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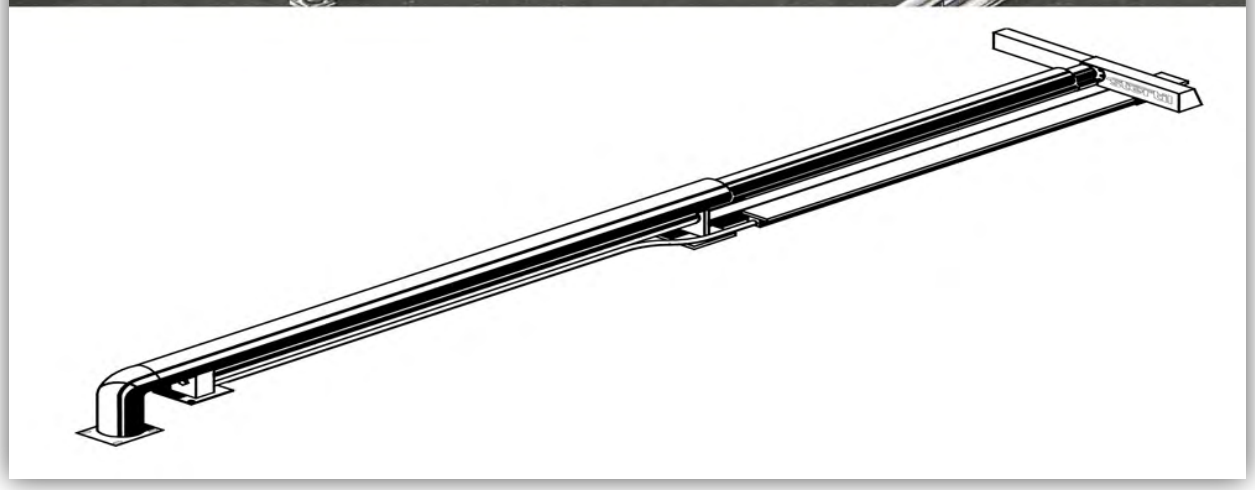
Ellickson Wheel Lock



Custom Made Quality Solutions.

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THE COMBILOK® FROM STERTIL GUARANTEES SAFETY

As a leading manufacturer of vehicle lifts and dockproducts Stertil realises only too well the importance of safety. That's why the *Combilok®* has been included in the dockproduct's portfolio. This is a new product, which has been completely developed by Stertil. The *Combilok®* is a restraint system for vehicles parked at loading bays for loading and unloading. In such places the communication possibilities between the driver in his cab and the personnel in the distribution centre are usually poor. Accidents can happen during loading. For example, a fork lift truck driver can still be busy loading while the vehicle is already starting to drive away. A *Combilok®* system can prevent such a situation. It can help you to guarantee the safety of your personnel and the condition of your goods and equipment.

Sensor searches position

The Stertil *Combilok®* is integrated in a wheel alignment guide through which the approaching truck becomes centred in the dockshelter and level in front of the dockleveller. Activation of the control system, which is installed in the building, makes a hydraulic cylinder move a wheel block in the direction of the truck's rear wheel. An in-built sensor determines the position of the wheel, and then the wheel block is automatically extended and pushed against the rear wheel thereby restraining the vehicle.

The wheel restraint principle makes the *Combilok®* suitable for all kinds of trucks.

The movement of the wheel block is accompanied by both an acoustic and an external optical signal. An optical signal also operates inside the distribution centre. This indicates whether or not the truck has been restrained. When the *Combilok®* is removed, a clear green light shows that the truck is free to leave the dock safely.

Microprocessor controlled

The wheel restraint's integral micro-processor ensures trouble free control. The processor offers various possibilities with regard to combined interlocks with docklevellers and/or overhead doors to enhance overall safety.

Anti-theft

Besides restraining a vehicle safely, the *Combilok®* helps to prevent theft.

Simply assembly with low costs

The *Combilok®* distinguishes itself by its above ground installation. This makes it suitable for both existing and new sites. The drive route is free of obstacles and drainage and expensive civil engineering provisions are not necessary.

ENGLISH

Contents **page**

1 GENERAL

1.1 MANUFACTURER'S DATA

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1.2 DOCUMENT DEFINITION

Stertil B.V. reserves the right to change the construction and/or configuration of its products at any time without being obliged to make such changes to products that have already been supplied. The data in this manual refers to the most recent information. The data can be changed at any time without prior warning.

The information in this manual is designed specifically for the intended user of the product. If the product, product parts or procedures are used in any other way than that prescribed in this manual, then approval should be obtained as to the appropriateness and suitability of such usage. No rights may be derived from either this manual or the documentation which is supplied together with the products. The order confirmation is exclusively binding.

This manual contains useful and important information about the correct operation and maintenance of the product. This manual also contains important instructions for the prevention of possible accidents and serious damage during machine operation. We have done our utmost to ensure that this manual is correct. Should you find any errors or missing information, please bring this to our attention.

1.3 WHO IS THIS MANUAL INTENDED FOR?

This manual is intended for persons who install, use and/or maintain/repair the Combilok.

1.4 GUARANTEE AND LIABILITY

See the terms of delivery and the order confirmation.

1.5 ENVIRONMENTAL ASPECTS

The owner and/or user of the Combilok is responsible for the removal of waste materials (oil, etc.) in accordance with the statutory legislation or regulations that are in force.

1.6 REMOVAL OF THE COMBILOK

At the end of the operational life of the Combilok, the owner and/or user is responsible for the safe disassembly of it and for the removal of the parts, in accordance with the statutory legislation or regulations that are in force.

1.7 TECHNICAL DETAILS

See also the type plate on the control box. For the model of the type plate see 6.2

Model	**Combilok**
Serial no.	
Pressure relief valve	210 Bar
Length of stroke	3250 mm
Net stroke	2800 mm
Stroke lateral movement	400 mm
Pressure switch blocking	50 Bar
Power blocking	14 kN(=1400 kg.)
Pressure switch releasing	190 Bar
Power releasing	15.5 kN (=1550 kg.)
Electrical capacity	2.2 kW
Mains connection	3 x 400V, 50 Hz, 1 x nil,1 x earth 3 x 230V, 1 x earth
Mains fusing	3 x 16 A
Control voltage	24 V=
Potential free contact	max. 150 V=, 30 W of 125 V~, 60 VA
Time needed for locking	30 sec.
Setup	Outside (hydro-unit & control box inside)
Total length	7500 mm
Length needed for dock	ca. 8500 mm
Height	350 mm (450 mm option)
Noise level	74 dB(A)

1.8 LOCKING SYSTEM

The Combilok is a fully hydraulic vehicle locking mechanism with integrated wheel guidance, fitted with cylinders for making a longitudinal and lateral movement. During the longitudinal movement the locking mechanism is positioned in relation to the wheel of the vehicle.

The locking mechanism is used at loading and unloading platforms, where vehicles are loaded and unloaded with the back facing the dock. The locking mechanism positions a block in front of the rear wheel of the vehicle so that it is 'clamped' is between the platform and the block.

The locking device and the hydraulic unit are normally mounted at the driver's side. In the starting position, the longitudinal guide system is extended (the hydraulic cylinder is telescoped out) so that this section also has a wheel guide function when the vehicle reverses. The transverse movement block has been slid in, so that there are no obstacles in the vehicle's track. The control box is positioned on the drivers side inside the building. The traffic light is also on the drivers side but outside on the wall of the building. In order to guarantee the correct positioning of the vehicle, a standard wheel restraint is mounted on the drivers' side.

The locking mechanism is automatically positioned in relation to the rearmost wheel of the vehicle in a longitudinal direction. A block with a height of approximately 350 mm is pushed in front of the detected wheel by means of a laterally extendible mechanism. The longitudinal movement pushes the block against the wheel. The vehicle is then locked and the system must firstly be returned to its starting position before the vehicle can depart.

The functions are supported on the control box by indication lights and pictograms, and from outside by means of a traffic light indicating that the platform is free for docking or departure.

The Combilok is fitted with a microprocessor steering mechanism which ensures that:
- the rearmost wheel is automatically localised and blocked by means of button operation.
- if required, the pressure on the wheel is monitored and corrected.

And, if combined with a hydraulic dock leveller:
- Electrical locking ensures that the dock leveller **cannot** be used before the wheel of the vehicle is locked.
- Electrical locking ensures that the vehicle **cannot** be unlocked when the dock leveller is in operation.

The Combilok can be used as a 'stand-alone' unit. The use of this requires a certain amount of discipline (do not load when the red indication lamp is on).
A higher level of integration can be achieved by connecting the control to that of the dock leveller. To achieve this integration, use is made of the 'door' contact of the dock leveller (in Stertil products what is known as the 'D-D' contact), and an extra switch is mounted on the leveller to scan the neutral position (a limit switch with N.O. contact under the "Cross Traffic Legs").

2 OPERATION

2.1 GENERAL

The Combilok should only be used for locking vehicles that are loaded and discharged from the rear side on a loading/discharging platform.
The Combilok may only be operated by personnel appointed by the company management.
The Combilok prevents vehicles from rolling forward. It is possible (in the event of a small load and/or sufficient drive torque from the vehicle) to drive over the wheel block. Under normal circumstances the driver will find that there is sufficient resistance against the vehicle rolling back.
Under normal usage conditions the Combilok offers sufficient protection against (premature) moving off or gradual rolling back of vehicles.
The device has a preventative function against theft attempts. However, it is not intended as protection against theft.
In the event of a malfunction, or when the activities have been completed, the main switch must be put into the 0 position. It is only possible to render the Combilok voltage-free by switching off the main switch.

2.2 OPERATING INSTRUCTIONS

To gain a better understanding of the locking system see para 1.8. Read the general instructions in para 2.1. first.
Vehicles should be docked (with open rear doors) on the rear side. In order to avoid wearing out the fender rubbers on the vehicles and/or the platform, some space can be left between the vehicle and the leveller. It is advisable to use moveable bumpers on the dock to minimize wear of the bumpers. According to normal procedure, the parking brake of the truck is engaged.
The free space for the rear wheels must be 400 mm in height and 250 mm in length. This space is needed for pushing the block in. If this clearance is not provided for, the transverse movement slide-out piece will jam. Then, an operating time control facility ensures that the Combilok takes up the alarm position.

