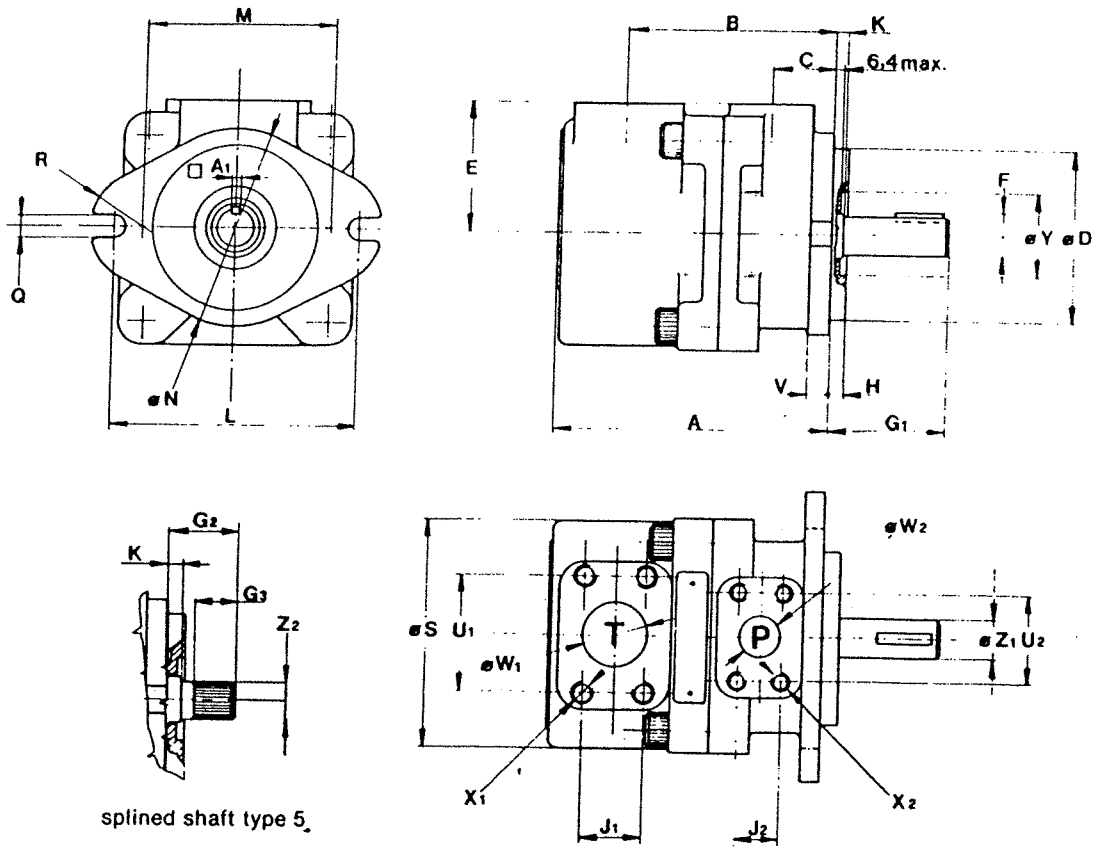
[3] **Multiple pumps**
The multiple pumps are designated by suffix «X» in the model code: X2 = double pump; X3 = triple pump, composed of single vane pumps type PFE.
For any questions regarding other types of pump combinations, please consult the Atos technical office. The pumps are assembled in decreasing order of size.
Example: PFE X2-41070 / 41045/D1T: double pump composed of one PFE-41070 and one PFE-41045, clockwise rotation, cylindrical shaft and oil ports according to T orientation.
PFE X3-41070 / 31028 / 31022/D6T: triple pump composed of one PFE-41070, one PFE-31028 and one PFE-31022, with splined shaft type 6.

[4] **Pumps with through-shaft and rear flange**
Pumps with through-shafts are designated by «X» followed by a letter:
XA = for coupling one PFE 31
XB = for coupling one PFE 41 (only for PFE 41 and PFE 51)
XC = for coupling one PFE 51 (only for PFE 51)
XO = with through-shaft, without rear flange.

[5] **Drive shaft**
1 = cylindrical shaft, keyed (supplied as standard if not specified in the model code)
2 = cylindrical shaft, keyed according to ISO/DIS 3109 standards (only for PFE-41 and PFE-51 pumps)
3 = cylindrical shaft, keyed, for high torque applications
5 = splined shaft: for PFE-31 according to SAE A 16/32 DP, 9 teeth; for PFE-41 according to SAE B 16/32 DP, 13 teeth; for PFE-51 according to SAE C 12/24 DP, 14 teeth
6 = splined shaft (only for multiple pumps): for PFEX*-31 according to SAE B 16/32 DP, 13 teeth; for PFEX*-41 according to SAE C 12/24 DP, 14 teeth
Other types of shaft supplied on request; consult the Atos technical office.

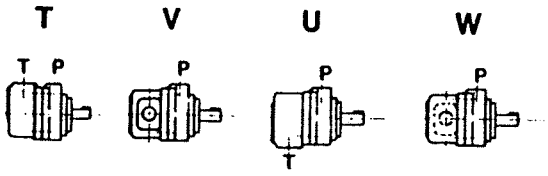
[6] **Ports orientation**
The pumps can be supplied with the oil ports orientated in different configurations in relation to the drive shaft, designated as follows (as viewed at the shaft end):
T = inlet and outlet ports on the same axis (standard)
U = outlet orientated 180° with respect to the inlet
V = outlet orientated 90° with respect to the inlet
W = outlet orientated 270° with respect to the inlet.
In the multiple pumps inlet ports and outlet ports are in line. Ports orientation can be easily changed by rotating the pump body that carries the inlet port.

[7] **Design number and special seals**
Design number is subject to change, but the installation dimensions remain unchanged for design numbers 10 through 19.
Special seals: /PE = Viton seals for phosphate ester based fluids.



T = inlet
P = outlet

mounting orientations for the oil ports, as mentioned in note 6;



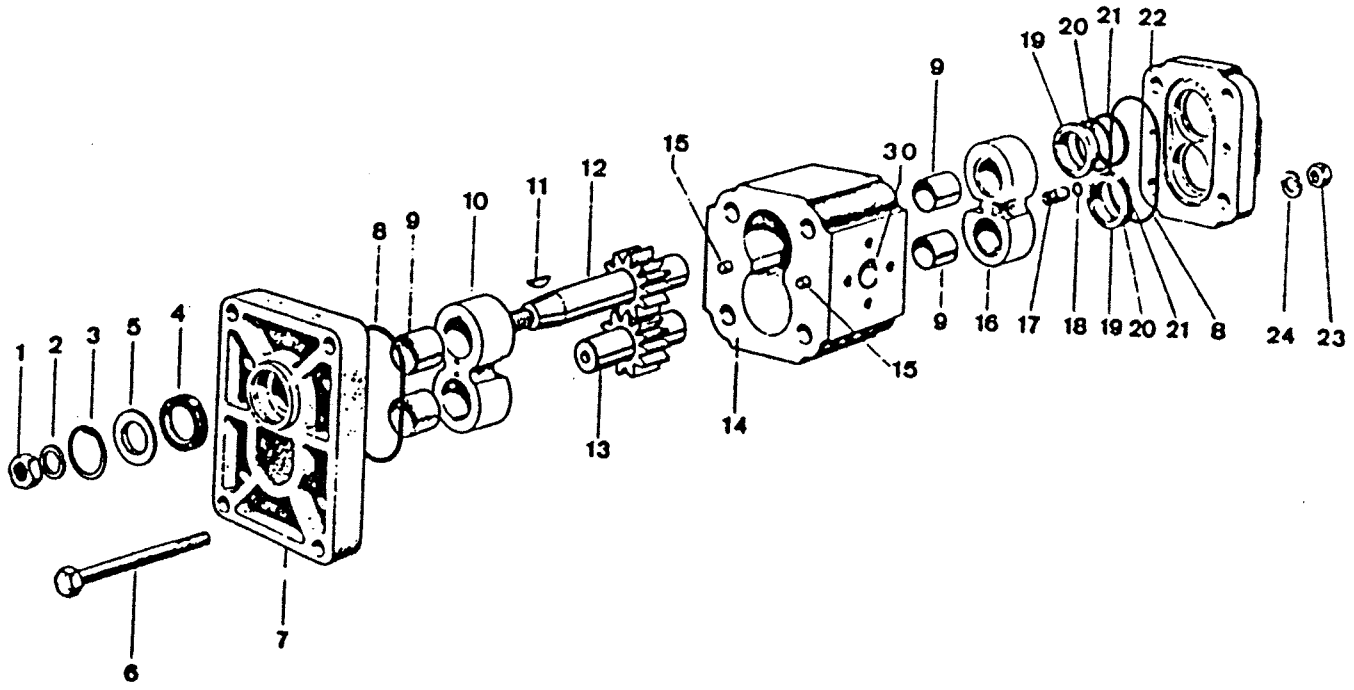
Model	Weight kg
PFE-31	9
PFE-41	14
PFE-51	24.5

all figures are metric (mm)

