MACHINERY WORLD

LIST OF CONTENTS

TECHNICAL DATA

HOMOGENISER

SERIAL/ORDER NO.: 1-93.109

MODEL: BLUE TOP TYPE: 40.60

MUST be stated when contacting Rannie.

PRODUCT		: SAUCES	
CAPACITY		: 3000	l/h
INLET PRESSURE		: 3 - 10	bar
		low speed/viscosity ------ high speed/viscosity	
HOMOGENISING PRESSURE (MAX.)		: 175	bar
COOLING WATER VOLUME		: 90	l/h
OIL VOLUME:	ECCENTRIC SUMP, approx.	: 18.5-20.0	l
	HYDRAULIC SYSTEM	: 7	l
	(for oil types, see Section 2.-)		
CONTROL VOLTAGE		110 V, 50 Hz AND 24 V DC	
OPERATING VOLTAGE		: 3x415 V 50	Hz
MOTOR:	SPECIFIKATIONS	: 22 kW 970	r.p.m.
	TYPE	: ABB MBT 200L	
WEIGHT (Homogeniser with motor) approx.		: 820	kg

Section 1.1- contains a key diagram showing the individual components included in the homogeniser, indicated by means of positions with position numbers.

POSITIONS MARKED ○

The position number indicates the group of components mentioned in Section 11.- / SPARE PARTS, describing the spare parts list of the component.

POSITIONS MARKED ○

These position numbers mean that there are two or more positions with identical position numbers in the same group of components. To distinguish between components with identical position numbers a drawing number is indicated in connection with the position number.

POSITIONS MARKED △

Indicate sizes and positions of connections to the machine. These are described later in this section and are shown on the key diagram in Section 1.1-.

TECHNICAL DESCRIPTION

Rannie's high pressure homogeniser is a positive piston pump with direct drive from an electric motor whose power is transmitted to the pistons through an eccentric shaft.

(1) *HOMOGENISING BRACKET*

The homogenising valve builds up the necessary homogenising pressure via manual or automatic control.

(13) *CYLINDER ARRANGEMENT*

Carries a closely limited product volume through the valve housing.

(30) *VALVE HOUSING*

The suction and delivery valves control the product flow from a lower to a higher pressure level.

○ *ECCENTRIC UNIT*

Converts the rotary motion of the eccentric shaft into a straight reciprocating motion which is transmitted to the piston in the cylinder via the piston coupling.

OTHER COMPONENTS

See previous pages and key diagram, Section 1.1-. ○ - ○

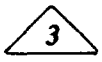
CONNECTIONS

COOLING WATER INLET

Cools the oil in the eccentric sump as well as the cylinders in the cylinder sump.

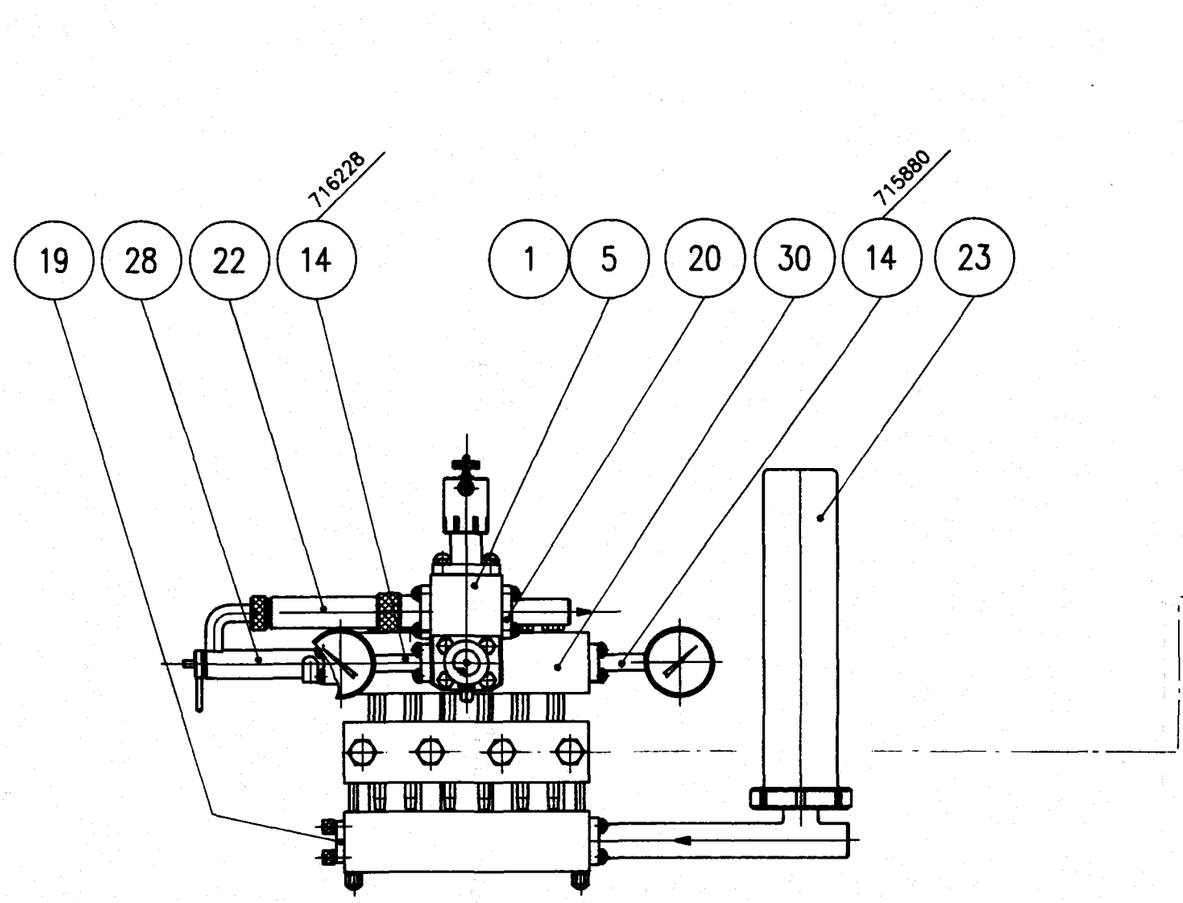
COOLING WATER OUTLET

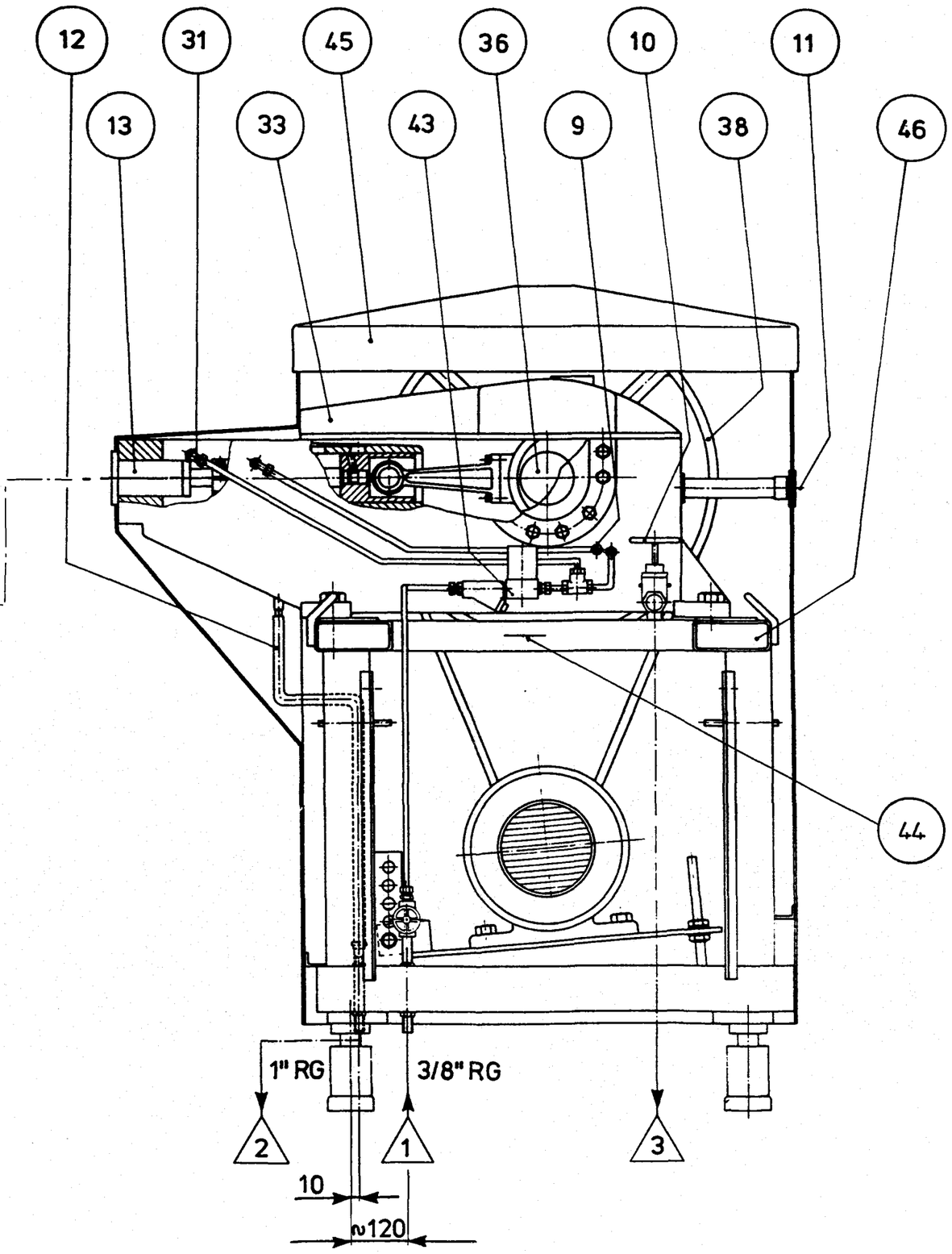
Outlet for cooling water from the cylinder sump.



OIL DRAINAGE

Oil drainage from the eccentric sump.


716228
715880
19
28
22
14
1
5
20
30
14
23


12
31
45
36
10
11
13
33
43
9
38
46
44
1" RG
3/8" RG
2
1
3
10
≈120

SECTION 1:
Konsolarrangement
Bracket unit
Konsoleanordnung
Dispositif de console

SECTION 5+6:
Homogeniseringsventil
Homogenising valve
Homogenisierventil
Soupape d'homogénéisation

SECTION 9:
Kølesystem, excentrikgrav
Cooling system, eccentric sump
Kühlvorrichtung, exzentrikgraben
Systéme de refroidissement, carter d'excentrique

SECTION 10:
Olieaftapning
Oil drain
Ölabzapfvorrichtung
Vidange d'huile

SECTION 11:
Oliestandsviser
Oil level indicator
Ölstandsvorrichtung
Indicateur de niveau d'huile

SECTION 12:
Afløb
Outlet
Auslaufanordnung
Sortie

SECTION 13:
Cylinderarrangement
Cylinder arrangement
Zylinderanordnung
Dispositif de cylindres

SECTION 14+15:
Trykindikering
Pressure indication
Druckanzeige
Indication de pression

SECTION 16:
Vindkedel
Air wessel
Windkessel
Bouteille d'air

SECTION 17:
Mellemblok
Intermediate part
Zwischenstück
Bloc intermediate

SECTION 18+19:
Blindflange
Blind flange
Blindflange
Bride d'obturation

SECTION 20:
Rørtilslutning
Pipe connection
Rohranschluss
Raccordement

SECTION 22:
Rørsikringsventil
Pipe connection
Rohrsicherungsventil
Soupape de protection de tuyauteries

SECTION 23:
Rørtilslutning med vindkedel
Pipe connection with air wessel
Rohranschluss mit windkessel
Raccordement de tuyau avec bouteille d'air

SECTION 25:
By-pass (omløbsarrangement)
By-pass arrangement
By-pass (umlaufvorrichtung)
Dispositif de by-pass

SECTION 26:
Tilløbstragt
Inlet funnel
Zulauftrichter
Entonnoir d'alimentation

SECTION 27:
Drejehane
Swing-cock unit
Drehhahnanordnung
Robinet tournant

SECTION 28:
Tryksikkerhedssystem
Pressure safety system
Drucksicherungssystem
Dispositif de sûrete de pression

SECTION 30:
Ventilhus
Valve house
Ventilgehäuse
Corps de soupape

SECTION 31:
Kølesystem, cylinder
Cooling system, cylinder
Kühlvorrichtung, zylinder
Système de refroidissement

SECTION 32:
Aseptisk system
Aseptic system
Aseptisches system
Dispositif aseptique

SECTION 33:
Bundramme
Base frame
Exzentrikgehäuse
Cadre de fond

SECTION 34:
Servosystem
Servo system
Servosystem
Servo-systeme

SECTION 36:
Excentrik
Eccentric
Exzentrik
Excentrique

SECTION 38 :
Transmission
Transmission
Transmission
Transmission

SECTION 41:
Udskyldningsarrangement
Flush system
Ausspühlvorrichtung
Dispositif de rincage

SECTION 42:
Sikkerhedssystem
Safety system
Sicherungssystem
Système de sécutite

SECTION 43:
El-styring, kølesystem
Electric control, cooling system
El-Steurung, Kühlvorrichtung
Commande électrique, système de refroidissement

SECTION 44:
Hydrauliksystem
Hydraulic system
Hydraulikanordnung
Dispositif d'hydraulique

SECTION 45:
Kabinet
Cabinet
Kabinett
Carrosserie

SECTION 46:
Stel
Frame
Rahmen
Bâti

SECTION 47:
Aseptisk system
Aseptic system
Aseptisches system
Dispositif d'hydraulique

SECTION 51:
Pulsationsdæmper
Pulsations damper
Pulsationsdämpfer
Armortisseur de pulsations

SECTION 52:
Tryktester
Pressure measuring instrument
Druckprüfer
Messureur de pression

SECTION 53:
Gearkasse
Gearbox
Getriebekasten
Boite de vitesse

SECTION 54:
Varmesystem
Heating system
Heizsystem
Systeme de chauffage

INSTALLATION

In order to ensure correct installation of the machine and to avoid damage, the following procedure must be observed:

IMPORTANT!! Clean all packings and lubricate with silicone grease (Molykote 111 - approved for food-stuffs)

Clean all screws and threads and lubricate with anti-seize compound (e.g. Molykote 1000).

Lubricant is kept in the tool case.

1. The machine is levelled by means of the four adjustable legs and a spirit level, so that the machined surfaces of the valve housing are true to both spirit level and plumb-line.

   REMEMBER!! When the machine has been levelled, the lock nuts on the adjustable feet are tightened.

2. The inlet pipe is fixed to the welding socket on the valve housing suction channel so that air pockets cannot form in the inlet pipe. The inlet pipe must have a downward gradient of 0.1% towards the inlet.

   NOTE: Some machine types have a welding socket on both sides of the valve housing in order that supply may be effected from both sides of the valve housing. ***Rannie*** supplies the valve housing in this fashion in order that the customer may decide the connection of such pipes.

3. The outlet pipe is fixed to the welding socket on the outlet channel of the homogenising bracket so that air pockets cannot form in the outlet pipe.

4. Shut-off valves or similar equipment must ***NOT*** be mounted in the outlet pipe as the machine is a positive piston pump.

5. The pistons in the cylinder sump must be cleaned of any impurities. Check whether packing nipple/union nut and piston couplings are tightened.

6. Connect the cooling water pipe and check that all pipe connections and fittings in the cylinder sump have been tightened.

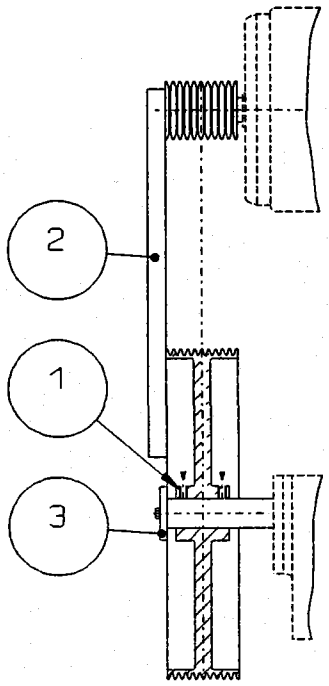
7. Check the eccentric sump for impurities and clean it if necessary.

8. Motor supply:

   MACHINES SUPPLIED WITH MOTOR

   The motor, belt pulleys and belts of such machines are mounted and tested on ***Rannie's*** test stand.

In the case of such a complete supply, the mounting screws Pos.1, retaining the large belt pulley to the eccentric shaft, have been tightened in ***Rannie's*** workshop.



MACHINES SUPPLIED WITHOUT MOTOR

The customer will supply the motor and mount it on the motor bracket.

The belt pulley is mounted on the motor shaft.

NOTE: ***Rannie*** has mounted the large belt pulley on the eccentric shaft, ***BUT mounting screws Pos.1 have NOT been tightened.***

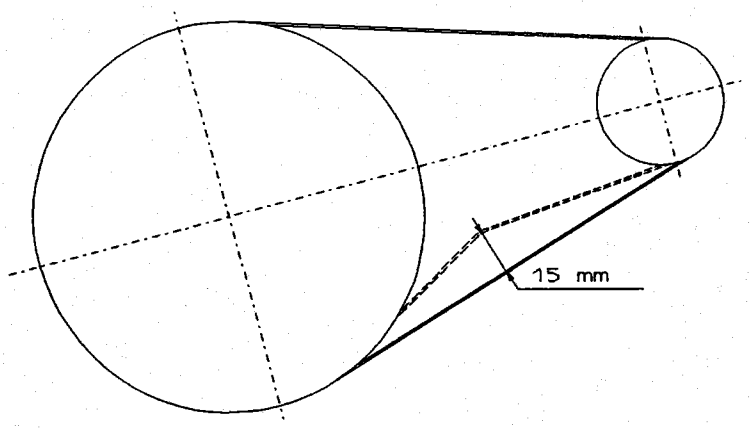
The two belt pulleys are aligned by means of straight edges Pos.2, until they are absolutely parallel.

When the belt pulleys are absolutely parallel, the mounting screws Pos.1 are tightened.

CHECK that the mounting screws have been TIGHTENED.

Tighten belt stop Pos.3.

IMPORTANT!! V-belts must only sag 15 mm per metre of free belt length.



9. If electrical equipment is included in the machine supply, it is to be mounted in compliance with the wiring diagrams.
See Section 8.- / WIRING DIAGRAM.

10. *NOTE:* If the machine type is B-LP, BLUE-TOP or BLUE-TOP-PLUS, a copy of the wiring diagrams is supplied in a box inside the cabinet.

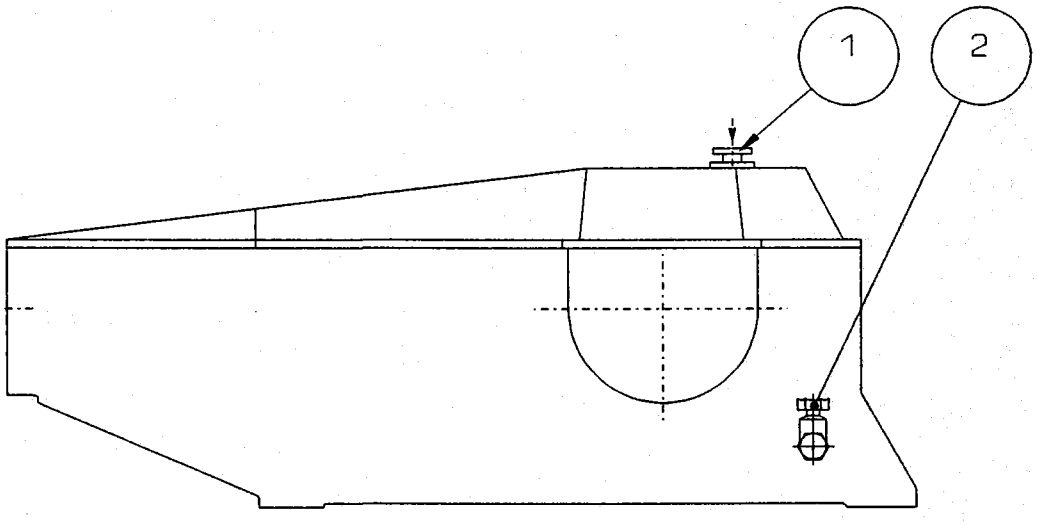
11. Fill the eccentric sump with oil.
For quantity, see Section 1.- / TECHNICAL DATA.

IMPORTANT!! ***ONLY*** oil types specified at the end of this section may be used.

In some countries the individual oil types may have other names, and it is, therefore, recommended that the oil supplier be contacted to ensure that the correct oil type is used.

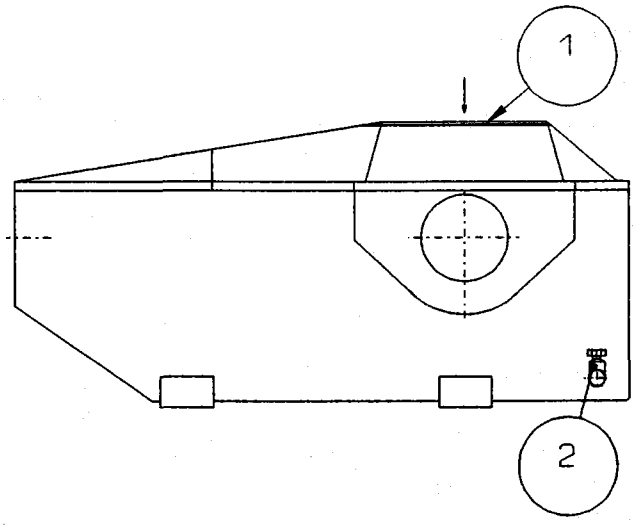
12. How to fill with oil depends on the size of the machine:

D.50 - .51 - .51H - .60 - .72



The air filter Pos.1 is removed and oil poured in. Oil drainage takes place through Pos.2.

D.79 - 79H - .80 - .80H - .90



Lid Pos.1 and splash guard are removed and oil poured in. Oil drainage takes place through Pos.2.

13. Check that the oil quantity is correct:

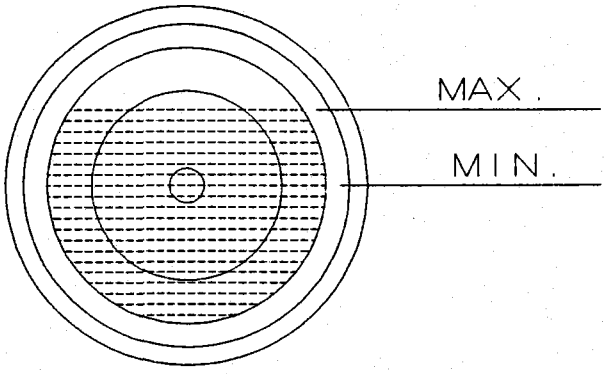
MACHINES WITH OIL DIPSTICK

Oil level should be between min. and max. on dipstick.

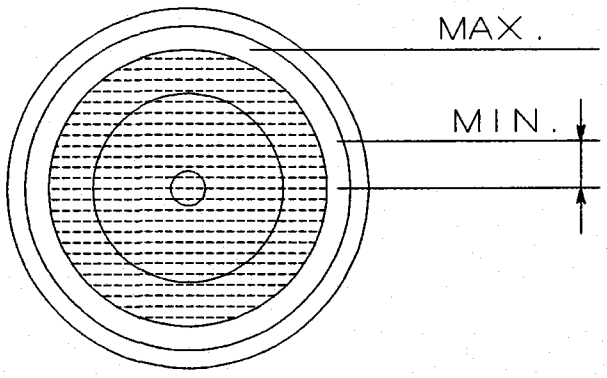
MACHINES WITH OIL-LEVEL GLASS

The oil level depends on the size of the machine:

D.50 - .51 - .60 - .72



D.51H - .79 - .79H - .80 - .80H - .90



D.90

The oil level can be checked on the control panel. If the oil level control lamp is activated (shows red) during operation, the oil level is too low and it will be necessary to top up the oil.

MACHINES WITH HYDRAULIC PRESSURE REGULATION

Filling of the hydraulic station with oil ***MUST*** take place through the filter. The oil-level glass must always be filled.

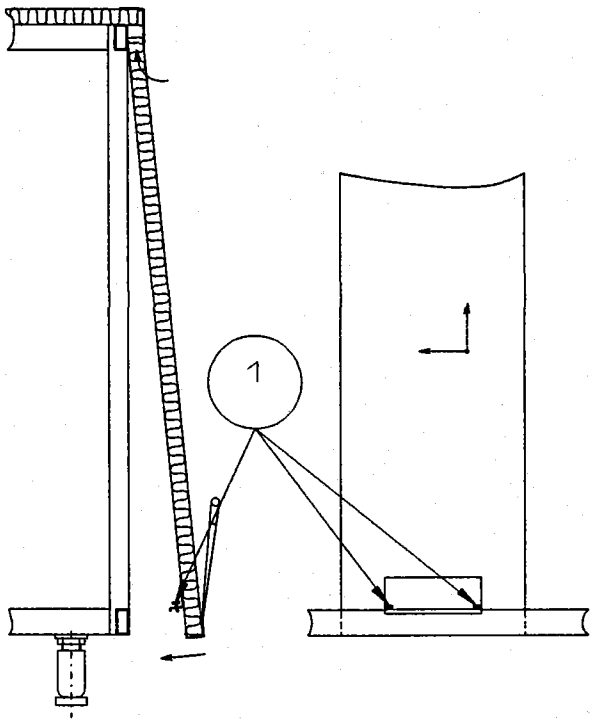
Volume, see Section 1.- / TECHNICAL DATA.

IMPORTANT!! ***ONLY*** oil types specified at the end of this section may be used.

MODEL BLUE-TOP-PLUS

All side and top panels for these models are supplied in a separate box.

When it has been checked that all parts of the machine are in complete order, the panels are removed from the box with caution and mounted on the frame.



1. The top panels are positioned and screwed on.

2. The side panels are mounted on the frame by means of a lifting hook.

3. The lifting hook is kept in the tool case.

4. An angle iron with two adjusting screws Pos.1 is mounted at the bottom of all side panels.

NOTE: The screws are supplied in a bag on the frame. All side panels are levelled by means of the adjusting screws Pos.1 until they are true to a plumb-line.

OIL TYPES

ALWAYS use one of the below oil types, or an equivalent type of oil that conforms to the below specification, for ***Rannie's*** machines:

First class industrial gear oil, viscosity 100-150 cSt, at 40°C,
or
First class motor oil API, classification SF/CC SAE 30-40

ECCENTRIC SUMP

BP	:	HLP 100	/	VANELLUS SAE 40
STATOIL	:	HYDRAWAY HM 100	/	
SHELL	:	TELLUS OIL S100	/	RIMULA SAE 40
TEXACO	:	MEROPA 100	/	URSATEX SAE 30
MOBIL	:	DTE 27		
CASTROL	:	HYSPIN AWS 100	/	RX SUPER 15W/40 or CRD 30
ESSO	:	NUTO H 100	/	

If a change is made to another oil type, the eccentric sump ***MUST*** be cleaned of all oil.
As regards the oil volume to be filled into the machine, reference is made to Section 1.- / TECHNICAL DATA.

HYDRAULIC SYSTEM

ALWAYS use one of the below oil types, or equivalent type, for the hydraulic pressure control:

BP	:	ENERGOL HLP 46	/	ENERGOL SHF 46
STATOIL	:	HYDRAWAY HV 46	/	
SHELL	:	TELLUS OIL 46	/	HYDROL DO 46
TEXACO	:	RANDO OIL HD 46	/	HYDRAULIC OIL HDW 46
MOBIL	:	DTE 25		
CASTROL	:	HYSPIN AWS 46	/	HYSPIN AWH 46 or VARIO HDX
ESSO	:	UNIVIS N 46	/	

For oil volume to be filled into the hydraulic system, see Section 1.- / TECHNICAL DATA.

STARTING THE MACHINE

Prior to starting the machine with a product charge, it *MUST* always be tested with water in the system.

IMPORTANT!! Before this trial-run it *MUST* be checked that the system contains water.

NOTE: Additionally, the following points will have to be inspected and checked before start:

1. Rotate the large belt pulley on the eccentric shaft by hand and listen for any jarring sounds.

   CHECK that the mounting screws have been *TIGHTENED UP.*

2. The necessary inlet pressure of cooling water (3-6 bar) must be present.

IMPORTANT!!

3. The manual or automatic pressure regulation in the homogenising system must *ALWAYS* leave the control system in the de-pressurized starting position.

4. The delivery side must *NOT* be shut off.

NOTE: This applies especially to machines without a homogenising bracket.

During the trial-start and trial-run with water in the machine, the following must be checked:

1. That the belt pulley on the eccentric shaft rotates in the correct direction.
   The direction of rotation is marked by an arrow.

2. That the correct inlet pressure is supplied to the machine.
   See Section 1.- / TECHNICAL DATA.

3. For machines with a cabinet, model BLUE-TOP-PLUS, check the direction of rotation of the suction fan in the top cassette. The direction of rotation is marked by an arrow.

4. That the eccentric sump contains the necessary amount of oil. Depending on the machine type, the oil level can be checked electrically or visually.

   For procedure, see Section 4.- / OPERATION AND SERVICE, paragraph "CHECKING THE OIL LEVEL".

5. That cooling water is supplied from both the cylinders and the eccentric sump. This can be checked visually in the cylinder sump into which cooling water from the eccentric sump is also fed. Depending on the machine type, the cooling water flow can be checked electrically or visually.

   For procedure, see Section 4.- / OPERATION AND SERVICE, paragraph "CHECKING THE COOLING WATER SYSTEM".

If the machine has other electric equipment, it must be checked and tested. See Section 8.- / WIRING DIAGRAM.

OPERATION AND SERVICE

B-LP - BLUE-TOP - BLUE-TOP-PLUS

Regular inspection should be made during daily operation to avoid unnecessary breakdowns.

Commence daily operation of the machine by activating the switch "ON-MAIN-MOTOR".

NOTE: Pilot lamp "MAIN-MOTOR" lights during operation.

All signal lamps should be examined regularly to ensure that irregularities do not exist.

Air pockets may occur in the valve housing during starting of the machine, resulting in irregular operation. These air pockets *MUST* be removed before homogenising begins. depending on the model, this can be done in one of the following ways:

MACHINES WITH RINSING VALVE

The rinsing valve is opened causing air and water to escape together. When water flows out in a regular jet, close the rinsing valve.

MACHINES WITHOUT RINSING VALVE

These machines have no venting facilities, and so the machine *MUST* operate until it reaches regular operation before homogenising is started.

CHECKING THE OIL LEVEL

Depending on the machine type, the oil level can be checked electrically or visually.

ELECTRICAL OIL LEVEL CONTROL

If "OIL-LEVEL" lamp lights during starting or operation, oil must be poured into the eccentric sump until the lamp is extinguished.

VISUAL OIL LEVEL CONTROL

Machines with an oil dipstick must be checked regularly to see that the oil level is between min. and max. If this is not so, refilling *MUST* take place.

CHECKING THE COOLING WATER SYSTEM

MACHINES WITH "WATER FLOW" CONTROL

Depending on the customer's wishes, some machines have a control unit for the flow of the cooling water to the cooling system.

This control unit "WATER FLOW" is connected either to a pilot lamp in front of the machine or to a control unit in the customer's control panel.

IMPORTANT!! If the "WATER FLOW" control indicates a fault, it should be examined *IMMEDIATELY.*

Adjustment of the regulation valve may often remedy the fault.

If the "WATER FLOW" control still indicates a fault in the system, the machine *MUST* be stopped and the fault located.

MACHINES WITHOUT "WATER FLOW" CONTROL

It must be checked visually, at regular intervals, that water flows continuously into the cylinder sump from, respectively:

1. Cooling of cylinders

2. Cooling water from eccentric sump.

IMPORTANT!! If cooling water does not flow into the cylinder sump, the cause *MUST* be determined at once. If it takes some time to do so, the machine *MUST* be stopped and the fault located.

GENERAL CHECK

1. That product does not flow out at cylinder pistons as this indicates defective cylinder packings.

2. That oil does not flow out where the fixed piston passes through the crosshead cover.
   If so, the oil seal ring is defective.

3. That oil does not flow out at the eccentric shaft where the large belt pulley is located.
   If so, the V-ring seal is defective.

4. Regarding the interdependent values of homogenising pressure and main motor power input, it should be noted that these values must be constant, and in the event of major deviations the homogenising valve should be checked.

IMPORTANT!! *HIGH PRESSURE MACHINES (HYPER)*

During production these machine operate under exceedingly high pressure and there is a danger, should there be a product leak, from the force of the escaping product.

Therefore, one must *always* use protective glasses when working around these machines during a production run.

FAULT LOCATION

B-LP -BLUE-TOP - BLUE-TOP-PLUS

Faults in the machine may have many different causes, and it will always be necessary to look out for irregularities in the machine.

The below table shows what the cause may be if the machine does not start when "ON-MAIN-MOTOR" is pressed, or the irregularities which may cause a lamp to indicate a fault during operation.

The instructions are common to all machine types and give a list of the pilot lamps with which a machine may be equipped.

ALWAYS CHECK that control voltage is supplied to the machine.

A - STARTING, WHEN CONTROL VOLTAGE HAS BEEN CUT OFF:

Machine does not start		**Cause**
No light in "OIL LEVEL"	-	If LED on relay d5 on panel does not light, oil level in eccentric sump is too low

B - STARTING, DAILY OPERATION

Machine does not start when "ON-MAIN-MOTOR" is pressed		**Cause**
No light in "OIL-FLOW"	-	Too little oil flow in lubricating system Oil pump has stopped for machine type D.90
"No light in "WATER FLOW"	-	Too little water flow in cooling system
"AIR-TEMP" lights	-	Too high temperature in cabinet
"OIL-TEMP" lights	-	Too high oil temperature in eccentric sump. (If temperature exceeds 65°C, machine does not start)
If the above is in order, and machine still does not start	-	Emergency switch activated

C - DURING OPERATION

Lamps which may indicate faults during operation		**Cause**
"OIL-FLOW" extinguished	-	Too little oil flow in lubricating system. Oil pump has stopped for machine type D.90

"WATER-FLOW" extinguished	-	Too little water flow in cooling system
"AIR-TEMP" lights	-	Too high temperature in cabinet
"OIL-TEMP" lights	-	Too high temperature in eccentric sump. (If temperature exceeds 65°C, main motor stops automatically)
"OVERLOAD-OIL-PUMP" lights	-	Thermal relay for oil pump has dropped out
"OIL-LEVEL" lights	-	Too little oil in eccentric sump
"SAFETY-HIGH-PRESSURE" (Lamp on panel at relay)	-	Too high pressure in system

MACHINE WITH ROTARY FLASH

The lamp is activated as soon as fault occurs in one of the above fields.

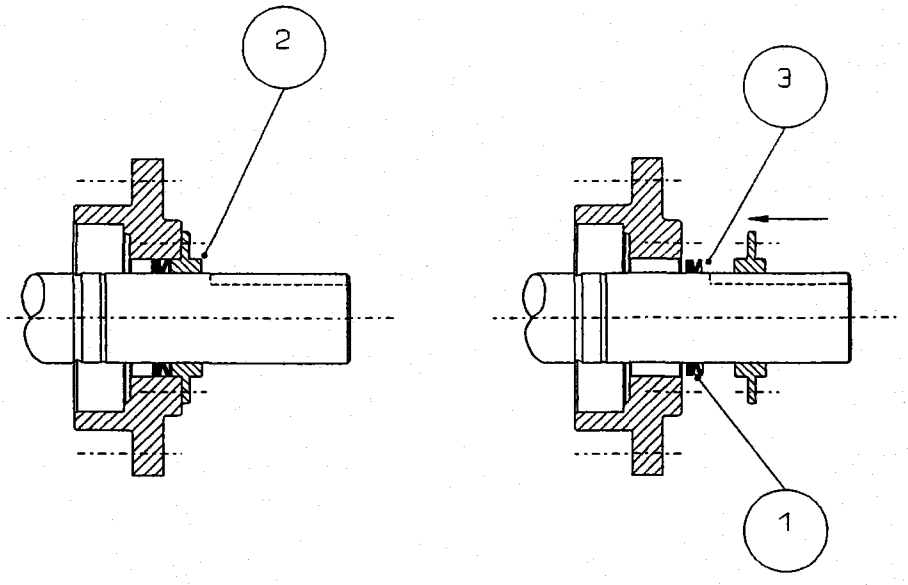
REMEMBER!! If irregularities or jarring sounds occur during operation, the machine ***MUST*** be stopped and these irregularities and sounds localized and corrected before restarting the machine.