Operation of the Combilok takes place inside the building (see control panel fig. 2 A). Because there is no overview of the vehicle to be locked, a choice has been made for an automatically operating system.

The mains voltage is passed to the system when the main switch is turned to position I. The control voltage is switched on by pressing button 4 'control voltage' once.

1. Main switch
2. Lock vehicle
3. Release vehicle
4. Alarm out/control voltage in
5. Alarm beeper
6. Lamp green loading/unloading
7. Lamp red loading/unloading forbidden
8. Lamp yellow release for dock leveller
9. Emergency stop

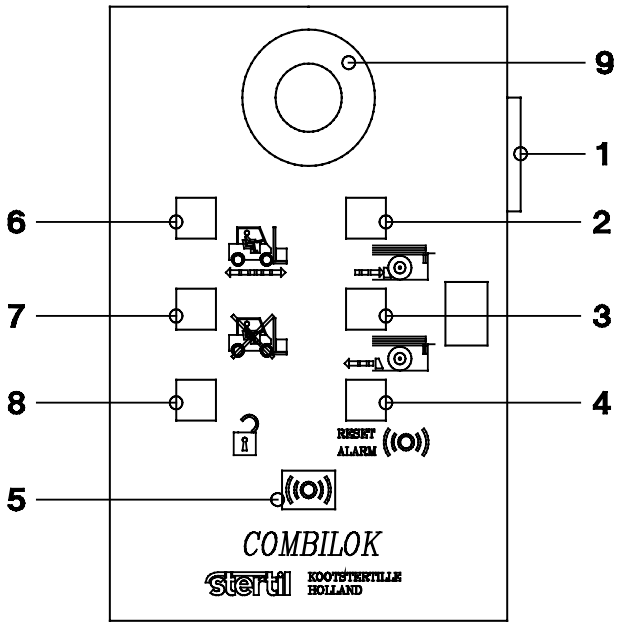


Fig. 2A, Control panel

To block the vehicle, button 2 'block vehicle' must be pressed 1x. The red lamp 7 'loading/unloading forbidden' will now flash. As soon as the vehicle has been locked (after approx. 25 sec.) the green lamp 6 'proceed with loading/unloading' will come on.

The dock leveller is now released and can be positioned. The yellow lamp 8 'release by dock leveller' on the control panel will go out. After use, the dock leveller must be put back in the starting position.
The yellow lamp 8 'release by dock leveller' on the control panel will come on, indicating that the locking of the vehicle can now be discontinued.

For alarm (interrupted noise signal)

The alarm can be reset by pressing button 4 'alarm out/control voltage in'.
The Combilok remains in the position in which the malfunction occurred.

Before the Combilok is put back into operation, the user must check that there are no obstacles or persons in the area of the Combilok that have caused the malfunction.

By operating button 3 'release vehicle' the Combilok is returned to its starting position.

In the event of faults see para 5.2, the trouble shooting.

3 INSPECTION AND MAINTENANCE

The hydraulic oil must be changed 1x per 2 years. The correct oil types are:
- Mobil AERO HFA
- Texaco Aircraft Hydr. Oil 5606G

or an equivalent that fulfils the specification MIL-H-5606A/G. The content of the tank is 10 ltr.

The Combilok should be rendered voltage-free during inspection and maintenance.
For this purpose the mainswitch should be turned to the 0 position.
The voltage can only be returned to the control box if this is required for certain adjustments and checks.

3.1 DAILY (BY USER)

- Check for visible damage.
- Check for oil leakage from the hydraulic unit, the cables and the cylinders.

3.2 MONTHLY (BY USER)

- Check the oil level. This must be checked with retracted lateral and longitudinal cylinder. The cylinders can be manually operated using internal pressure buttons (see para 4.3 putting into operation).

3.3 ANNUALLY (BY SERVICE DEPARTMENT)

The user should have the Combilok checked once a year by the Stertil service department or another service department recognized by Stertil (both to be further referred to as 'the service department'). For this **annual inspection** a **maintenance subscription** can be entered into with the service department. If a maintenance subscription is not entered into, the user himself should make an annual appointment for this inspection and maintenance service. This inspection is **signed off** on the **inspection checklist** (see page 74).

The inspections of the part with the lateral extendible unit (setting limit switches, operation of wheel sensor, inspection of slide blocks) can best take place when the end caps (see fig. B3 and B9) are removed.
The lateral cylinder can be pushed in and out using the internal operation (see para 4.3). The following actions must be taken:

- Check as described under "daily" and "monthly".
- Check the Combilok for loose anchors.
- Check the plastic slide blocks of the rail guidance for wear, the black plastic slices (see fig. B12) new 5 mm, min. thickness 3mm. Check the black plastic blocks (see fig. B4) for visible damage.
- Visually check the wear of the plastic slide blocks on the lateral extendible unit, the black plastic slices (see fig. B12) new 5 mm, min. thickness 3mm.

- Check the operation and setting of the limit switches according to para 4.3.1.
- Check the functioning of the pressure switches according to para 4.3.1.
- Check the operation of the wheel sensor according to para 4.3.1.
  If necessary, clean the lens of the sensor with a soft cloth.

4 ASSEMBLY AND PUTTING INTO OPERATION

4.1 GENERAL

The assembly of the Combilok is carried out by the service department.

4.2 ASSEMBLY

4.2.1 Foundation directions (fig. I, right model), (fig. J, left model)

The Combilok must be placed on a level foundation of concrete (200 mm) or on a level plate made up of Stelcon plates (the plates must have been down for approx. 1 year or are laid in stabilised and compacted sand. In the case of asphalt or clinkers a concrete foundation should be poured according to fig. I and J).

The fixed part of the Combilok should be set up according to fig. I and J. The holes of the Combilok are used as a drilling aid.

Thickness of concrete foundation	: 200 mm floor foundation according to fig. I and J
Concrete quality	: B25 - DIN 1045
Reinforcement	: min. 2 mats 150 x 150 x 8, qual. QRN 48
Finishing	: mechanical levelling or plane level.
Concrete volume strip	: 4,0 m³ (Combilok and wheel control)

The reinforcement must not inhibit the fitting of the anchors (see fig. I and J). Both spreading anchors and chemical anchors can be used for mounting the Combilok. The anchors must be positioned according to the instructions supplied by the manufacturer.

Spreading anchors	: 13 x. UPAT EXA 16/10 GV2, drill 16 mm

It is the responsibility of the user to indicate whether the concrete floor is of adequate quality.

4.2.2 Construction

- The Combilok is supplied pre-assembled.
- The Combilok is positioned according to fig. I and J.
- Leave the rail on the Combilok until the Combilok is positioned at the right place.
- Install the rail (A11), slide the rail between the steel angles of the transverse guide, slide the rail on the pipe with hoses and cable, with the hose towards the cylinder head in the square opening; do not yet fasten the rail (see 4.3.2.).
- The holes from the base plate can be taken over with a Ø16 mm concrete drill. Drill under a small angle, the drill will just pass along the Combilok. Fit expanding anchor bolts and tighten.
- Place the bend (A8) and drill holes Ø16, so that after fitting of the anchor bolts the bend can be slid outwards (see detail fig. A)
- Saw the tube (A4) to size.
- Pull the four hoses and the control cable through the rail and the tube.

4.2.3 Hydraulics

- Fit the support of the hydraulic unit to the wall by means of 4 coach screws M8 x 50 and 4 S10 plugs.
- For walls consisting of sandwich panels etc., fastening will have to be decided on in-situ.
- Hang the hydraulic unit on the support and tighten the two M10 bolts.
- Remove the swivels with ball from the unit and screw the end covers from the hoses. Fit the hoses according to the codes on the hoses and the valve casing (see fig. G).

- hose with code "Long Out (A)" to the 10 mm coupling on the "A" side of the valve casing.
- hose with code "Long In (B)" to the 10 mm coupling on the "B" side of the valve casing.
- hose with code "Lat In (A)" to the 6 mm coupling on the "A" side of the valve casing.
- hose with code "Lat Out (B)" to the 6 mm coupling on the "B" side of the valve casing.

N.B.: The hose "Lat Out (B)" can be fitted easily when the magnet coil is removed temporarily; this can be done by loosening the plastic nut in front of the magnet coil.

- The hand-operated valve must be shut, with the handle positioned transversely to the pipe connections. Using this valve, pressure can be removed from the system in the event of a power breakdown.
- Remove the plug from the filling opening of the tank and replace it by the breather cap supplied with the equipment.

4.2.4 Electrical installation

- The control box must be fitted with a fused mains supply. As an alternative, the supply can be drawn from the dock leveller control box.
- Connect the terminals 1,3,5 and 7 and the ground wire provisionally to the power available on site according to the electrical circuit diagram (fig. 4A).
- Mount control box (fig. 2A).
- Install the electrical cables, generally according to the electrical diagram (fig. 4A), and use the swivels according to the swivel connections (fig. 4B).
- Connect the signal cables (fig. 4A).
- Mount the limit switch on the C.T.L. (Cross Traffic Leg) of the dock leveller. The switch is mounted in such a way that the contact is made at the moment that the dock leveller is in the stop position.
- Fit the control cable between the control box of the dock leveller (door contact "D-D") and the "release dock" contact of the Combilok. If a door contact has already been connected to the "D-D" contact, then "release dock" works in series with the door contact according to the leveller box connection (fig. 4D).
  This contact must not allow more current and capacity than indicated in para 1.7. **230 VAC must not be switched through under any circumstances**. If the control voltage of the dock leveller is 230 VAC, an auxiliary relay must be placed in the dock leveller control box according to the connection diagram for auxiliary relay (fig. 4C).
- Place the outside light indication on the wall of the building so that the driver can see it clearly when reversing, i.e. ± 2000 mm high on the driver's side of the dock. Connect the light according to the colour coding: LR on the red wire, LG on the green wire, N on the blue wire and green/yellow on earth.
- Fit the yellow/green ground wire (E8) between motor and motor support.