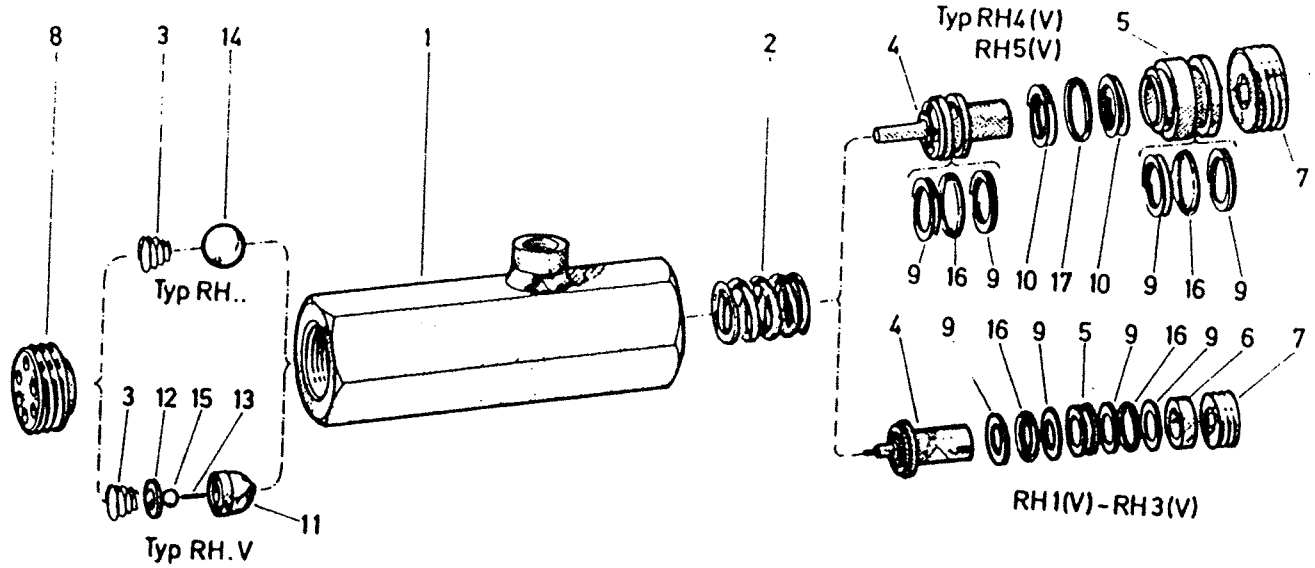
Model	A	B	C	∅ D	E	H	L	M	∅ N	Q	R
PFE - 31	135	98,5	27,5	82,5	70	6,4	106	73	95	11,1	28,5
PFE - 41	159,5	121	38	101,6	76,2	9,7	146	107	120	14,3	34
PFE - 51	171	125	38	127	82,6	12,7	181	143,5	148	17,5	35
Model	**∅ S**	**U1**	**U2**	**V**	**∅ W1**	**∅ W2**	**J1**	**J2**	**X1**	**X2**	**∅Y**
PFE - 31	114	58,7	47,6	10	32	19	30,2	22,2	M10x20	M10x17	47
PFE - 41	134	70	52,4	13	38	25	35,7	26,2	M12x20	M10x17	76
PFE - 51	158	77,8	58,7	15	51	32	42,9	30,2	M12x20	M10x20	76

Model	Shaft 1 (standard)					Shaft 2					Shaft 3					Spined shaft type 5			
	Ø Z1	G1	A1	F	K	Ø Z1	G1	A1	F	K	Ø Z1	G1	A1	F	K	Z2	G2	G3	K
PFE-31	19,05 19,00	55,6	4,76 4,75	21,11 20,94	8	–	–	–	–	–	22,22 22,20	55,6	4,76 4,75	24,54 24,41	8	9 T 16/32 DP	32	19,5	8
PFE-41	22,22 22,20	59	4,76 4,75	24,54 24,51	11,4	22,22 22,20	71	6,36 6,35	25,03 25,07	8	25,38 25,36	78	6,36 6,35	28,30 28,10	11,4	13 T 16/32 DP	41	28	8
PFE-51	31,75 31,70	73	7,95 7,94	35,33 35,07	13,9	31,75 31,70	84	7,95 7,94	35,33 35,07	8	34,90 34,88	84	7,95 7,94	38,58 38,46	13,9	14 T 12/24 DP	56	42	8

1. Sexkantmutter
2. Fjäderbricka
3. Spårring
4. Radialtätning
5. Stödbricka
6. Sexkantskruv
7. Främre gavel
8. O-ring
9. Lager
10. Främre tryckplatta
11. Kil
12. Drivaxel
13. Löpaxel
14. Hus
15. Styrstift
16. Bakre tryckplatta
17. Stödpinne
18. O-ring
19. Tryckutjämningsbox
20. O-ring
21. Stödbricka
22. Bakre gavel
23. Sexkantmutter
24. Fjäderbricka

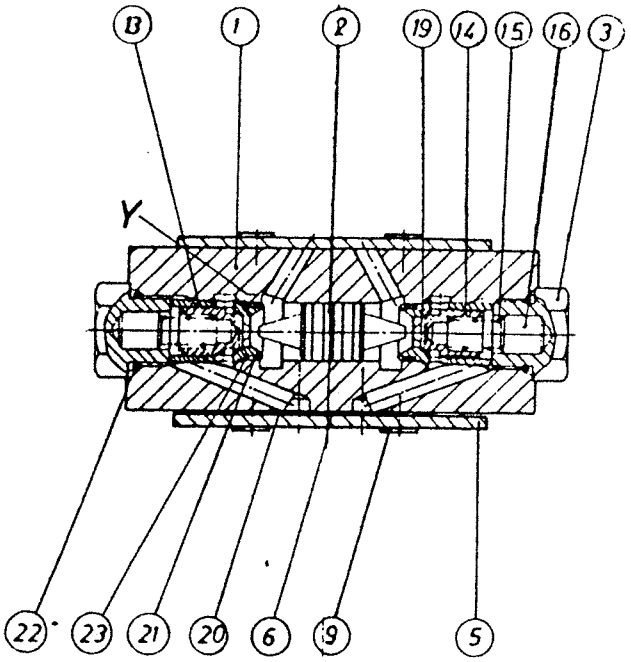


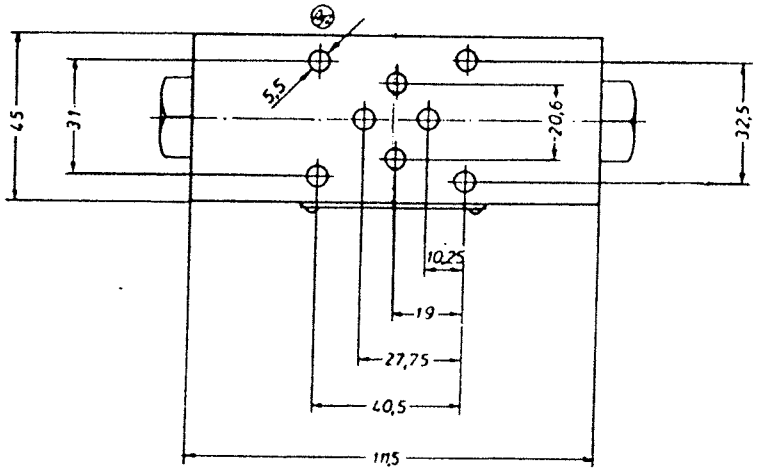
HAWE PILOT CHECK VALVE TYPE RH

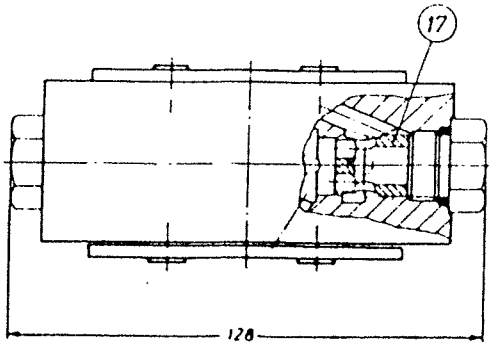


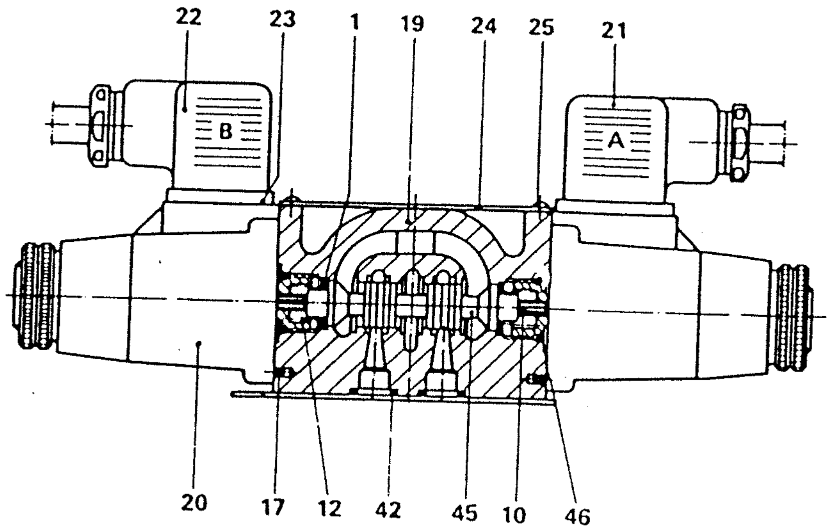
PARKER

DOUBLE PILOT CHECK VALVES
TYPE CPOM-2-D (G-MDCP-406-S)