REPLACEMENT OF THE V-RING AT THE CRANKSHAFT COVER

REMOVAL AND REPLACEMENT

Replace V-ring Pos.1 if there is a major leakage of oil from the crankshaft cover behind the belt pulley.

1. Remove the large belt pulley and then crankshaft cover Pos.2.
2. The damaged V-ring is removed.
3. The new V-ring is placed on the shaft and pushed over keyway Pos.3.



REMEMBER!! that the V-ring must be placed with the lip turned away from the bearing. See drawing Pos.3.

NOTE!! Below does not apply to stroke lengths 50, 60 and 72.

4. Use the outside of the cover as mounting tool. The cover is pushed over the end of the shaft; the outside must be turned towards the V-ring.
   The V-ring is placed correctly when the cover touches the bearing housing.

5. The cover is pulled back over the shaft, turned correctly and mounted again, see Pos.2.

MAINTENANCE

IMPORTANT!! Clean all packings and lubricate with silicone grease (Molykote 111 - approved for food-stuffs) every time the machine has been dismounted and mounted.

Clean all screws and threads and lubricate with anti-seize compound (e.g. Molykote 1000).

Lubricant is kept in the tool case.

AFTER THE FIRST 24 HOURS OF OPERATION

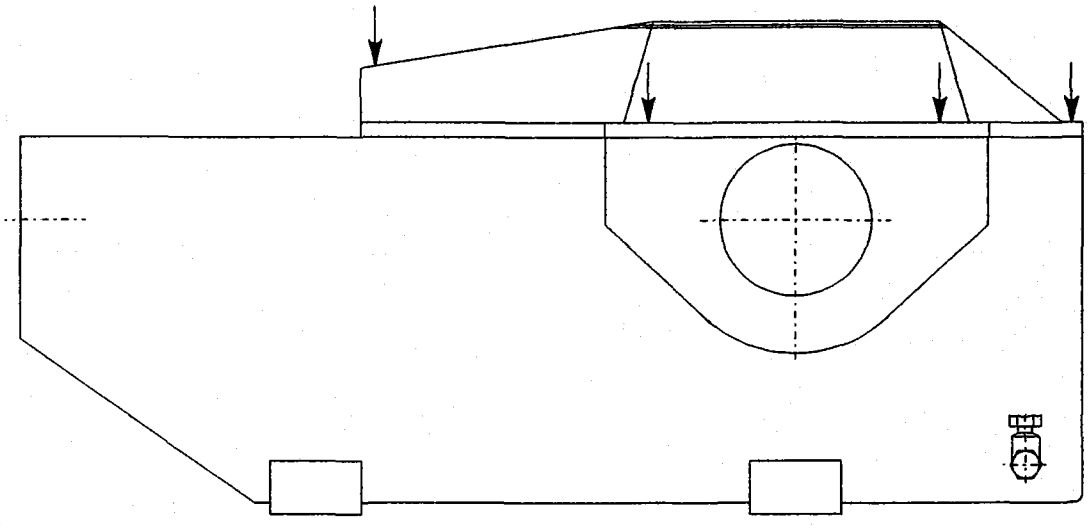
Check the V-belt tension. V-belts may only sag 15 mm per metre of free belt length. This check should then be made regularly.

AFTER THE FIRST 250 HOURS OF OPERATION

Change the oil in the eccentric sump. Before new oil is added, the eccentric sump must be thoroughly cleaned with paraffin oil.

AFTER 1 MONTH OF OPERATION

Tighten screws in the cover of the eccentric sump (see drawing).



AFTER EVERY 250 HOURS OF OPERATION

1. If the machine has a homogenising bracket, the homogenising valve must be checked for wear. When the wear has reached such an extent that parts of the surface are damaged or the separate annular faces are worn through, the homogenising valve must be replaced.

2. See that water does not penetrate into the eccentric sump. This can be seen by the oil changing from a brownish to a yellowish colour.

AFTER EVERY 500 - 1000 HOURS OF OPERATION

1. Replace all valve springs. For disounting and mounting of valve housing, see Section 6.5-.

2. Inspect valve seats. Contact faces must be without marks/traces of wear. Normally, small pits will form in the seat areas, but these do not impair the pump function unless their number is so high that they are interconnected.

   For renovation and grinding of seats, see Section 6.1-.

AFTER EVERY 2000 HOURS OF OPERATION

1. Change the oil in the eccentric sump.
   For oil type, see Section 2.00.

2. Before new oil is added, the eccentric sump must be cleaned thoroughly with paraffin oil.

Besides the regular inspections and checks after the above periods, damage and destruction may occur in other places and require maintenance in the form of replacement of single parts. The cause of abnormal operation must always be found and remedied. If the cause can be attributed to the following fields:

Crosshead, piston and connecting rod	Section 6.2
Cylinder and piston	Section 6.3
Valve housing	Section 6.5
Homogenising bracket	Section 6.6

a description of dismounting and mounting of these parts of the machine is attached.

NOTE: Spare parts lists covering the separate fields of the machine are contained in Section 11.- / SPARE PARTS.

For machines equipped with PFTFE O-rings please note:

1. Before mounting the PTFE O-rings in a U-recess, they must be heated to MAX. 150°C to facilitate the mounting.

2. Components with PTFE O-rings should be lubricated with Molykote grease before every mounting.

If problems arise outside the said fields, in connection with maintenance or during the daily operation, Rannie should be contacted.

MACHINES WITH HYDRAULIC CONTROL SYSTEM

AFTER 3000 HOURS OF OPERATION

Replace oil in hydraulic system with new oil. The oil change *MUST* be made with clean auxiliaries.

REMEMBER!! The filter cartridge should be replaced for the first time after 50 hours of operation.

Then after every 6 months.

The filter screen should be replaced once a year.

MACHINES WITH "AUTOMATIC" HYDRAULIC CONTROL"

The fine filter before the proportional valve *MUST* be replaced for the first time after 50 hours of operation.

Then after every 6 months.
Spare parts lists for the separate fields are contained in Section 11.- / SPARE PARTS.

If the cause lies outside the escribed areas, *Rannie* should be contacted.

MAINTENANCE

POPPET VALVE AND VALVE SEATS

THREE-PART VALVE HOUSING

D.60 - .72 - .79 - .80 - .90 - 100.80

During inspection and maintenance of poppet valves in a three-part valve housing, a distinction is made between small and large wear marks.

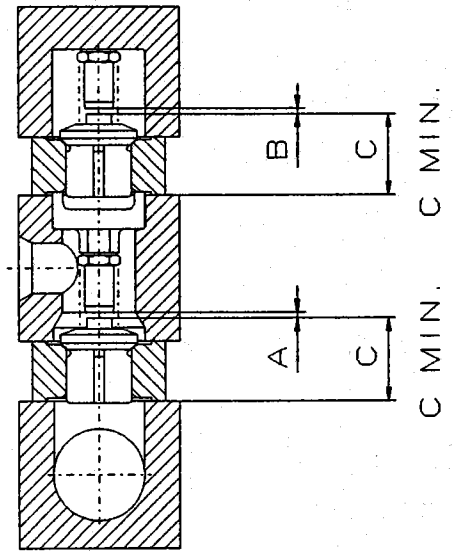
The following table contains a list of three-part types of valve housing, with details of poppet valve positions and lifts as well as dimensions specified for renovation.

NOTE: The numbers in the table apply to a new three-part valve housing. The table states a C-min. which is a machining measurement for renovation of the poppet valve.

IMPORTANT!! When the C-min is reached, the poppet valve *MUST NOT* be subjected to further grinding.

When the C-min. is reached the valve seat *CAN* be turned through 180° (if this has not been done already) and be used again.

MACHINE TYPE	POPPET VALVE			RENOVATION MEASUREMENT C-min.
	A	B	C	
D.60	2.25	2.25	58.4	56.8
D.72	3.75	3.75	58.4	56.8
D.79	4.65	4.95	62.4	60.0
D.80	9.65	4.95	62.4	60.0
D.90	9.65	4.95	62.4	60.0
100.80	12.00	10.00	63.3	60.8



REPAIR OF SMALL WEAR MARKS

Removed by match grinding.

See *MATCH GRINDING.*

REPAIR OF LARGE WEAR MARKS

If a poppet valve and a valve seat are heavily worn, and turning off is required, the following procedure must be adopted:

1. The poppet valve is turned off on the 45° conical surface until the surface is absolutely smooth and without wear marks.

2. The valve seat is turned off on the 45° conical surface until the surface is absolutely smooth and without wear marks.

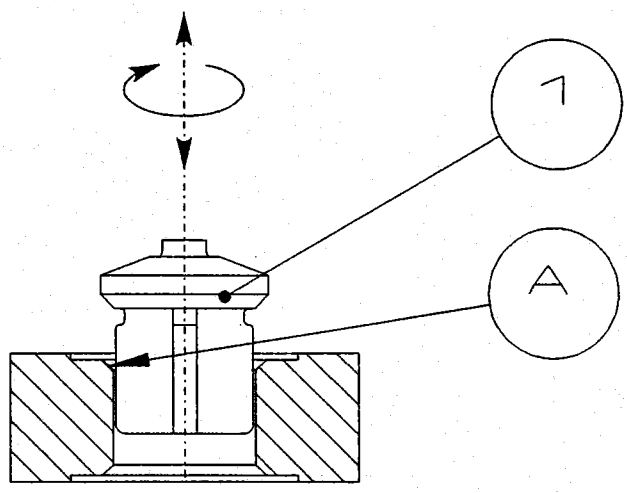
NOTE: If the valve seat has been used on *ONE SIDE ONLY,* it can be turned through 180° and used again.

IMPORTANT!! When large wear marks are to be repaired, it must *ALWAYS* be ensured that the renovation measurement C-min. is maintained after the repair.

MATCH GRINDING

Match grinding of the poppet valves is carried out as follows:

1. A suitable amount of abrasive compound is placed on the valve seat contact face marked A (fine powdered Carborundum, grain size 180, suspended in acid-free oil).



2. The poppet valve Pos.1 is lowered to the valve seat and turned gently clock-wise.

Match grinding is continued until the poppet valve and the valve seat have complete contact with the entire contact face.

REMEMBER!! Always clean the poppet valve and the valve seat of all traces of abrasive compound.

MAINTENANCE

CROSSHEAD, PISTON, AND CONNECTING ROD

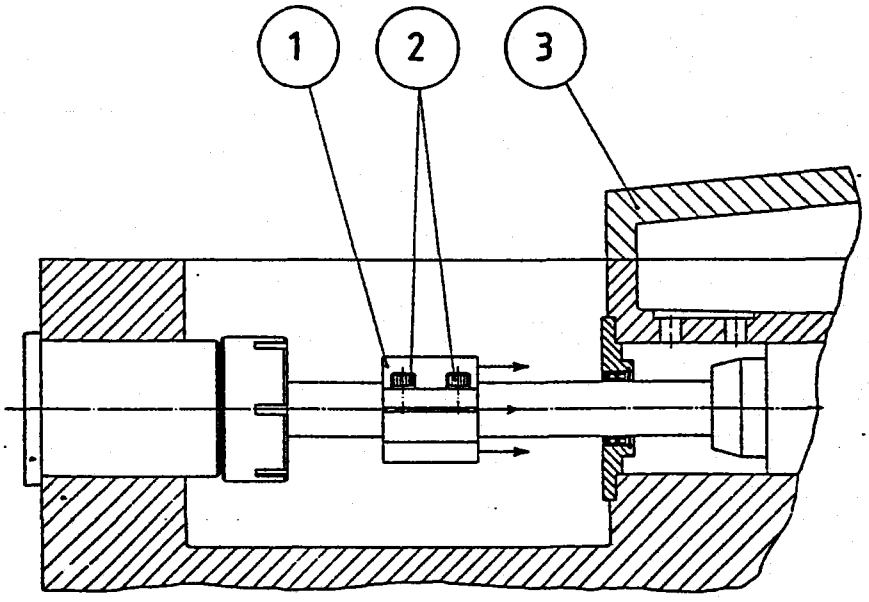
22.51 - D.51H - .60 - .72 - .72H

Dismounting is necessary for inspection and replacement of a fixed piston and oil seal ring.

REMEMBER!! Always check that the power supply from the main panel is switched off, and that the main fuses are removed.

DISMOUNTING

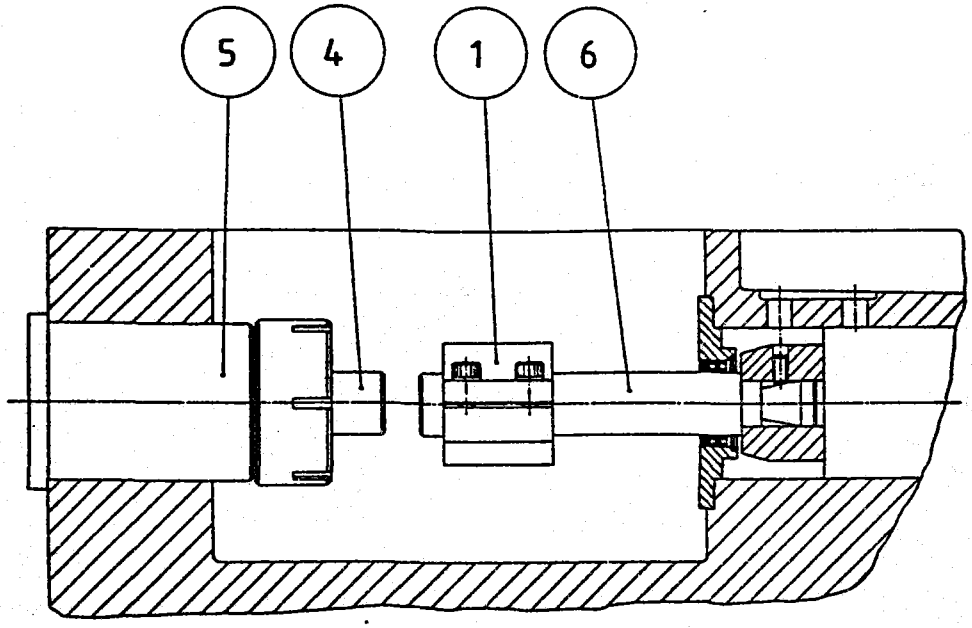
1. The eccentric shaft is turned by means of the V-belt drive of the machine so that piston coupling Pos.1 is in the rear position.



2. Remove cover Pos.3 over the eccentric sump.

3. Screws Pos.2 on piston coupling Pos.1 are unscrewed approximately 5 mm.

4. One screw Pos.2 on piston coupling Pos.1 is unscrewed completely, screwed into the centre threaded hole and then tightened so that the piston coupling is opened and remains loose.

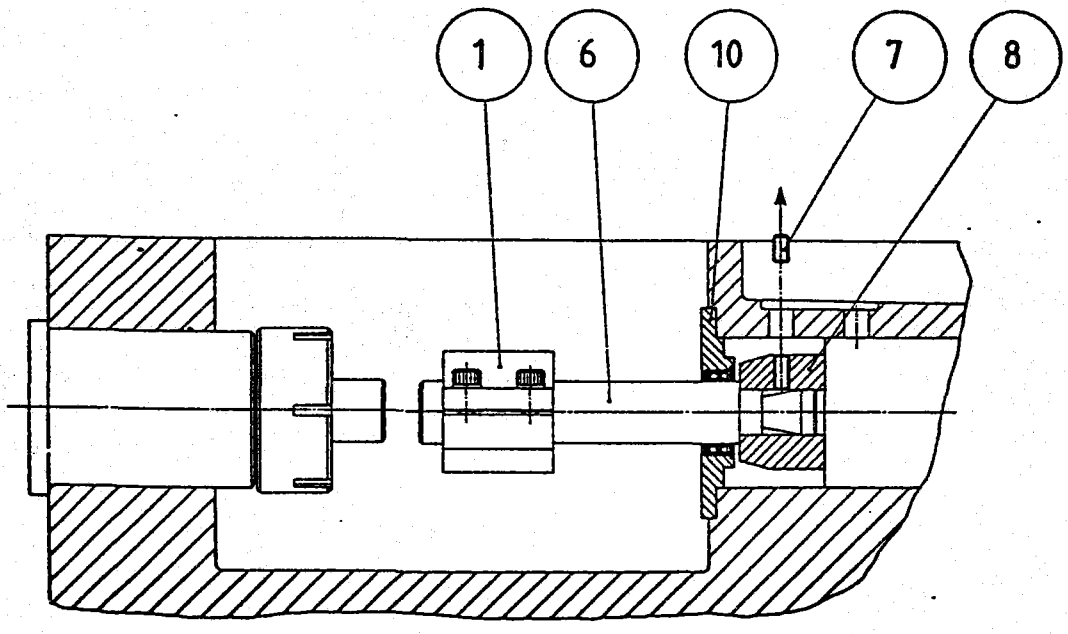


5. Piston Pos.4, in contact with the product, is pushed fully forward into cylinder Pos.5.

6. Piston coupling Pos.1 is secured to fixed piston Pos.6 by unscrewing screw Pos.2 in the centre threaded hole and tightening the other screw at the same time.

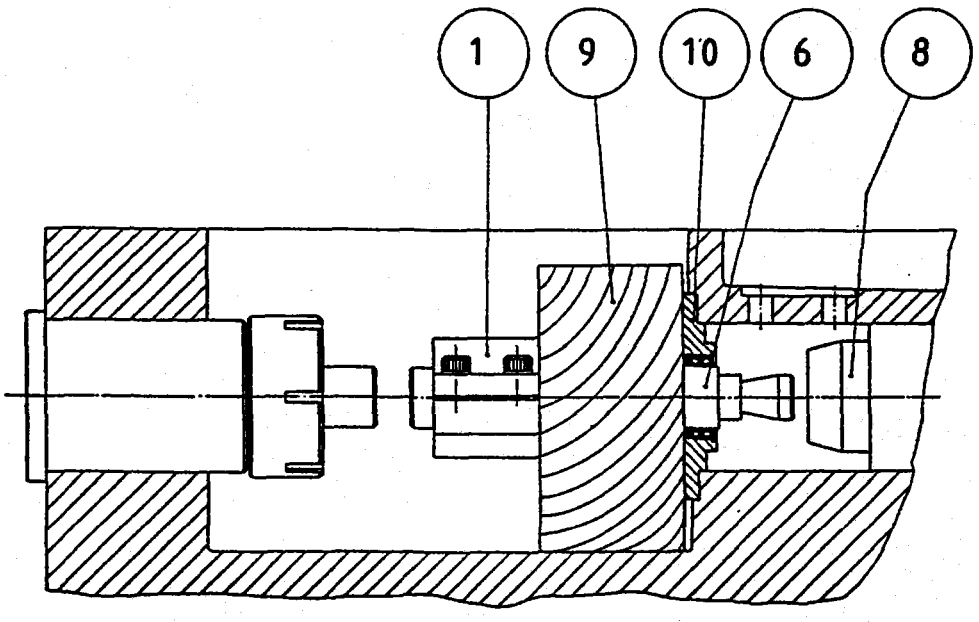
7. Fixed piston Pos.6 is moved to the front position by means of the V-belt drive of the machine.

8. Remove hollow point screw Pos.7 securing fixed piston Pos.6 to crosshead Pos.8



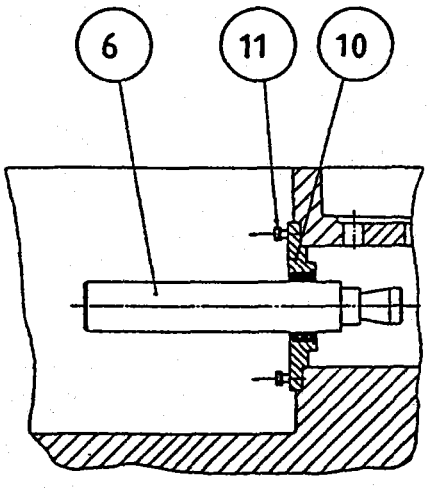
9. A wooden block Pos.9 (approximately 2 x 6 x 15 cm) is placed on both sides of fixed piston Pos.6, between piston coupling Pos.1 and crosshead cover Pos.10.

NOTE: If fixed piston Pos.6 of the machine is cylindrical without recess, piston coupling Pos.1 can be pushed up to crosshead cover Pos.10 and secured.



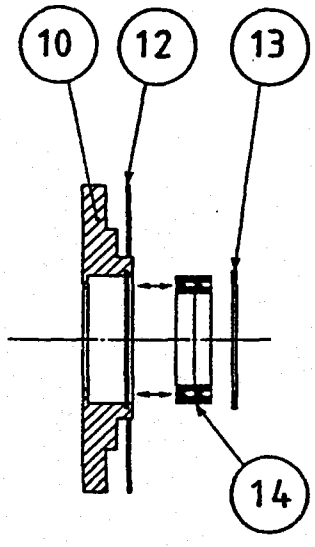
10. Crosshead Pos.8 is moved back by means of the V-belt drive of the machine so that fixed piston Pos.6 is extracted from crosshead Pos.8.

11. Crosshead cover Pos.10 with fixed piston Pos.6 is dismounted by unscrewing screws Pos.11 which are then screwed into the two free threaded holes in the crosshead cover and tightened so that the crosshead cover is forced out.



12. Crosshead cover Pos.10 and fixed piston Pos.6 are removed for separation.

13. Packing Pos.12 is dismounted from crosshead cover Pos.10.



14. Locking ring Pos.13, if any, is removed.

15. Oil seal ring Pos.14 is forced out of crosshead cover Pos.10.

The separate component parts are examined for wear, and all damaged or worn parts are replaced.

MOUNTING

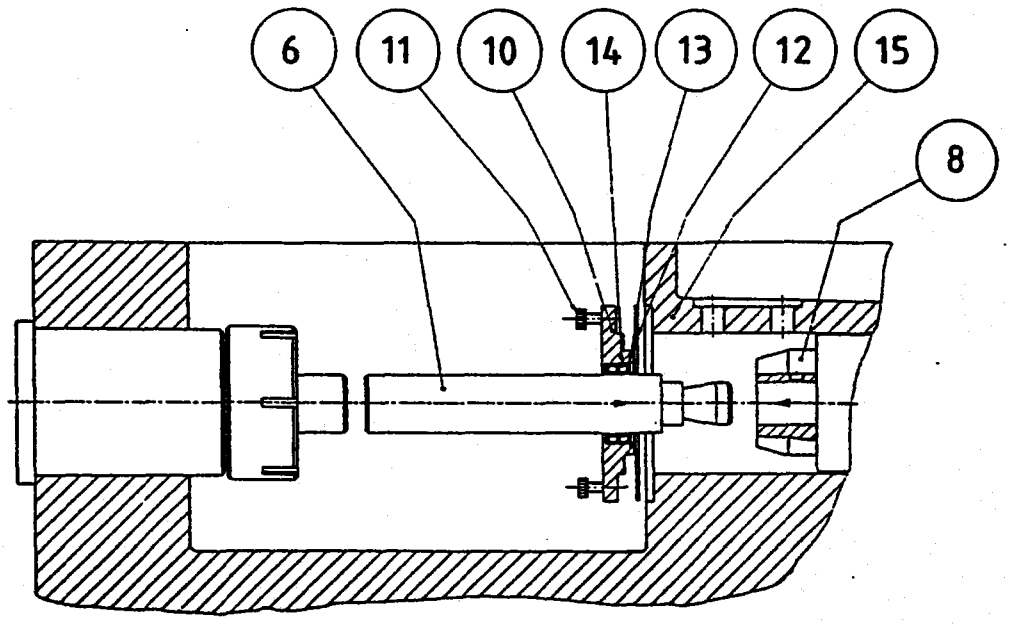
1. Oil seal ring Pos.14 is pressed into crosshead cover Pos.10.

   NOTE: Locking ring Pos.13, if any, is mounted.

   IMPORTANT!! The oil seal ring *MUST* be oiled before mounting.

   The oil seal ring *MUST* be absolutely straight in the crosshead cover in order to avoid leakage.

2. Crosshead cover Pos.10 and packing Pos.12 are mounted on fixed piston Pos.6 and placed in base frame Pos.15.

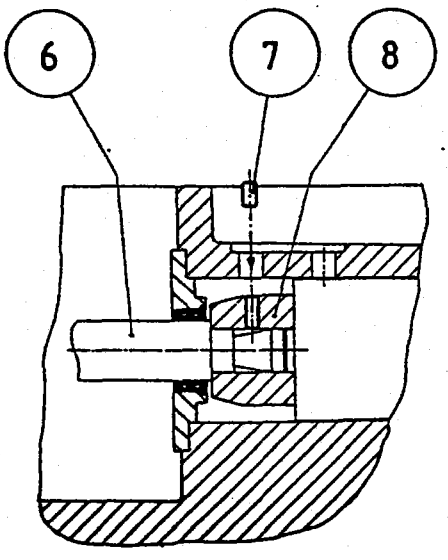


3. Crosshead Pos.8 is moved to the front position by means of the V-belt drive of the machine, and fixed piston Pos.6 is pushed into crosshead Pos.8.

4. Crosshead cover Pos.10 is secured to base frame Pos.15 by means of screws Pos.11.

   REMEMBER!! Check that fixed piston Pos.6 is bottomed completely in crosshead Pos.8.

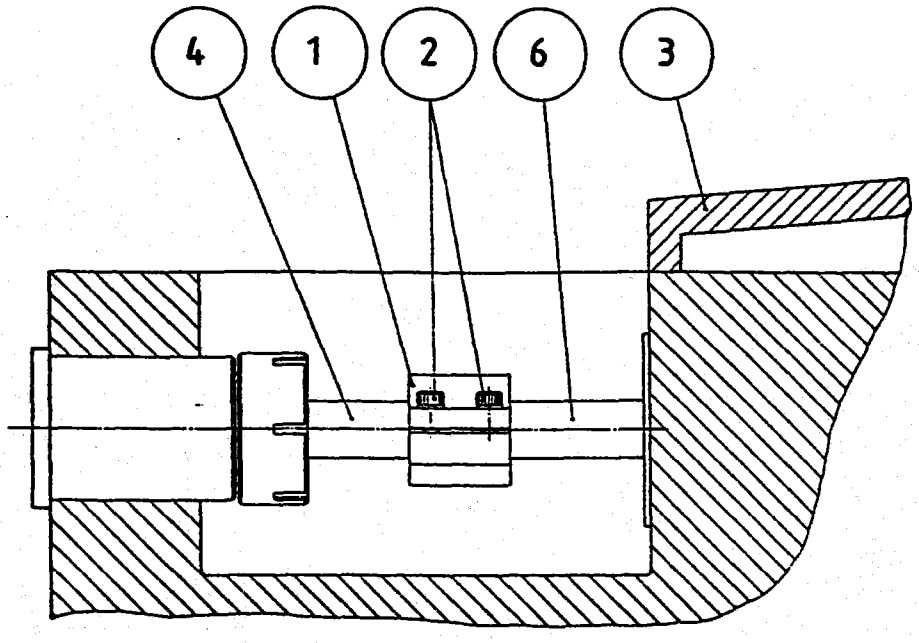
5. Insert and secure hollow point screw Pos.7 to crosshead Pos.8 so that fixed piston Pos.6 is secured to crosshead Pos.8.



6. Cover Pos.3 is mounted over the eccentric sump.

7. Piston coupling Pos.1 is placed loosely on fixed piston Pos.6.

8. Piston Pos.4, inconvccvwith the product, is moved up to fixed piston Pos.6, and piston coupling Pos.1 is placed over the joint between the two pistons.



NOTE: Some fixed pistons Pos.6 have a small groove showing where piston coupling Pos.1 is to be mounted.

9. The two screws Pos.2 on piston coupling Pos.1 are tightened.

MAINTENANCE

CYLINDER AND PISTON WITH A SINGLE U-RING

OPEN WATER COOLING

D.60 - .79 - 30.72 - 50.90 - 58.90 - 63.90

Dismounting of the piston is necessary for inspection and replacement of cylinder packing.

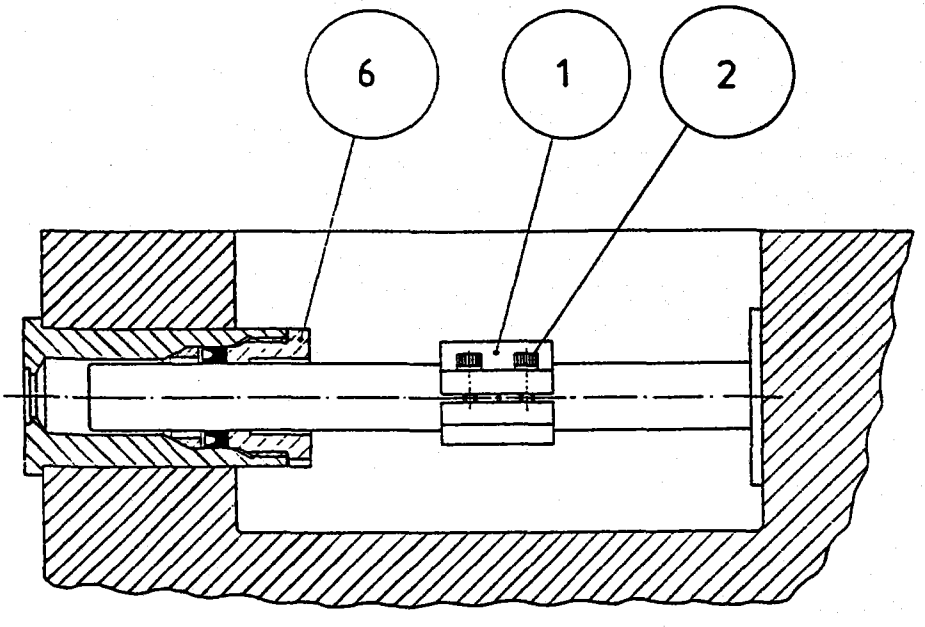
DISMOUNTING

REMEMBER!! Always check that the power supply from the main panel is switched off, and that the main fuses are removed.

IMPORTANT!! Dismount ***only one*** cylinder at a time.

1. Dismount the irrigation system for the cylinders.

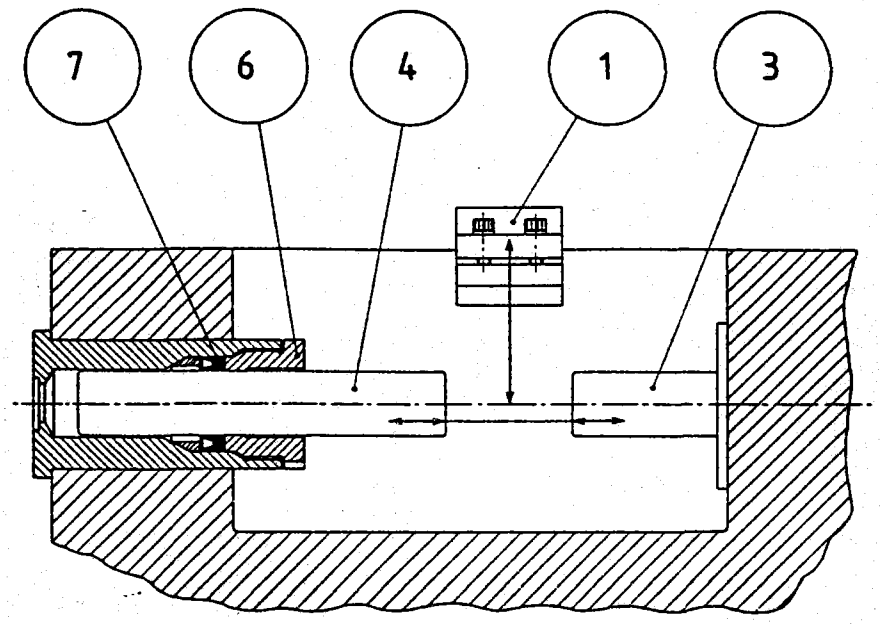
2. The eccentric shaft is turned by means of the V-belt drive of the machine so that piston coupling Pos.1 is in the front position.



3. Screws Pos.2 on piston coupling Pos.1 are unscrewed approximately 5 mm.

4. One screw on piston coupling Pos.1 is unscrewed completely, screwed into the centre threaded hole and then tightened so that the piston coupling is opened and remains loose.

5. The eccentric shaft is turned by means of the V-belt drive of the machine so that fixed piston Pos.3 is in the rear position.



6. Remove piston coupling Pos.1.

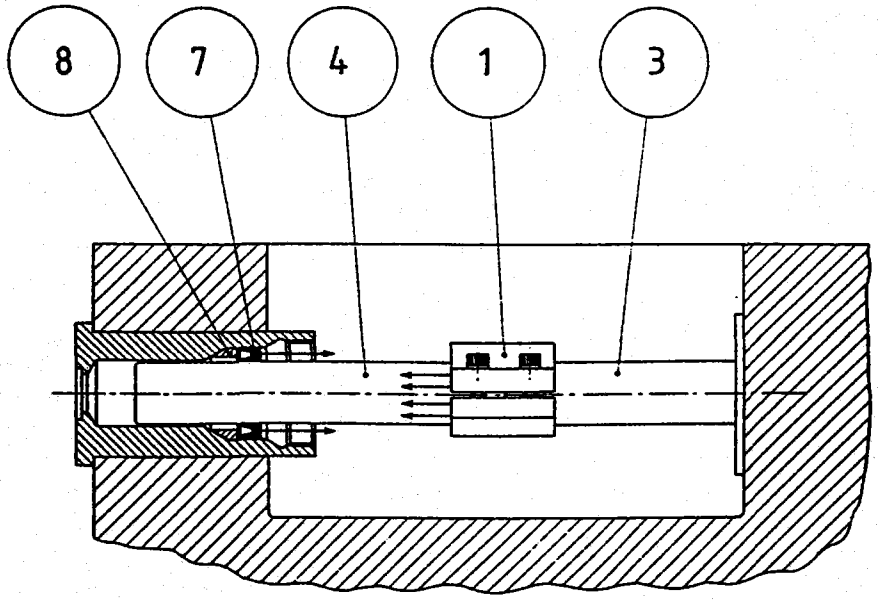
IMPORTANT!! If the machine is provided with ceramic pistons Pos.4, they must be handled with great care. Ceramic pistons ***MUST NOT*** be subjected to blows.

7. Remove packing ring Pos.6.

8. Extract loose piston Pos.4 from the cylinder. U-ring Pos.7 will often come out with the piston.

NOTE: If it is difficult to extract loose piston Pos.4 from the cylinder, it may be because the packing in the cylinder sticks. This state can be remedied by moving the homogenising valve in the homogenising bracket completely together. Packing ring Pos.6 must be dismounted. Loose piston Pos.4 is pulled back until it touches the fixed piston.

The eccentric shaft is turned by means of the V-belt drive of the machine so that the loose piston is moved into the cylinder. Because of the pressure thus created in the cylinder, the packing is pressed out.



9. If U-ring Pos.7 has not followed the loose piston, it can now be taken out together with neck ring Pos.8.

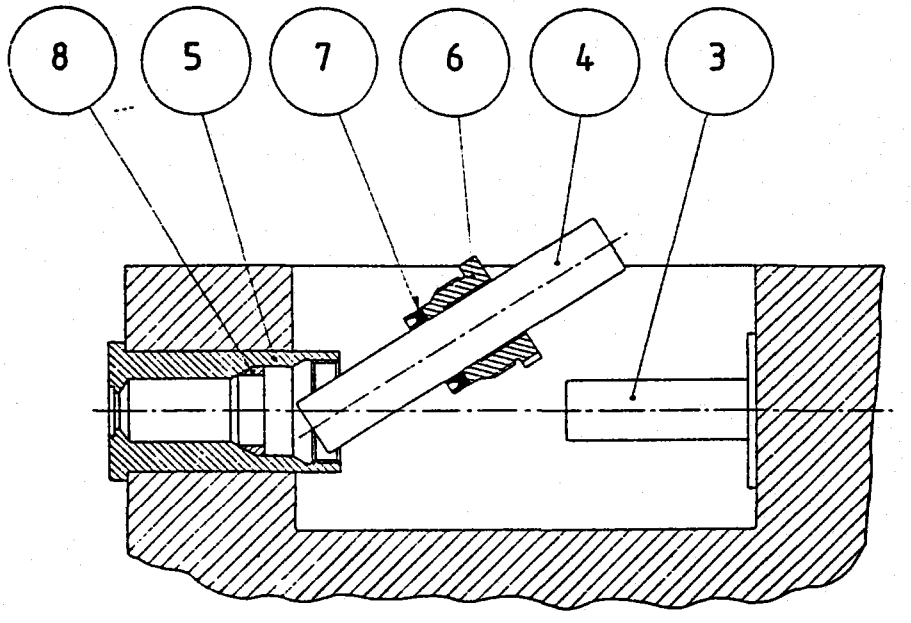
   The U-ring is examined for wear and replaced if necessary.