4.3 PUTTING INTO OPERATION

4.3.1 General

The control is of the dedicated control type (i.e. is only suitable for the Combilok) with a OTP (One Time Programmable) microprocessor (a calculation unit) and a number of fixed I/Os (Inputs/Outputs).
On the outside of the control box there are a number of pressure buttons and indication lamps for the automatic execution of the locking program. The control box contains a number of microswitches for the manual execution of the four movement options. The text next to the buttons indicates which movement is being executed. There are also a number of LEDs for detecting the non-visible inputs (the limit and pressure switches, the wheel sensor, the release contact), all of which are designed to simplify putting into operation and fault analysis. The cables are colour-coded and are connected to the connection terminals provided with text according to the electrical circuit diagram (fig. 4A).

Before automatic starting, the following inputs and outputs are tested:

Checking the outputs (see fig. 2A and fig. 4A)

- Turn the main switch on.
- Press the 'reset alarm' button, this switches on the control voltage.
- Press the 'long out' button of the internal operation. The longitudinal cylinder now goes out. Hold in the button until the cylinder is completely out.
- Press the 'long in' button. The cylinder now goes in.
- Do the same with the lateral cylinder using the 'lat in' and 'lat out' buttons.

If necessary, replace the hoses and/or the plugs of the valves.

Checking the inputs (see fig. 2A and fig. 4A)

- Check the operation of the wheel sensor. Mask off the hole in the plastic block on the top of the Combilok. Check that LED D11 (wheel sensor) is on.
- Using the button 'lat in' guide the lateral cylinder in until LED D12 (limit switch on) goes **out**.
- Using the button 'lat out' guide the lateral cylinder out until LED D13 (limit switch off) goes **out**.
- Using the button 'long in' guide the longitud. cylinder in until LED D14 (press. switch released) comes on.
- Using the button 'long out' guide the longitud. cylinder out until LED D15 (press.switch blocked) comes on.
- Operate the limit switch for release on the C.T.L. of the dock leveller, so that LED D16 comes on.

Checking and adjusting the wheel sensor

The range of the wheel sensor, with the cross-head fully retracted, is Ex Works set to a maximum of 50 cm. When checked, this value should be 40 up to 50 cm, absolutely not more!
The switch point can be checked by moving the hand or a subject in front of the hole of the sensor in the plastic block, starting at about 70 cm and then moving towards the sensor. At the moment the sensor switches, a click is heard in the control box and LED 11 (wheelsensor) starts lighting. The range of the sensor can be adjusted with the adjusting screw on top of the housing. Turning to the left (towards NEAR) decreases the range, turning to the right (towards FAR) increases it.

Setting the DIP switches

The following DIP switch settings can be made (see fig. D).

Release (through dock) function (switch 1). With the switch in the right hand position, the neutral position of the dock leveller is scanned with the connected limit switch. The Combilok will not function as long as the contact on clamp 1 and 11 is not made. With the switch in the left hand position, this contact is bridged and the Combilok functions independently of the dock leveller.

Pressure monitoring (switch 2). At the moment that the wheel is pressed by the Combilok, the pressure stops at a set pressure. With the switch in the left hand position, the pressure stops when the set pressure is reached. The pressure on the wheel is maintained by means of a non-return ball check valve. This pressure is not monitored. With the switch in the right hand position the set pressure is also stopped. The pressure on the wheel is maintained by means of a non-return ball check valve. If the pressure drops, the pump will switch on until the set pressure is reached again.

Inversion switch (switch 3). Set in position on the right. In left position, "release dock" ("D-D") is turned into a normally closed contact.

Release (of dock 'D-D') function (switch 4). With the switch in the right hand position, the dock leveller (if connected by means of contact 'D-D') is released at the moment that the vehicle is locked.
With the switch in the left hand position the dock leveller is continuously released (service position dock leveller).