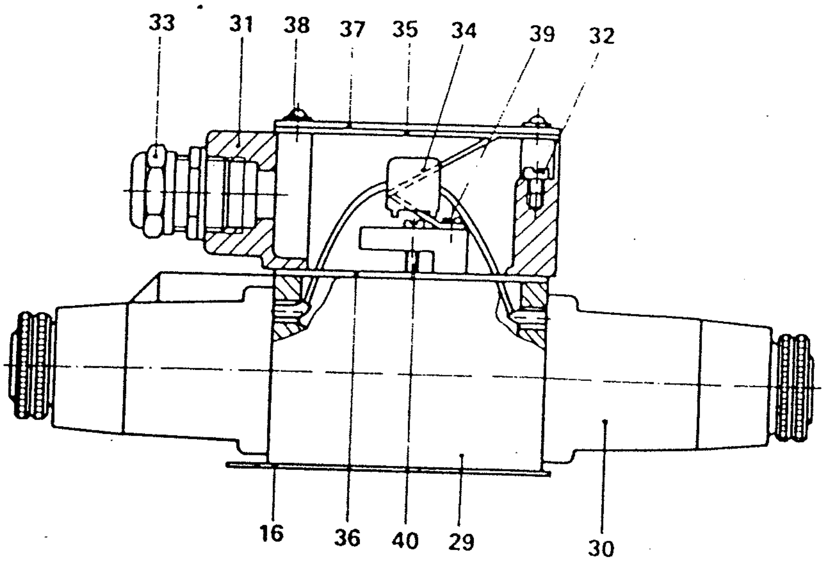
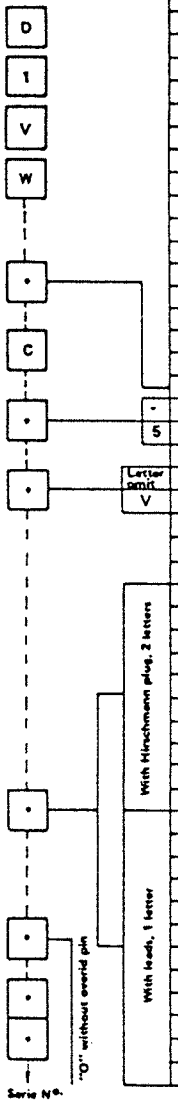


Table 2
Tabelle 2

	SPOOL KOLBEN TIROIR	PART No. TEIL NR. PIECE No.		SPOOL KOLBEN TIROIR	PART No. TEIL NR. PIECE No.
1		692531	8		702209
2		692532	10		693220
3		692533	11		692541
4		692534	14		692537
5		692535	15		692533
6		692536	16		692535
7		692537			

180 B



ITEM	QTY.	PART / ITEM N°.	DESCRIPTION
1	2	692526	Retainer
2			
3			
4			
5			
6			
7			
10	2	692616	Push rod
11			
12	2	692525	Spring for spool 8
12	2	692524	Spring for other spools
13			
14			
15			
16	1	700599	Shipping plate
17	2	7346-3x6	Roll pin DIN 7346
18			
45	1		Spool (see table 2)
			Standard
	2	700864	Signal light, Hirschmann plug
42	4	2-012-N552-9	O-Ring, Buna N
42	4	2-012-V709-9	O-Ring, Viton
46	2	3-907-V709-9	O-Ring, Viton
19	1	702176	Valve body
20	2		Solenoid (see table 1)
21	1	931470-106	Hirschmann plug, grey A
22	1	931470-100	Hirschmann plug, black B
23	2	731531-002	Hirschmann plug gasket
24	1	702199	Name plate
25	2	1131-0304	Chobert Rivet 2,4x4
26			
27			
28			
29	1	692395	Body
30	2		Solenoid (see table 1)
31	1	121629	Conduit box
32	1	121536	Ground screw
33	1	R1/2-8,159D	Cable damp
34	1	2740.2	Connector
35	1	121479	Gasket
36	1	692635	Gasket
37	1	702284	Name plate
38	4	121486	Captive screw
39	1	668001-2	Screw
40	2	4x281	Screw

180 C

Table 1
Tabelle 1

CURRENT SPANNUNG TENSION	SOLENOID* MAGNET* ELECTRO-AIMANT*	COIL* SPULE* BOBINE*	CODE N°. TEIL NR. CODE N°.	SOLENOID ϕ MAGNET ϕ ELECTRO-AIMANT ϕ	COIL ϕ SPULE ϕ BOBINE ϕ
24V-50 Hz	702136/1	702136/1S	X5096		
42V-50 Hz	702136/2	702136/2S	X5160		
48V-50 Hz	702136/3	702136/3S	X5163		
110V-50 Hz	702136/4	702136/4S	PP		
220V-50 Hz	702136/5	702136/5S	NN		
240V-50 Hz	702136/6	702136/6S	X5102		
250V-50 Hz	702136/7	702136/7S	X5154		
380V-50 Hz	702136/8	702136/8S	X5129		
127V-50 Hz	702136/9	702136/9S	X5170		
24V-60 Hz	702136/27	702136/27S	EE		
120V-60 Hz	702136/28	702136/28S	YY		
240V-60 Hz	702136/29	702136/29S	TT		
24V-50 Hz			X5121	702137/1	702137/1S
110V-50 Hz			P	702137/4	702137/4S
220V-50 Hz			N	702137/5	702137/5S
24V-60 Hz			E	702141/27	702141/27S
120V-60 Hz			Y	702141/28	702141/28S
240V-60 Hz			T	702141/29	702141/29S
6V ⎓	702138/1	702138/1S	LL		
12V ⎓	702138/2	702138/2S	KK		
24V ⎓	702138/3	702138/3S	JJ		
48V ⎓	702138/4	702138/4S	QQ		
110V ⎓	702138/5	702138/5S	X5099		
120V⎓	702138/6	702138/6S	DD		
180V ⎓	702138/7	702138/7S	X5094		
190V ⎓	702138/9	702138/9S	X5100		
196V ⎓	702138/11	702138/11S	GG		
200V ⎓	702138/12	702138/12S	X5095		
220V ⎓	702138/13	702138/13S	X5093		
98V ⎓	702138/18	702138/18S	UU		
6V ⎓			L	702139/1	702139/1S
12V ⎓			K	702139/2	702139/2S
24V ⎓			J	702139/3	702139/3S
48V ⎓			Q	702139/4	702139/4S
120V ⎓			D	702139/6	702139/6S
64V ⎓			X5323	702139/14	702139/14S