MOUNTING

REMEMBER!! Lubricate the cylinder thread with Molycote grease before mounting.

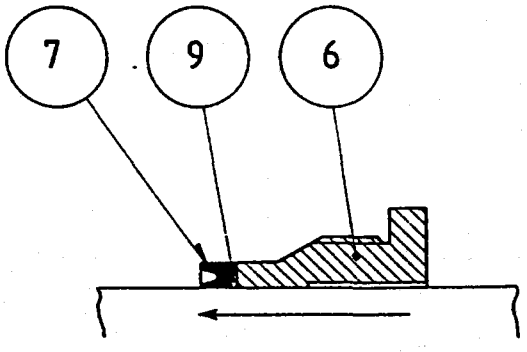
1. Fixed piston Pos.3 is moved to the rear position by means of the V-belt drive of the machine.

2. Neck ring Pos.8 is mounted in cylinder.

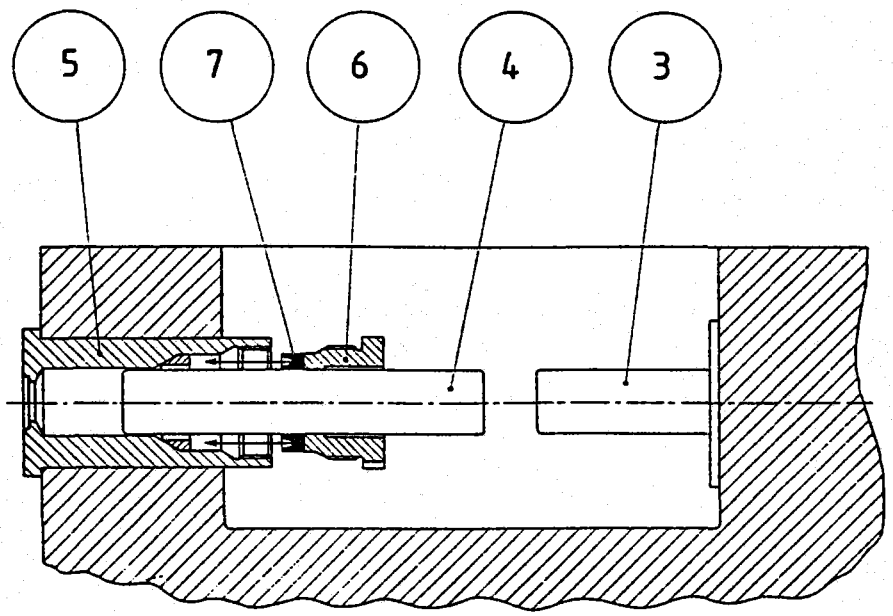


3. U-ring Pos.7 is placed together with packing ring Pos.6 on loose piston Pos.4 and moved into cylinder Pos.5.

REMEMBER!! If U-ring Pos.7 has a back ring Pos.9, it ***MUST*** be ensured that it is placed correctly in U-ring Pos.7 and that the U-ring turns correctly.

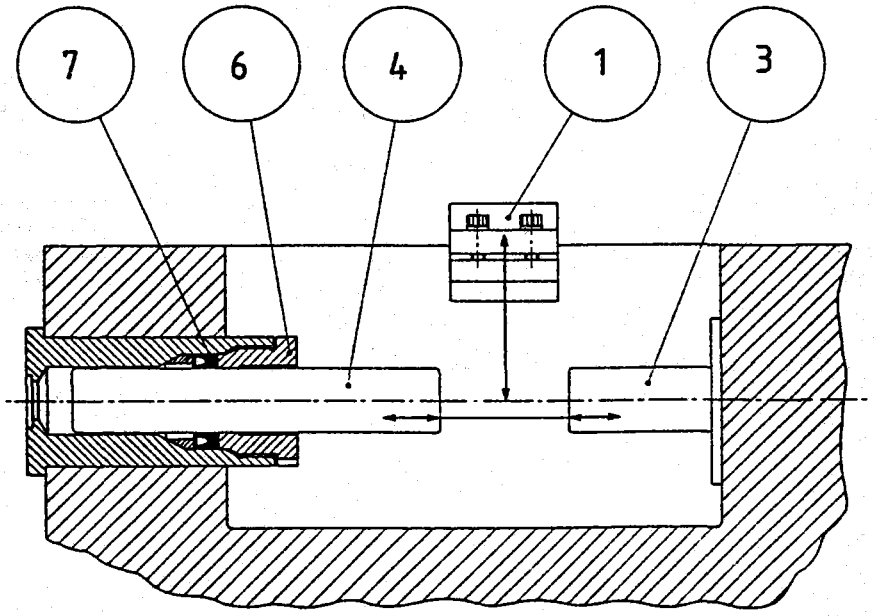


4. U-ring Pos.7 is pressed into position in cylinder Pos.5 by tightening packing ring Pos.6.



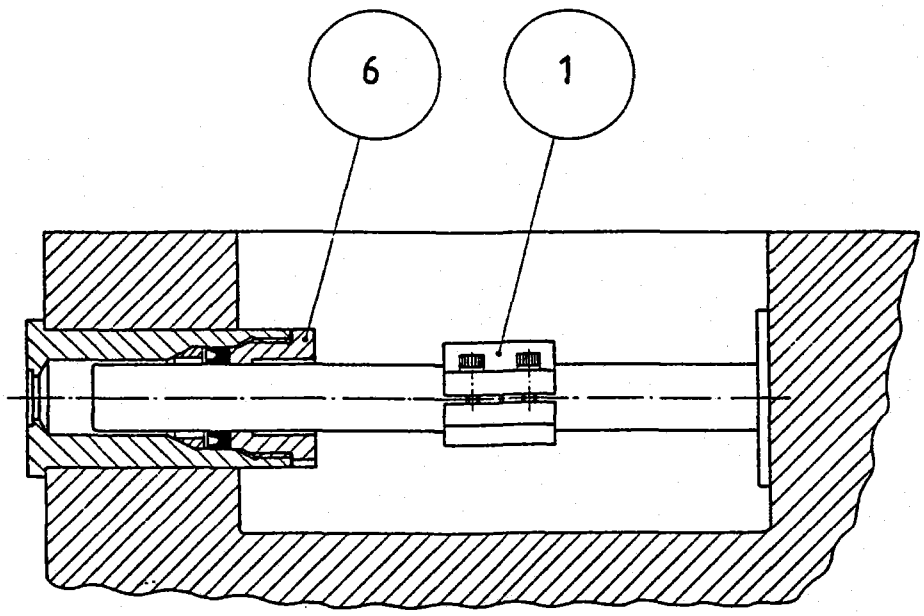
5. Piston coupling Pos.1 is placed on fixed piston Pos.3.

6. Fixed piston Pos.3 is moved to the front position by means of the V-belt drive of the machine until in contact with loose piston Pos.4.



REMEMBER!! Loose piston Pos.4 and fixed piston Pos.3 must be in contact before piston coupling Pos.1 is tightened.

Piston coupling Pos.1 must be placed at the marked groove, if any, on fixed piston Pos.3 before piston coupling Pos.1 is tightened.



7. Piston coupling Pos.1 is tightened.

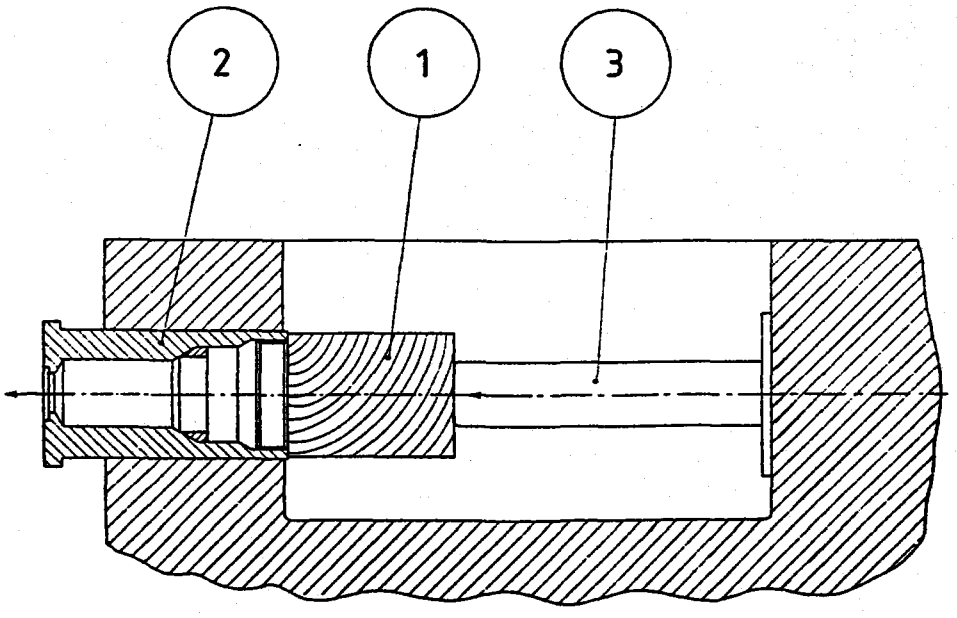
8. Packing ring Pos.6 is prevented from WORKING LOOSE by striking a rubber hammer against the shank of the hook spanner.

9. Mount the irrigation system for the cylinders.

DISMOUNTING OF CYLINDER

If it is necessary to dismount the cylinder proper from the base frame, the loose piston and the valve housing must be dismounted first.

1. Place a wooden block Pos.1, with the same diameter as the cylinder, between cylinder Pos.2 and fixed piston Pos.3.



2. The eccentric shaft is turned by means of the V-belt drive of the machine so that the piston is moved to the front position, and the cylinder is then pressed out.

3. The cylinder can be taken out through the front of the base frame.

MOUNTING OF CYLINDER

1. The cylinder is placed in the base frame.
2. The valve housing is mounted carefully on the studs in the base frame.
3. Tighten the box nuts.

MAINTENANCE

THREE-PART VALVE HOUSING WITH POPPET VALVES

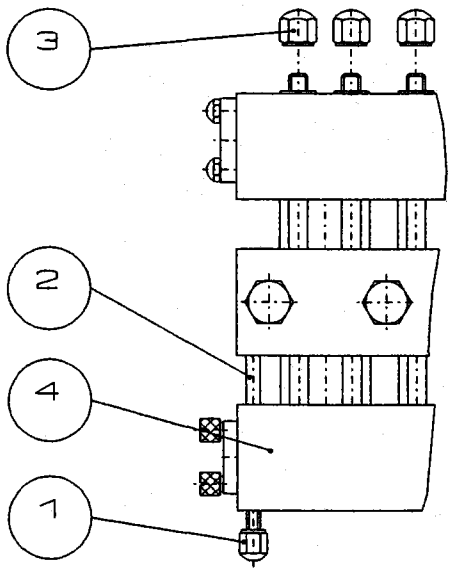
D.60 - .70 - .79 - .80 - .90

The valve housing must be dismounted for inspection and maintenance of poppet valves and valve seats.

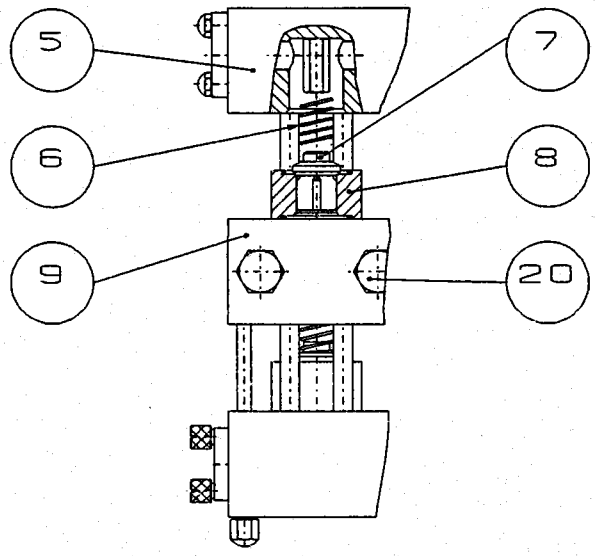
DISMOUNTING

REMEMBER!! Always check that the power supply from the main panel is switched

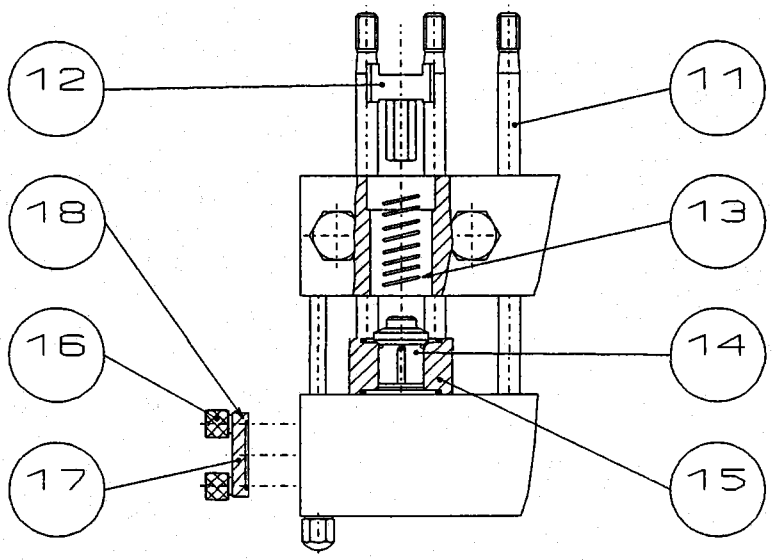
1. Box nuts Pos.1 are screwed down 10 mm on studs Pos.2.
2. Box nuts Pos.3 are unscrewed so that bottom part Pos.4 of valve housing rests on box nuts Pos.1.



3. Top part Pos.5 of the valve housing is lifted away cautiously and delivery valve spring Pos.6 can be removed.
4. Poppet valve Pos.7 on the delivery side and valve seat Pos.8 are removed for inspection.



5. A stud setter is used to loosen and remove one of the foremost studs Pos.11 at each valve on the suction side.
Stud setter is kept in tool case.



6. Valve stop Pos.12 and suction valve spring Pos.13 are removed from intermediate part Pos.9 of the valve housing.

7. Poppet valve Pos.14 on the suction side and valve seat Pos.15 are removed for inspection.

8. Thumb screws Pos.16 are unscrewed, and flange Pos.17 and O-ring Pos.18 are removed for cleaning of the suction duct.

NOTE: ***FOR INSPECTION AND MAINTENANCE OF POPPET VALVE AND VALVE SEATS, SEE SECTION 6.12.***

9. Intermediate part Pos.9 of the valve housing is removed from the base frame by unscrewing box nuts Pos.20. Intermediate part Pos.9 is then lifted carefully over the studs in the base frame.

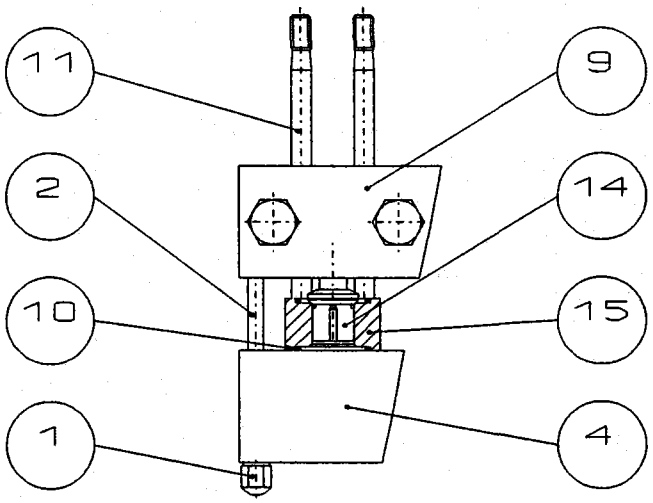
MOUNTING

REMEMBER!! All O-rings ***MUST*** be replaced before mounting.

Mounting of the valve housing is best done on a table. The following assembly instructions are based on this.

1. The dismounted studs Pos.11 are screwed into bottom part Pos.4 of the valve housing and tightened by means of the stud setter.

2. Poppet valve Pos.14 on the suction side is mounted in valve seat Pos.15 together with O-rings Pos.10 and placed on bottom part Pos.4 of the valve housing.



3. Intermediate part Pos.9 of the valve housing and studs Pos.2 are lowered carefully on studs Pos.11 and placed on valve seat Pos.15.

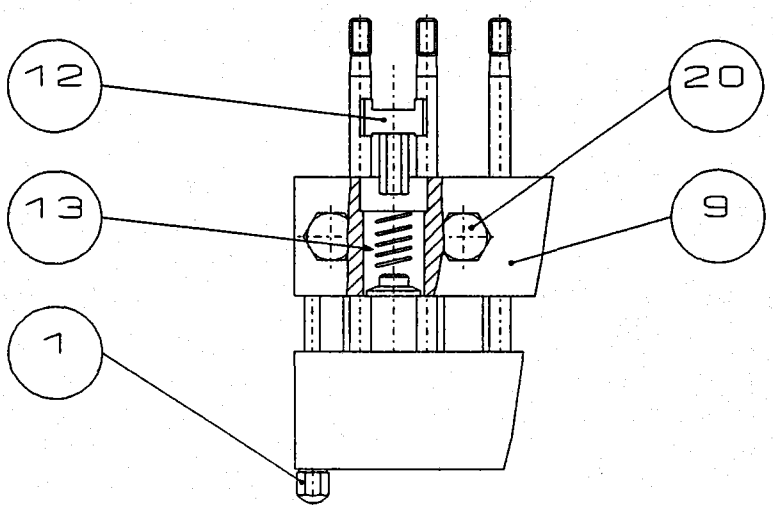
4. The valve seat with poppet valve is fixed between intermediate part Pos.9 and bottom part Pos.4 of the valve housing by means of box nuts Pos.1 which are tightened on studs Pos.2.

5. Suction valve spring Pos.13 is secured on the small recess on valve stop Pos.12.

6. Valve stop Pos.12, secured on the recess, is mounted in intermediate part Pos.9 of the valve housing.

   NOTE: Valve stop Pos.12 may consist of two parts screwed together.

   REMEMBER!! Check before mounting that valve stop Pos.12 is screwed completely together. The parts are prevented from working loose with *LOCKTITE* - activator 764 and adhesive 326.

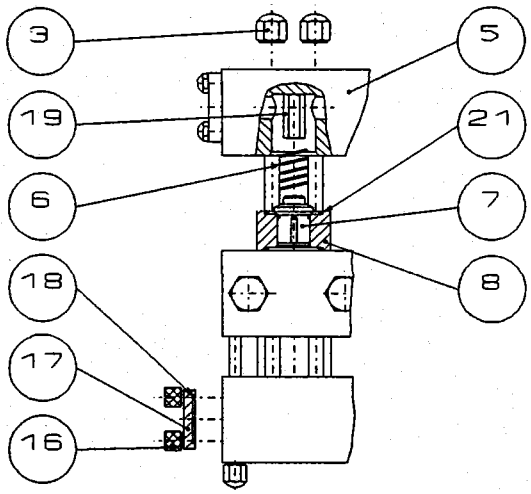


7. Poppet valve Pos.7 on the delivery side is mounted in valve seat Pos.8, together with O-ring Pos.21, and placed on intermediate part Pos.9 of the valve housing.

8. Valve stop Pos.19 is mounted in top part Pos.5 of the valve housing with a pipe wrench.
Pipe wrench is kept in tool case.

REMEMBER!! Check before mounting that valve stop Pos.19 is secured to the top part Pos.5 of the valve housing. The valve stop is prevented from working loose with *LOCKTITE* - activator 764 and adhesive 326.

9. Delivery valve spring Pos.6 is secured on the small recess on valve stop Pos.19.



10. Top part Pos.5 of the valve housing, with the valve stop and the delivery valve spring, is lifted carefully into position on delivery valve seat Pos.8.

IMPORTANT!! Delivery valve spring Pos.6 must not move or get caught during mounting of top part Pos.5.

11. Box nuts Pos.3 are screwen on and tightened.

    IMPORTANT!! If part assembly drawing for THREE-PART VALVE HOUSING, Section 11.-, states a torque for box nuts Pos.3 this ***MUST*** be observed.

12. Box nuts Pos.1 are re-tightened.

13. Flange Pos.17 with O-ring Pos.18 is fixed by means of thumb screws Pos.16.

14. The complete valve housing is lifted carefully over the studs in the base frame and secured by means of box nuts Pos.20.

    IMPORTANT!! If part assembly drawing for THREE-PART VALVE HOUSING, Section 11.-, states a torque for box nuts Pos.20, this ***MUST*** be observed.

MAINTENANCE

HOMOGENISING BRACKET FOR HYDRAULIC CONTROL

STAGE I

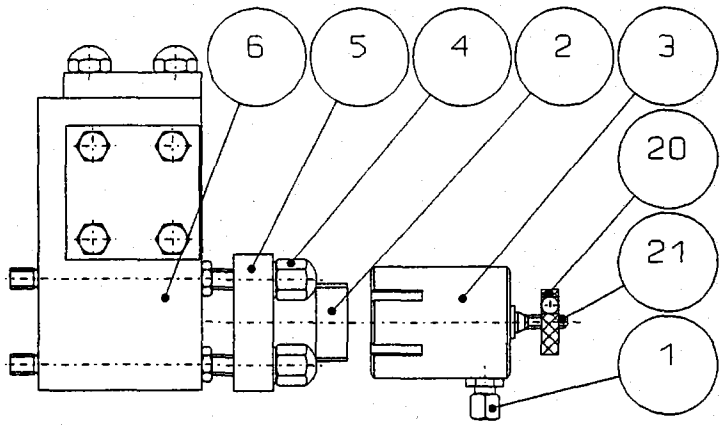
22.51 - D.60 - .72

The homogenising bracket on must be dismounted for inspection and maintenance of the homogenising valve.

DISMOUNTING

REMEMBER!! Always check that the power supply from the main panel is switched off and that the main fuses are removed.

1. Hydraulic oil hose Pos.1 is dismounted and stop ring Pos.20 is screwed off threaded spindle Pos.21.



2. Hydraulic cylinder Pos.3 is loosened with a hook spanner and removed from guide Pos.2.
   Hook spanner is kept in tool case.

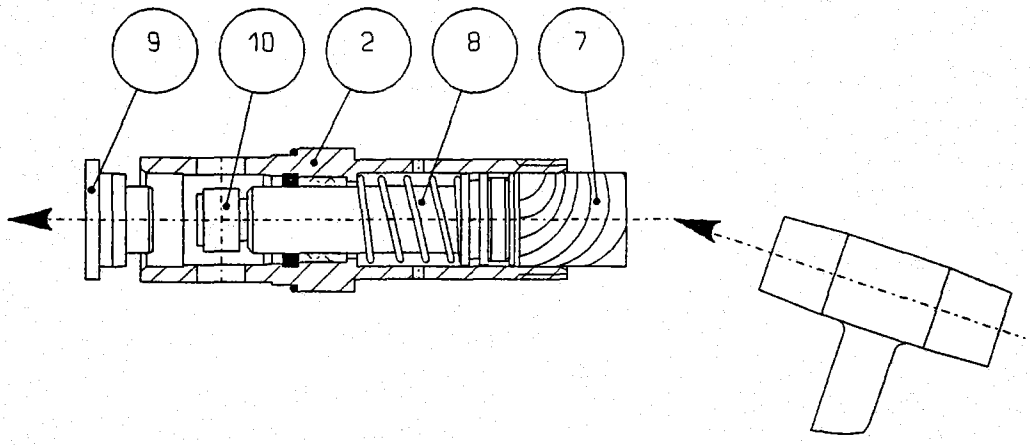
3. Box nuts Pos.4 are unscrewed and flange Pos.5 can then be removed.

4. Guide Pos.2, with the homogenising valve, is removed from homogenising bracket Pos.6 by hand.

NOTE: To check the homogenising valve it has to be removed from guide Pos.2.

1. A small wooden block Pos.7 is placed on spindle Pos.8 in guide Pos.2.

2. Light blows with a rubber hammer against the wooden block make it possible to push bottom part Pos.9 of the homogenising valve out of guide Pos.2.

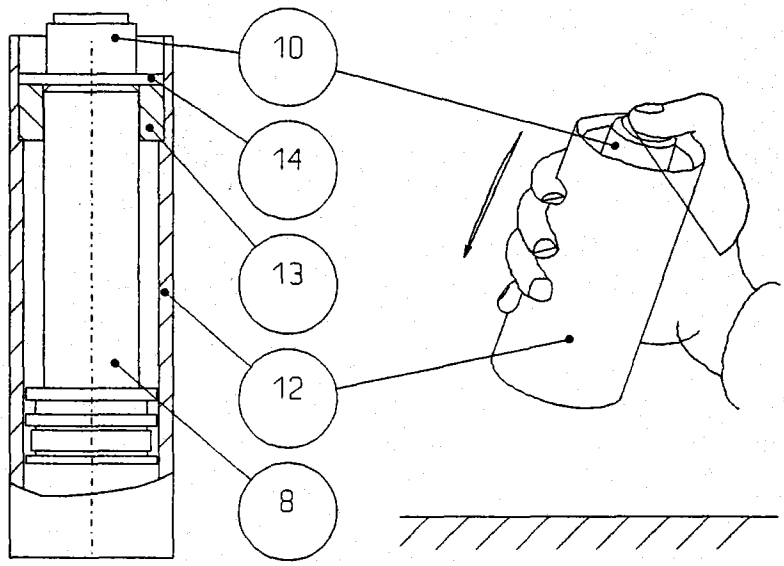


3. Spindle Pos.8 is pushed out of guide Pos.2 by exerting light pressure on top part Pos.10 of the homogenising valve.

SEPARATION OF SPINDLE FROM TOP PART OF HOMOGENISING VALVE

1. Spindle Pos.8, with top part Pos.10 of the homogenising valve, is placed in puller tube Pos.12.

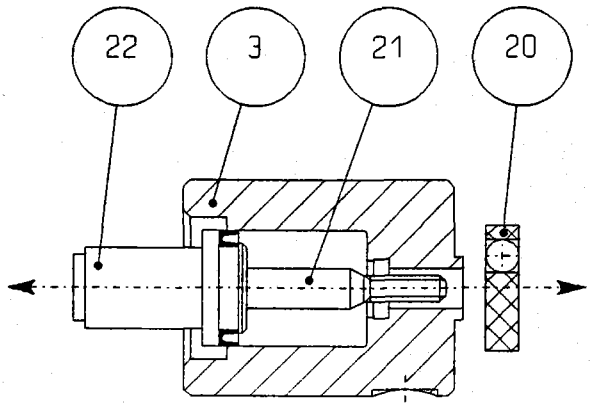
2. Ring Pos.13 for the puller is placed in puller tube Pos.12. Puller disc Pos.14 is inserted between spindle Pos.8 and top part Pos.10 of the homogenising valve.
Puller is kept in tool case.



3. Puller tube Pos.12 is struck lightly against a wooden block or a similar material whereby top part Pos.10 of the homogenising valve is loosened from the spindle.

If the hydraulic cylinder is to be dismounted, the following procedure is adopted:

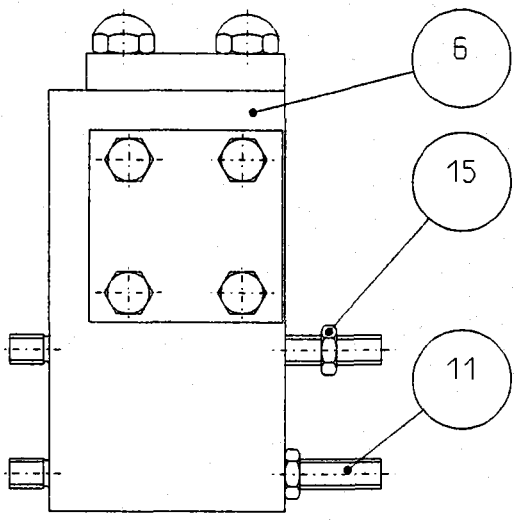
1. Stopring Pos.20 is screwed off threaded spindle Pos.21.



2. Hydraulic piston Pos.22, with threaded spindle Pos.21 and nut ring Pos.23, is pushed out of hydraulic cylinder Pos.3 by hand.

If the homogenising bracket is to be removed from the valve housing, the following procedure is adopted:

1. Nuts Pos.15 are unscrewed and homogenising bracket Pos.6 can be removed.



2. Studs Pos.11 can be removed by means of a stud setter.
Stud setter is kept in tool case.

MOUNTING

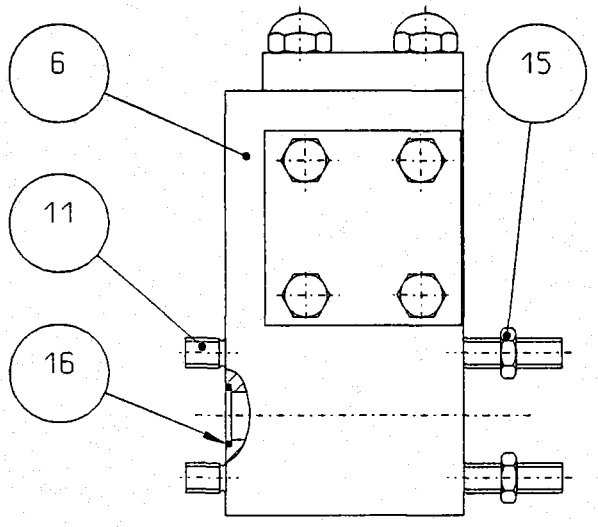
REMEMBER!! ***ALL*** defective packings ***MUST*** be renewed before mounting.

All packings are renewed ***every time*** the homogenising bracket is dismounted.

If the homogenising bracket has been removed from the valve housing it has to be mounted first.

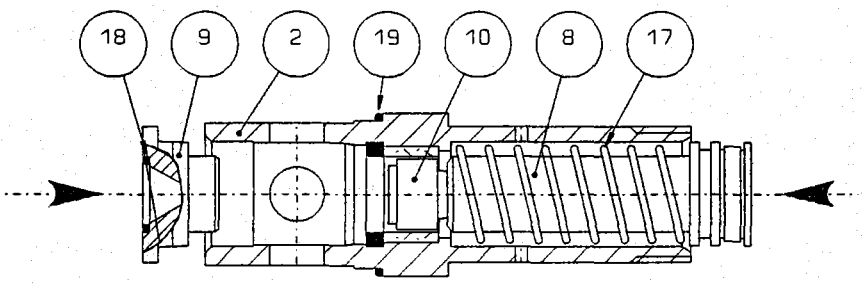
1. If studs Pos.17 have been removed, they are now inserted and tightened with stud setter.

2. Homogenising bracket Pos.6, with O-ring Pos.16, is mounted and secured with nuts Pos.15.



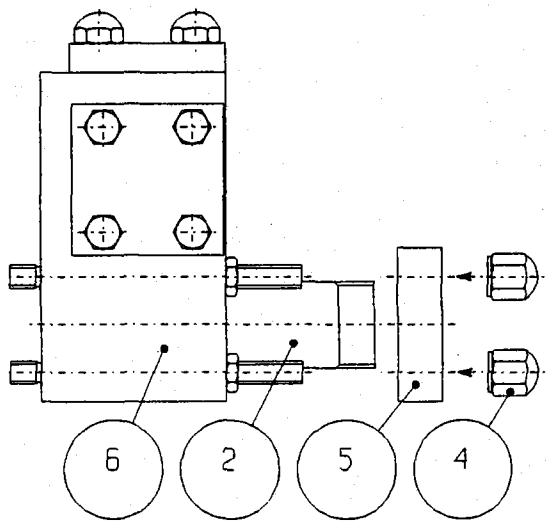
3. Top part Pos.10 of the homogenising valve is secured in spindle Pos.8 by exerting light pressure.

4. Spring Pos.17 is placed on spindle Pos.8 before the spindle is placed in guide Pos.2.



5. Bottom part Pos.9 of the homogenising valve is placed in guide Pos.2.

6. O-rings Pos.18 and Pos.19 are placed on the guide.

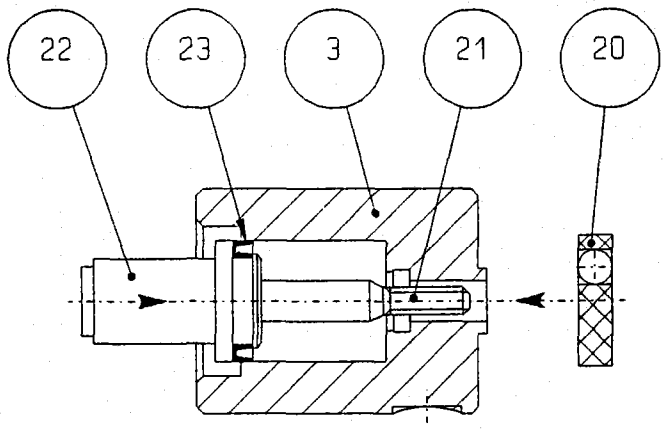


7. The assembled guide Pos.2 is bottomed by hand in homogenising bracket Pos.6.

8. Flange Pos.5 and box nuts Pos.4 are mounted.

If the hydraulic cylinder has been dismounted, it has to be mounted.

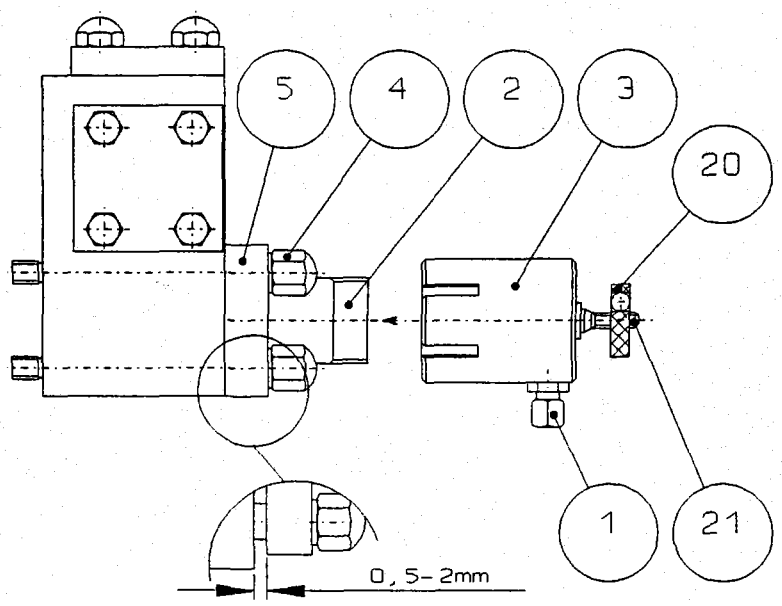
1. Hydraulic piston Pos.22 with threaded spindle Pos.21 is mounted in hydraulic cylinder Pos.3.



2. Stop ring Pos.20 is screwed on to threaded spindle Pos.21.

3. The assembled hydraulic cylinder Pos.2 is screwed on guide Pos.2 by hand and tightened.

4. Tighten box nuts Pos.4.



IMPORTANT!! When box nuts Pos.4 are tightened, it must be ensured that the slot between the flange and homogenising bracket is *ALWAYS* the same all the way round.

- there *MUST ALWAYS* be a slot in order to ensure the necessary tightening pressure between the homogenising valve and homogenising bracket.
- tightening of box nuts Pos.4 *MUST* be done diagonally until a uniform tightening torque is obtained.
- the slot will be from 0.5 - 2 mm.

NOTE: If part assembly drawing for HOMOGENISING BRACKET, Section 11.-, indicates a torque for box nuts Pos.4, this *MUST* be observed.

5. Hydraulic cylinder Pos.3 is tightened.

6. Hydraulic cylinder Pos.3 is prevented from WORKING LOOSE by striking a rubber hammer against the shank of the hook spanner.

7. Hydraulic oil hose is mounted.

8. Stop ring Pos.20 is screwed halfway down on threaded spindle Pos.21.

NOTE: Stop ring Pos.20 *MUST NEVER* be screwed more than halfway down on threaded spindle Pos.21.