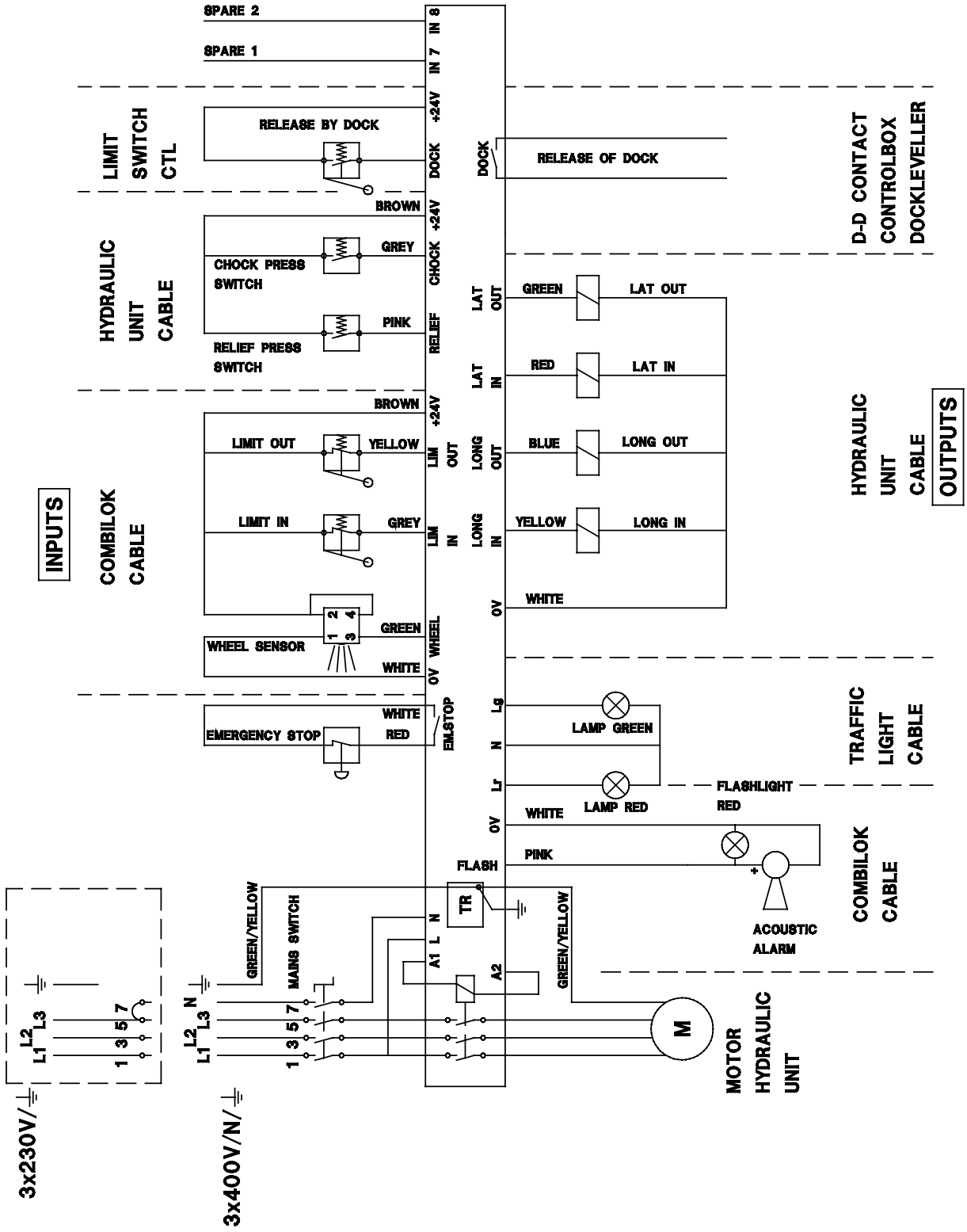


Fig. 4A, Electrical diagram

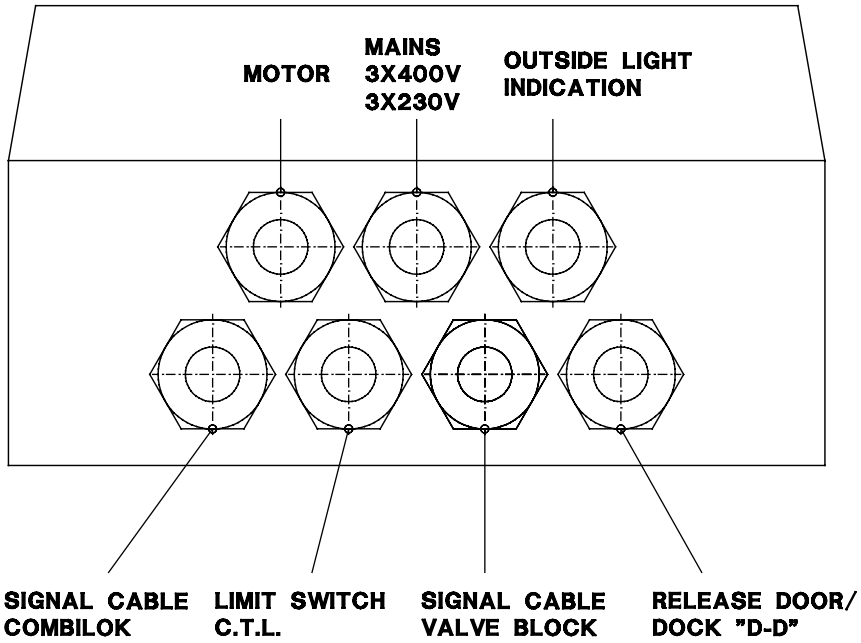


Fig. 4B, Swivel connections

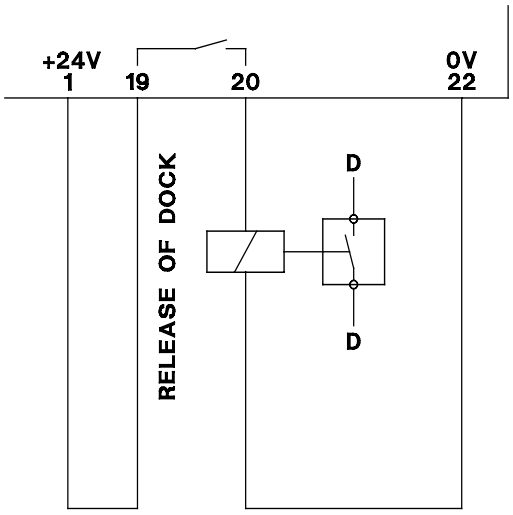


Fig. 4C, Auxiliary relay

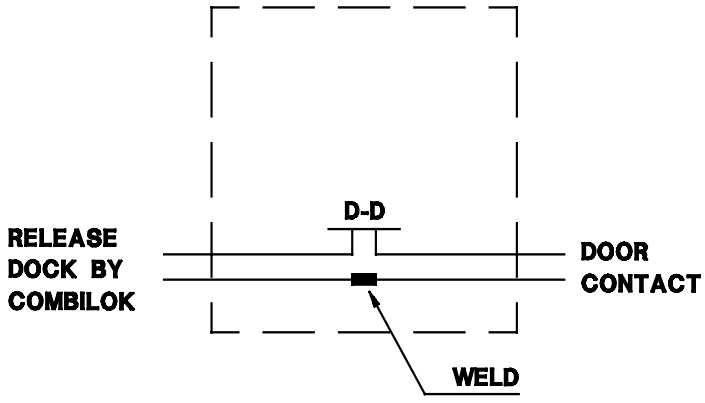


Fig. 4D, Connection leveller box

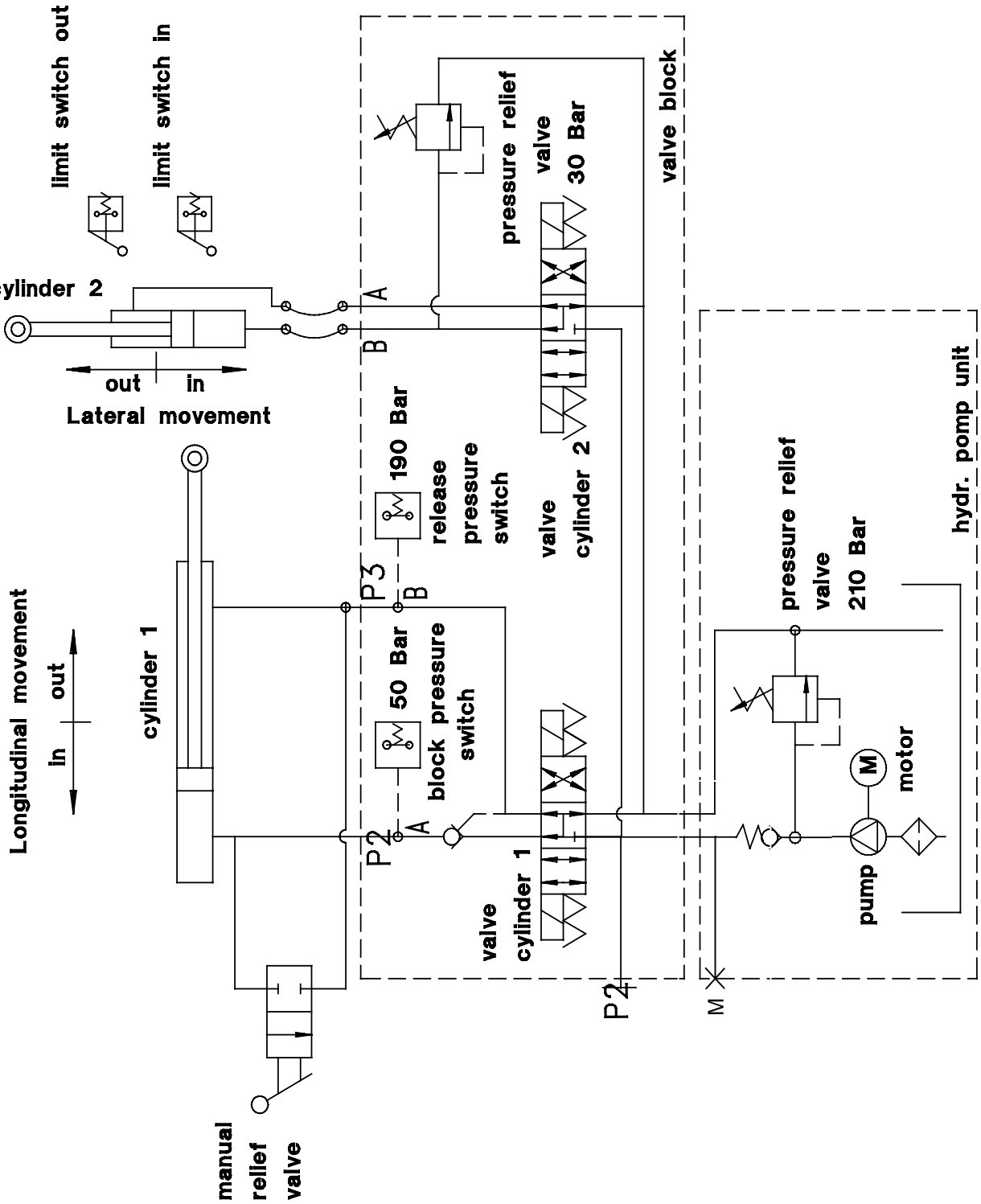


Fig. 4E, Hydraulic diagram

4.3.2 Finishing

- Using the internal pressure buttons 'long in' and 'long out' set the lateral guide at the beginning, half-way and at the end of the stroke. Check the play between the fixed and the moveable tube. The play must be the same in all three positions. It may be necessary to equalise the play using filling plates. Also check longitudinal positioning
- Using ' long in' and 'long out' place the lateral guide in the middle. Using a Ø16 drill take over the holes in the rail. Position the anchors and fasten them.
- Remove the foot protecting plate (B1 and B13) and fit the guides (B4), adjust the clearance between guides and rail to approx. 1 to 2 mm by means of the slotted holes. Reinstall protecting plates.
- Using 'long in' and 'long out', again check the play all around.
- Fasten the control and hydraulic hoses using cable bands.
- The hoses are of a standard length; if they are too long, they can be hung rolled up around the hydraulic unit before the casing is installed.
- The Combilok can be permanently connected to the mains by a recognized mechanic. If connection is made to a 3 x 400V without neutral conductor, the Combilok will not function.

4.3.3 Start-up

The Combilok is ready for use. Park and lock the vehicle according to the operating instructions (see para 2.2.).

5 SERVICE

5.1 GENERAL

NB: all activities carried out by persons other than those of the service department and the consequences of such activities are entirely at the Combilok user's own risk.

The fault diagnosis below can be used for localising defects. In the event of doubts the user should contact the service department.

5.2 TROUBLE SHOOTING

COMBILOK DOES NOT LOCK OR BLOCK		
A.	No mains voltage.	See relevant table.
B.	No control voltage.	See relevant table.
C.	Combilok not in stop position.	Press 'Release vehicle' button 1 x.
D.	Release dock not present (green light at symbol is out).	Dock leveller is not in stop position or door is not closed.
E.	Oil level too low.	Top up, see inspection and maintenance chapter 3.
F.	Air in pump (only possible after the tank has been empty).	Open the by-pass valve (place handle in line with pipe) and operate internal 'long out' for 1 minute.
G.	Max. pressure valve opens against overload.	Max. pressure not set correctly; have service department set correctly.
H.	Pump has too little yield.	Have pump replaced by service department.

FAILURE COMBILOK DURING LOCKING		
A.	Stops during longitudinal movement.	Press button "reset alarm" once to silence alarm. Press "release truck" button once to bring Combilok in starting position. Press "block truck" button once to lock. With repeated failure call in service department.
B.	Stops at the end of the longitudinal movement.	No wheel signalized during locking movement. If required, clean the lens of the sensor with a soft cloth. The range of the wheelsensor is possibly not adjusted correctly. Check and eventually adjust as described in paragraph 4.3.1. Furthermore same procedure as A.
C.	Transverse movement started but not completed.	Transverse guide jammed due to obstacle. Check clearance behind wheel. Furthermore same procedure as A.

NO CONTROL VOLTAGE (see control panel fig. 2A) **No LEDS light on the front.**		
A.	Control voltage (not yet) switched on.	Press 'reset alarm' 1 x.
B.	Emergency-push button pressed in.	Unlock in the direction of the arrow and press reset alarm button 1 x.
C.	Keyboard not functioning.	Check internal plug connection.
D.	Fuse defective.	Replace fuse F2 (2,5A) see fig. 4D. Alert service department if problem returns.

NO MAINS VOLTAGE (see control panel fig. 2A) **No LED lights on the front.**		
A.	Mains voltage not present.	Have fault repaired by recognized electrician.
B.	Mains fuse defective.	Replace the defective fuse.
C.	Main switch out.	Turn on main switch.

EXTERNAL LIGHT INDICATION NOT FUNCTIONING		
A.	Fuse defective.	Replace fuse F1 (630 mAT), see fig. 4D.
B	Neutral conductor not connected.	Fit neutral conductor.

5.3 POWER FAILURE

In the event of a power failure the locking can be carried out manually without pressure.
The hand tap under the cover of the hydraulic unit is placed in line with the connections.
The extendible unit can be retracted using a suited tool (Long gluing clamp) for this purpose.