*with Hirschmann plug
*mit Hirschmann stecker
*avec prise Hirschmann

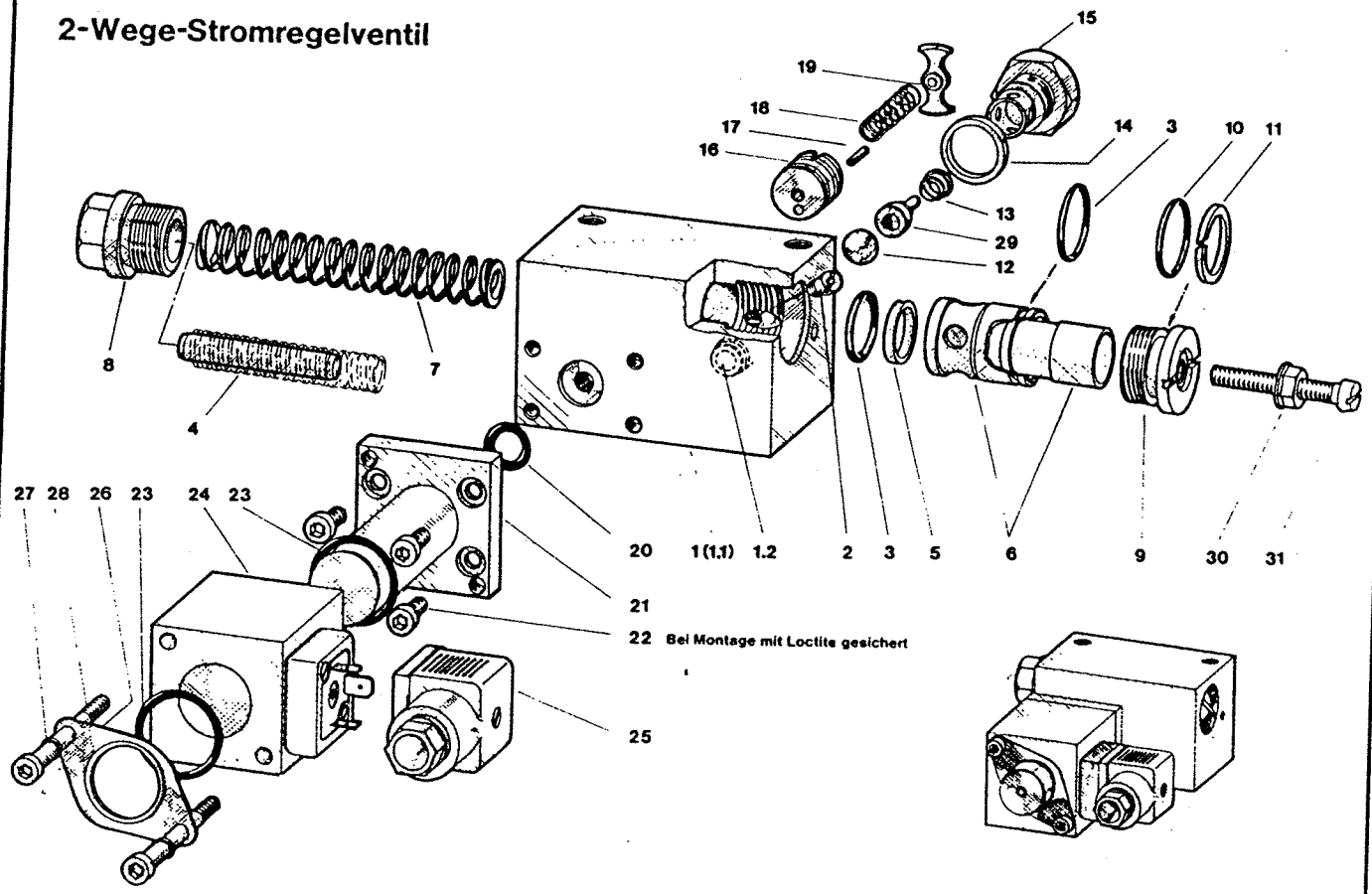
ϕ without
ϕ ohne
ϕ sans

Einzelteilliste für Elektrisch-proportional betätigtes Stromregelventil Typ SE 2-... und SE 3-...für Rohranschluß

nach Druckschrift 7177

407 A

2-Wege-Stromregelventil



SE 2-4 R	SE 2-3 R	SE 2-4	SE 2-3	Benennung	Sach-Nr.	Teil
			1	Block	6233 101	1
		1		Block	6234 101	1
	1			Block	6233 102	1.1 *)
1				Block	6234 102	1.1 *)
	1			Ventilsitz	4646 006	1.2 *)
1				Ventilsitz	4646 007	1.2 *)
1	1	1	1	Vergaserdüse M 4/0,40	(SOLEX)	2
2	2	2	2	O-Ring 18 x 2		3
	1		1	Führungsbolzen	6233 041	4
1		1		Führungsbolzen	6234 011	4
1	1	1	1	Ring	6233 117	5
1	1	1	1	Regelkolben m. Hülse	6233 115	6
1	1	1	1	Feder	5700 064/1	7
	1		1	Verschlußschraube	6680 040	8
1		1		Verschlußschraube	6234 009	8
	1		1	Verschlußschraube	6233 122	9
1		1		Verschlußschraube	6233 106	9
1	1	1	1	O-Ring 20,29 x 2,62		10
1	1	1	1	Teflon-Stützring	3771 003	11
	1			Kugel 10	DIN 5401	12
1				Kugel 13	DIN 5401	12
	1			Feder	5116 017	13
1				Feder	6399 003/1	13
	1			Dichtring A 18 x 22 x 1,5	DIN 7603-St	14
1				Dichtring A 22 x 27 x 1,5	DIN 7603-St	14
	1			Verschlußschraube	5116 016/1	15
1				Verschlußschraube	6980 019/2	15
	1		1	Regelblende f. 6 l/min	6233 110/1	16
	od.		od.	Regelblende f. 15 l/min	6233 111/1	16
	od.		od.	Regelblende f. 30 l/min	6233 112/1	16
	od.		od.	Regelblende f. 50 l/min	6233 113/1	16
1		1		Regelblende	6234 106	16
	1		1	Spiralstift 2 x 14	DIN 7343	17
1		1		Spiralstift 2 x 16	DIN 7343	17

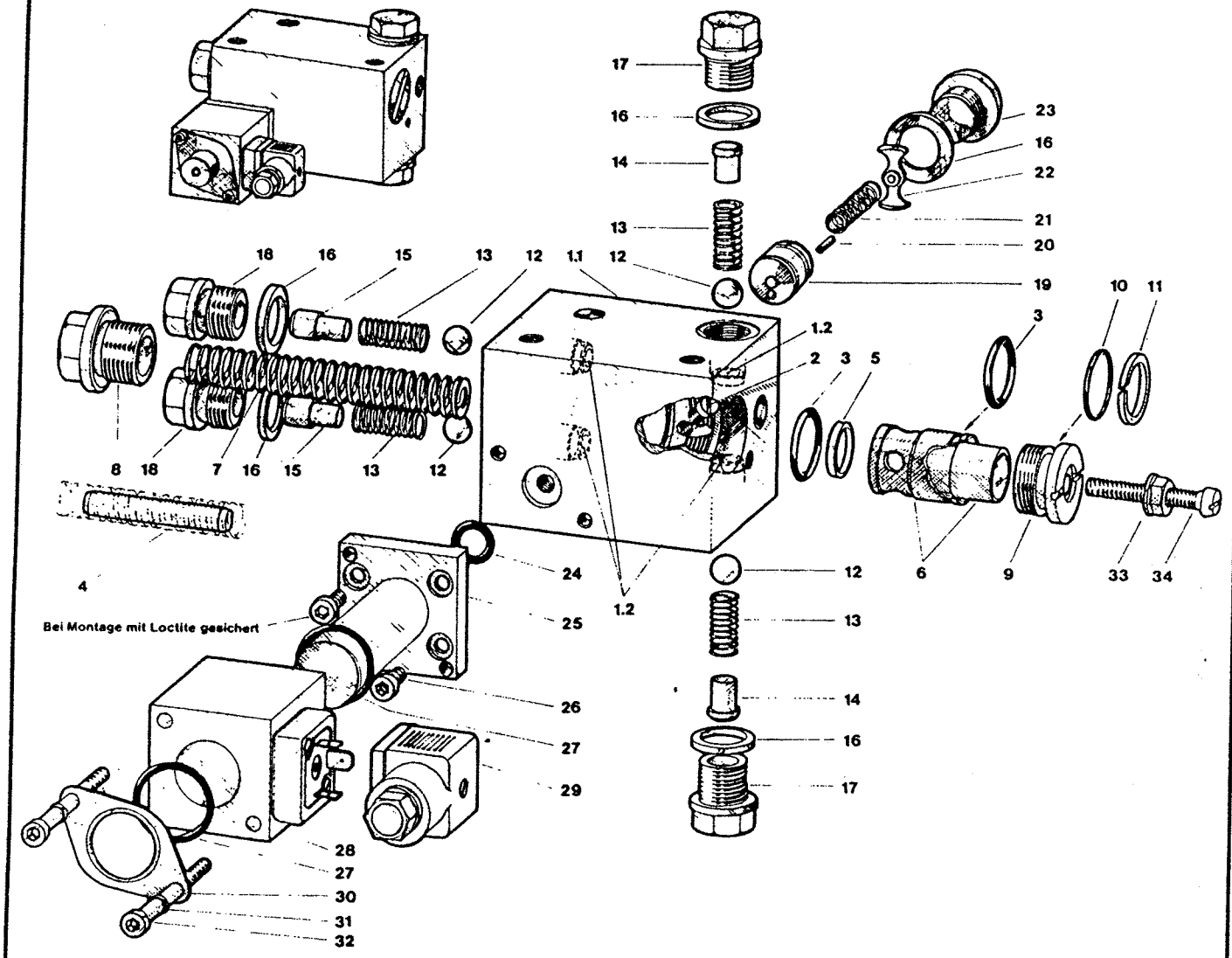
SE 2-4 R	SE 2-3 R	SE 2-4	SE 2-3	Benennung	Sach-Nr.	Teil
1	1	1	1	Feder für Verstellb. Kennb. E	7177 004/3	18
	1		1	Federhalterung	6233 107	19
1		1		Gewindebüchse	6234 107	19
1	1	1	1	O-Ring 7,52 x 3,53		20
1	1	1	1	Magnet mechanischer Teil	7171 005/1	21
4	4	4	4	Zyl.-Schraube M 5 x 8	DIN 6912-8.8	22
2	2	2	2	O-Ring 22 x 1,5	30 SHORE	23
1	1	1	1	Magnet elektrischer Teil (12 V)	7177 010	24
	oder			Magnet elektrischer Teil (24 V)	7177 011	24
	oder			Magnet elektrischer Teil (42 V)	7177 012	24
	oder			Magnet elektrischer Teil (48 V)	7177 013	24
	oder			Magnet elektrischer Teil (60 V)	7177 014	24
	oder			Magnet elektrischer Teil (80 V)	7177 015	24
	oder			Magnet elektrischer Teil (110 V)	7177 016	24
	oder			Magnet elektrischer Teil (220 V)	7177 017	24
1	1	1	1	Gerät-Steckdose MSD 3-309		25
1	1	1	1	Flansch	7177 007	26
2	2	2	2	Federring B 5	DIN 127	27
2	2	2	2	Zyl.-Schr. M 5 x 55 DIN 912-8.8	gal Zn 8 bk	28
1				Federbolzen	7165 048	29
	1		1	SEAL-LOCK-Mutter M 6 Art. Nr.	0531 0060 230	30
	1		1	Zyl.-Schraube A M 6 x 40	DIN 84	31

*) Teil 1.1 und 1.2 werden jeweils nur zusammen geliefert, bei Ersatzteilbestellung bitte hinzufügen: "in montiertem Zustand".

Bei Ersatzteilbestellung bitte vollständige Bestellbezeichnung und Sachnummer angeben!