NOTE: Setting of the hydraulic cylinder is carried out during start, see Section 9.1 / CONTROL SYSTEM.

MAINTENANCE

HOMOGENISING BRACKET FOR HYDRAULIC CONTROL STAGE II

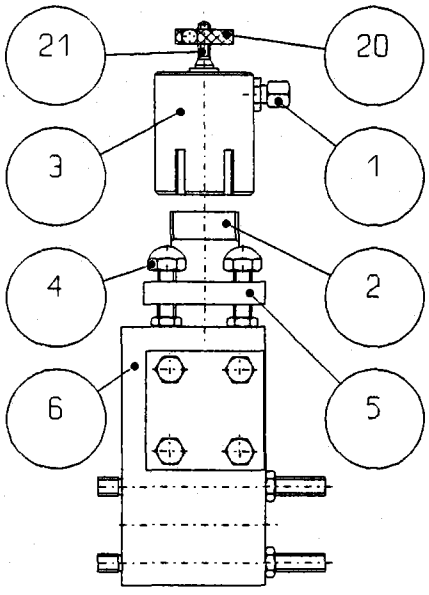
22.51 - D.60 - .72

The homogenising bracket must be dismounted for inspection and maintenance of the homogenising valve.

DISMOUNTING

REMEMBER!! Always check that the power supply from the main panel is switched off and that the main fuses are removed.

1. Hydraulic oil hose Pos.1 is dismounted and stop ring Pos.20 is screwed off threaded spindle Pos.21.



2. Hydraulic cylinder Pos.3 is loosened with a hook spanner and removed from guide Pos.2.
   Hook spanner is kept in tool case.

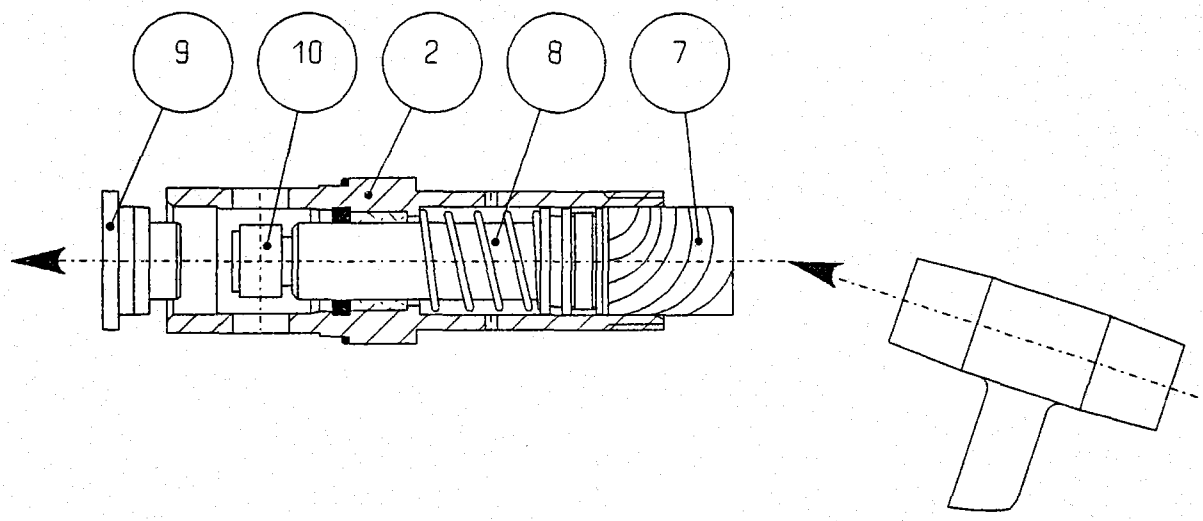
3. Hexagon-headed screws Pos.4 are unscrewed and flange Pos.5 can then be removed.

4. Guide Pos.2, with the homogenising valve, is removed from homogenising bracket Pos.6 by hand.

NOTE: To check the homogenising valve it has to be removed from guide Pos.2.

1. A small wooden block Pos.7 is placed on spindle Pos.8 in guide Pos.2.

2. Light blows with a rubber hammer against the wooden block make it possible to push bottom part Pos.9 of the homogenising valve out of guide Pos.2.

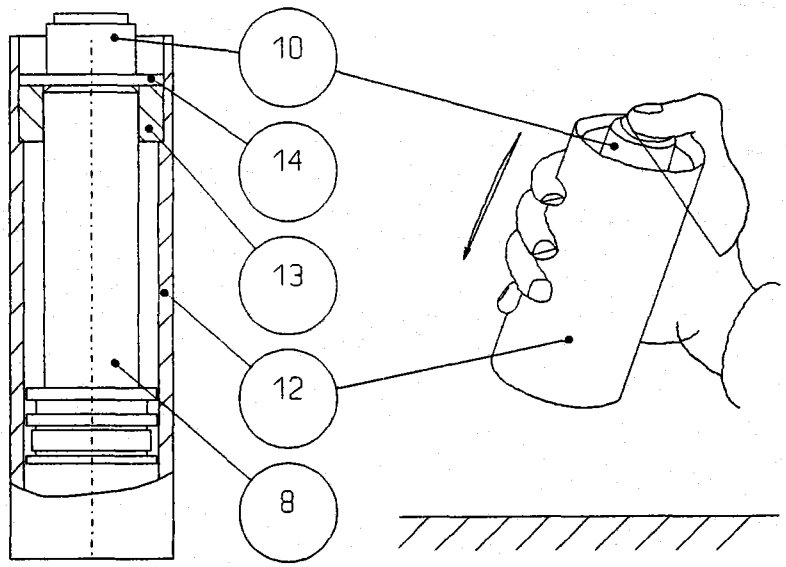


3. Spindle Pos.8 is pushed out of guide Pos.2 by exerting light pressure on top part Pos.10 of the homogenising valve.

SEPARATION OF SPINDLE FROM TOP PART OF HOMOGENISING VALVE

1. Spindle Pos.8, with top part Pos.10 of the homogenising valve, is placed in puller tube Pos.12.

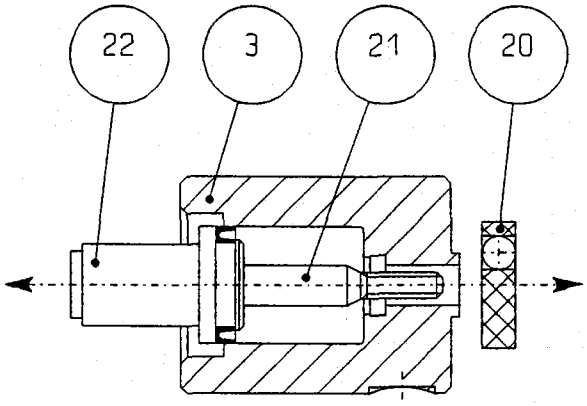
2. Ring Pos.13 for the puller is placed in puller tube Pos.12. Puller disc Pos.14 is inserted between spindle Pos.8 and top part Pos.10 of the homogenising valve.
Puller is kept in tool case.



3. Puller tube Pos.12 is struck lightly against a wooden block or a similar material whereby top part Pos.10 of the homogenising valve is loosened from the spindle.

If the hydraulic cylinder is to be dismounted, the following procedure is adopted:

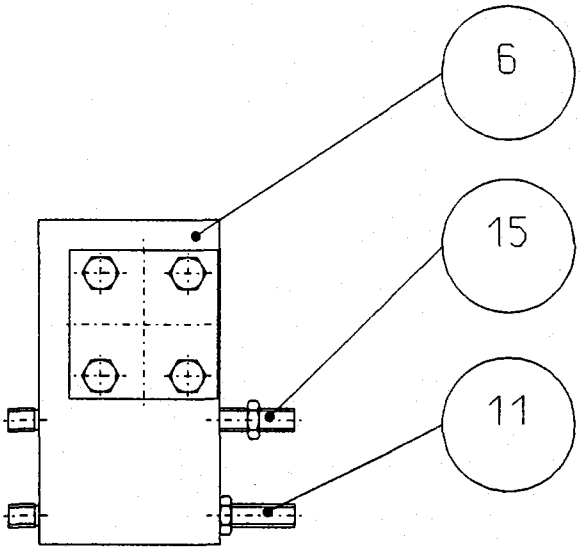
1. Stopring Pos.20 is screwed off threaded spindle Pos.21.



2. Hydraulic piston Pos.22, with threaded spindle Pos.21, is pushed out of hydraulic cylinder Pos.3 by hand.

If the homogenising bracket is to be removed from the valve housing, the following procedure is adopted:

1. Nuts Pos.15 are unscrewed and homogenising bracket Pos.6 can be removed.



2. Studs Pos.11 can be removed by means of a stud setter.
Stud setter is kept in tool case.

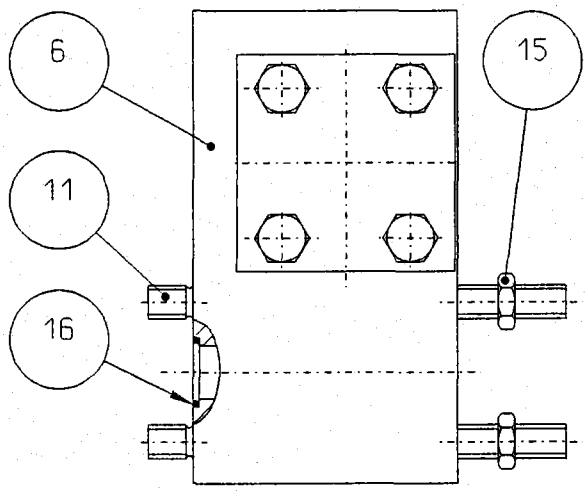
MOUNTING

REMEMBER!! ***ALL*** defective packings ***MUST*** be renewed before mounting.

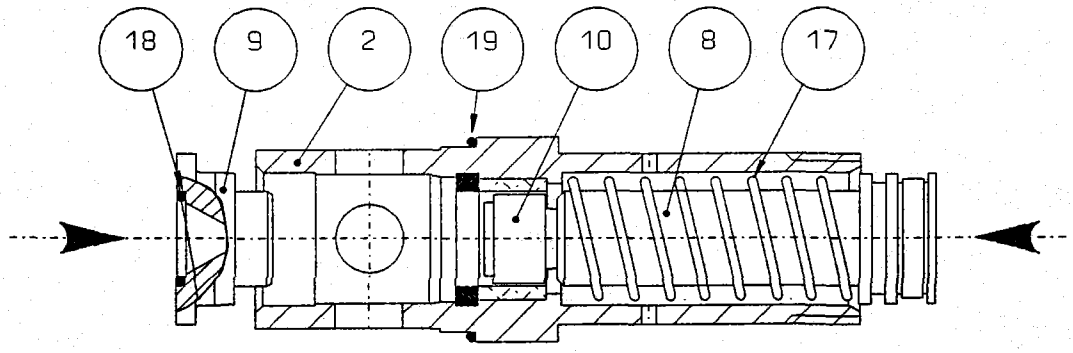
All packings are renewed ***every time*** the homogenising bracket is dismounted.

If the homogenising bracket has been removed from the valve housing it has to be mounted first.

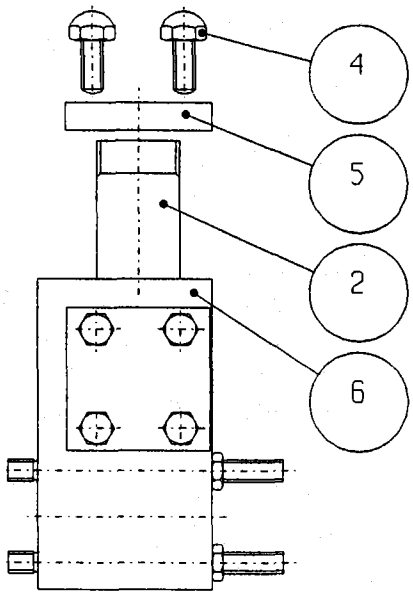
1. If studs Pos.17 have been removed, they are now inserted and tightened with stud setter.
2. Homogenising bracket Pos.6, with O-ring Pos.16, is mounted and secured with nuts Pos.15.



3. Top part Pos.10 of the homogenising valve is secured in spindle Pos.8 by exerting light pressure.
4. Spring Pos.17 is placed on spindle Pos.8 before the spindle is placed in guide Pos.2.



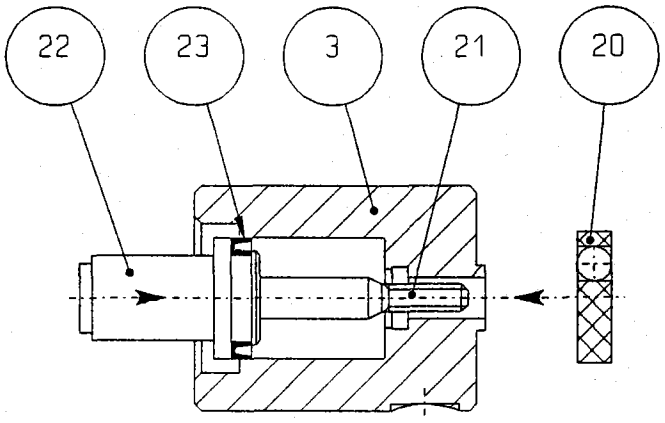
5. Bottom part Pos.9 of the homogenising valve is placed in guide Pos.2.
6. O-rings Pos.18 and Pos.19 are placed on the guide.
7. The assembled guide Pos.2 is bottomed by hand in homogenising bracket Pos.6.



8. Flange Pos.5 and hexagon-headed screws Pos.4 are mounted.

If the hydraulic cylinder has been dismounted, it has to be mounted.

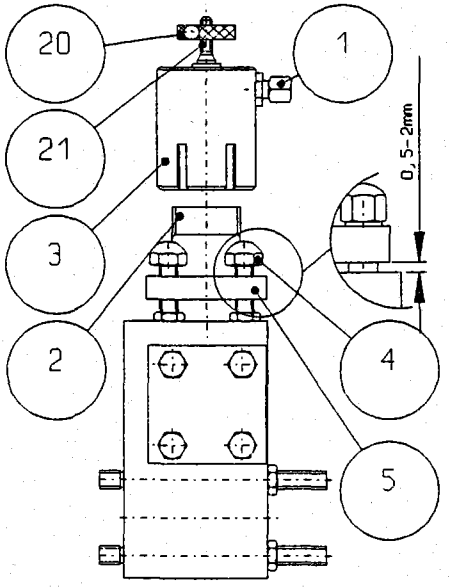
1. Hydraulic piston Pos.22 with threaded spindle Pos.21 is mounted in hydraulic cylinder Pos.3.



2. Stop ring Pos.20 is screwed on to threaded spindle Pos.21.

3. The assembled hydraulic cylinder Pos.2 is screwed on guide Pos.2 by hand and tightened.

4. Tighten hexagon-headed screws Pos.4.



IMPORTANT!! When hexagon-headed screws Pos.4 are tightened, it must be ensured that the slot between the flange and homogenising bracket is *ALWAYS* the same all the way round.

- there *MUST ALWAYS* be a slot in order to ensure the necessary tightening pressure between the homogenising valve and homogenising bracket.
- tightening of hexagon-headed screws Pos.4 *MUST* be done diagonally until a uniform tightening torque is obtained.
- the slot will be from 0.5 - 2 mm.

NOTE: If part assembly drawing for HOMOGENISING BRACKET, Section 11.-, indicates a torque for hexagon-headed screws Pos.4, this *MUST* be observed.

5. Hydraulic cylinder Pos.3 is tightened.

6. Hydraulic cylinder Pos.3 is prevented from WORKING LOOSE by striking a rubber hammer against the shank of the hook spanner.

7. Hydraulic oil hose Pos.1 is mounted.

8. Stop ring Pos.20 is screwed halfway down on threaded spindle Pos.21.

NOTE: Stop ring Pos.20 *MUST NEVER* be screwed more than halfway down on threaded spindle Pos.21.

NOTE: Setting of the hydraulic cylinder is carried out during start, see Section 9.1 / CONTROL SYSTEM.

CLEANING

The best possible result is obtained when the cleaning is started immediately after production is finished.

The machine ***MUST*** be completely relieved of pressure during the cleaning process, enabling the CIP pump to rinse out valve housing, etc.

NOTE: The detergent must have a flow velocity of approximately 3 m/sec.

The cleaning process (CIP) must be adapted to the product, but could be as follows:

1. ***PREWASHING*** with hot water, approximately 40°C, for approximately 8 minutes.
2. ***CIRCULATION*** of hot detergent, approximately 75°C, e.g. 1 percent NAOH, for at least 20 minutes, whereafter the detergent is to be washed out.
3. ***REWASHING*** for approximately 5 minutes with hot water.
4. ***DISINFECTION*** with hot water, minimum 90°C, or steam.
5. ***DESCALING*** of the inner surfaces is done by application of a diluted nitric acid solution, (approximately 1 percent concentrate).
   Rewash with water for at least 10 minutes after the treatment.

If the machine is equipped with a safety valve or a rinsing valve, these are opened to a brief passage of detergent and washing water.

IMPORTANT!! Any inlet filter mounted in the suction duct or before the machine ***MUST*** be inspected and cleaned regularly.

WIRING DIAGRAM

If the machine is equipped with a control box, a control panel or some other form of connection box, this section will describe such equipment, in the form of a wiring diagram and parts list, showing the interconnections of the individual electrical components.

NOTE: The numbering of the guiding lines is not necessarily consecutive. Intervals in the numbers may occur on the individual wiring diagrams.

CONNECTION OF THE RANNIE HOMOGENISER

Machines with no other electrical equipment than a cooling water valve may be equipped with start/stop buttons for direct connection to the customer's motor starter unit, as shown by the supplier of the starter unit.

MACHINES WITH INTERLOCK SIGNALS

Machines with interlock signals have been equipped with a tension free contact for starting of the main motor (Start Contact for Main Motor Starter). This contact is used for activation of the main contact of the starter unit (start-delta starter, frequency converter). When the main motor has been started and delta connected (motor at the frequency converter has reached the correct speed), a signal is given by means of the tension free contact from the delta contactor to the Rannie control (Main Motor started, ready for load), that the homogenisor can be loaded, e.g. servo system, hydraulic system, etc.

Other interlock signals, information or warning signal, as shown on the "interlock page", may be used freely by the customer (only the indicated terminal numbers) for computer control, warning lamps, etc., max. contact load 250 V, 5 A.

SYMBOLS:

xxx
• cable clamps for connection of in/out signals. The first two numbers state the position in the guiding line on the wiring diagramme.

Cable clamp outside the Rannie machine, e.g. from starter unit, remote control, or the like.

Cable connection in the Rannie machine.

Cable connection from customer to Rannie machine.

CONTROL SYSTEM

II-STAGE HOMOGENISING BRACKET

HYDRAULIC OPERATION AT STAGE I (MANUAL)

HYDRAULIC OPERATION AT STAGE II (MANUAL)

The hydraulic pressure regulation consists of a hydraulic station which, through manual pressure control valves on stages I and II, controls the pressure of the corresponding homogenising valves.

The hydraulic pressure regulation system is controlled ***manually*** by adjusting the handles Pos. 27 and Pos.34, of the pressure control valves, on page 2/5:

MODELS LAB AND INDUSTRY
on the connection box for the hydraulic system

MODELS BLUE-TOP AND BLUE-TOP-PLUS
on the front of the machine

IMPORTANT: In case of back pressure after the homogenising bracket (i.e. a pressure after the 2nd stage) - as is the case with spray drying plants - is it important that page 5/5 is studied before reading any further in this section.

Every time the hydraulic operating system is started the procedure described below should be followed:

START WITH SET HOMOGENISING PRESSURE

The machine must be running smoothly and steadily, and the back pressure must be stable, before the hydraulic system is activated.

See SECTION 4.- / OPERATION AND SERVICE.

1. Press button "START HMG-PRESS" which causes the hydraulic station to start.

2. Pressure control valve for Stage II can now be adjusted to the required homogenising pressure. Stage II must always have the specified homogenising pressure before stage I is activated.
   It is only possible to fine adjust stage II when stage I has been activated.

3. Adjust pressure control valve for stage I to the required homogenising pressure.

4. The mechanical stops are adjusted till stop and locked.

INTERRUPTION OF HOMOGENISING PROCESS

Is done by pressing the button "STOP HMG-PRESS".

NOTE: If the button "STOP MAIN-MOTOR" is pressed, the hydraulic system will automatically stop at the same time as the main motor.

For *DISMOUNTING AND MOUNTING* of the homogenising bracket, see **SECTION 6.7-.**

When a machine is delivered from ***Rannie*** the hydraulic system has been set and tested (on water) to the homogenising pressure that the client has specified in his order.

NOTE: If a homogenising pressure higher than that preset for stage I is required, the hydraulic pressure in the hydraulic station ***must*** be increased, see **ADJUSTMENT OF HYDRAULIC PRESSURE AT STAGE I**, items 5 and 6.

If a homogenising pressure different from that preset for stage II is required, the mechanical stop ***must*** be reset.

IMPORTANT!! The MAXIMUM WORKING PRESSURE for the hydraulic 2nd stage is stated on the machine, on the hydraulic bracket for 2nd stage.

REMEMBER!! ***ALWAYS*** check with ***Rannie*** that the machine can handle a higher homogenising pressure before changes are made.

Should it for some reason be necessary to change the setting of the manual hydraulic system, the procedure described below should be followed:

ADJUSTMENT OF HYDRAULIC PRESSURE AT STAGE I

REMEMBER!! The mechanical stop ring ***MUST ALWAYS*** be screwed backwards.

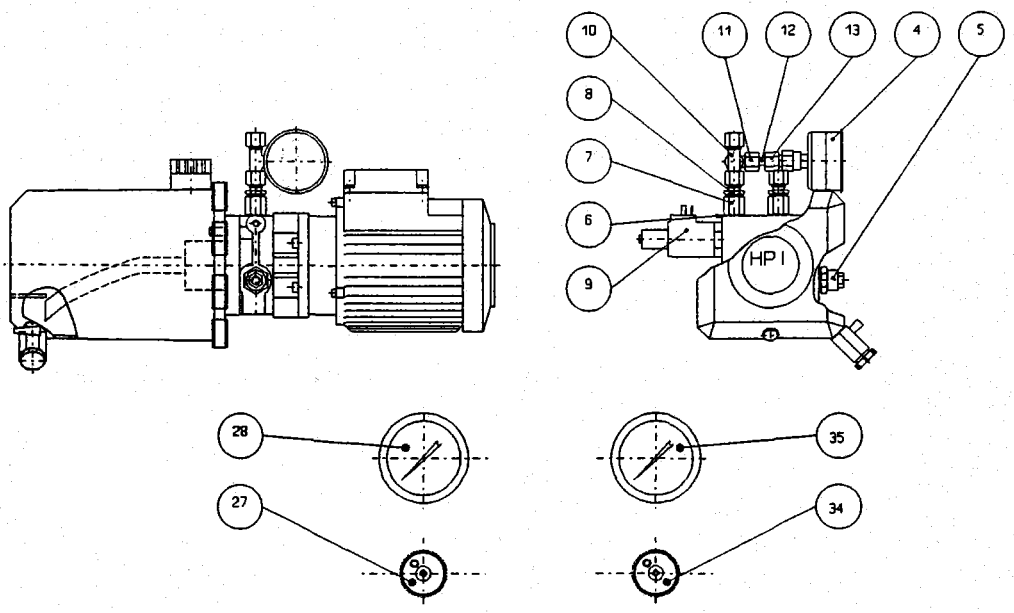
For ***ADJUSTMENT OF MECHANICAL STOP***, see later in this section.

1. Screw pressure control valve Pos.27 anticlockwise all the way back.

2. Press button "START HMG-PRESS" on the front panel to start the hydraulic station's motor.

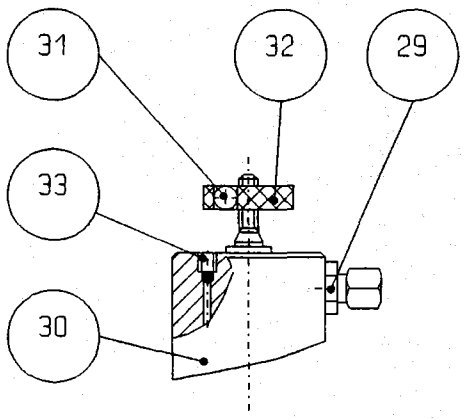
3. By tightening screw Pos.5 the hydraulic station is subjected to a higher pressure (oil pressure).

4. Activate pressure control valve Pos.27, located on the front of the machine, until the required homogenising pressure is reached. The homogenising pressure can be read either on the pressure gauge or on the transducer display.



5. When the required homogenising pressure is reached pressure gauge Pos.28, also located on the front of the machine, shows the necessary oil pressure to attain the homogenising pressure.

6. Adjust screw Pos.5 on the hydraulic station so that pressure gauge Pos.4 shows a pressure which is 5 bar higher than the necessary oil pressure shown on pressure gauge Pos.28.



NOTE: A nozzle, mounted in fittings Pos.29, in the hydraulic system controls the speed at which the homogenising pressure rises and falls.

If the homogenising pressure does not drop to 0-10 bar when the button "STOP HMG-PRESS" is pressed, it may be due to impurities in the hydraulic oil. This may clog up the orifice of the nozzle and thereby prevent a relief of the hydraulic cylinder.

Error Indication: The homogenising pressure indicator keeps indicating a high homogenising pressure and the pressure gauges Pos.4 and 28 show 0 bar hydraulic pressure.

Error Recovery: Press the button "STOP HMG-PRESS".
Screw Pos.33 is loosened carefully to relieve the hydraulic pressure in hydraulic cylinder Pos.30 to 0 bar.
Remove fittings Pos.29 and clean the orifice for impurities.
Replace the hydraulic oil and high pressure filter, when the parts have been cleaned and reassembled.
For correct type of oil, see Section **2.00.**

REMEMBER!! The hydraulic system must be aired through the hydraulic cylinder **every time** the hydraulic hose has been removed from hydraulic cylinder Pos.30.

REMEMBER!! Stop ring Pos.32 must be adjusted till stop and locked **every time** the homogenising pressure is altered.

ADJUSTMENT OF HYDRAULIC PRESSURE AT STAGE II

When the homogenising pressure for stage I has been set and adjusted, the 1st stage is relieved by turning pressure control valve Pos.27 all the way back.

7. Mechanical stop ring Pos.32 for stage II is loosened.

8. Pressure control valve Pos.34 is turned until the required homogenising pressure is reached.
Pressure gauge Pos.35 shows the necessary oil pressure to attain the homogenising pressure.

9. Stage I can be readjustment to the required homogenising pressure, when stage II has been set.

10. When stages I and II have been set to the correct homogenising pressures, the stop rings Pos.32 must be adjusted.

    For *ADJUSTMENT OF MECHANICAL STOP* see later in this section.

NOTE: There is a nozzle, mounted in fittings Pos.29, for stage II as well, that controls the speed at which the homogenising pressure rises and falls.

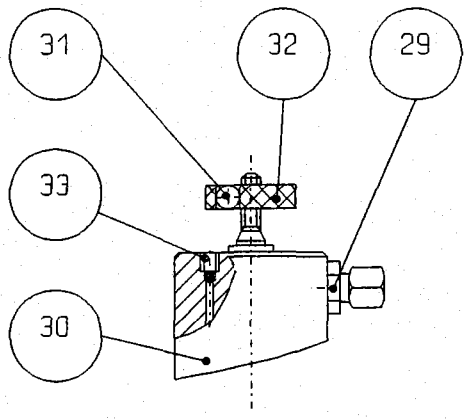
ADJUSTMENT OF MECHANICAL STOP

The mechanical stop ensures that the top and bottom parts of the homogenising valve do not close completely in the event of air or product failure to the homogeniser, or changes in the back pressure.

IMPORTANT!! Product failure or air in the valve housing cause heavy changes in pressure in the valve housing and thereby an overload of all parts in connection with the cylinder.

REMEMBER!! Mechanical stop ring Pos.32 *MUST* be adjusted whenever the homogenising valve is changed or the hydraulic pressure is changed at the hydraulic station.

The mechanical stop is adjusted during operation as follows:



1. Loosen screw Pos.31 on stop ring Pos.32, which is then screwed all the way back.

2. The machine is set to the required homogenising pressure.
   For procedure see ADJUSTMENT OF HYDRAULIC PRESSURE.

3. Screw stop ring Pos.32 down to contact with hydraulic cylinder Pos.30.

4. Tighten screw Pos.31 so that stop ring Pos.32 cannot move.

AIRING OF THE HYDRAULIC SYSTEM

After every check or replacement of the homogenising valve, the hydraulic system MUST be aired through the hydraulic cylinder.

NOTE: Always refer to the starting instructions described in Section 3.- and 4.-.

Airing of the hydraulic system is carried out by loosening Allen screw Pos.33 on hydraulic cylinder Pos.30.
When oil, without air bubbles, appears around the screw, tighten Allen screw Pos.33 again.

Is the hydraulic system still unstable and difficult to adjust after the airing of the hydraulic cylinders, it may be due to impurities in the hydraulic system itself.

II-STAGE HYDRAULICS WITH BACK PRESSURE (Pressure after Stage II)

Pressure after a hydraulic operated homogenising valve always has an affect on the adjustment. The influence is considerable with a large back pressure. The homogenising pressure will therefore have to be upward adjusted backwards, i.e. the back pressure first, then the pressure for stage II, and finally then the pressure for stage I.

Downward adjustment is done in reverse order.

Oscillations in the back pressure affects the preceding homogenising pressure, i.e the falling back pressure makes the preceding homogenising pressure rise, and vice versa.

When starting a new machine, or when starting with a new homogenising valve, it is important to adjust the mechanical stops on both stages to avoid large pressure rises. The mechanical stop does not prevent minor pressure rises because of the elasticity of the materials.

It is thus an advantage to keep the back pressure as stable as possible to avoid oscillations in the preceding pressures.

SAFETY SYSTEM

SPRING LOADED SAFETY VALVE

The safety valve is a spring loaded ball valve opening at an over-pressure in valve housing and homogenising bracket during operation.

NOTE: The safety valve only protects against over-pressure which can damage the machine.

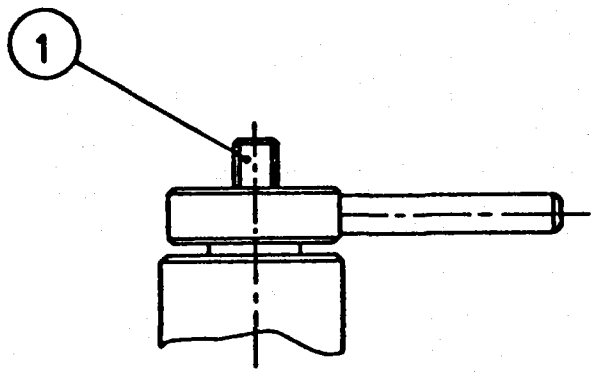
IMPORTANT!! *Rannie* has factory-set the safety valve for a fixed pressure adapted to the maximum operating pressure required by the customer.

DURING OPERATION

The safety valve will be closed when the machine operates at the specified operating pressure.

If the safety valve leaks slightly during operation, it may be due to a slight leak in the seat. It can be remedied by deforming the seat as follows:

Light blows on spindle Pos.1 are given with a rubber hammer.



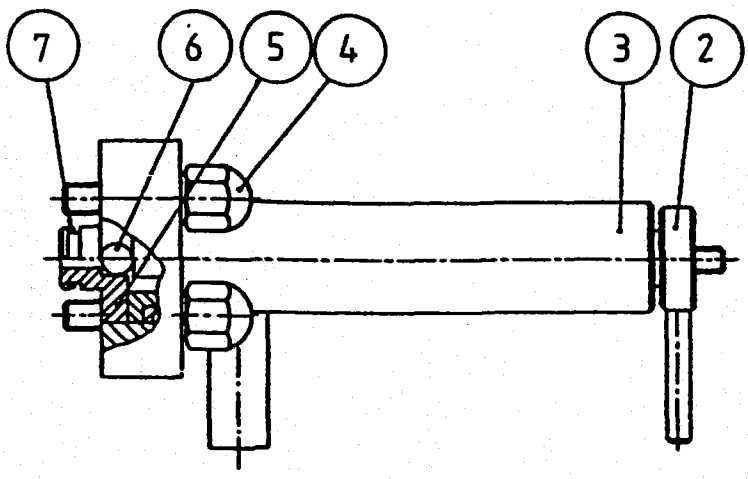
If the safety valve continues to leak, inspection will be necessary, possibly succeeded by the replacement of the valve seat and valve ball.

DISMOUNTING

1. Air escape handle Pos.2 is screwed against spring housing Pos.3.

2. Hexagon head screw/box nut Pos.4 is unscrewed, so that the safety valve can be removed for inspection and/or cleaning.

3. Valve seat Pos.5 and valve ball Pos.6 are inspected. If worn or scratched, the damaged part ***MUST*** be replaced.



MOUNTING

1. Valve seat Pos.5 is mounted.

   CHECK that O-ring Pos.7 is undamaged. Defective O-rings ***MUST ALWAYS*** be replaced.

2. The safety valve is mounted.

   CHECK that valve ball Pos.6 is placed correctly.

3. Hexagon head screw/box nut Pos.4 is screwed on and tightened.

4. Air escape handle Pos.2 is unscrewed through 2-3 revolutions.

The safety valve is now ready for use.

SPARE PARTS

This section contains parts lists and part assembly drawings of all the components of the machine.

Section 1.- contains a layout drawing of the machine where all components are shown by a ***POSITION NUMBER.***

The spare parts lists contained in this section have a ***GROUP OF COMPONENTS NUMBER.*** This number corresponds to a ***POSITION NUMBER*** on the layout drawing in Section 1.-.

NOTE: A six-figure number added to the ***POSITION NUMBER*** means that two or more components have the same ***POSITION NUMBER.*** The six-figure number refers to a spare parts list. This spare parts list belongs to the ***GROUP OF COMPONENTS*** corresponding to the ***POSITION NUMBER*** on the layout drawing in Section 1.-.

SPARE PARTS ORDERING

1. The layout drawing in Section 1.- shows the component and the corresponding ***POSITION NUMBER.***
2. Section 11.- contains the equivalent spare parts list and part assembly drawing.
3. The spare parts list and the part assembly drawing contain the necessary information for ordering of spare parts.

IMPORTANT!! To order spare parts from ***Rannie,*** the following information ***MUST ALWAYS*** be given:

a. machine serial No.
(see Section 1.-: ORDER/SERIAL NO.)

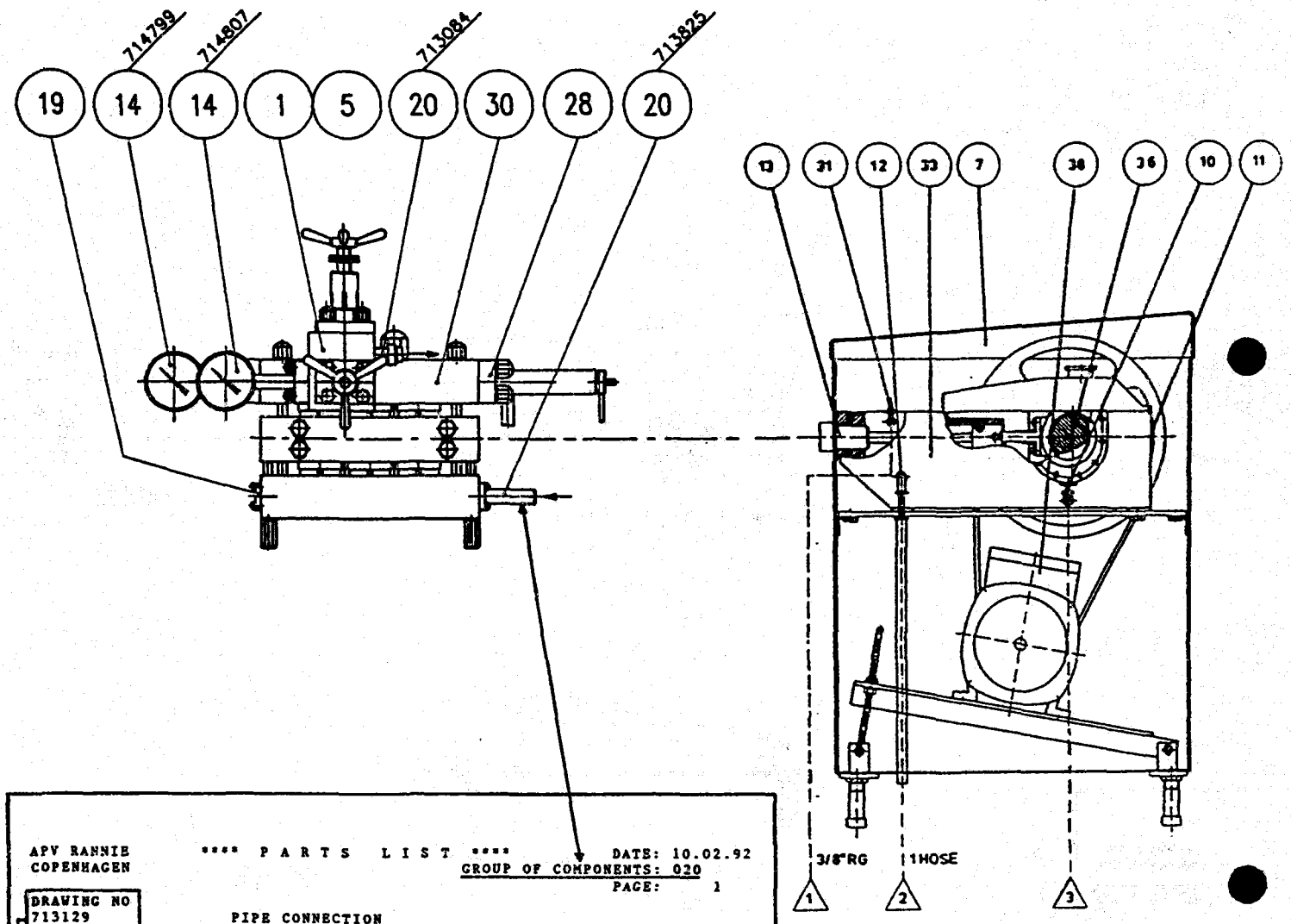
b. description of component

c. order number of component

d. quantity required

See also schematic representation of spare parts ordering on page 2/2.