FIG. A - ASSEMBLY COMBILOK

INDEX	REFERENCE		DESCRIPTION
	Right model	Left model	
1	03-714-000	03-719-100	Assembly cross-head standard (see fig. B)
	03-714-900	03-719-940	Assembly cross-head high (Option) (see fig. H)
2	03-710-022		Channel beam
3	03-705-031		Conduit
4	03-705-032		Conduit
5	03-700-041		Sliding plug
6	03-700-043		Plate
7	03-705-575		Cylinder "A" (see fig. C)
8	03-701-000	03-719-050	Elbow assembly
9	03-707-000		Longitudinal guide
10	03-710-100		Cover
11	03-705-200		Rail
12	03-713-000	03-719-200	Sliding pipe
15	03-700-025		Plate
20	66-201-058		Cable tread
21	65-055-021		Washer M12 DIN 125A
22	1036-30-06-16		Hex. socket screw M6 x 16 ISO 7380-8.8
23	65-051-048		Hex. nut M24 DIN 6924
24	1038-06-02-70		Washer M24 DIN 125A St
25	65-003-529		Hex. bolt M16 X 35 DIN 933-8.8
26	65-055-216		Washer M16 DIN 125A St
27	65-002-617		Hex. bolt M20 x 90 DIN 931-8.8
28	65-051-044		Hex. nut M20 DIN 985
29	65-003-287		Hex. bolt M6 x 20 DIN 933-8.8
30	65-052-914		Special nut M6
31	66-101-255		Pipe clamp
32	65-016-003		Anchor bolt UPAT EXA 16/10 GV2
33	65-050-128		Hex. nut M6 DIN 934
34	65-058-018		Spring washer M6 DIN 127
35	65-003-448		Hex. bolt M12 x 35 DIN 933
36	65-050-136		Hex. nut M12 DIN 934
37	1037-86-05-04		Selflocking nut M4
38	65-012-285		Hex. socket head cap screw M6 x 16
39	65-055-204		Washer M6
40	1035-31--7402		Hex. bolt M4 x 40

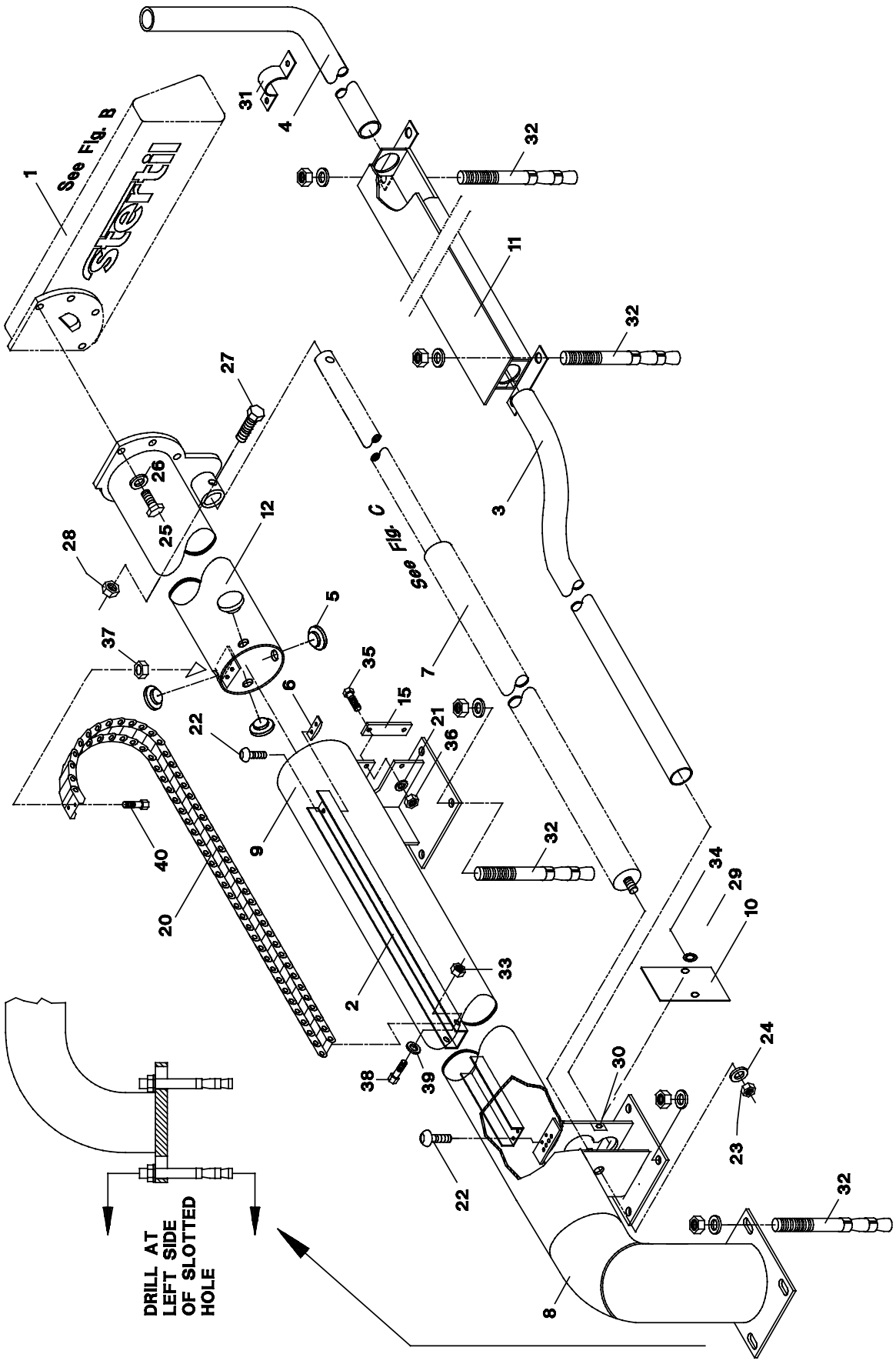


FIG. A

FIG. B - ASSEMBLY CROSS-HEAD STANDARD

INDEX	REFERENCE		DESCRIPTION
	Right model	Left model	
1	03-704-022		Foot protector
2	03-704-023		Switching device
3	03-704-215	03-719-101	Plate-HMPE
4	03-704-044		Plate-HMPE assembly
5	03-704-216		Plate-HMPE
6	03-704-046		Wering plate
7	03-714-200	03-719-110	Sliding beam
8	03-714-100	03-719-120	Cross guide
9	03-714-125		Cover
10	03-714-150	03-719-615	Switch bracket
11	03-700-550		Cylinder "B" (See fig. C)
12	02-400-002		Wering plate
13	03-704-024		Foot protector
14	1036-23-03-53		Screw M5 x 20
20	65-052-900		Nut M10 H = 3 x D
21	65-003-407		Hex. bolt M10 x 30 DIN 933-8.8
22	65-055-210		Washer M10 DIN 125A
23	1035-38-07-79		Hex. bolt M16 x 50 DIN 933-8.8
24	65-055-216		Washer M16 DIN 125A St
25	1035-38-04-13		Hex. bolt M6 x 12 DIN 933-8.8
26	65-055-204		Washer M6 DIN 125A St
27	1039-80-00-15		Collar ☛15 DIN 705A St.
28	65-052-914		Special nut M6
29	65-055-208		Washer M8 DIN 125A St
30	65-003-359		Hex. bolt M8 x 12 DIN 933-8.8
31	65-003-363		Hex. bolt M8 x 20 DIN 933-8.8
32	65-025-043		Hex. socket countersunc screw M8 x 25 DIN 7991-8.8
33	1002-17-53-04		Limit switch
34	65-030-226		Slotted screw M4 x 25 DIN 84
35	69-205-001		Sensor
36	65-030-257		Bold M5 x 30 DIN 84
37	65-025-053		Screw M8 x 10 DIN 7991
38	1002-15-00-56		Turnbuckle
39	65-005-014		Washer M5 DIN 125-A
40	1002-11-00-32		Special nut M5
41	03-710-631		Bracket

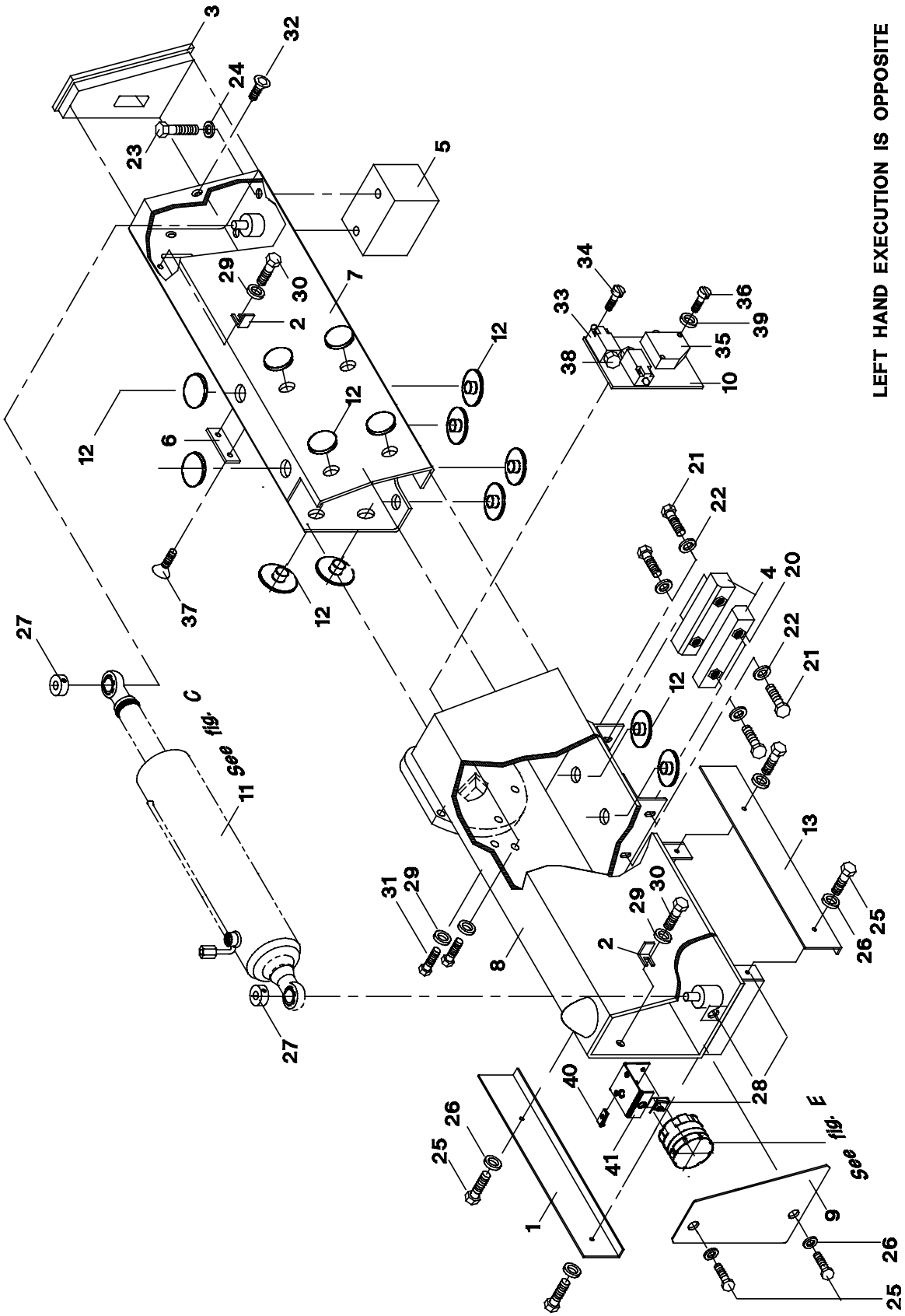


FIG. B

FIG. C - ASSEMBLY HYDRAULIC CILINDERS “ A” AND “B”