Änderungen vorbehalten!

2-Wege-Stromregelventil in Brückenschaltung



SE 2-3B

Bestellbezeichnung

	Benennung	Sach-Nr.	Teil
1	Block	6885 101	1.1 *)
4	Ventilsitz	4646 006	1.2 *)
1	Vergaserdüse M 4/0,40	(SOLEX)	2
2	O-Ring 18 x 2		3
1	Führungsbolzen	6233 041	4
1	Ring	6233 117	5
1	Regelkolben m. Hülse	6233 115	6
1	Feder	5700 064/1	7
1	Verschlußschraube	6680 040	8
1	Verschlußschraube	6233 122	9
1	O-Ring 20,29 x 2,62		10
1	Teflon-Stützring	3771 003	11
4	Kugel 10	DIN 5401	12
4	Feder	470 046	13
2	Bolzen	6233 018	14
2	Bolzen	6885 002	15
5	Dichtring A 16,5 x 22 x 2	DIN 7603-St	16
2	Verschlußschraube	1242 008	17
2	Verschlußschraube	640 004	18
1	Regelblende f. 6 l/min	6233 110/1	19
od.	Regelblende f. 15 l/min	6233 111/1	19
od.	Regelblende f. 30 l/min	6233 112/1	19
od.	Regelblende f. 50 l/min	6233 113/1	19
1	Spiralstift 2 x 14	DIN 7343	20
1	Feder f. Verst. Kennb. E	7177 004/3	21
1	Federhalterung	6880 104	22

SE 2-3B

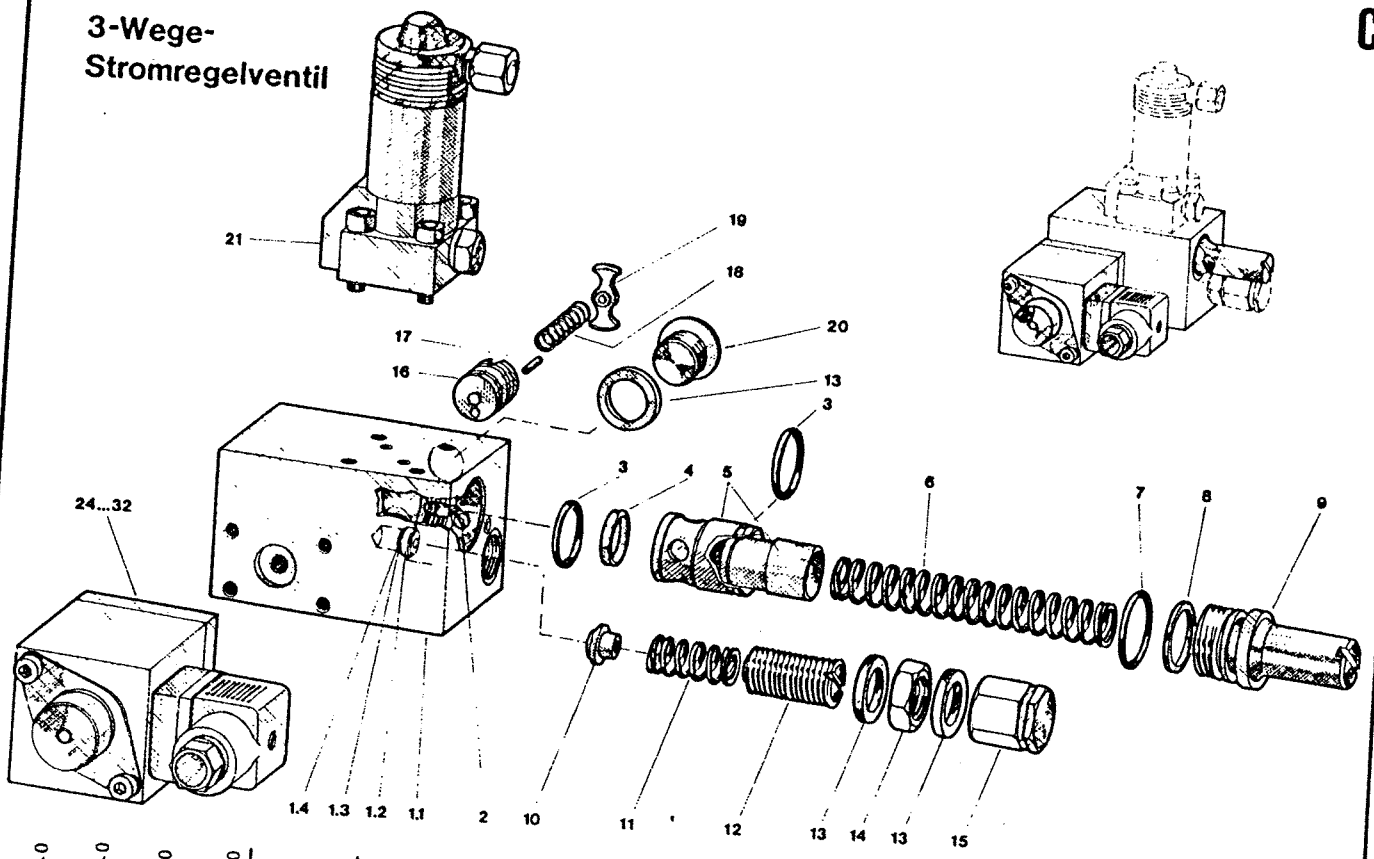
Bestellbezeichnung

	Benennung		Sach-Nr.	Teil
1	Verschlußschraube R 3/8" x 12		DIN 908	23
1	O-Ring 7,52 x 3,53			24
1	Magnet mechanischer Teil		7177 005/1	25
2	Zyl.-Schraube M 5 x 8		DIN 6912-8.8	26
2	O-Ring 22 x 1,5		30 SHORE	27
1	Magnet elektrischer Teil	(12 V)	7177 010	28
od.	Magnet elektrischer Teil	(24 V)	7177 011	28
od.	Magnet elektrischer Teil	(42 V)	7177 012	28
od.	Magnet elektrischer Teil	(48 V)	7177 013	28
od.	Magnet elektrischer Teil	(60 V)	7177 014	28
od.	Magnet elektrischer Teil	(80 V)	7177 015	28
od.	Magnet elektrischer Teil	(110 V)	7177 016	28
od.	Magnet elektrischer Teil	(220 V)	7177 017	28
1	Gerät-Steckdose MSD 3-309			29
1	Flansch		7177 007	30
2	Federring B 5		DIN 127	31
2	Zyl.-Schraube M 5 x 55 DIN 912-8.8		gal Zn 8 bk	32
1	SEAL-LOCK-Mutter M 6	Art. Nr.	0531 0060 230	33
1	Zyl.-Schraube A M 6 x 40		DIN 84	34

*) Teil 1.1 und 1.2 werden jeweils nur zusammen geliefert, bei Ersatzteilbestellung bitte hinzufügen: "in montiertem Zustand".

Bei Ersatzteilbestellung bitte vollständige Bestellbezeichnung und Sachnummer angeben! Änderungen vorbehalten!