EXAMPLE OF SPARE PARTS ORDERING



APV RANNIE COPENHAGEN **** P A R T S L I S T **** DATE: 10.02.92

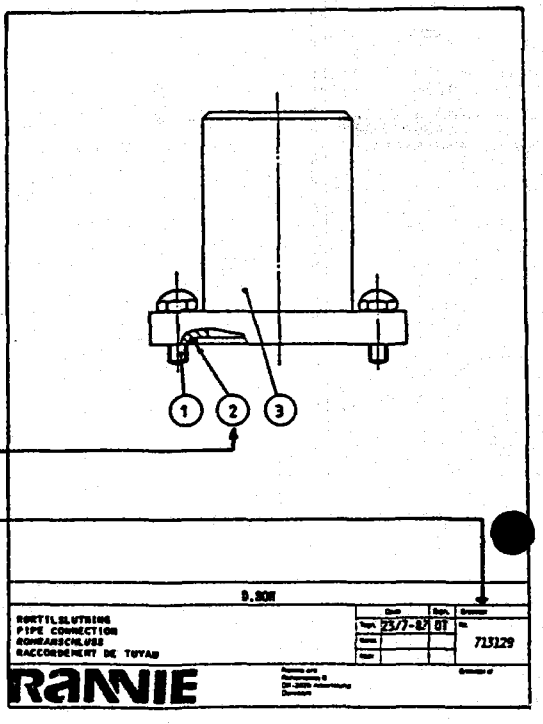
GROUP OF COMPONENTS: 020

PAGE: 1

DRAWING NO 713129

PIPE CONNECTION

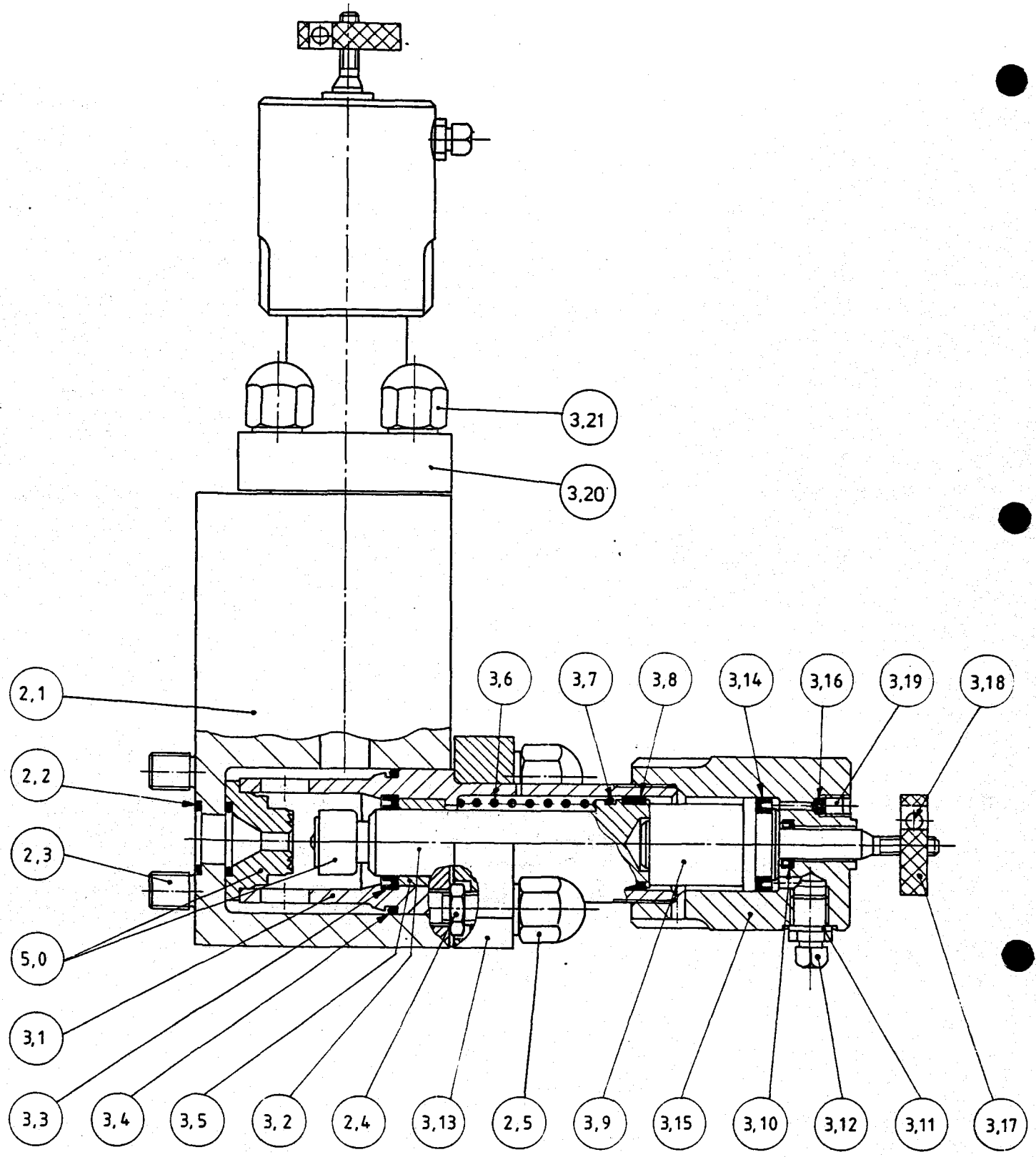
POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	106864	4,000	Hexagon head screw
0002	000041	1,000	O-ring
0003	113146	1,000	Pipe branch



TOOL CASE

The tool case is a blue plastic case supplied with all new machines and containing the necessary auxiliary tools for the daily maintenance of the machine.

The individual subsections under *SECTION 6.- / MAINTENANCE* specify the different auxiliary tools contained in the tool case.



22.51 / D.60 / D.72

KONSOLARRANGEMENT
BRACKET UNIT
KONSOLEANORDNUNG
DISPOSITIF DE CONSOLE

	Dato	Sign.	Erstatter
Tegn.	23/6-88	KJ	Nr.
Kontr.			716529
Appr.			

RANNIE

Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

Erstattet af

DRAWING NO
716529 BRACKET UNIT

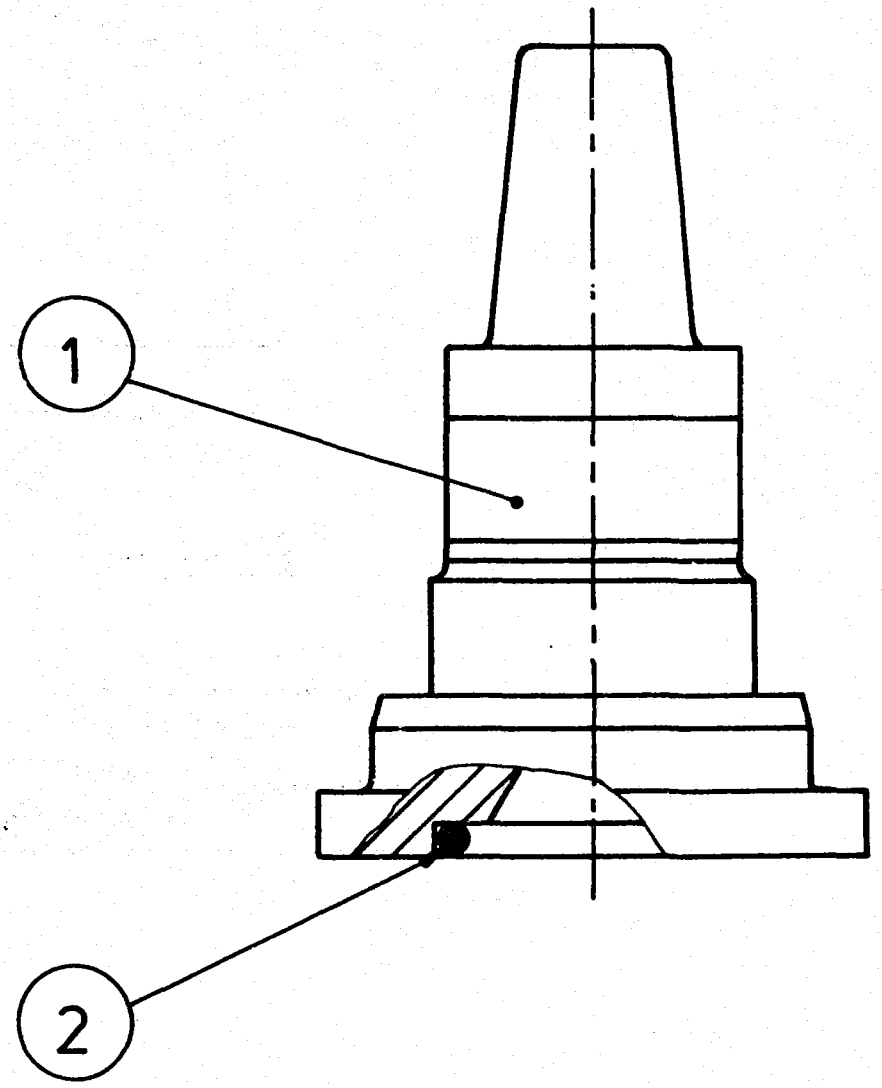
POS NO	ORDER NO	QUANTITY	DESCRIPTION
0002	714021	1,000	BRACKET
0003	716530	1,000	INTERNAL UNIT FOR BRACKET

DRAWING NO 714021 BRACKET

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	111818	1,000	Bracket
0002	000018	1,000	O-ring
0003	107595-1	4,000	Stud
0004	108028	4,000	Nut
0005	102750-2	4,000	Box nut
0098	714021V	1,000	SERVICE TOOLS

DRAWING NO
716530 INTERNAL UNIT FOR BRACKET

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	113714	2,000	Guide
0002	107342	2,000	Spindle
0003	000109	2,000	Nut ring
0004	000077	2,000	O-ring
0005	108246	2,000	Bushing
0006	111484	2,000	Spring
0007	002196	2,000	O-ring
0008	000164	2,000	Guiding ring
0009	115029	2,000	Piston
0010	001403	2,000	Nut ring
0011	000172	2,000	Packing washer
0012	000171	2,000	Screwed connection
0013	107581	1,000	Flange
0014	000110	2,000	Nut ring
0015	115030	2,000	Hydraulic cylinder
0016	000170	2,000	Ball
0017	110389	2,000	Stop ring
0018	001009	2,000	Cheese-head screw
0019	001033	2,000	Pointed screw
0020	107953	1,000	Flange
0021	103189-2	4,000	Hexagon head screw
0098	716530V	1,000	SERVICE TOOLS



22.51 / D.60 / D.72

HOMOGENISERINGSVENTIL
HOMOGENISING VALVE
HOMOGENISIERVENTIL
SOUPAPE D'HOMOGÉNÉISATION

	Dato	Sign.	Erstatter
Tegn.	2/11-87	OT	Nr.
Kontr.			715878
Appr.			

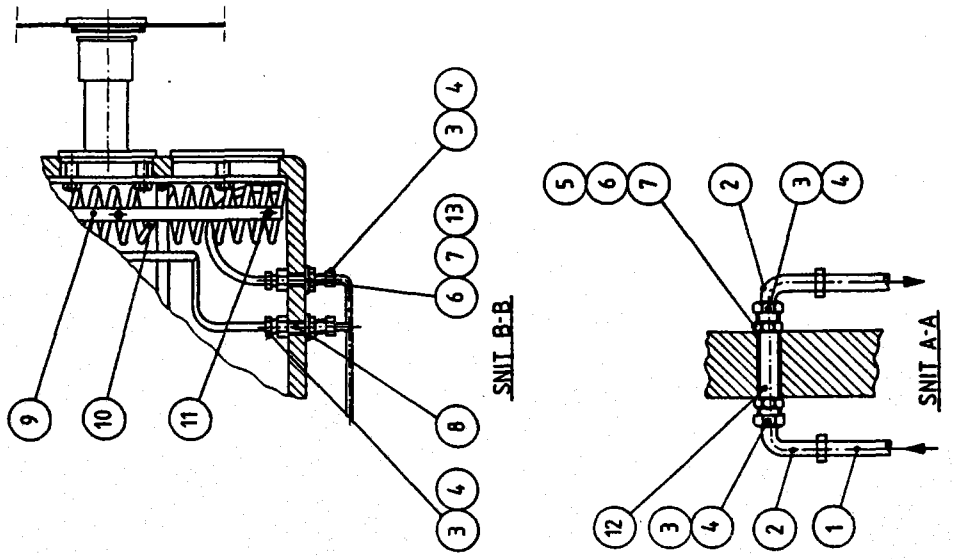
RANNIE

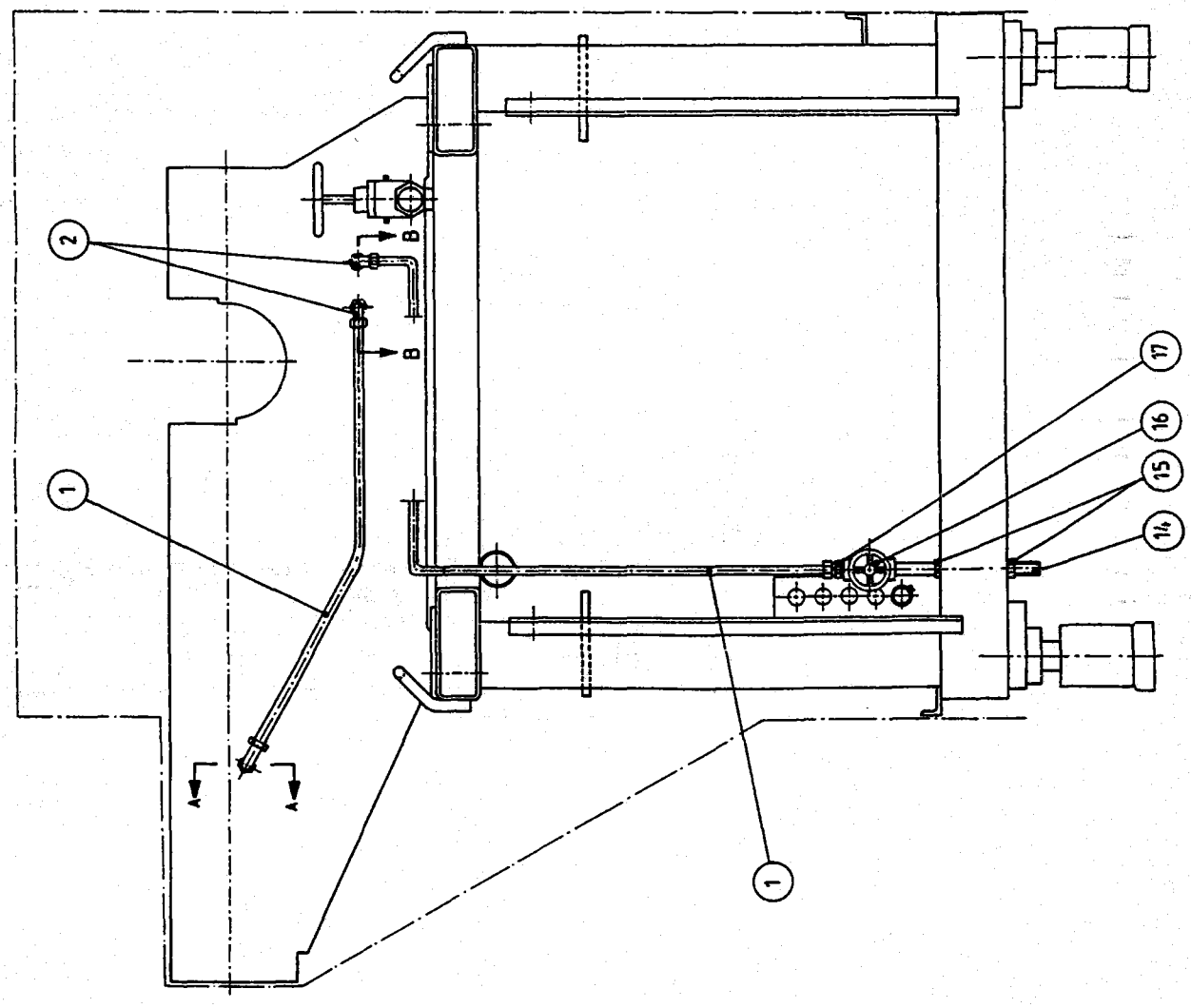
Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

Erstattet af

DRAWING NO
715878 HOMOGENISING VALVE

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	108625	1,000	Homogenising valve
0002	000018	1,000	O-ring





D.60 / 63.60

KØLESYSTEM, EXCENTRIKGRAV
COOLING SYSTEM, ECCENTRIC SUMP
KÜHLVORRICHTUNG, EXZENTRIKGRABEN
SYSTÈME DE REFROIDISSEMENT, CARTER D'EXCENTRIQUE

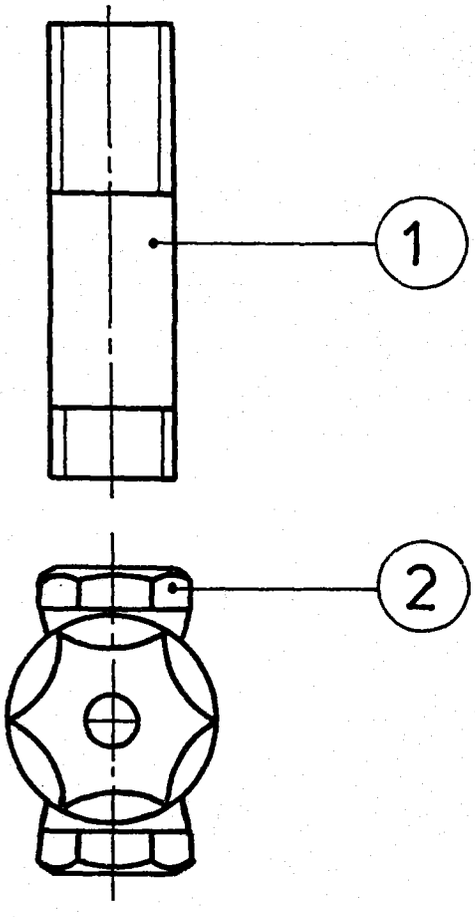
	Dato	Sign.	Erstatter
Tegn.	14/9-87	OT	Nr. 715688
Kontr.			
Appr.			

Erstattet af

RANNIE
Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

DRAWING NO
715688 COOLING SYSTEM, ECCENTRIC SUMP

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	203443	1,500	Pipe
0002	000673	4,000	Screwed connection
0003	000230	6,000	Sealing ring
0004	000232	6,000	Union nut
0005	000172	1,000	Packing washer
0006	000680	3,000	Disc
0007	000231	3,000	Lock nut
0008	111549	2,000	Screwed connection
0009	111553	1,000	Track
0010	111552	1,000	Cooling coil
0011	000681	2,000	Slotted screw
0012	113389	1,000	Screwed connection
0013	001970	2,000	Packing
0014	114957	1,000	Nipple pipe
0015	000260	2,000	Lock nut
0016	000227	1,000	Seated valve
0017	000475	1,000	Screwed connection



D.60 / D.72

OLIEAFTAPNING
OIL DRAIN
ÖLABZAPFVORRICHTUNG
SOUTIRAGE D'HUILE

	Dato	Sign.	Erstatter
Tegn.	29/6-87	OT	Nr.
Kontr.			709116
Appr.			

RANNIE

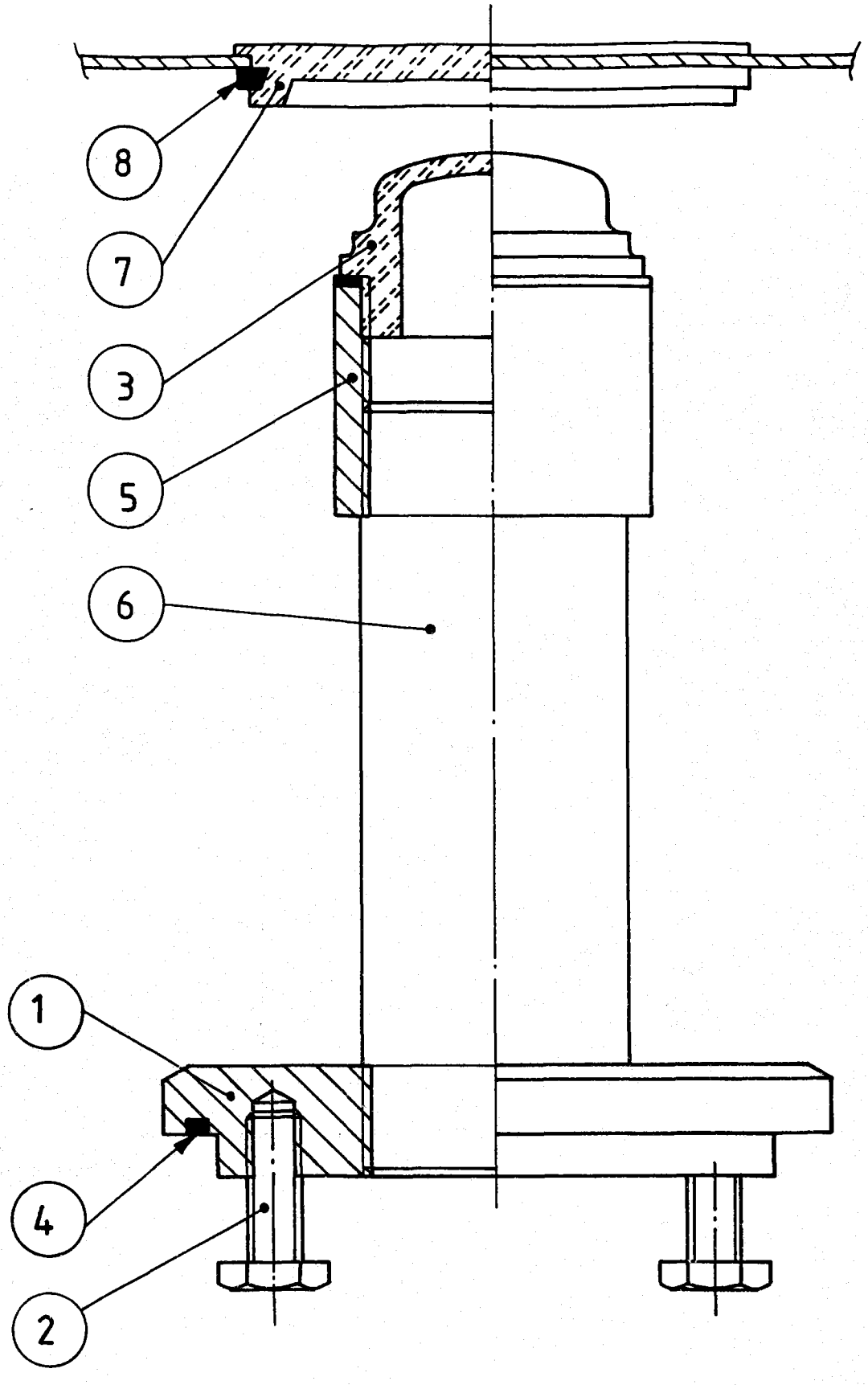
Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

Erstattet af

APV RANNIE **** P A R T S L I S T **** DATE: 27.01.93
COPENHAGEN GROUP OF COMPONENTS: 010
PAGE: 1

DRAWING NO
709116 OIL DRAIN

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	113387	1,000	Nipple pipe
0002	000266	1,000	Slide valve



D.60 / 63.60

OLIESTANDSVISER
OIL LEVEL INDICATOR
ÖLSTANDSVORRICHTUNG
INDICATEUR DE NIVEAU D'HUILE

	Dato	Sign.	Erstatter
Tegn.	21/10-87	OT	Nr.
Kontr.			716055
Appr.			

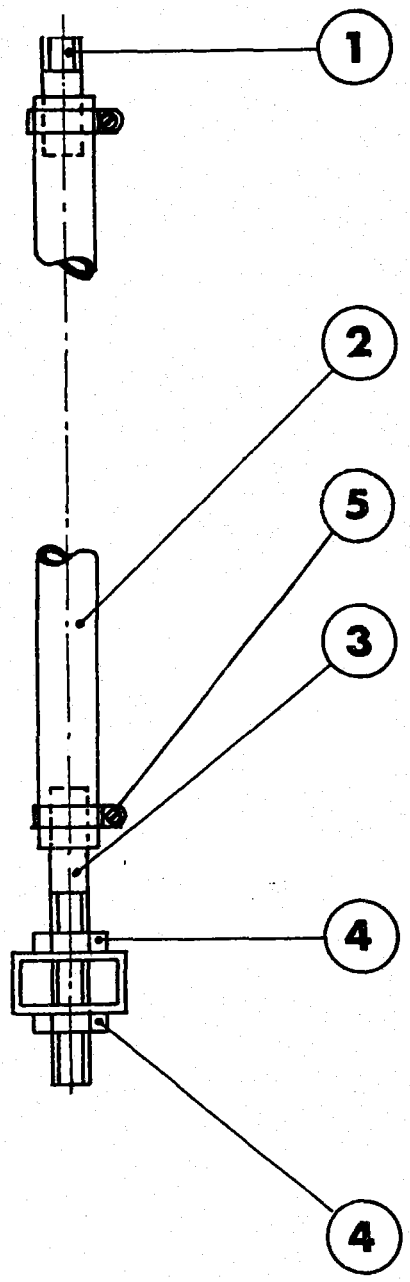
Erstattet af

RANNIE

Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

DRAWING NO
716055 OIL LEVEL INDICATOR

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	106045	1,000	Cover
0002	002633	2,000	Hexagon head screw
0003	002474	1,000	Oil-level glass
0004	000066	1,000	O-ring
0005	001452	1,000	Socket
0006	115187	1,000	Nipple pipe
0007	106947	1,000	Oil-level glass
0008	000052	1,000	O-ring



D.60 / 63.60

AFLØB
OUTLET
AUSLAUFANORDNUNG
SORTIE

	Dato	Sign.	Erstatter
Tegn.	21/7-87	OT	Nr. 712797
Kontr.			
Appr.			

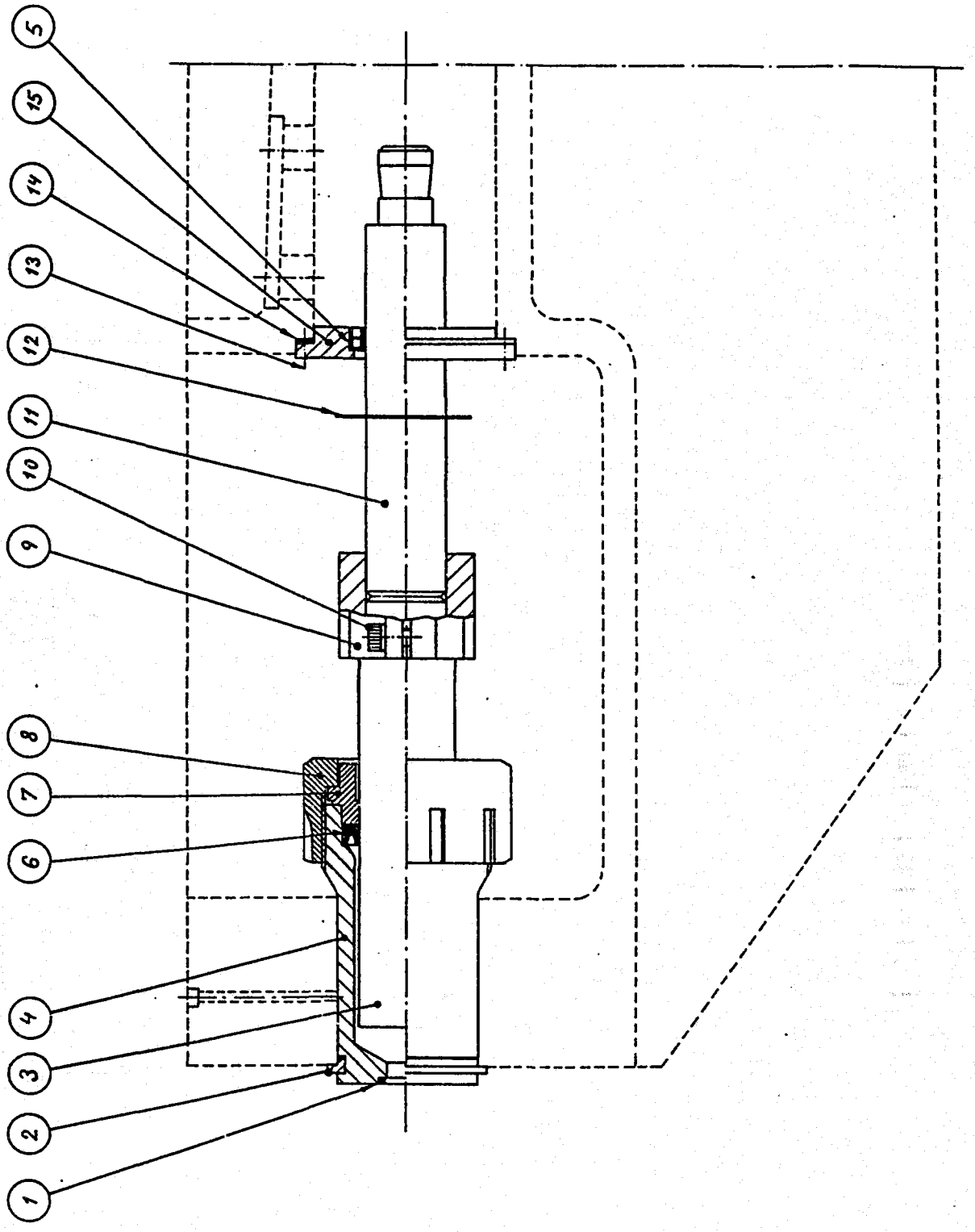
Erstattet af

RANNIE

Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

DRAWING NO
712797 OUTLET

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	113522	1,000	Nipple pipe
0002	205160	0,700	Hose
0003	113524	1,000	Nipple pipe
0004	000407	2,000	Lock nut
0005	001160	2,000	Hose clamp



40.60

CYLINDERARRANGEMENT
CYLINDER ARRANGEMENT
ZYLINDERANORDNUNG
DISPOSITIF DE CYLINDRES

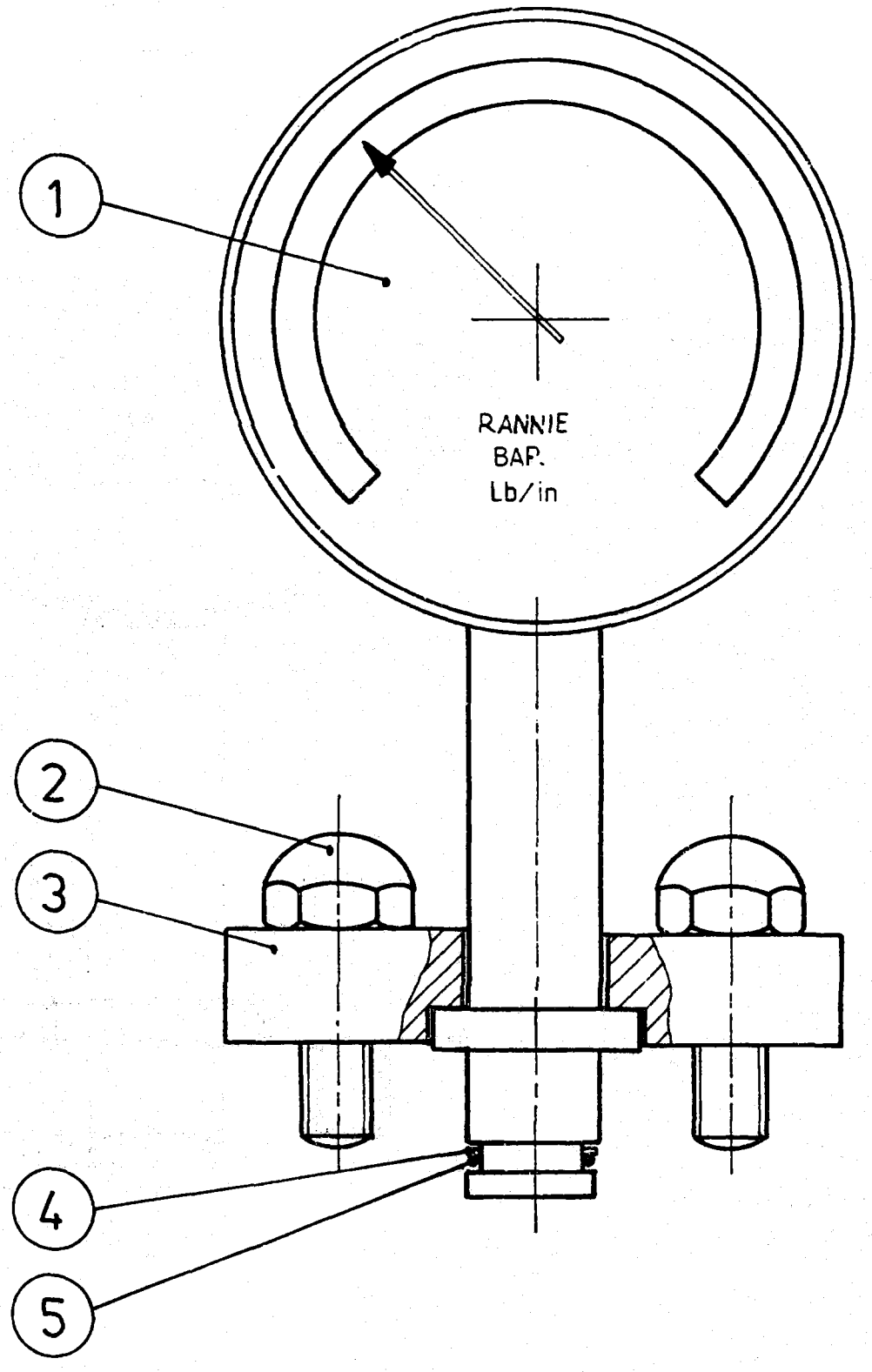
	Dato	Sign.	Erstatter
Tegn.	3/5-91	AEL	Nr.
Kontr.			718398
Appr.			