INDEX	REFERENCE	DESCRIPTION
1	03-705-575	Cylinder "A" assembly
2	03-705-590	Cylinder tube
3	03-705-577	Piston rod
4	03-700-578	Piston
5	03-700-580	Guide ring
6	03-700-579	Sealing set
7	03-700-550	Cylinder "B" assembly
8	03-700-559	Sealing set

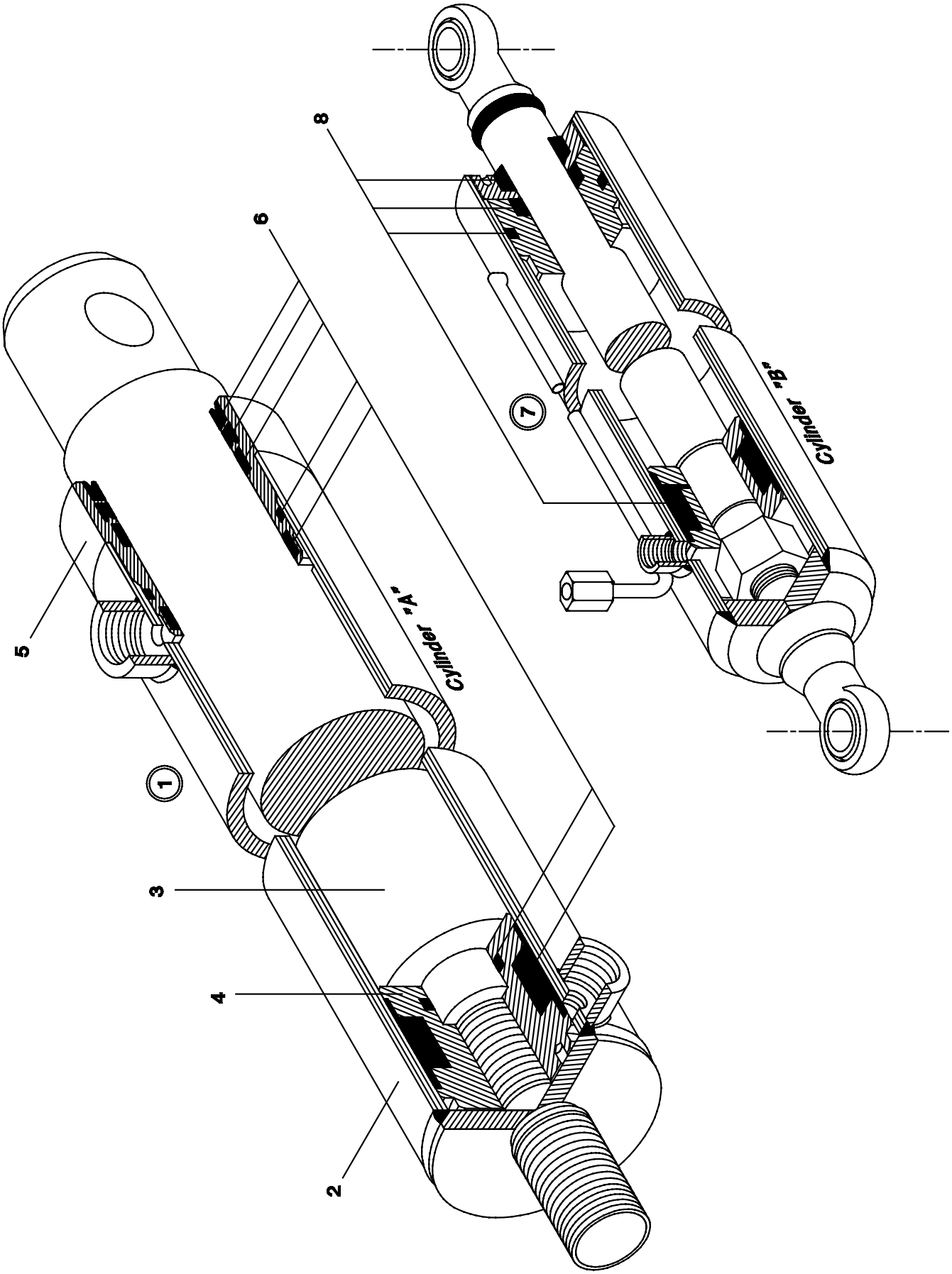
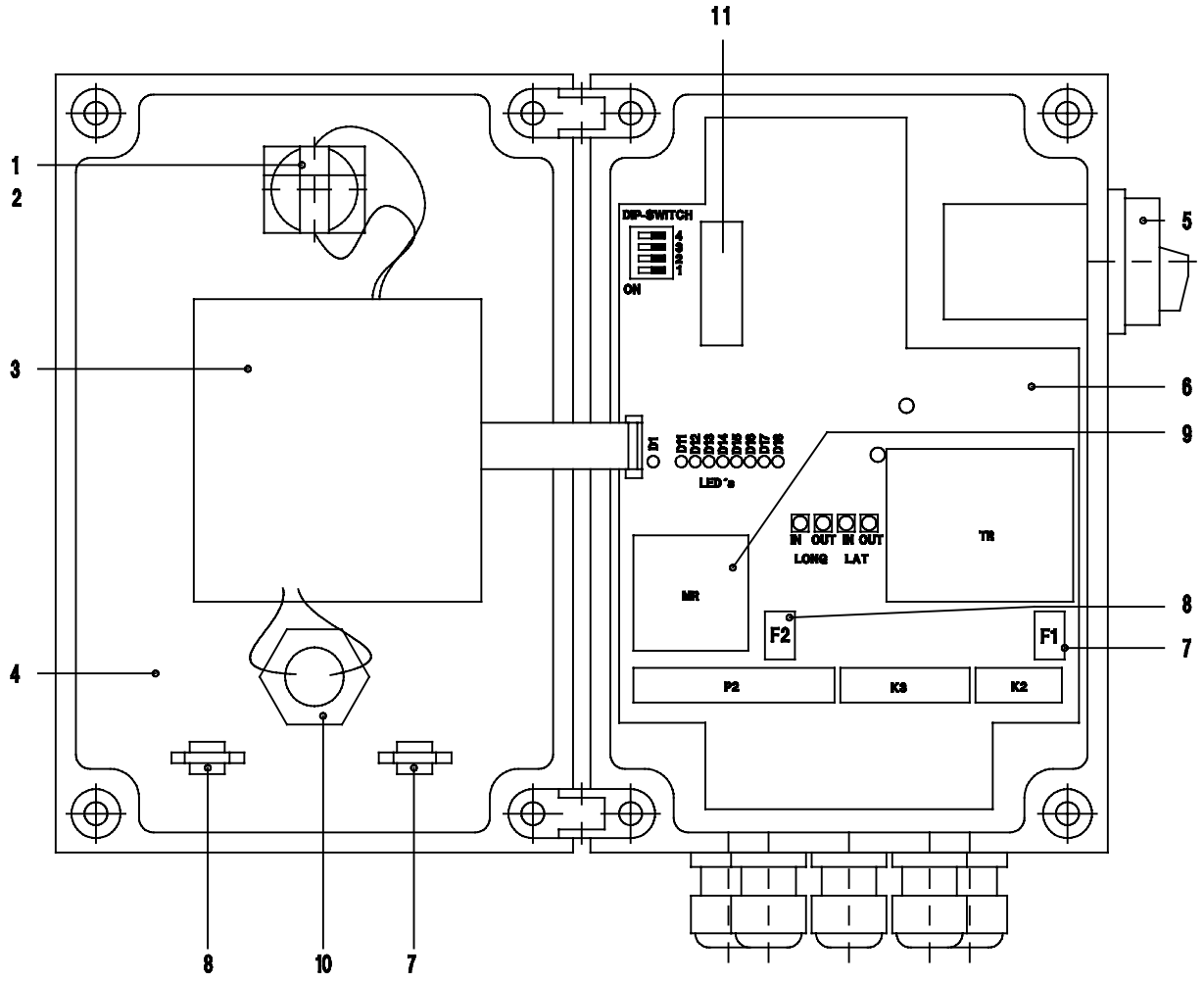


FIG. C

FIG. D - PRINTED CIRCUITBOARD



INDEX	REFERENCE	DESCRIPTION
	03-700-650	Control box assy.
1	69-120-010	Contact block 3 SB 14 00-0C
2	69-120-011	Emergency stop 3 SB 10 00-1FC01
3	69-900-045	Keyboardprint
4	03-700-651	Box 35040
5	69-120-002	Main switch 16A 4P
6	69-900-040	Printed circuitboard
7	69-206-001	Fuse 630 mAT
8	69-206-009	Fuse 2,5 A
9	3501-50-90-03	Motorrelay
10	69-202-004	Acoustical alarm
11	69-601-001	Micro processor SW STER 21.a03

FIG. E - ASSEMBLY ELECTRICAL

INDEX	REFERENCE	DESCRIPTION	INDEX	REFERENCE	DESCRIPTION
1	1002-17-53-04	Limit switch	8	02-335-602	Earth cable
2A	03-705-601	Electric cable (20380) Contr. box - Cross head	9	03-700-650	Control box
2B *	03-705-913	Electric cable (26340) Contr. box - Cross head	10	69-202-001	2 lamp traffic light 40W230V
3A	03-700-602	Electric cable (2000) Contr. box - Unit			(RER-above GREEN - under RND 200)
3B *	03-705-911	Electric cable (12000) Contr. box - Unit	11	69-202-002	Flashlight (RED)
4	03-710-603	Electric cable-tree cross head	12	03-710-630	Acoustic alarm
5	03-700-604	Cable-tree hydr. unit	13	69-701-001	Light bulb
6	03-700-605	Traffic light cable	14	03-705-530	Cover hydraulic unit
7A	03-700-606	Motor cable	15	69-205-001	Sensor
7B *	03-705-912	Motor cable long	16	03-705-535	Bracket