3-Wege-Stromregelventil

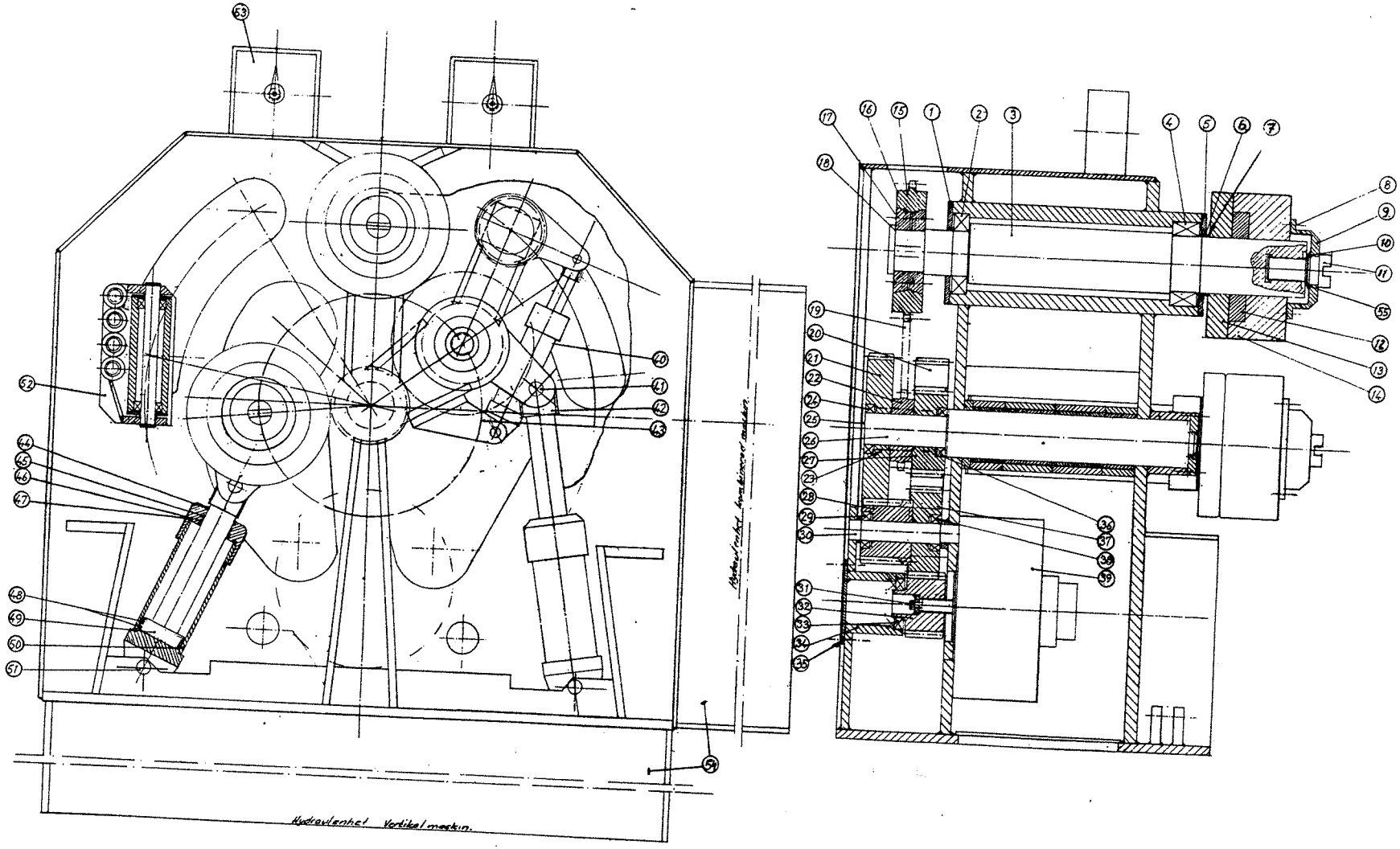


SE 3-4 S--G(W)S 2-0	SE 3-4 S--G(W)R 2-0	SE 3-3S--G(W)S 2-0	SE 3-3S--G(W)R 2-0	SE 3-4 S	SE 3-3 S	SE 3-4	SE 3-3	Bestellbezeichnung Benennung	Sach-Nr.	Teil
							1	Block		
					1	1		Block	6233 101	1.1 *)
					1			Block	6234 101	1.1 *)
									6233 103	1.1 *)
				1				Block		
		1	1					Block	6234 103	1.1 *)
1	1							Block	6233 104	1.1 *)
									6234 104	1.1 *)
1	1	1	1	1	1			Ventilsitz		
1	1	1	1	1	1			Filter	5700 042	1.2 *)
1	1	1	1	1	1			Sieb	5700 040	1.3 *)
									5700 041	1.4 *)
1	1	1	1	1	1	1	1	Vergaserdüse 4/0,60	(SOLEX)	2
2	2	2	2	2	2	2	2	O-Ring 18 x 2		3
1	1	1	1	1	1	1	1	Ring	6233 116	4
1	1	1	1	1	1	1	1	Regelkolben mit Hülse	6234 115	5
1	1	1	1	1	1	1	1	Feder	5700 064/1	6
1	1	1	1	1	1	1	1	O-Ring 20,29 x 2,62		7
1	1	1	1	1	1	1	1	Teflon-Stützring	3771 003	8
1	1	1	1	1	1	1	1	Verschlußschraube	6233 105	9
1	1	1	1	1	1			Federbolzen komplett	7164 022	10
1	1	1	1	1	1			Feder	5700 044/1	11
1	1	1	1	1	1			Einstellschraube	5585 008	12
3	3	3	3	3	3			Dichtring A 14 x 18 x 1,5	DIN 7603-St	13
1	1	1	1	1	1			Sechskantmutter	5585 006	14
1	1	1	1	1	1			Hutmutter	5585 009/1	15
		1	1		1	1		Regelblende für 6 l/min	6233 110/1	16
		1	1		1	1		Regelblende für 15 l/min	6233 111/1	16
		1	1		1	1		Regelblende für 30 l/min	6233 112/1	16
		1	1		1	1		Regelblende für 50 l/min	6233 113/1	16
1	1			1		1		Regelblende		
		1	1		1			Spiralstift 2 x 14	6234 106	16
1	1			1		1		Spiralstift 2 x 16	DIN 7343	17
									DIN 7343	17
1	1	1	1	1	1	1	1	Feder f. Verstellb. Kennb. E	7177 004/3	18
		1	1		1		1	Federhalterung	6233 107	19
1	1			1		1		Gewindebüchse	6234 107	19
1	1	1	1	1	1			Verschlußschraube R 1/4" x 12	DIN 908	20
	1		1					Wegesitzventil G(W) R 2-0	siehe	21
1		1						Wegesitzventil G(W) S 2-0	E 7300-0	21
1	1	1	1	1	1	1	1	Proportional-Magnet komplett	s. Seite 1	20..:28

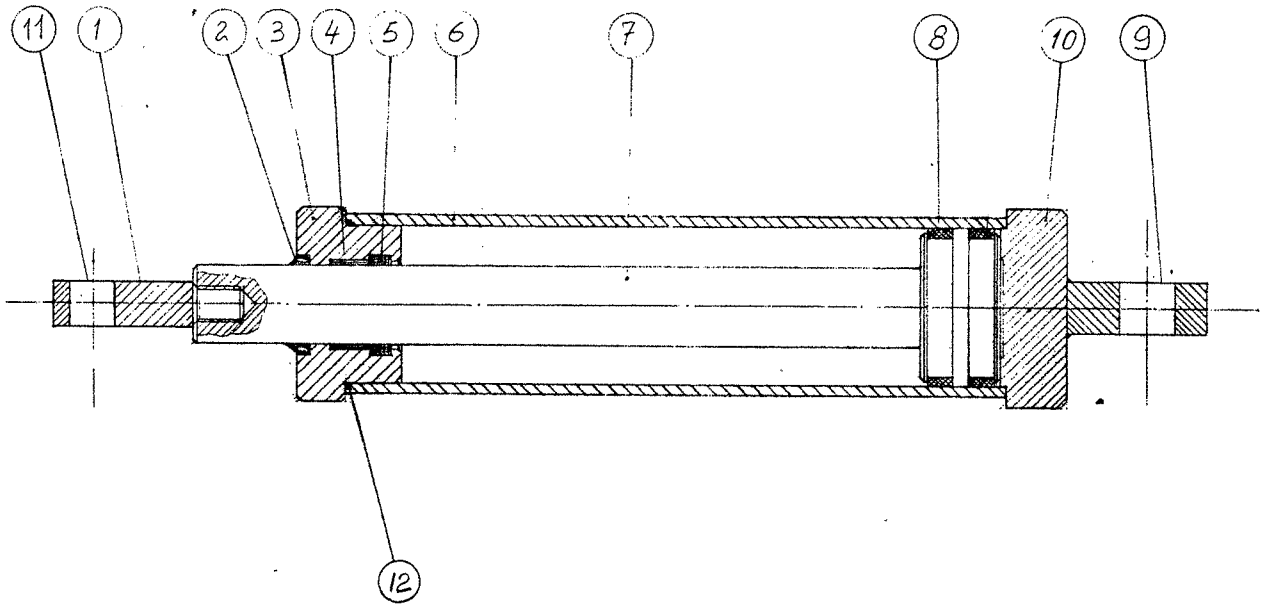
*) 1.1-1.4 werden nur kompl. geliefert, zur Bestellbezeichnung bitte hinzufügen: "im montiertem und verstopselten Zustand! "

Bei Ersatzteilbestellung bitte vollständige Bestellbezeichnung und Sach-Nr. angeben!

Änderungen vorbehalten!



ROUNDO
R-5-S



Det.-nr	Ant.	Benämning	Material	Mod.-nr Ämne Dimension	Anm.
Konstr.	Ritad B	Kop. / Kontr. / Stand. / Godk.	Skala 1:2,5	Ersätter	Ersatt av
ROUNDO	Hydraulic guide roll turning cylinder Vridcylinder R-5-S, R-6-S, R-7-S			Dat. 21.5.91	Ritn.-nr R-7-S-051