Erstattet af

APV Rannie

DRAWING NO 718398 — CYLINDER ARRANGEMENT

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	000018	3,000	O-ring
0002	118382	3,000	Locking ring
0003	118395	3,000	Piston
0004	118396	3,000	Cylinder
0005	000139	6,000	Oil seal ring
0006	002024	3,000	Nut ring
0007	118397	3,000	Union nut
0008	107485	3,000	Union nut
0009	113472	3,000	Piston coupling
0010	002867	6,000	Cheese-head screw
0011	106358-1	3,000	Piston
0012	109797	3,000	Rubber sleeve
0013	000398	9,000	Cheese-head screw
0014	105081	3,000	Packing
0015	106002	3,000	Crosshead cover
0098	718398V	1,000	SERVICE TOOLS



22.51 / D.60 / D.72

TRYKINDIKERING
PRESSURE INDICATION
DRUCKANZEIGE
INDICATION DE PRESSION

	Dato	Sign.	Erstatter
Tegn.	30/7-87	OT	Nr.
Kontr.			715880
Appr.			

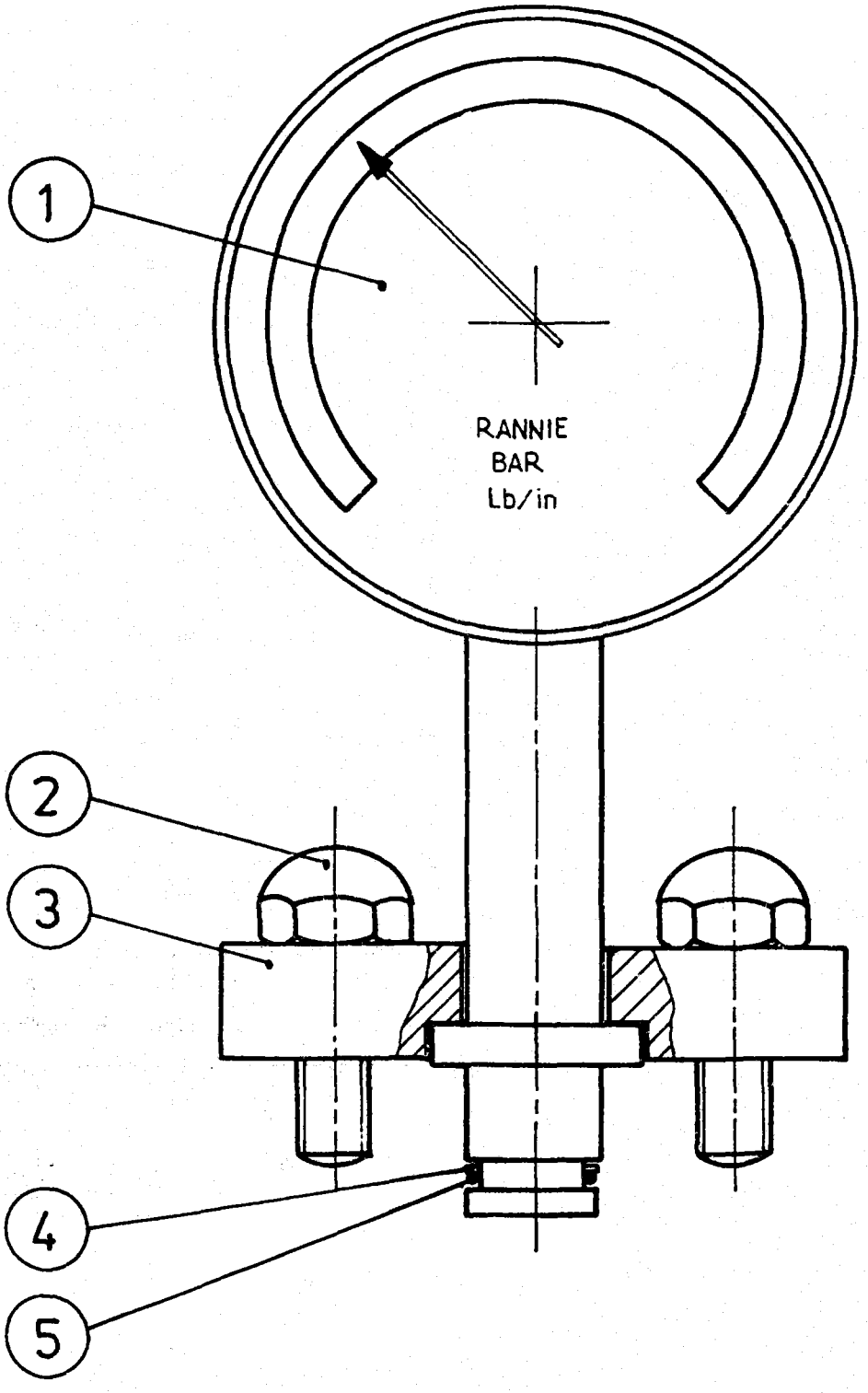
RANNIE

Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

Erstattet af

DRAWING NO
715880 PRESSURE INDICATION

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	002402	1,000	Pressure gauge
0002	103189-5	4,000	Hexagon head screw
0003	111940	1,000	Flange
0004	001100	1,000	Back ring
0005	000017	1,000	O-ring



22.51 / D.60 / D.72 / D.79

TRYKINDIKERING
PRESSURE INDICATION
DRUCKANZEIGE
INDICATION DE PRESSION

	Dato	Sign.	Erstatter
Tegn.	12/2-88	KJ	Nr.
Kontr.			716228
Appr.			

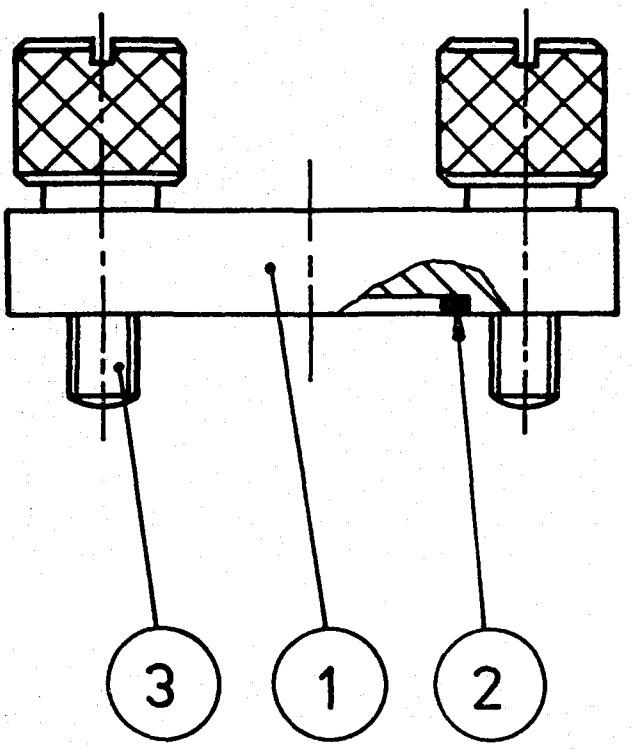
RANNIE

Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

Erstattet af

DRAWING NO
716228 PRESSURE INDICATION

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	002036	1,000	Pressure gauge
0002	103189-5	2,000	Hexagon head screw
0003	111943	1,000	Flange
0004	001100	1,000	Back ring
0005	000017	1,000	O-ring



D.60

BLINDFLANGE
BLIND FLANGE
BLINDFLANSCH
BRIDE D'OBTURATION

	Dato	Sign.	Erstatter
Tegn.	23/7-87	OT	Nr. 715251
Kontr.			
Appr.			

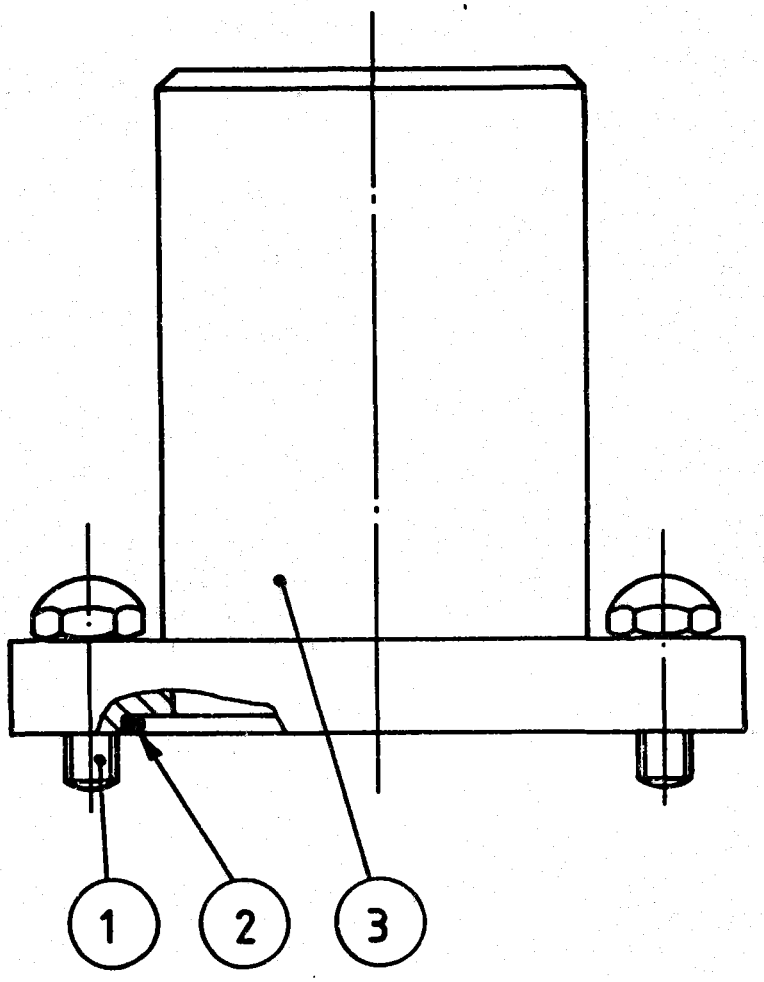
RANNIE

Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

Erstattet af

DRAWING NO
715251 BLIND FLANGE

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	109483	1,000	Flange
0002	000079	1,000	O-ring
0003	103189-7	2,000	Hexagon head screw



22.51 / D.60 / D.72

RØRTILSUTNING
PIPE CONNECTION
ROHRANSCHLUSS
RACCORDEMENT DE TUYAU

	Dato	Sign.	Erstatter
Tegn.	23/7-87	OT	Nr.
Kontr.			713084
Appr.			

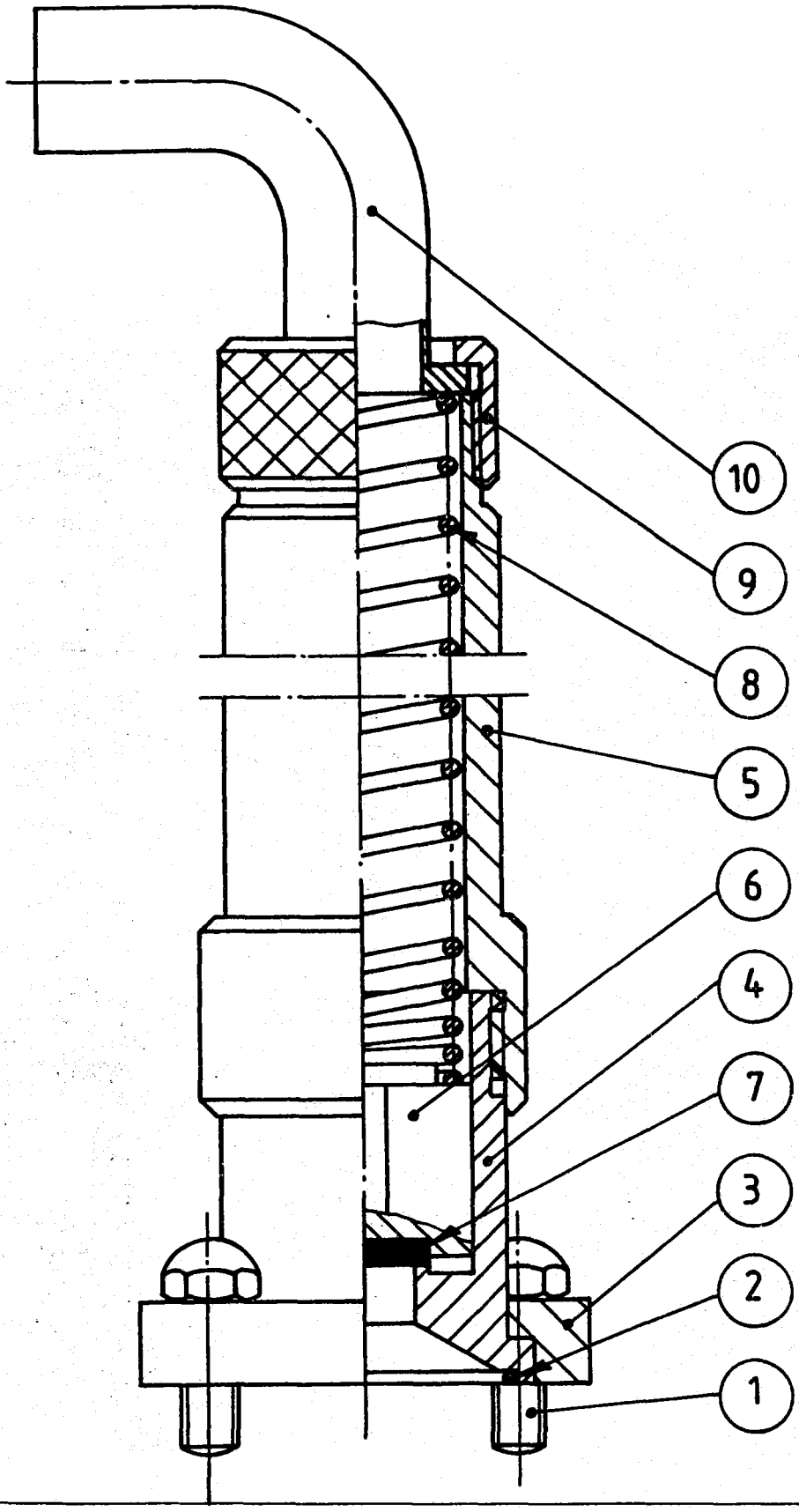
Erstattet af

RANNIE

Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

DRAWING NO
713084 PIPE CONNECTION

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	103189-5	4,000	Hexagon head screw
0002	000035	1,000	O-ring
0003	113166	1,000	Pipe branch



22.51 / D.60 / D.72

RØRSIKRINGSVENTIL
PIPE PROTECTION VALVE
ROHRSICHERUNGSVENTIL
SOUPAPE DE PROTECTION DE TUYAUTERIES

	Dato	Sign.	Erstatter
Tegn.	24/7-87	OT	Nr.
Kontr.			714577
Appr.			

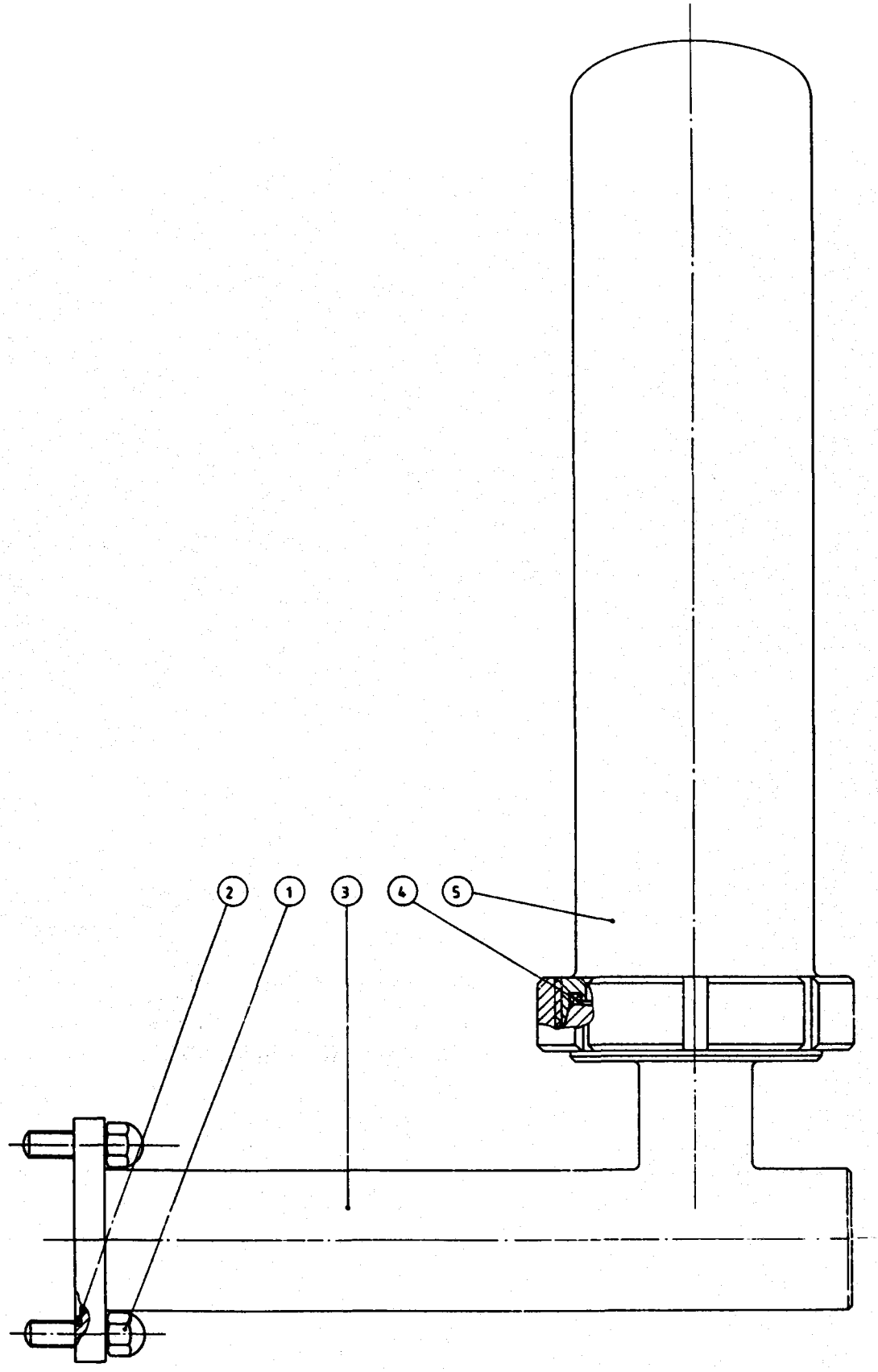
RANNIE

Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

Erstattet af

DRAWING NO
714577 PIPE PROTECTION VALVE

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	103189-5	4,000	Hexagon head screw
0002	000038	1,000	O-ring
0003	109140	1,000	Flange
0004	110791	1,000	Valve seat housing
0005	109135	1,000	Spring housing
0006	109138	1,000	Valve piston
0007	000711	1,000	Packing
0008	111486	1,000	Spring
0009	109141	1,000	Union nut
0010	109143	1,000	Outlet pipe



D.60

RØRTILSLUTNING MED VINDKEDEL
PIPE CONNECTION WITH AIR WESSEL
ROHRANSCHLUSS MIT WINDKESSEL
RACCORDEMENT DE TUYAU AVEC BOUTEILLE D'AIR

	Dato	Sign.	Erstatter
Tegn.	18/8-87	OT	Nr. 713196
Kontr.			
Appr.			

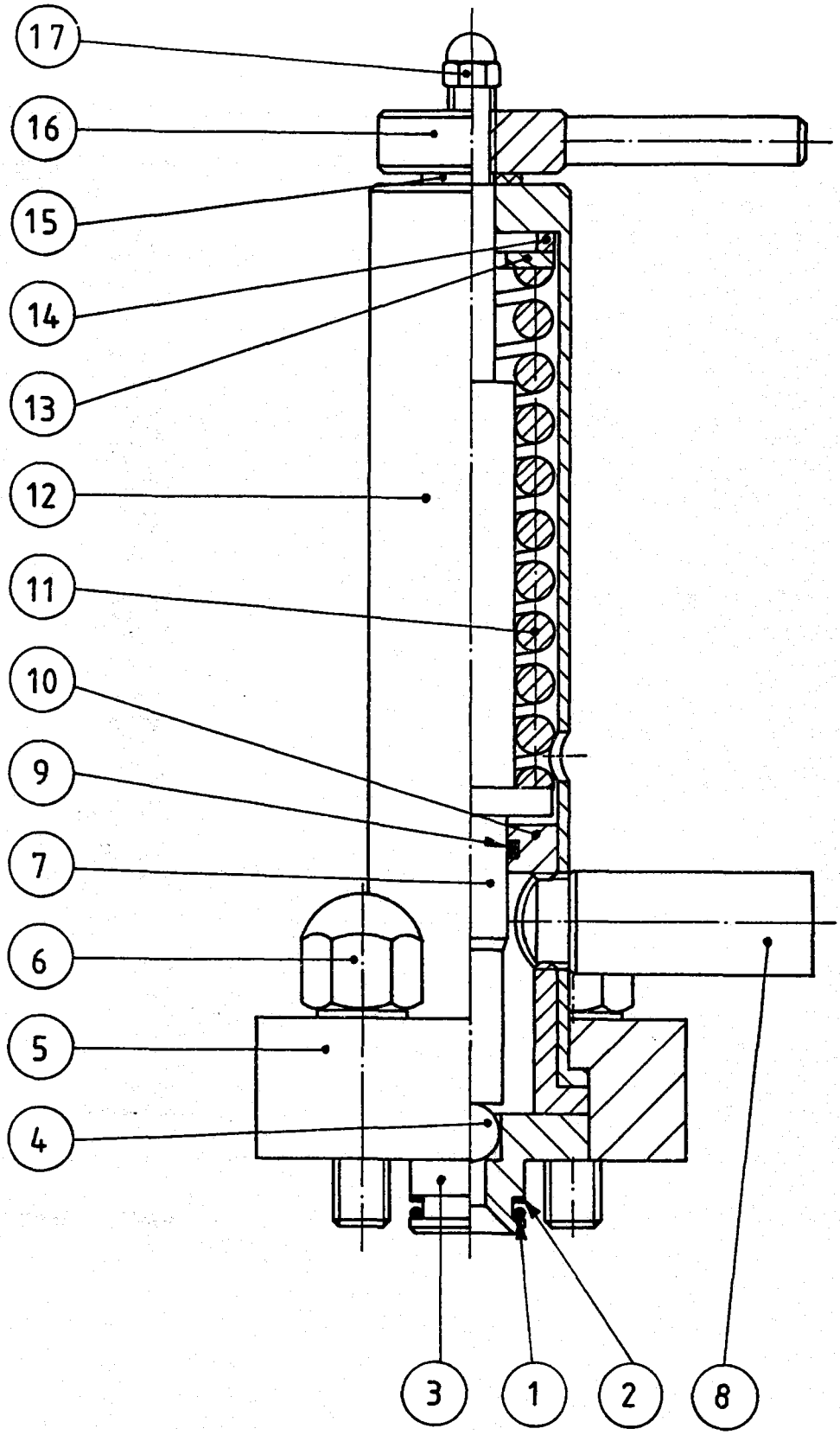
Erstattet af

RANNIE

Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

DRAWING NO
713196 PIPE CONNECTION WITH AIR WESSEL

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	103189-7	4,000	Hexagon head screw
0002	000085	1,000	O-ring
0003	113195	1,000	Pipe branch
0004	000369	1,000	Packing
0005	108712	1,000	Air vessel
0098	713196V	1,000	SERVICE TOOLS



D.60 / D.72

TRYKSIKKERHEDSSYSTEM
PRESSURE SAFETY SYSTEM
DRUCKSICHERUNGSSYSTEM
DISPOSITIF DE SÛRETE DE PRESSION

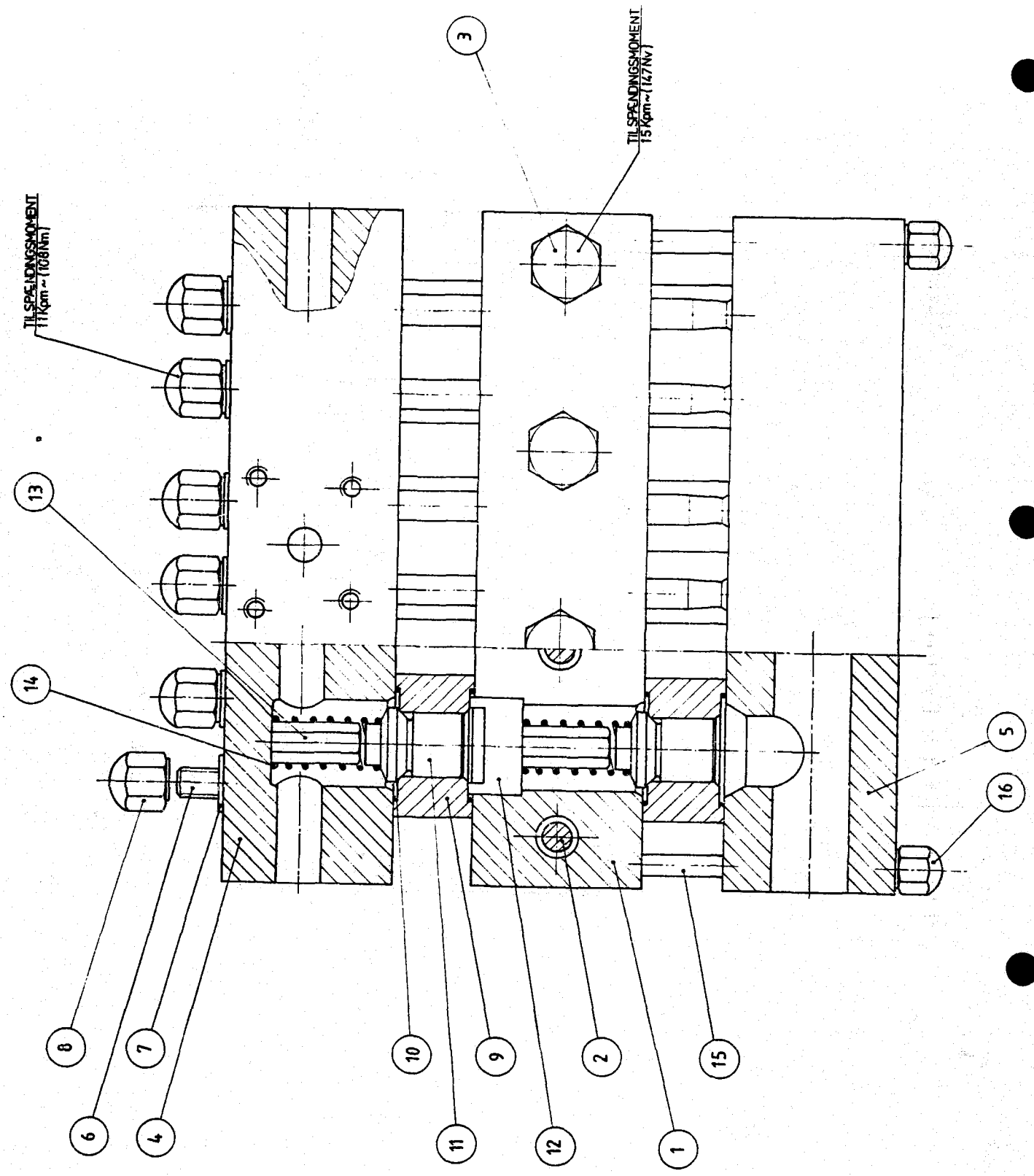
	Dato	Sign.	Erstatter
Tegn.	23/5-89	OT	Nr.
Kontr.			
Appr.			716578

Erstattet af

APV Rannie

DRAWING NO
716578 PRESSURE SAFETY SYSTEM

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	000017	1,000	O-ring
0002	001100	1,000	Back ring
0003	113514	1,000	Valve seat
0004	001572	1,000	Ball
0005	113070	1,000	Flange
0006	103189-3	4,000	Hexagon head screw
0007	113068	1,000	Spindle
0008	113289	1,000	Outlet pipe
0009	000012	1,000	O-ring
0010	113067	1,000	Spindle guide
0011	111490	1,000	Spring
0012	113072	1,000	Spring housing
0013	113177	1,000	Ring
0014	001633	10,000	Disc
0015	001634	1,000	Disc
0016	113066	1,000	Handle
0017	000655	1,000	Box nut



D.60

VENTILHUS
VALVE HOUSING
VENTILGEHÄUSE
CORPS DE SOUPAPE

	Dato	Sign.	Erstatter
Tegn.	24/7-87	OT	Nr. 714599
Kontr.			
Appr.			

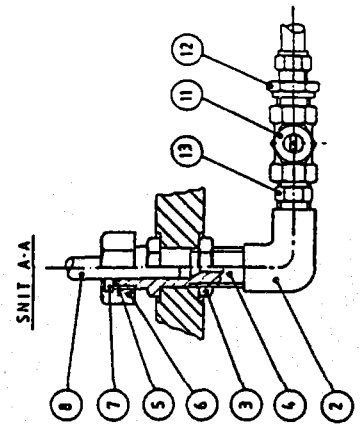
RANNIE

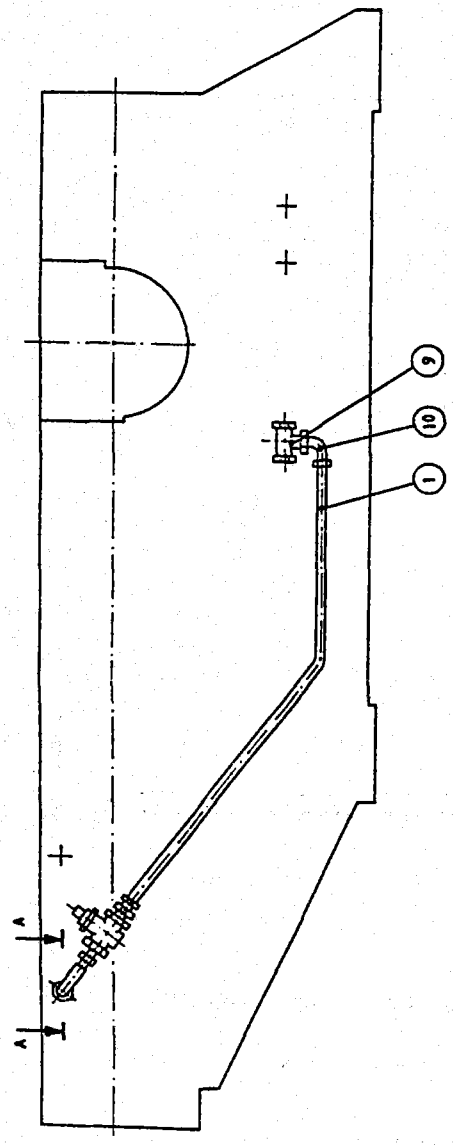
Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

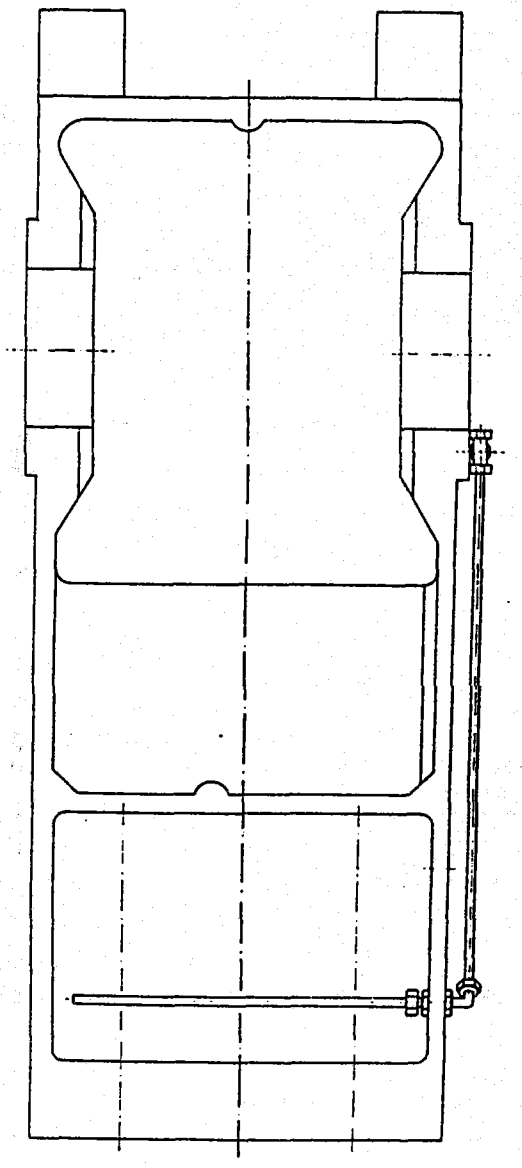
Erstattet af

DRAWING NO
714599 VALVE HOUSING

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	110901	1,000	Intermediate part
0002	110517	4,000	Stud
0003	107724	4,000	Box nut
0004	111826	1,000	Top part
0005	110903	1,000	Bottom part
0006	110511	12,000	Stud
0007	000658	12,000	Disc
0008	103193-7	12,000	Box nut
0009	110509	6,000	Valve seat
0010	000046	12,000	O-ring
0011	110512	6,000	Poppet valve
0012	110870	3,000	Distance piece
0013	116827	6,000	Valve stop
0014	111375	6,000	Spring
0015	110514	2,000	Stud
0016	102750-2	2,000	Box nut
0098	714599V	1,000	SERVICE TOOLS







60/63

KØLESYSTEM, CYLINDER
COOLING SYSTEM, CYLINDER
KÜHLVORRICHTUNG, ZYLINDER
SYSTEME DE REFROIDISSEMENT, CYLINDRE

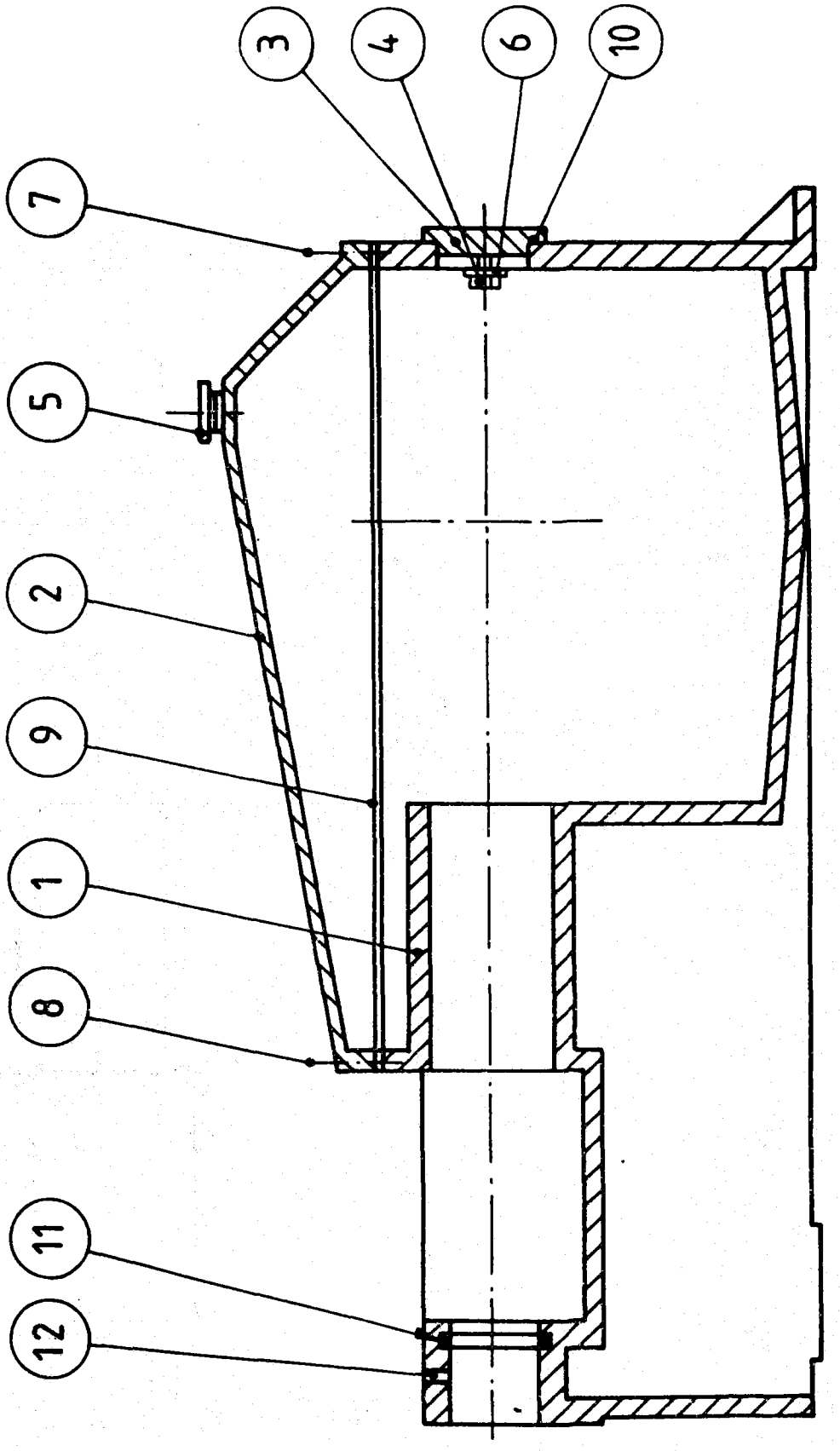
	Dato	Sign.	Erstatter
Tegn.	2.9.91	ÅFL'	Nr.
Kontr.			
Appr.			718687

Erstattet af

APV Rannie

DRAWING NO
718687 COOLING SYSTEM, CYLINDER

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	203443	1,500	Pipe
0002	000904	1,000	Angle
0003	003015	1,000	Nut
0004	105754	1,000	Screwed connection
0005	000009	1,000	O-ring
0006	106196	1,000	Union nut
0007	105720-2	1,000	Supporting ring
0008	105712	1,000	Irrigation pipe
0009	001342	1,000	Screwed connection
0010	000678	1,000	Screwed connection
0011	000417	1,000	Stop cock
0012	000475	1,000	Screwed connection
0013	115956	1,000	Nippel pipe



D.60

BUNDRAMME
BASE FRAME
EXCENTRIKGEHÄUSE
CADRE DE FONDATION

	Dato	Sign.	Erstatter
Tegn.	4/1-88	OT	Nr. 715171
Kontr.			
Appr.			