* For control box at opposite position of dooropenining

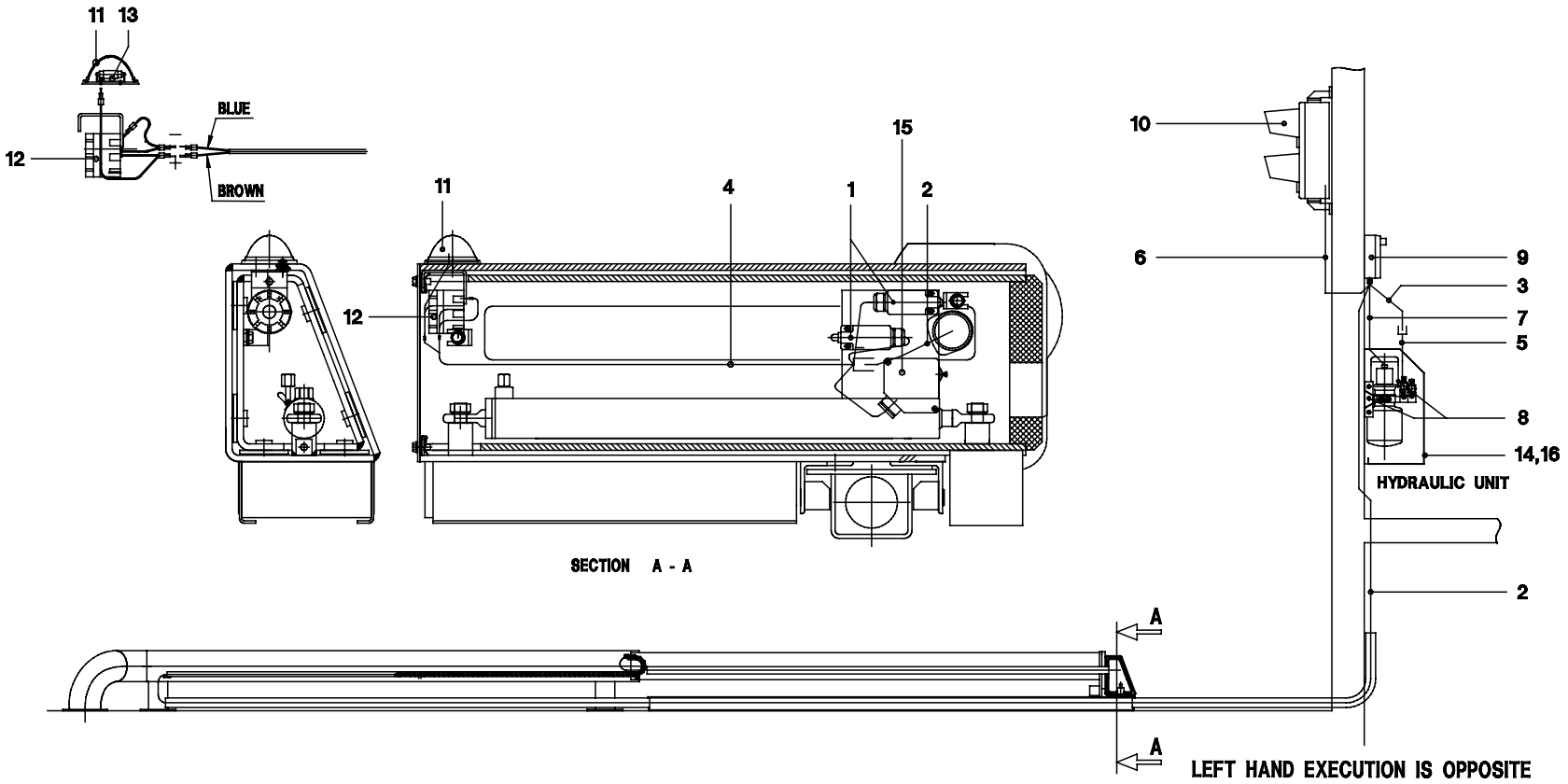


FIG. F - HYDRAULIC

INDEX	REFERENCE	DESCRIPTION
1	03-705-541	H.D. Hose Long OUT (A) 11400
2	03-705-542	H.D. Hose Long IN (B) 8150
3A	03-705-543	H.D. Hose Lat IN (A) 11550
3B	03-705-545	H.D. Hose Lat OUT (B) 11550
4A	03-705-544	H.D. Hose Lat IN (A) 7680
4B	03-705-546	H.D. Hose Lat OUT (B) 7680
5	68-700-106	Elbow W 6-PL
7	68-700-410	Straight adaptor GE 6-PL/R1/4"
8	68-700-420	Straight adaptor GE 10-PL/R3/8"
9	68-703-003	Elbow EVW 10-PL

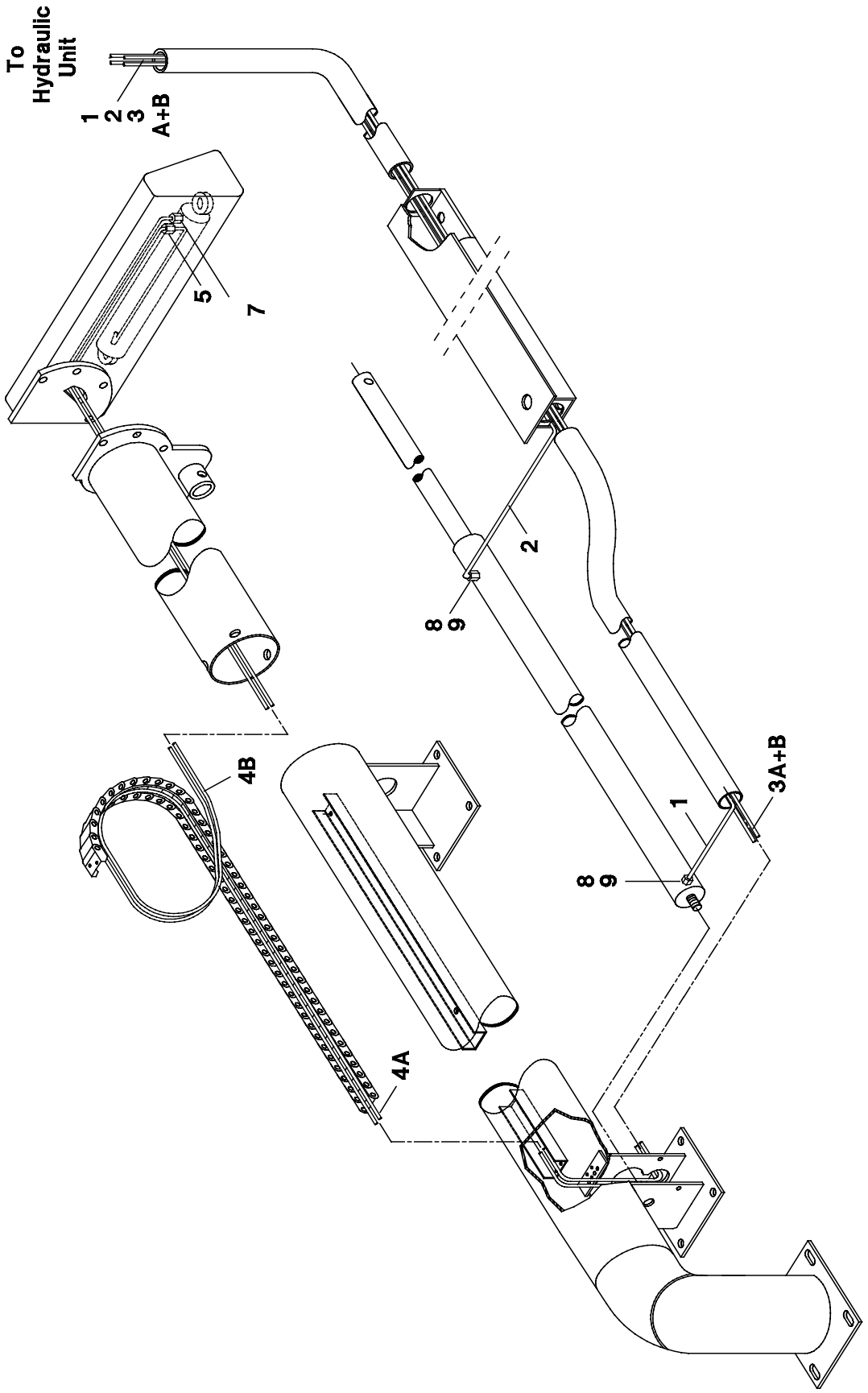


FIG. F

FIG. G - HYDRAULIC UNIT

INDEX	REFERENCE	DESCRIPTION
	03-705-525	Hydr.unit (assembly)
1	68-900-021	Pressure switch 190 Bar
2	68-900-020	Pressure switch 50 Bar
3	68-703-001	Coupling EVW 6-PL
4	68-700-410	Coupling GE 6-PL/R 1/4"
5	68-700-418	Coupling GE 10-PL/R
6	68-703-003	Coupling EVW 10-PL
7	68-703-103	Coupling EVT 10-PL
8	68-705-103	Valve KH-10-PL
9	68-703-403	Coupling EVGE 10-PLR-ED
10	68-510-911	O-ring 110.72 x 3.53
11	325-06-103	Suction filter D.62 da 3/8"
12	03-700-527	Pump 3.8 cc
13	03-700-528	4/3-valve
14	68-512-140	O-ring 14 x 1.78 80 SH
15	03-700-529	Pressure relief valve 210 Bar
16	325-06-108	Coupling pumpside "LP x MC"
17	325-06-109	Coupling motorside "LM x MC"
18	325-06-110	Electromotor MT 80 2.2 Kw
19	320-06-261	Return valve
20	03-705-521	Pipe 10 mm
21	68-703-203	Coupling EVL 10-PL
22	320-06-262	Breather cap
23	03-705-527	Tank 12 Ltr.
24	68-039-901	Valve block/Pump casing
25	68-039-902	Intermediate block
26	68-039-903	Valve block large
27	68-039-904	Valve block small
28	03-705-528	Manometerport kit