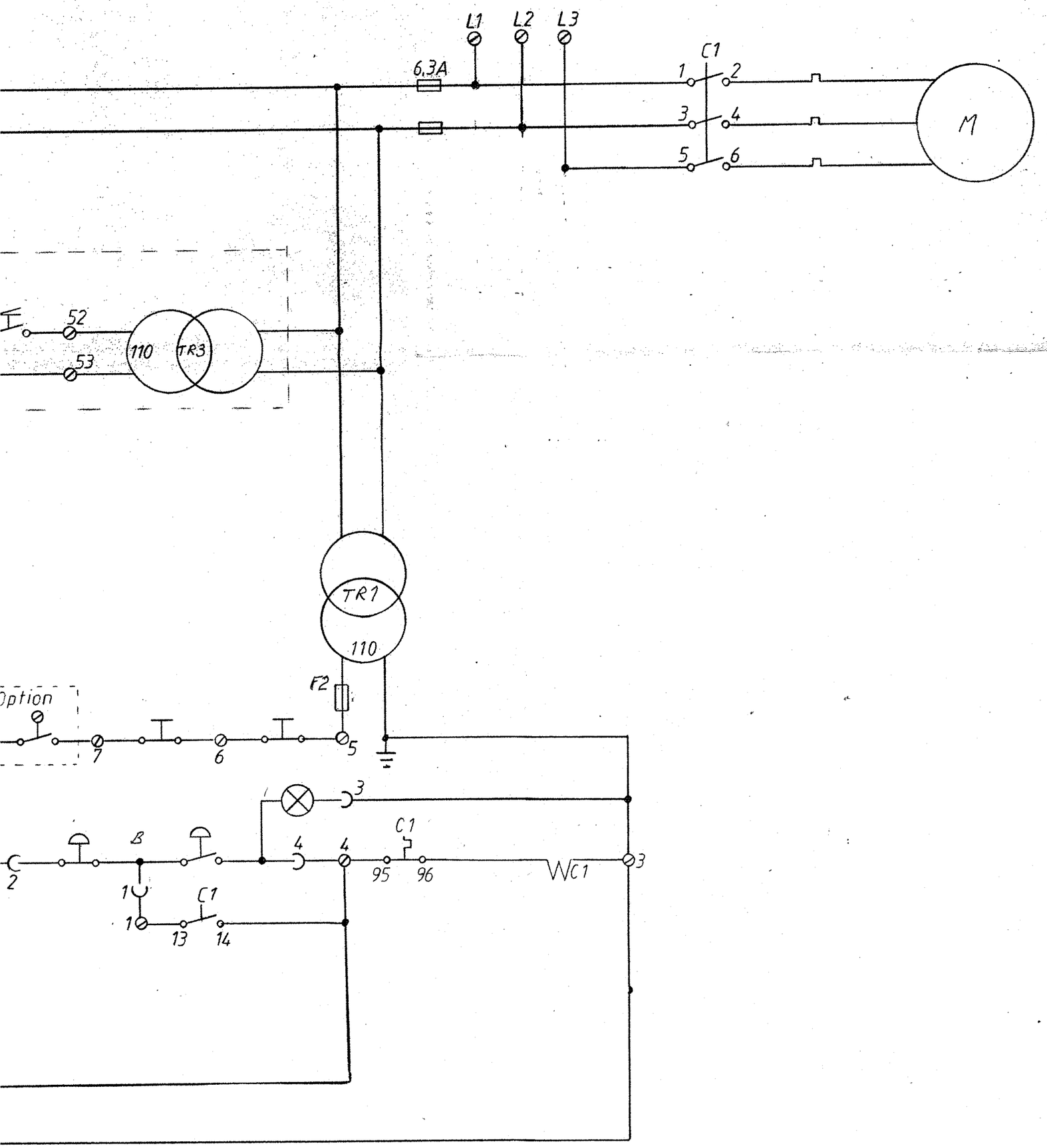
Nr	Ant.	Ändring och/eller medd.-nr	Datum	Inf.	Godk.

SMS 687-A3

ROUNDO

www.roundo.com

Roundo AB
Box 171
SE-281 22 Hässleholm
Sweden
Tel: +46 451 422 00
Fax: +46 451 824 04
info@roundo.com



5

		Part list 4.8492				
Det.-nr	Ant.	Benämning		Material	Mod.-nr Ämne Dimension	Anm.
Konstr.	Ritad	Kop.	Kontr.	Stand.	Godk.	Skala

Ersätter	Ersatt av
	Dat. 86/12/15

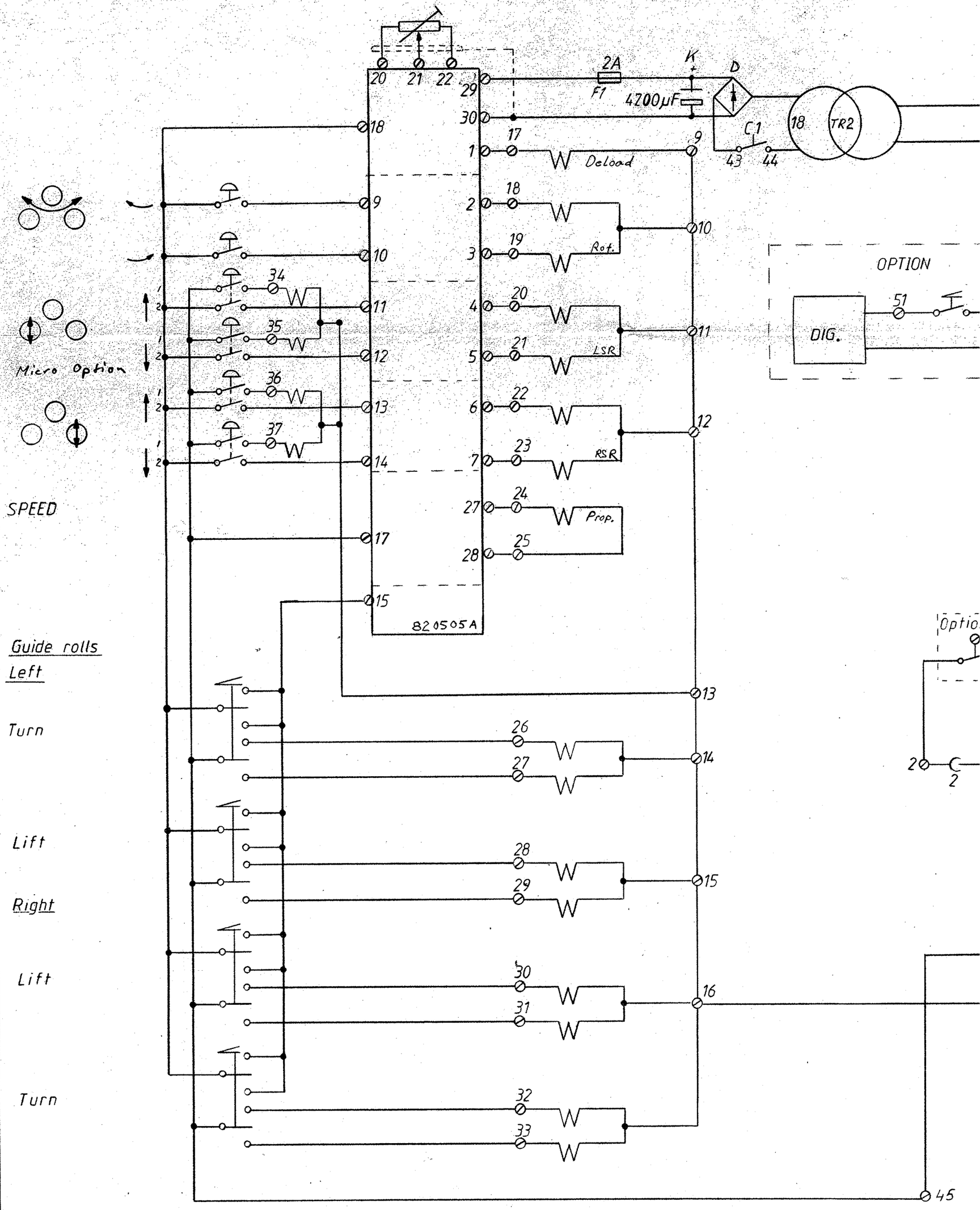
ROUNDO

ELECTRICAL DIAGRAM

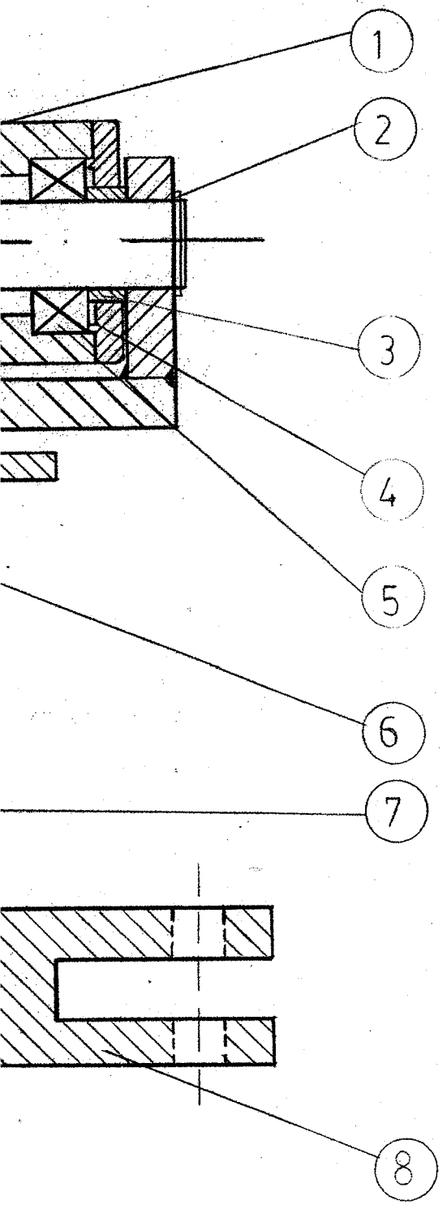
R5-S

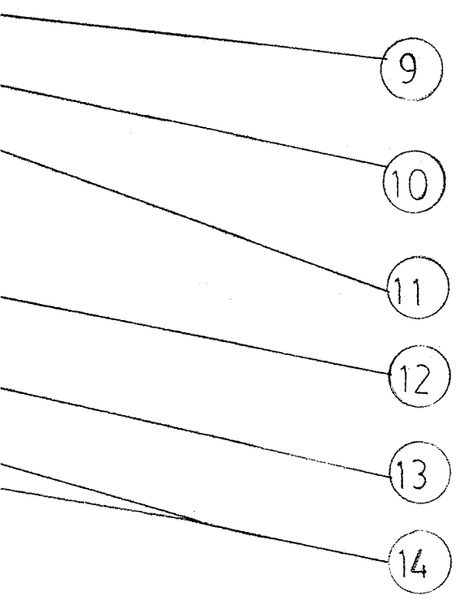
Ritn.-nr I-2,8322

r	Datum	Inf.	Godk.