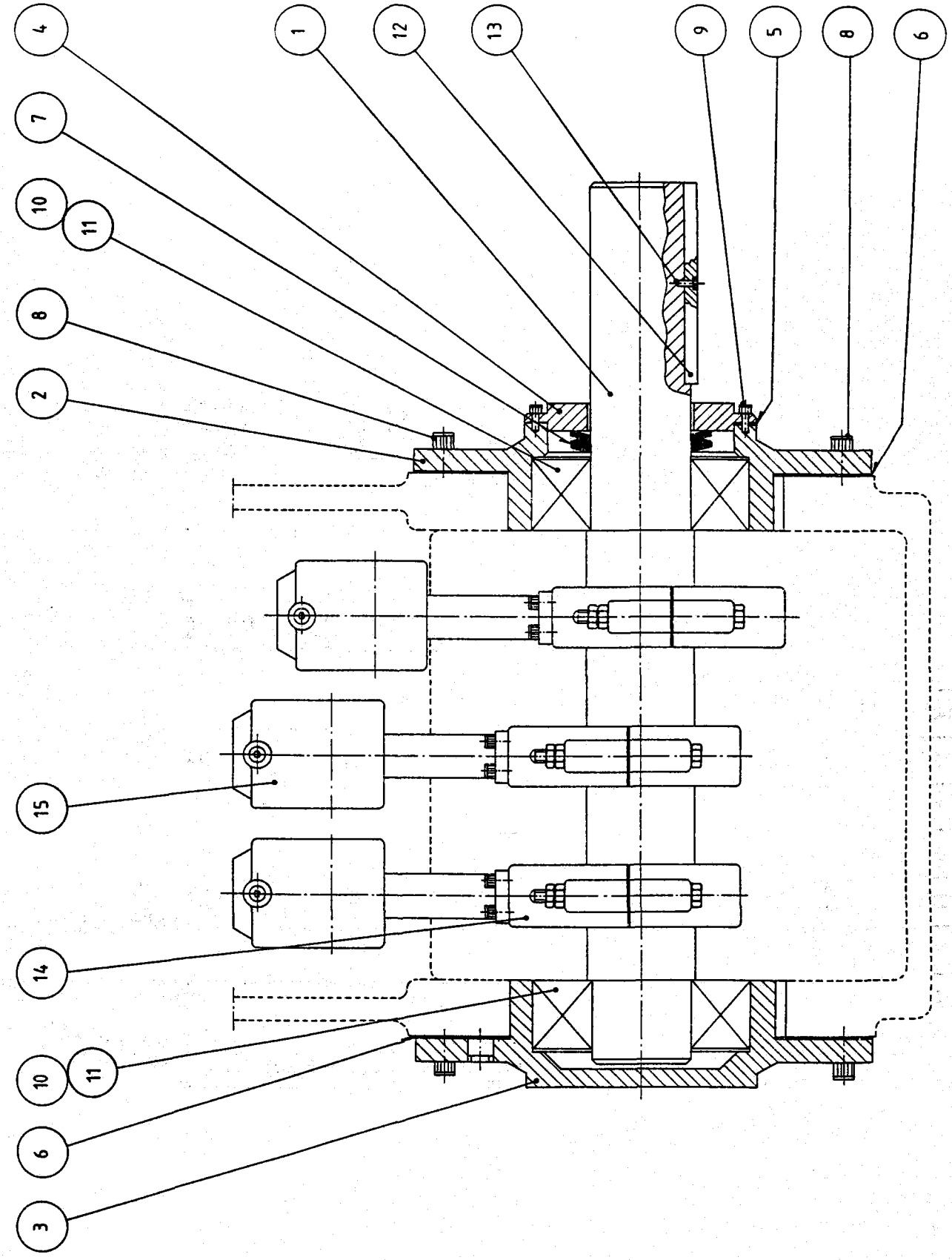
RANNIE

Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

Erstattet af

DRAWING NO
715171 BASE FRAME

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	111166	1,000	Base frame
0002	112728-1	1,000	Cover
0003	102147	2,000	End cover
0004	106046	1,000	Clamp
0005	000179	1,000	Air filter
0006	000174	4,000	Hexagon head screw
0007	000181	11,000	Cheese-head screw
0008	000720	1,000	Cheese-head screw
0009	115170	1,000	Packing
0010	000066	2,000	O-ring
0011	000051	3,000	O-ring
0012	000178	3,000	Plastic plug
0098	715171V	1,000	SERVICE TOOLS



D.60 / 63.60

EXCENTRIK
ECCENTRIC
EXZENTRIK
EXCENTRIQUE

	Dato	Sign.	Erstatter
Tegn.	11/5-88	OT	Nr.
Kontr.			714622
Appr.			

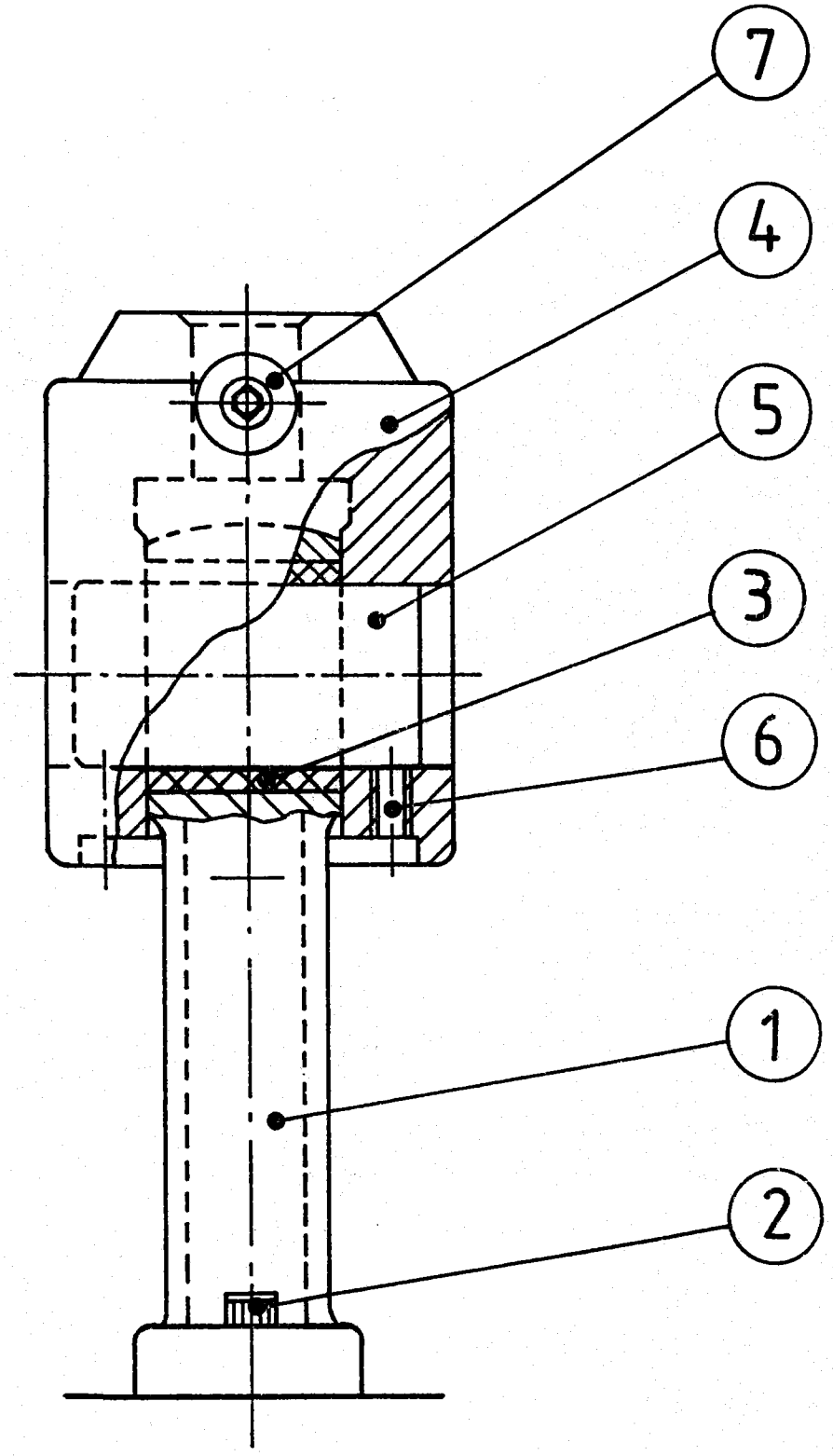
RANNIE

Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

Erstattet af

DRAWING NO
714622 ECCENTRIC

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	106054	1,000	Eccentric
0002	106301	1,000	Bearing cover
0003	106300	1,000	Bearing cover
0004	106052-1	1,000	Cover
0005	115159	1,000	Packing
0006	104909	2,000	Packing
0007	000667	1,000	V-ring
0008	000668	16,000	Cheese-head screw
0009	000466	4,000	Slotted screw
0010	000669	2,000	Roller bearing
0011	000670	2,000	Adaptor
0012	114649	1,000	Tongue
0013	001024	1,000	Cheese-head screw
0014	103169	3,000	Eccentric strap
0015	716400	3,000	CROSSHEAD UNIT
0098	714622V	1,000	SERVICE TOOLS



D.60 / 63.60

KRYDSHOVEDARRANGEMENT
CROSSHEAD UNIT
KREUZKOPFEINHEIT
UNITÉ DE CROSSE

	Dato	Sign.	Erstatter
Tegn.	11/5-88	OT	Nr.
Kontr.			716400
Appr.			

Erstattet af

RANNIE

Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

DRAWING NO
716400 CROSSHEAD UNIT

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	102871-1	1,000	Connecting rod
0002	000463	2,000	Cheese-head screw
0003	102871-2	1,000	Bushing
0004	102134	1,000	Crosshead
0005	102137	1,000	Crosshead pin
0006	002698	2,000	Pointed screw
0007	000666	1,000	Pointed screw

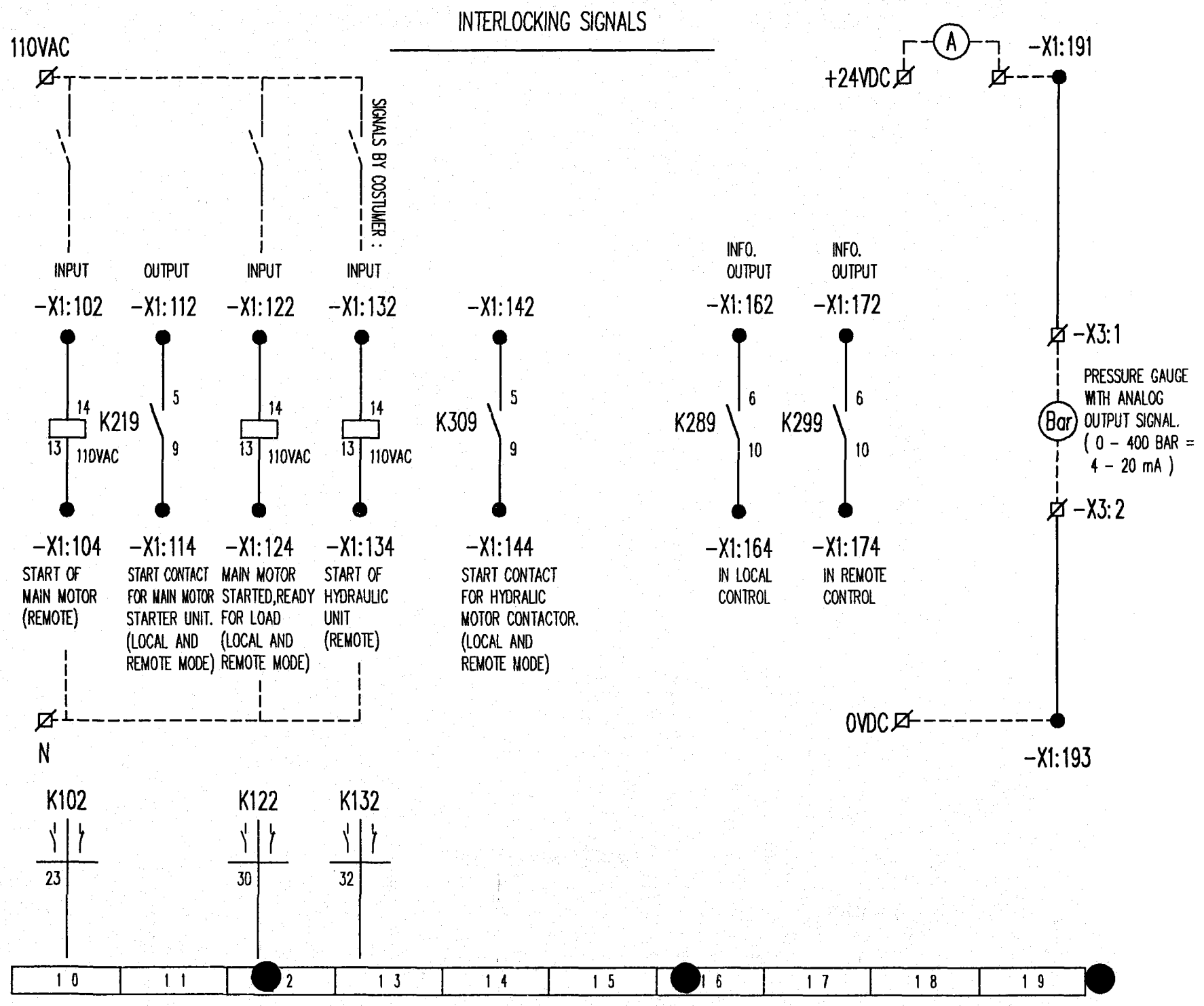
APV Rannie

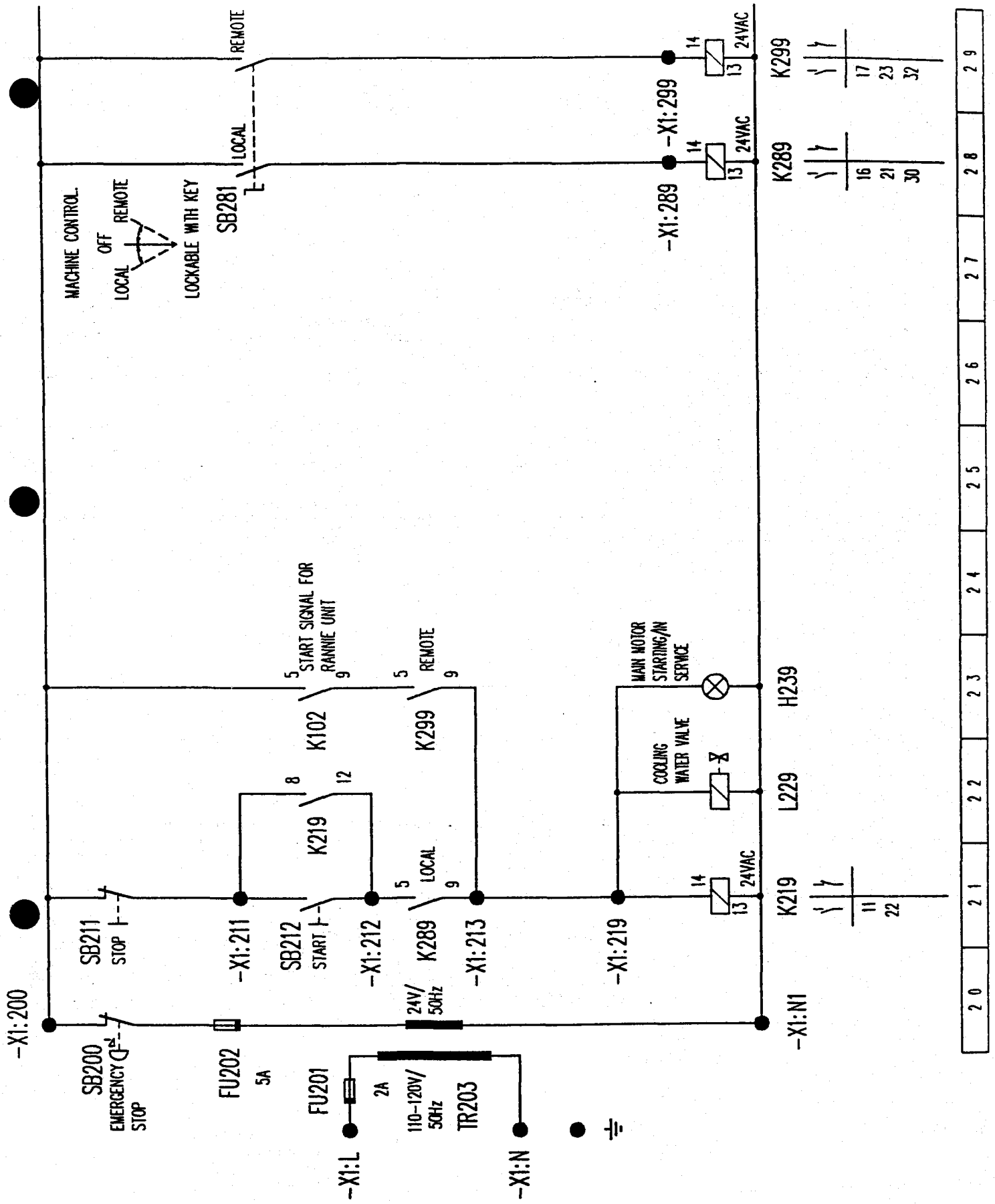
START-STOP FUNKTION
START/STOP FUNKTION
START-STOP FUNKTION
FONDATIONS DE DÉMARRAGE ÉT D'ARRET

Dato	Tegn.	17/2-93	
	Kontr.		
	Appr.		
Sign.		AS	
Erstatter			
Nr.		719274	
Side		4/5	

Erstattet af

INTERLOCKING SIGNALS



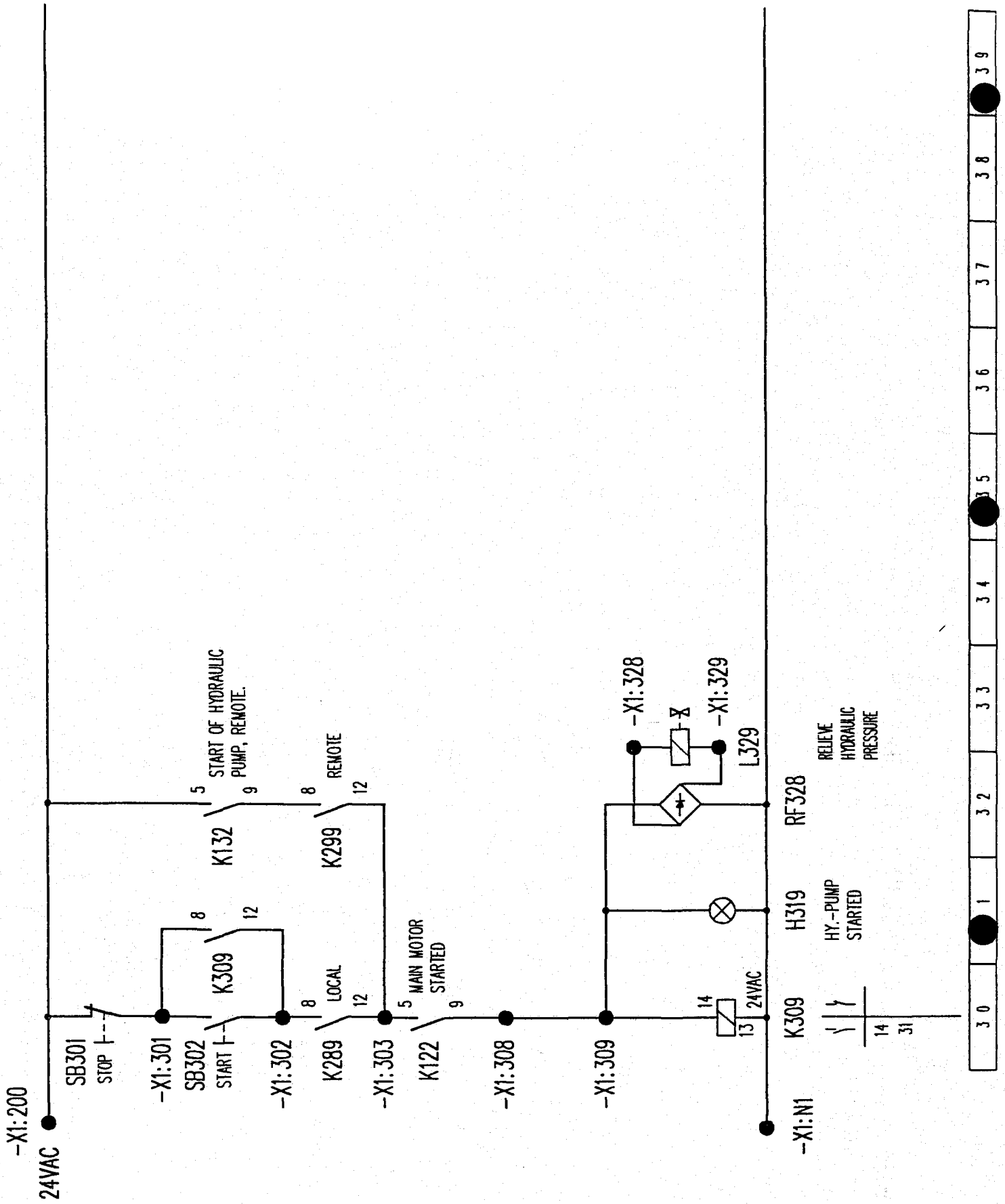


START-STOP FUNKTION
START/STOP FUNKTION
START-STOP FUNKTION
FONDATIONS DE DÉMARRAGE ÉT D'ARRET

	Dato	Sign.	Erstatter
Tegn.	1/2-93	AS	Nr. Side
Kontr.			719274 2/5
Appr.			

Erstattet af

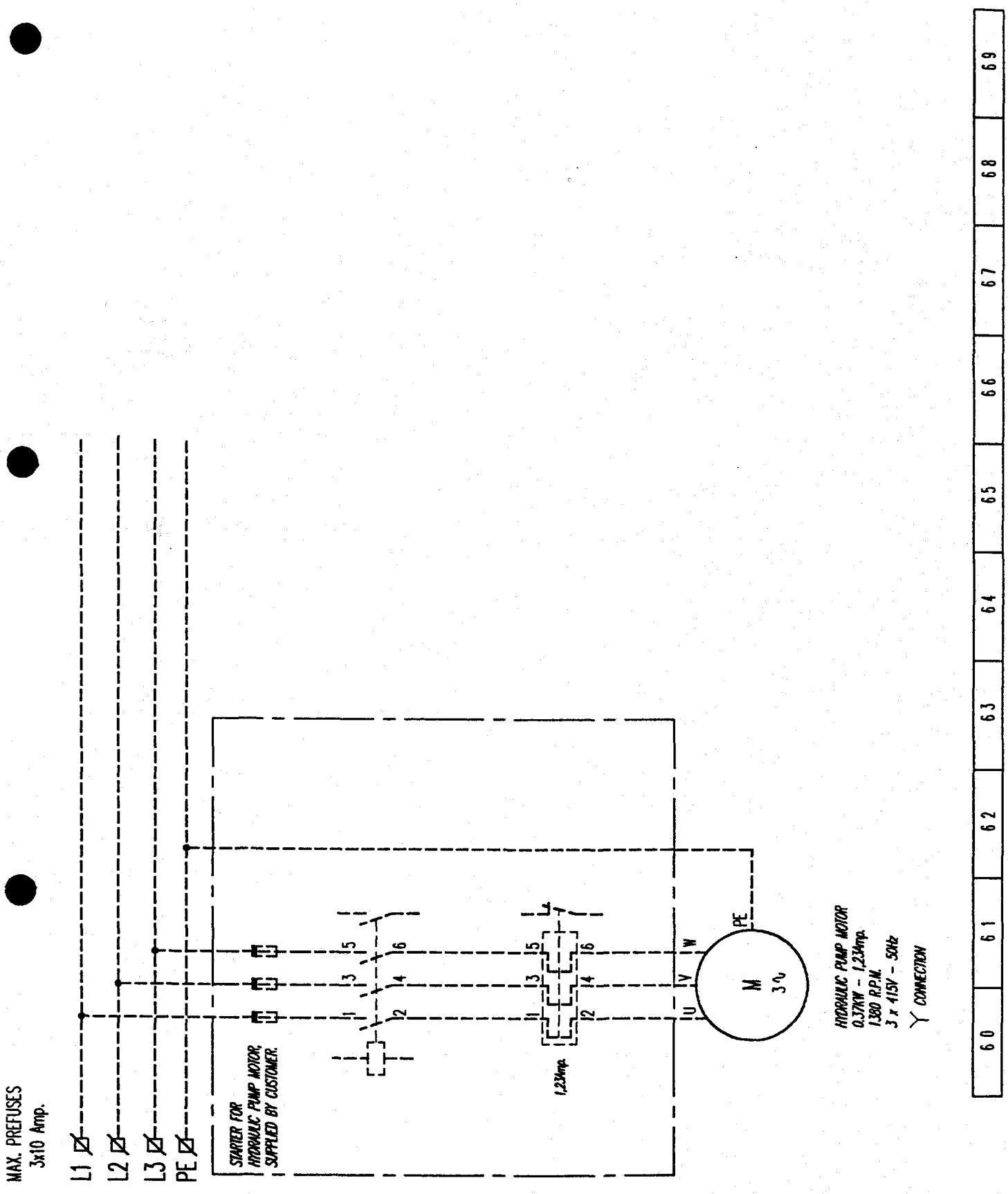
APV Rannie



HYDRAULIK STYRING HYDRAULIC CONTROL HYDRAULIK STEURUNG CONTROLE HYDRAULIQUE	Dato	Sign.	Erstatter
	Tegn. 9/2-93	AS	Nr. 719274 Side 3/5
	Kontr.		
	Appr.		

Erstattet af

APV Rannie



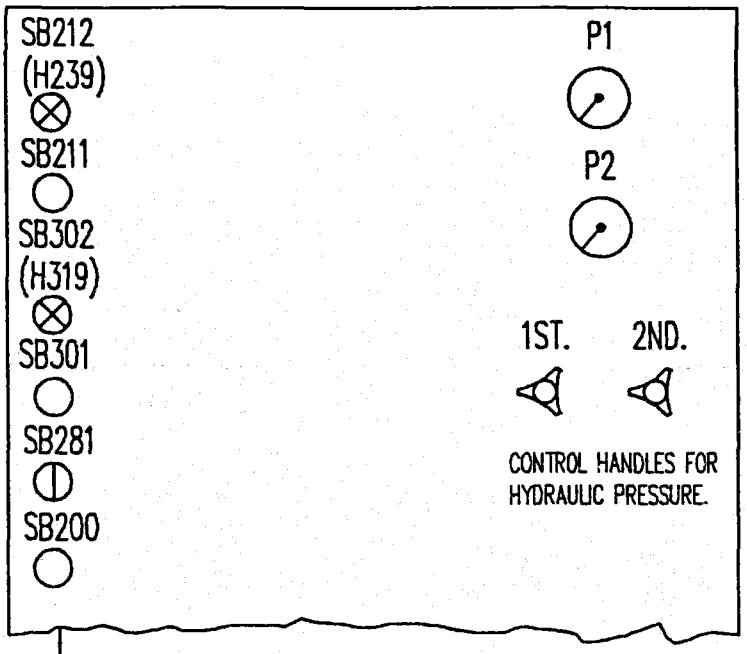
EL–KOMPONENTER
ELECTRIC COMPONENTS
EL–KOMPONENTEN
COMPOSANTES ÉLECTRIQUE

	Dato	Sign.	Erstatter
Tegn.	10/2–93	AS	Nr. Side
Kontr.			719274 4/5
Appr.			

Erstattet af

APV Rannie

FRONTPANEL RANNIE UNIT



SB212(H239) : MAIN MOTOR START, (MAIN MOTOR STARTING/IN SERVICE)

SB211 : MAIN MOTOR STOP

SB302(H319) : HYDRAULIC MOTOR START (PRESSURE ON, HYDRAULIC MOTOR)

SB301 : HYDRAULIC MOTOR STOP

SB281 : LOCKABLE CHANGE-OVER SWITCH (LOCAL - OFF - REMOTE).

SB200 : EMERGENCY STOP

P1 : PRESSURE GAUGE FOR HYDRAULIC PRESSURE. 1ST.STAGE

P2 : PRESSURE GAUGE FOR HYDRAULIC PRESSURE. 2ND.STAGE

CONTROL CABINET
INSIDE RANNIE UNIT

INTERLOCKING SIGNALS,
COSTUMER SUPPLIED.

SUPPLY FOR CONTROL SYSTEM
110V - N - PE - 50Hz
MAX. PREFUSE 4A 3 x 1 mm²

SUPPLY FOR HY-PUMP MOTOR,
CONNECTED THROUGH MOTOR STARTER,
3x415V - PE - 50Hz
MAX. PREFUSE 3x10A 5 x 1 mm²

M

HYDRAULIC MOTOR

3 x 1 mm²

L229

COOLING
WATER VALVE

3 x 1 mm²

L329

RELIEVE VALVE,
HYDRAULIC PRESSURE

2 x 0,5 mm²

-X3:

B

PRESSURE GAUGE FOR
HMG.-PRESSURE,
1ST.STAGE
ANALOG SIGNAL, 4-20mA.

EL-DIAGRAM, KOMPLET
COMPLETE WIRING DIAGRAMME
ELECTRISCHES DIAGRAM, KOMPLETT
DIAGRAMME DE MONTAGE ÉLECTRIQUE COMPLET

	Dato	Sign.	Erstatter
Tegn.	10/2-93	AS	Nr. Side
Kontr.			719274 5/5
Appr.			

Erstattet af

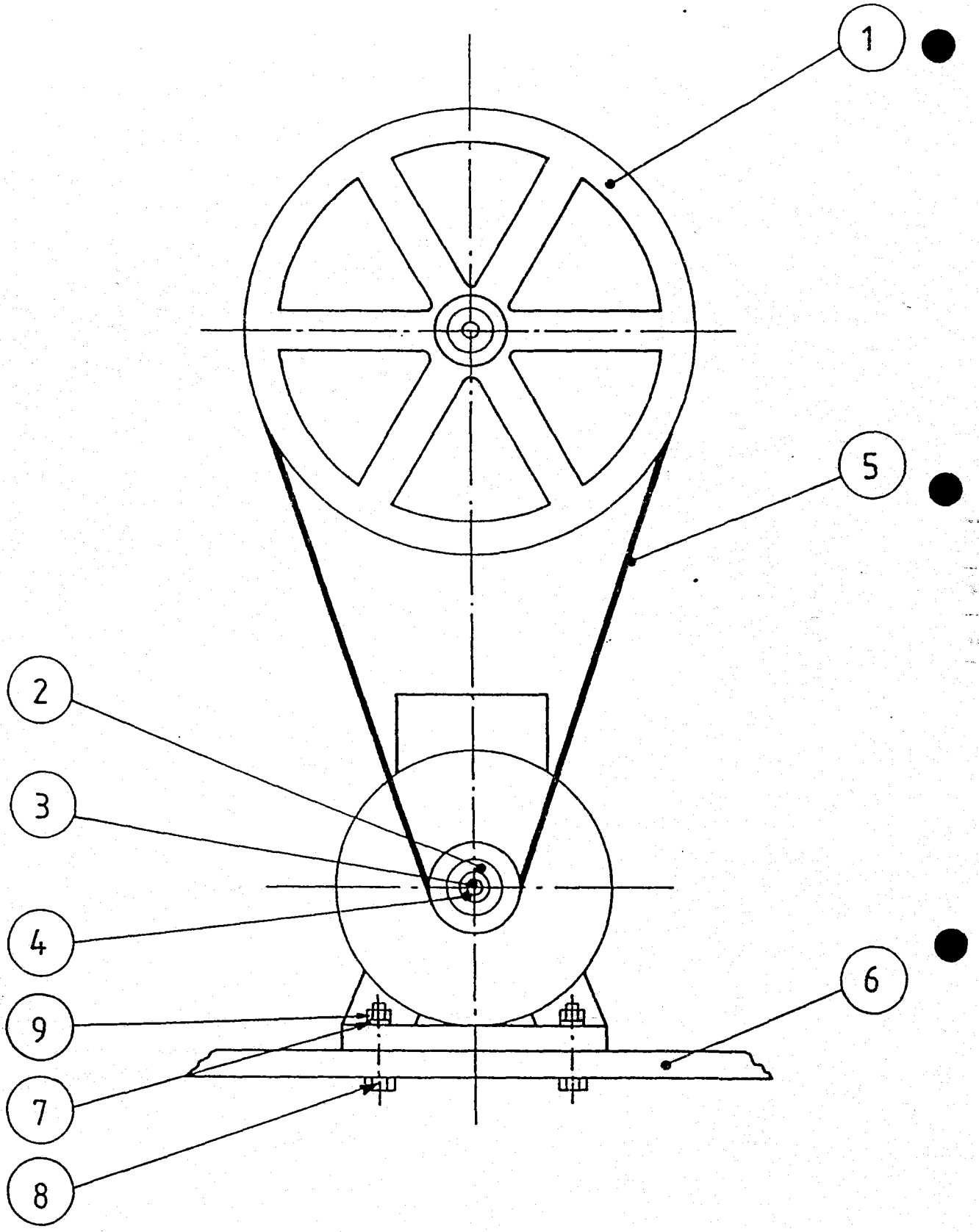
APV Rannie

DRAWING NO
719274 COMPLETE WIRING DIAGRAMME

POS NO	ORDER NO	QUANTITY	DESCRIPTION
	002155	45,000	Terminal
	002158	5,000	Terminal, earth
	002511	1,000	Wiring cabinet
	112826	1,000	Guard
1020	003706	1,000	Relay
1021	000994	1,000	Socket
1220	003706	1,000	Relay
1221	000994	1,000	Socket
1320	003706	1,000	Relay
1321	000994	1,000	Socket
2000	001185	1,000	Emergency switch
2001	001127	1,000	Pushbutton body
2002	003050	1,000	Name plate
2010	001610	1,000	Fuse terminal
2011	001614	1,000	Fuse
2020	001610	1,000	Fuse terminal
2021	001728	1,000	Fuse
2022	001611	1,000	End plate
2030	001238	1,000	Transformer
2110	001124	1,000	Pushbutton head
2111	001127	1,000	Pushbutton body
2120	001355	1,000	Illuminated pushbutton head
2121	002523	1,000	Illuminated pushbutton body
2190	000564	1,000	Relay
2191	000565	1,000	Socket

DRAWING NO
719274 COMPLETE WIRING DIAGRAMME

POS NO	ORDER NO	QUANTITY	DESCRIPTION
2290	000790	1,000	Coil
2291	000791	1,000	Plug
2390	001453	1,000	Incandescent lamp
2810	002803	1,000	Adjusting knob
2811	001126	1,000	Pushbutton body
2812	001481	1,000	Part of switch
2890	001277	1,000	Relay
2891	001278	1,000	Socket
2990	001277	1,000	Relay
2991	001278	1,000	Socket
3010	001124	1,000	Pushbutton head
3011	001127	1,000	Pushbutton body
3020	001355	1,000	Illuminated pushbutton head
3021	002523	1,000	Illuminated pushbutton body
3090	000564	1,000	Relay
3091	000565	1,000	Socket
3190	001453	1,000	Incandescent lamp
3280	003600	1,000	Terminal
3290	000791	1,000	Plug



TRANSMISSION
TRANSMISSION
TRANSMISSION
TRANSMISSION

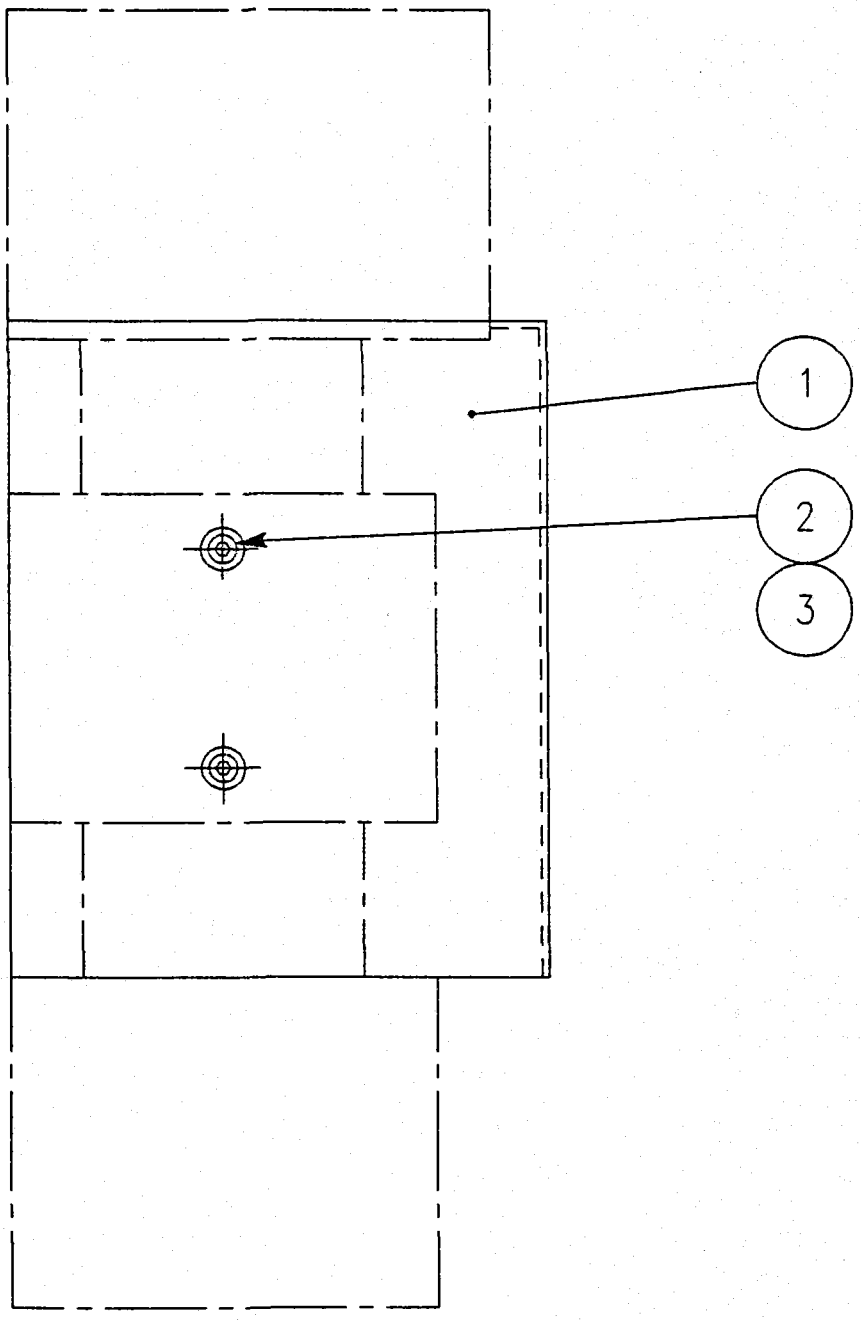
	Dato	Sign.	Erstatter
Tegn.	14/8-90	KJ	Nr.
Kontr.			
Appr.			1-93.109T

Erstattet af

APV Rannie

DRAWING NO
1-93.109T TRANSMISSION

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	109317	1,000	Pulley
0002	115794	1,000	Pulley stop
0003	002859	1,000	Hexagon head screw
0004	000869	1,000	Disc
0005	001906	7,000	V-belt
0006	115877	1,000	Motor bracket
0007	000472	4,000	Disc
0008	003293	4,000	Hexagon head screw
0009	001698	4,000	Nut



D.60

SIKKERHEDSSYSTEM
SAFETY SYSTEM
SICHERUNGSSYSTEM
SYSTEME DE SECURITE

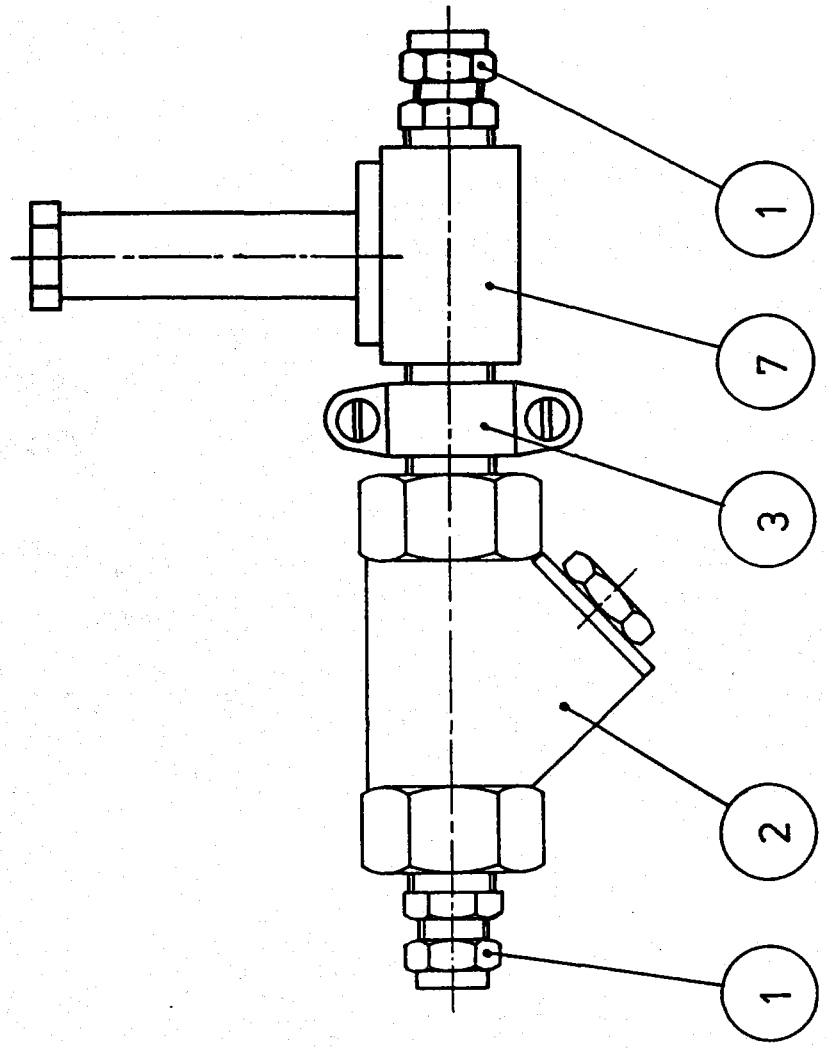
	Dato	Sign.	Erstatter
Tegn.	8/10-91	ÆL	Nr.
Kontr.			717811
Appr.			

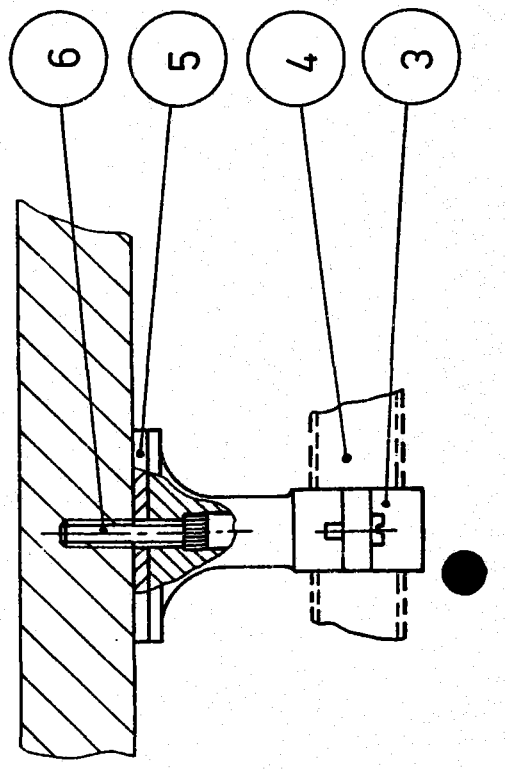
Erstattet af

APV Rannie

DRAWING NO
717811 SAFETY SYSTEM

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	117803	1,000	Guard
0002	001071	4,000	Cheese-head screw
0003	000692	4,000	Flexible disc





Snit A-A

ELSTYRING - KØLESYSTEM
ELECTRIC CONTROL - COOLING SYSTEM
ELSTEURRUNG - KÜHLSYSTEM
COMMANDE ÉLECTRIQUE - SYSTÈME DE REFROIDISSEMENT

	Dato	Sign.	Erstatter
Tegn.	18/10-88	OT	Nr.
Kontr.			714628
Appr.			

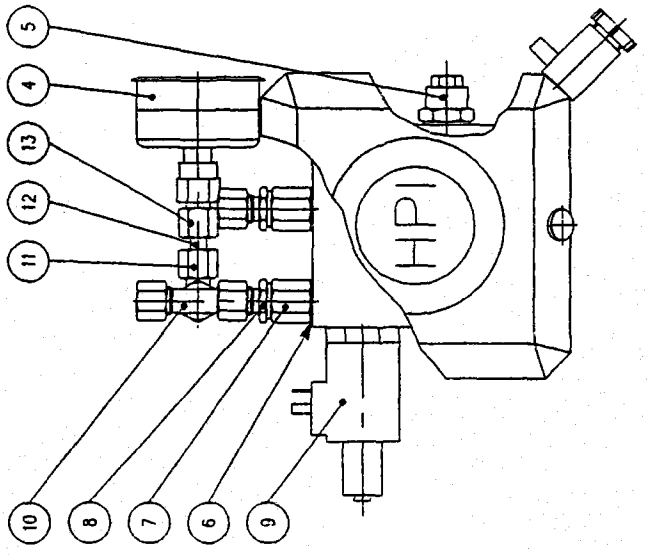
RANNIE

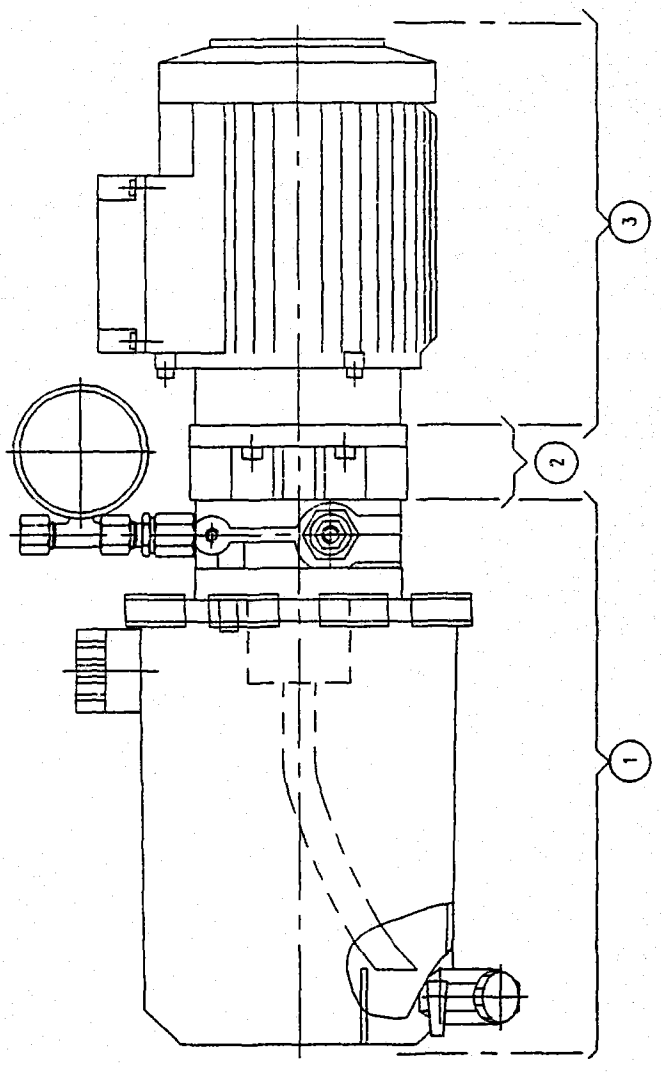
Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

Erstattet af

DRAWING NO
714628 ELECTRIC CONTROL - COOLING SYSTEM

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	000475	2,000	Screwed connection
0002	000225	1,000	Trap strainer
0003	000961	1,000	Pipe holder
0004	118202	1,000	Nipple pipe
0005	000472	1,000	Disc
0006	001020	1,000	Cheese-head screw
0007	000938	1,000	Solenoid valve





HYDRAULISK STATION
HYDRAULIC STATION
HYDRAULISCHE STATION
STATION Y D'HYDRAULIQUE

	Dato	Sign.	Erstatter
Tegn.	27-4-92	AEL	Nr.
Kontr.			718987
Appr.			

Erstattet af

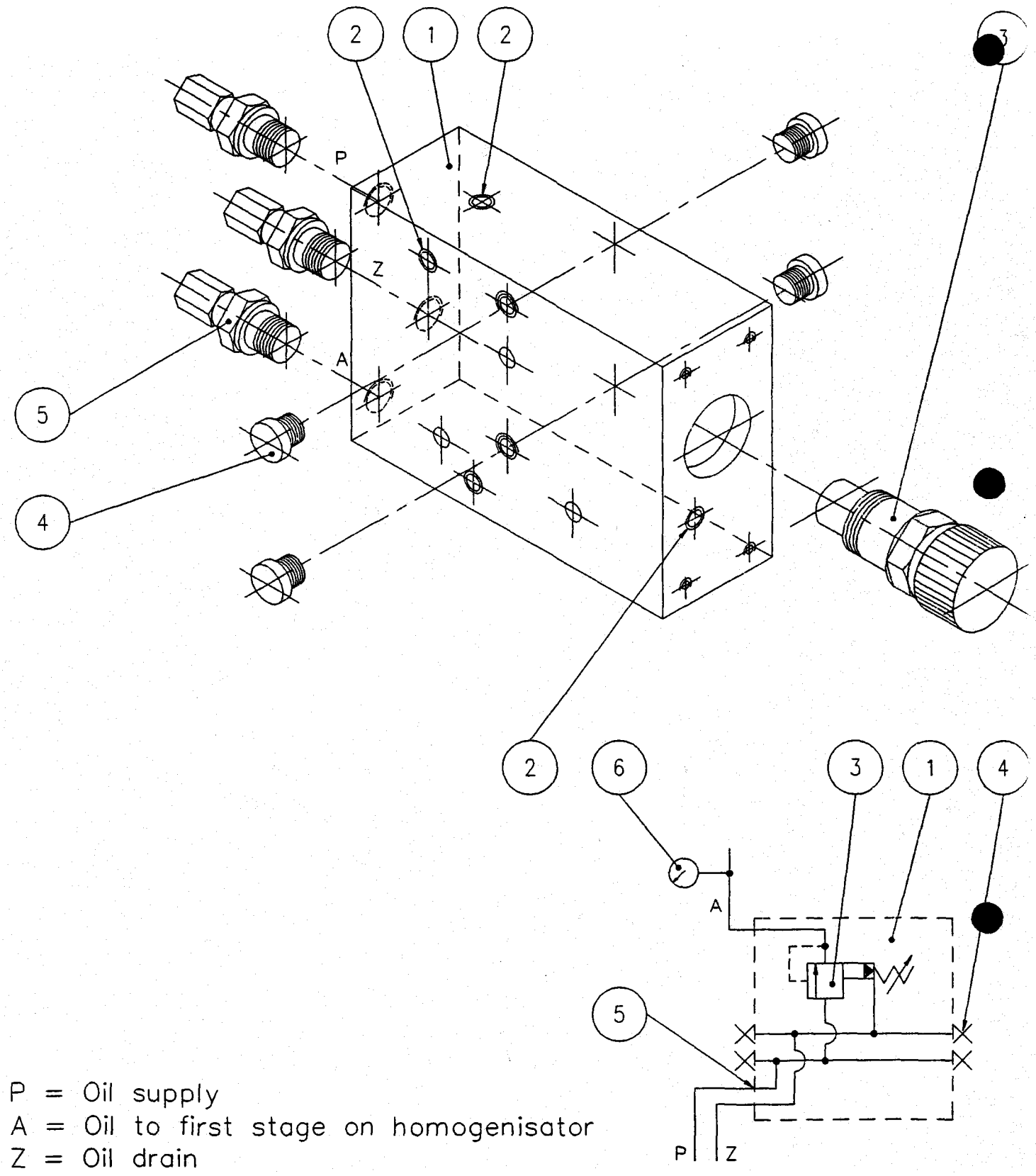
APV Rannie

DRAWING NO
718987 HYDRAULIC STATION

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0000	118991	1,000	Hydraulic system
0001	003510	0,000	Hydraulic station
0002	003512	0,000	Coupling
0003	003511	0,000	Motor
0004	002787	0,000	Pressure gauge
0005	118886	0,000	Pressure control valve
0006	003582	0,000	Copper ring
0007	003583	0,000	Screwed connection
0008	003584	0,000	Screwed connection
0009	003593	0,000	Solenoid valve
0010	002887	0,000	Screwed connection
0011	000349	0,000	Screwed connection
0012	203001	0,000	Pipe
0013	001181	0,000	Union nut

DRAWING NO
719265 HYDRAULIC SYSTEM

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	718985	1,000	HYDRAULIC SYSTEM
0002	719053	1,000	HYDRAULIC SYSTEM
0003	718887	1,000	FINE FILTER



P = Oil supply
A = Oil to first stage on homogenisator
Z = Oil drain

I-STAGE MANUEL 60 BAR

HYDRAULIKSYSTEM
HYDRAULIC SYSTEM
HYDRAULIKANORDNUNG
DIPOSITIF D'HYDRAULIQUE

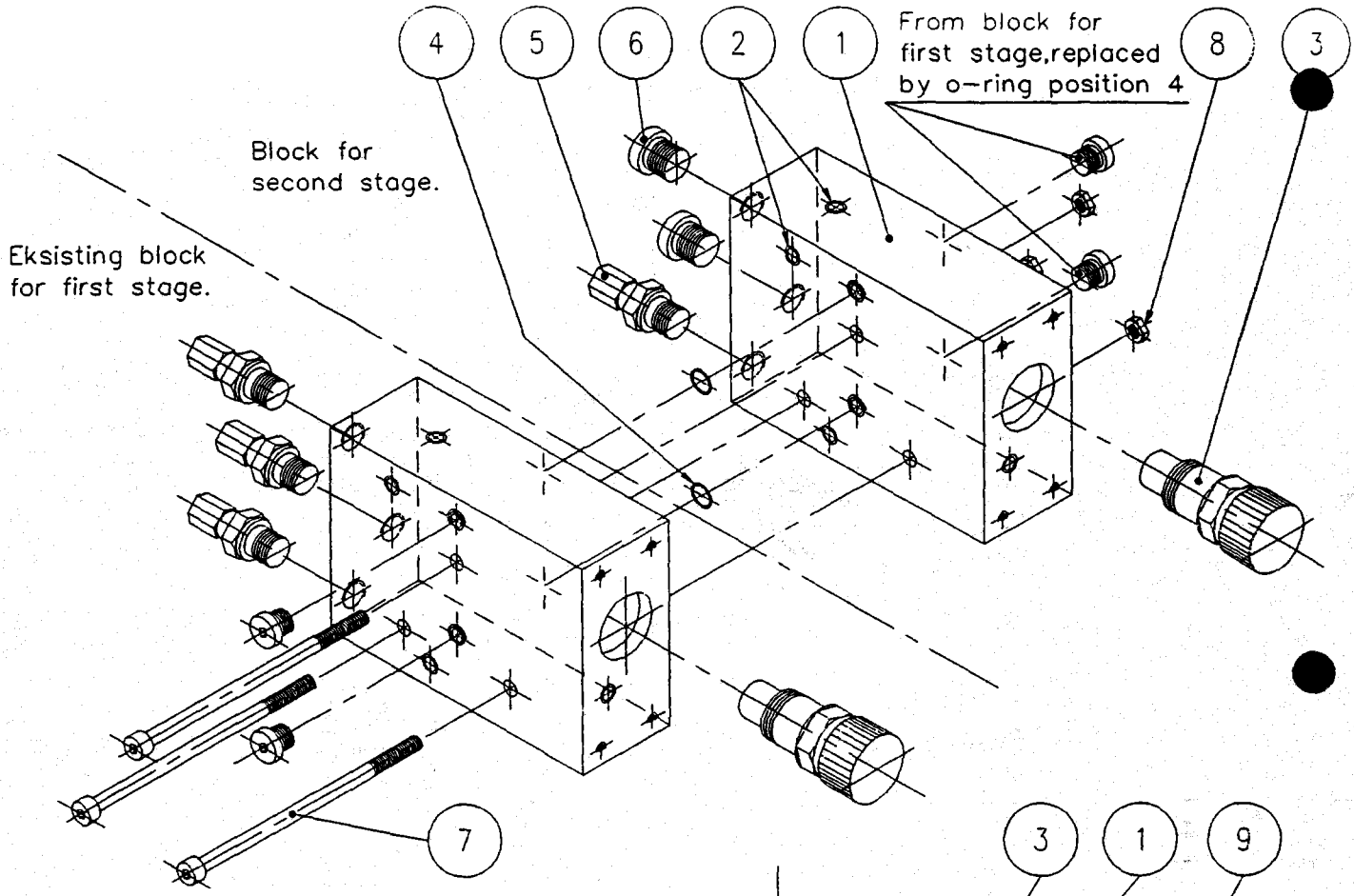
	Dato	Sign.	Erstatter
Tegn.	14-4-92	AEL	Nr.
Kontr.			718985
Appr.			

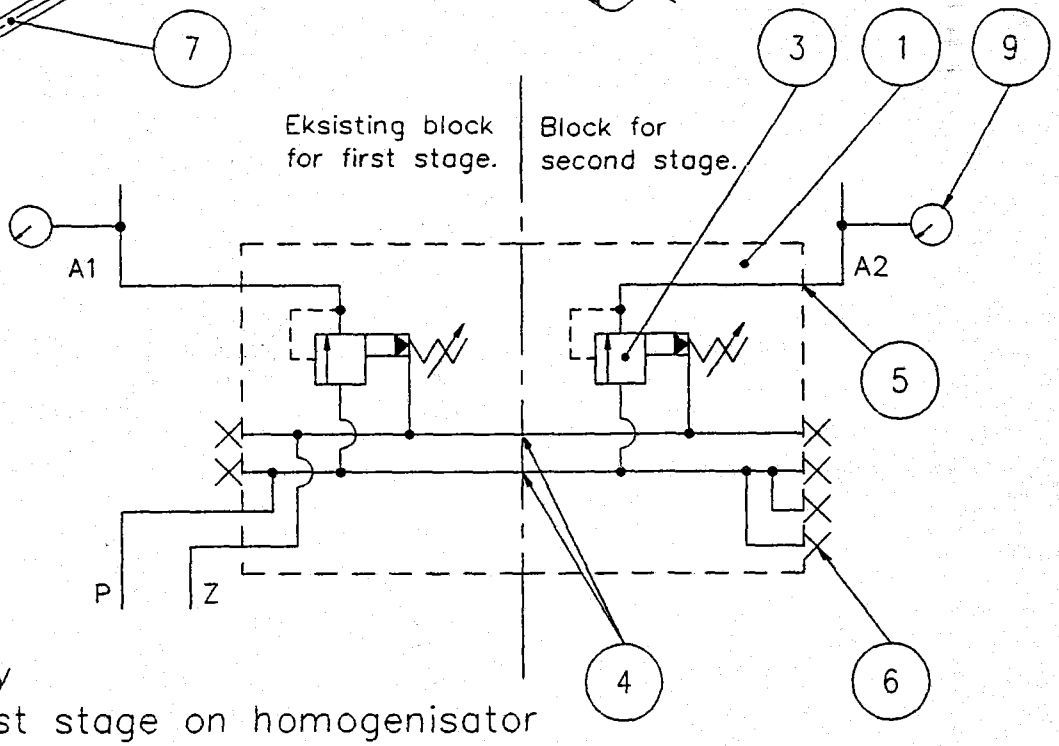
Erstattet af

APV Rannie

DRAWING NO
718985 HYDRAULIC SYSTEM

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	118879	1,000	Pressure control block
0002	003469	6,000	Bushing
0003	003580	1,000	Pressure control valve
0004	003544	4,000	Plug
0005	000171	3,000	Screwed connection
0006	000344	1,000	Pressure gauge





P = Oil supply
A1= Oil to first stage on homogenisator
A2= Oil to second stage on homogenisator
Z = Oil drain

2 STAGE MANUAL (60 BAR)

HYDRAULIKSYSTEM
HYDRAULIC SYSTEM
HYDRAULIKANORDNUNG
DIPOSITIF D'HYDRAULIQUE

	Dato	Sign.	Erstatter
Tegn.	26-5-92	AEL	Nr.
Kontr.			719053
Appr.			

Erstattet af

APV Rannie

DRAWING NO
719053 HYDRAULIC SYSTEM

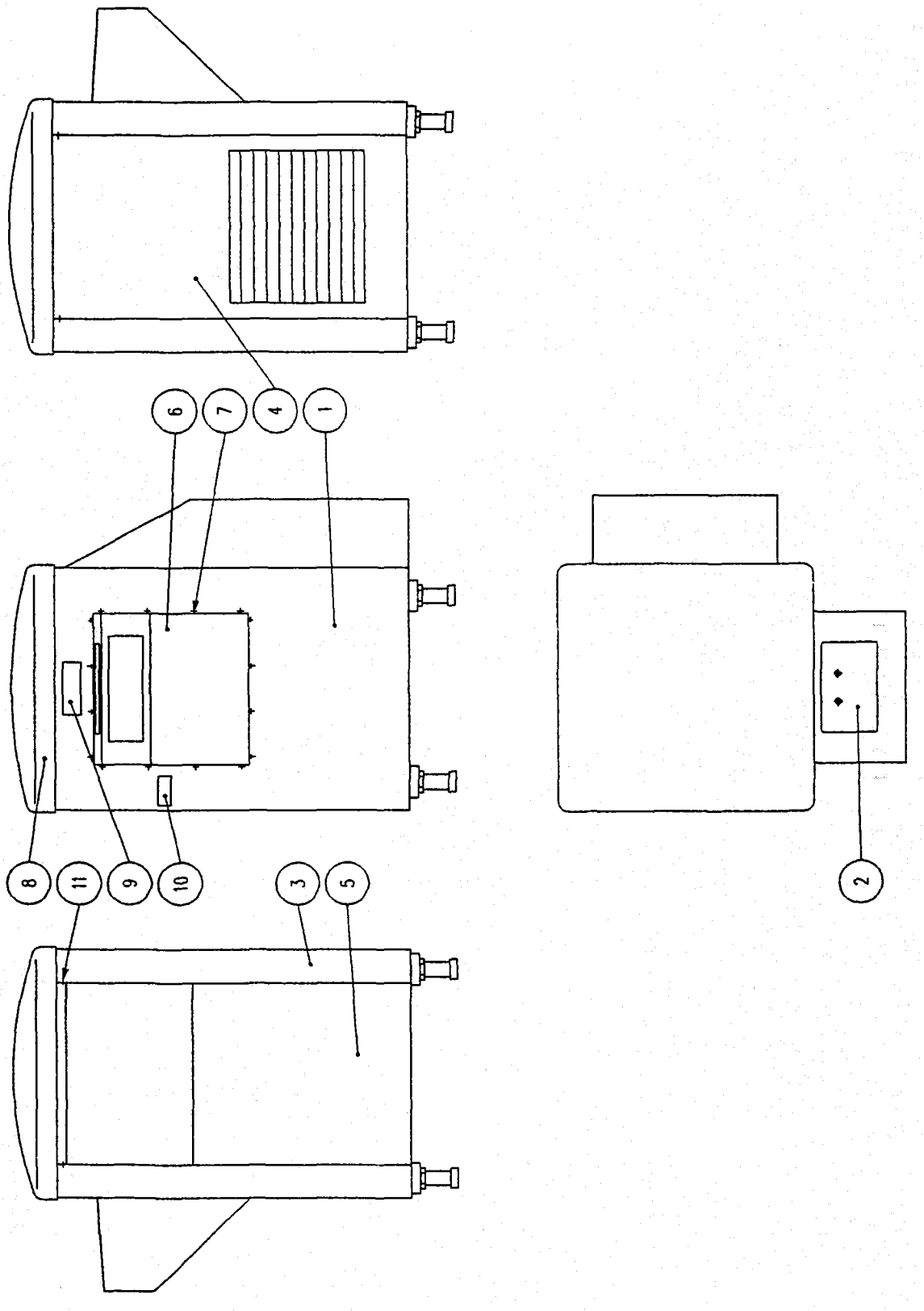
POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	118879	1,000	Pressure control block
0002	003469	6,000	Bushing
0003	003580	1,000	Pressure control valve
0004	000009	2,000	O-ring
0005	000171	1,000	Screwed connection
0006	000353	2,000	Plug
0007	003543	3,000	Cheese-head screw
0008	000771	3,000	Nut
0009	000344	1,000	Pressure gauge

DRAWING NO
718887 FINE FILTER

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	119012	1,000	Fine filter
0002	119010	1,000	Fittings

DRAWING NO
719266 HYDRAULIC SYSTEM

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	003595	2,000	Recess
0002	118996	2,000	Screwed connection
0003	205170	5,000	HYDRULIKSLANGE BE 704 - 1/4
0004	003507	8,000	Coupling
0005	203001	1,400	Pipe
0006	000349	6,000	Screwed connection
0007	002887	2,000	Screwed connection
0008	000604	2,000	Screwed connection
0009	118898	2,000	Fittings
0010	002594	8,000	Screw
0011	000774	8,000	Nut
0012	119264	1,000	Fittings
0013	001687	2,000	Hexagon head screw
0014	119267	1,000	Front plate
0015	119282	1,000	Fittings
0016	001191	4,000	Cheese-head screw



60 / 63.60

KABINET
CABINET
KABINETT
ARMOIRE

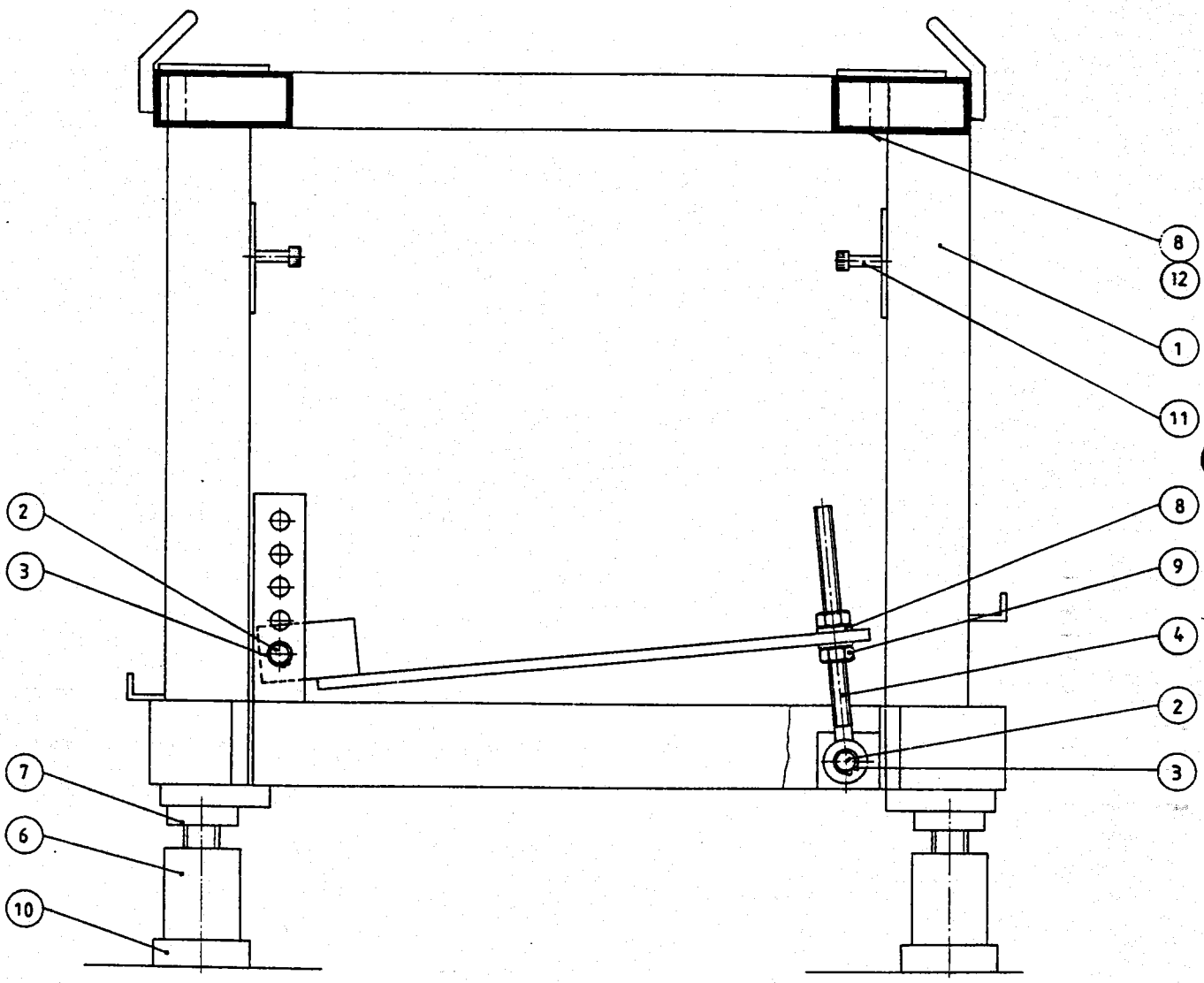
	Dato	Sign.	Erstatter
Tegn.	4/9-91	AEL	Nr.
Kontr.			718700
Appr.			

Erstattet af

APV Rannie

DRAWING NO
718700 CABINET

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	118593	1,000	Front plate
0002	110237	1,000	Cover
0003	109163	1,000	Back plate
0004	109161	1,000	Side plate
0005	117604	1,000	Side panel
0006	118591	1,000	Front box
0007	003122	16,000	Nut
0008	106039	1,000	Blue top
0009	116788	1,000	Name plate
0010	117184	1,000	Name plate
0011	000952	4,000	Nut



D.60 / 63.60

STEL
FRAME
RAHMEN
BÂTI

	Dato	Sign.	Erstatter
Tegn.	28/10-88	OT	Nr.
Kontr.			715093
Appr.			

Erstattet af

RANNIE

Rannie a/s
Roholmsvej 8
DK-2620 Albertslund
Denmark

DRAWING NO
715093 FRAME

POS NO	ORDER NO	QUANTITY	DESCRIPTION
0001	115094	1,000	Frame
0002	107699	4,000	Pin
0003	000470	8,000	Locking ring
0004	113663	2,000	Spindle
0006	108359	4,000	Foot
0007	000366	4,000	Lock nut
0008	000472	8,000	Disc
0009	001698	4,000	Nut
0010	108382	4,000	Supporting block
0011	000183	4,000	Cheese-head screw
0012	000921	4,000	Hexagon head screw
0098	715093V	1,000	SERVICE TOOLS