Nr	Ant.	Ändring och/eller medd.-nr	Datum	Inf.	Godk.	Nr	Ant.	Ändring och/eller medd.-nr	Datum	Inf.	Godk.	Nr	Ant.	Ändring och/eller medd.-nr





205

Hydraulic guideroll

Det.-nr	Ant.	Benämning	Material	Mod.-nr Ämne Dimension	Anm.

Konstr.	Ritad	Kop.	Kontr.	Stand.	Godk.	Skala	Ersätter	Ersatt av
	G.					1·2,5	R-5 6-5-01	

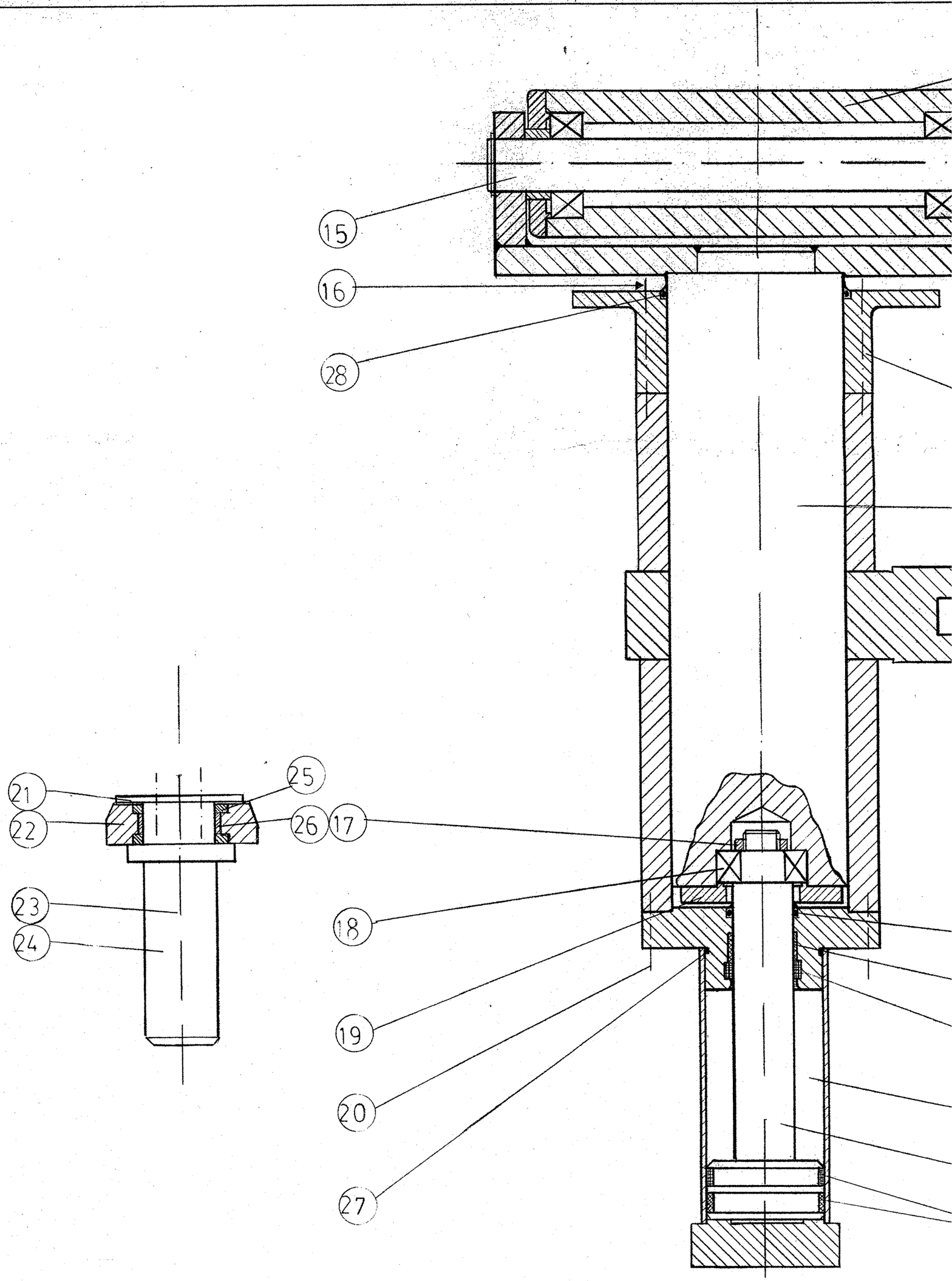
ROUNDO

Hyd. steering unit

Dat. 10/6-86

Ritn.-nr

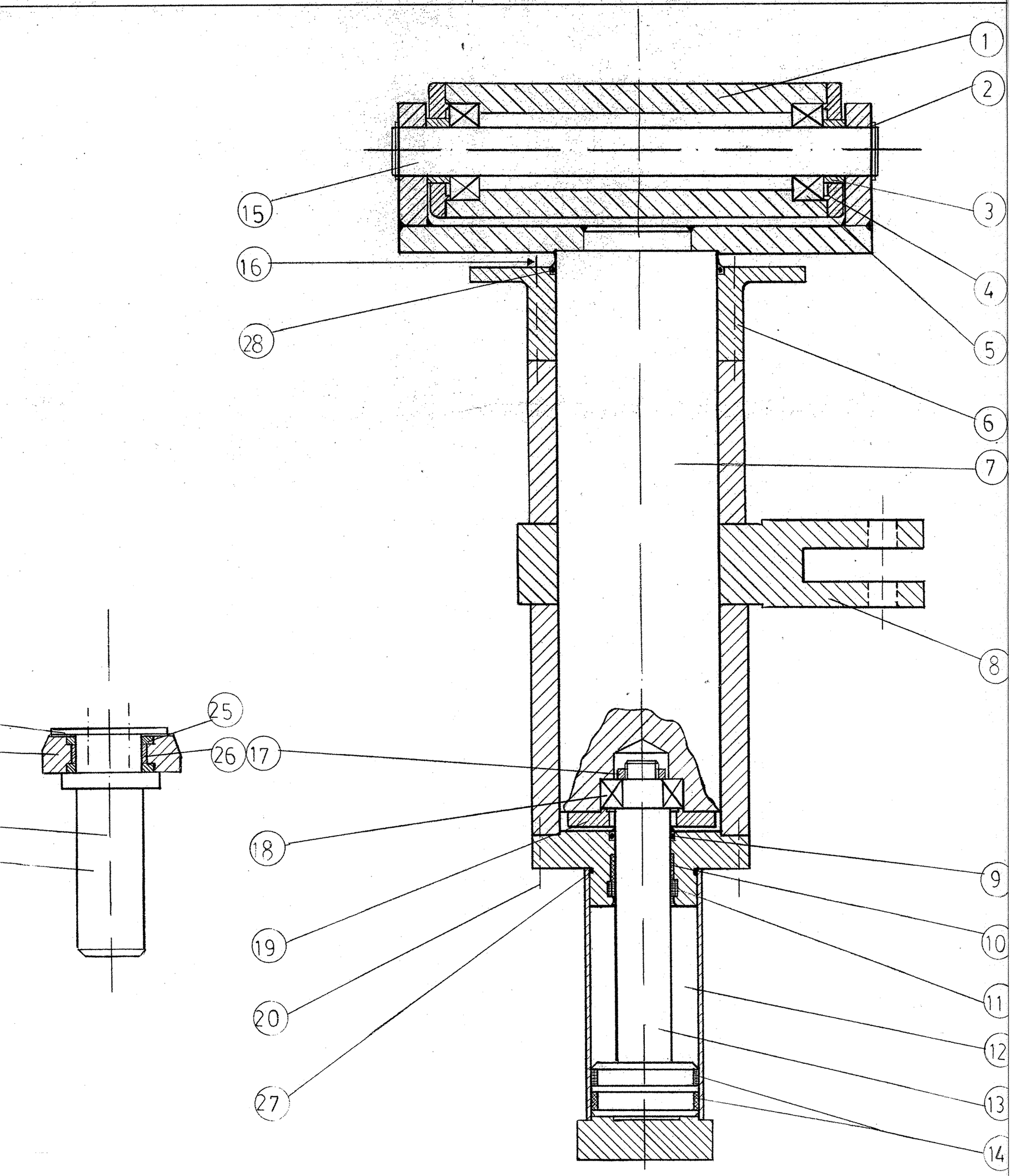
Datum	Inf.	Godk.



Océ
7363-42

S 687 1.11

Nr	Ant.	Ändring och/eller medd.-nr	Datum	Inf.	Godk.	Nr	Ant.	Ändring och/eller medd.-nr	Datum	Inf.	Godk.	Nr	Ant.	Ändring och/eller medd.-nr	D



r medd.-nr	Datum	Inf.	Godk.	Nr	Ant.	Ändring och/eller medd.-nr	Datum	Inf.	Godk.	Nr	Ant.	Ändring och/eller medd.-nr	Datum	Inf.	Godk.