FIG. G

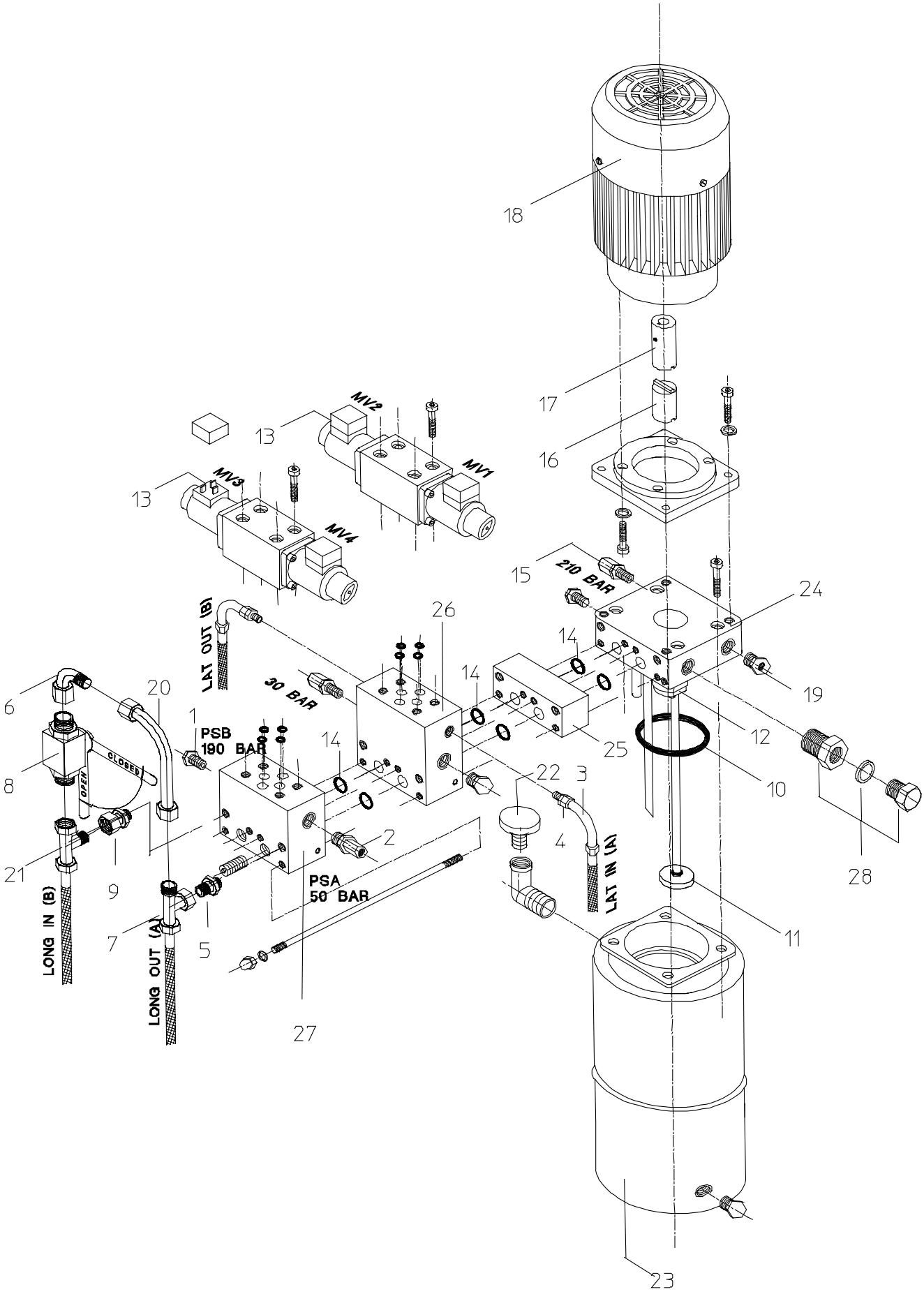

18
17
16
15
210 BAR
24
19
12
10
28
11
23
MV2
MV1
MV3
MV4
13
13
LAT OUT (B)
30 BAR
26
14
14
25
22
3
4
LAT IN (A)
PSB
190 BAR
14
1
20
6
8
CLOSED
OPEN
21
9
7
5
2
PSA
50 BAR
27
LONG IN (B)
LONG OUT (A)

FIG. H - ASSEMBLY CROSS-HEAD HIGHER (OPTION)

INDEX	REFERENCE		DESCRIPTION
	Right model	Left model	
1	03-704-022		Foot protector
2	03-704-023		Switching device
3	03-704-215	03-719-101	Plate-HMPE
4	03-704-044		Plate-HMPE assembly
5	03-704-216		Plate-HMPE
6	03-704-046		Wearing plate
7	03-714-920	03-719-970	Sliding beam high
8	03-714-910	03-719-960	Cross guide high
9	03-714-901		Cover
10	03-714-150	03-719-615	Switch bracket
11	03-700-550		Cylinder "B" (see fig. C)
12	02-400-002		Wearing plate
13	03-704-024		Foot protector
14	1036-23-03-53		Screw M5 x 20
20	65-052-900		Nut M10 H = 3 x D
21	65-003-407		Hex. bolt M10 x 30 DIN 933-8.8
22	65-055-210		Washer M10 DIN 125A St.
23	1035-38-07-79		Hex. bolt M16 x 50 DIN 933-8.8
24	65-055-216		Washer M6 DIN 125A St.
25	1035-38-04-13		Hex. bolt M6 x 12 DIN 933-8.8
26	65-055-204		Washer M6 DIN 125A St.
27	1039-80-00-15		Collar 15 DIN 705A St.
28	65-052-914		Special nut M6
29	65-055-208		Washer M8 DIN 125A St.
30	65-003-359		Hex. bolt M8 x 12 DIN 933-8.8
31	65-003-363		Hex. bolt M8 x 20 DIN 933-8.8
32	65-025-043		Hex. socket countersunk screw M8 x 25 DIN 7991-8.8
33	1002-17-53-04		Limit switch
34	65-030-226		Slotted screw M4 x 25 DIN 84
35	69-205-001		Sensor
36	65-030-257		Bolt M5 x 30 DIN 84
37	65-025-053		Screw M8 x 10 DIN 7991
38	1002-15-00-56		Turnbuckle
39	65-055-014		Washer M5 DIN 125-A
40	1002-11-00-32		Special nut M5
41	03-710-631		Bracket

FIG. H

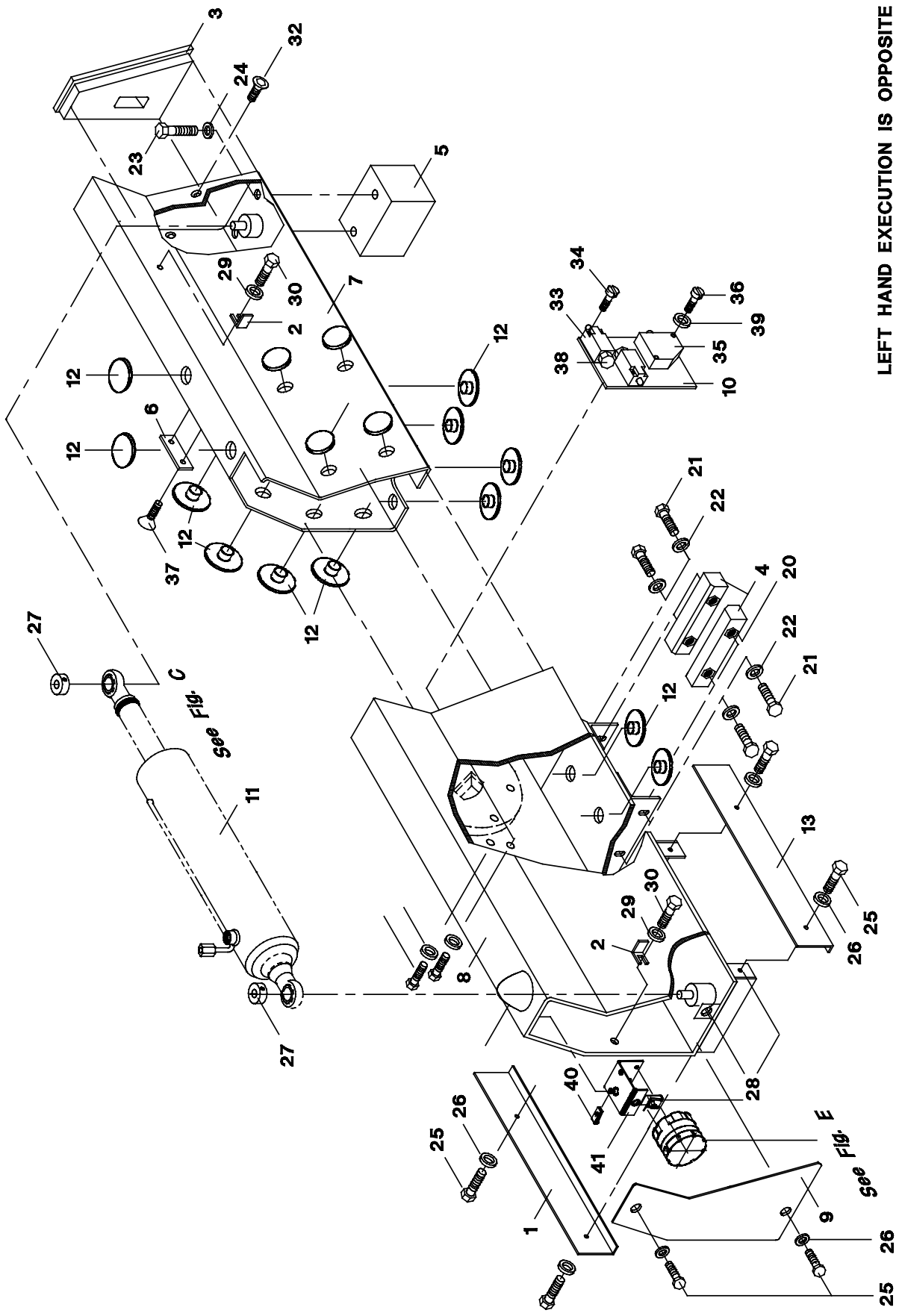


FIG. I - FOUNDATION INSTRUCTION (RIGHT MODEL)

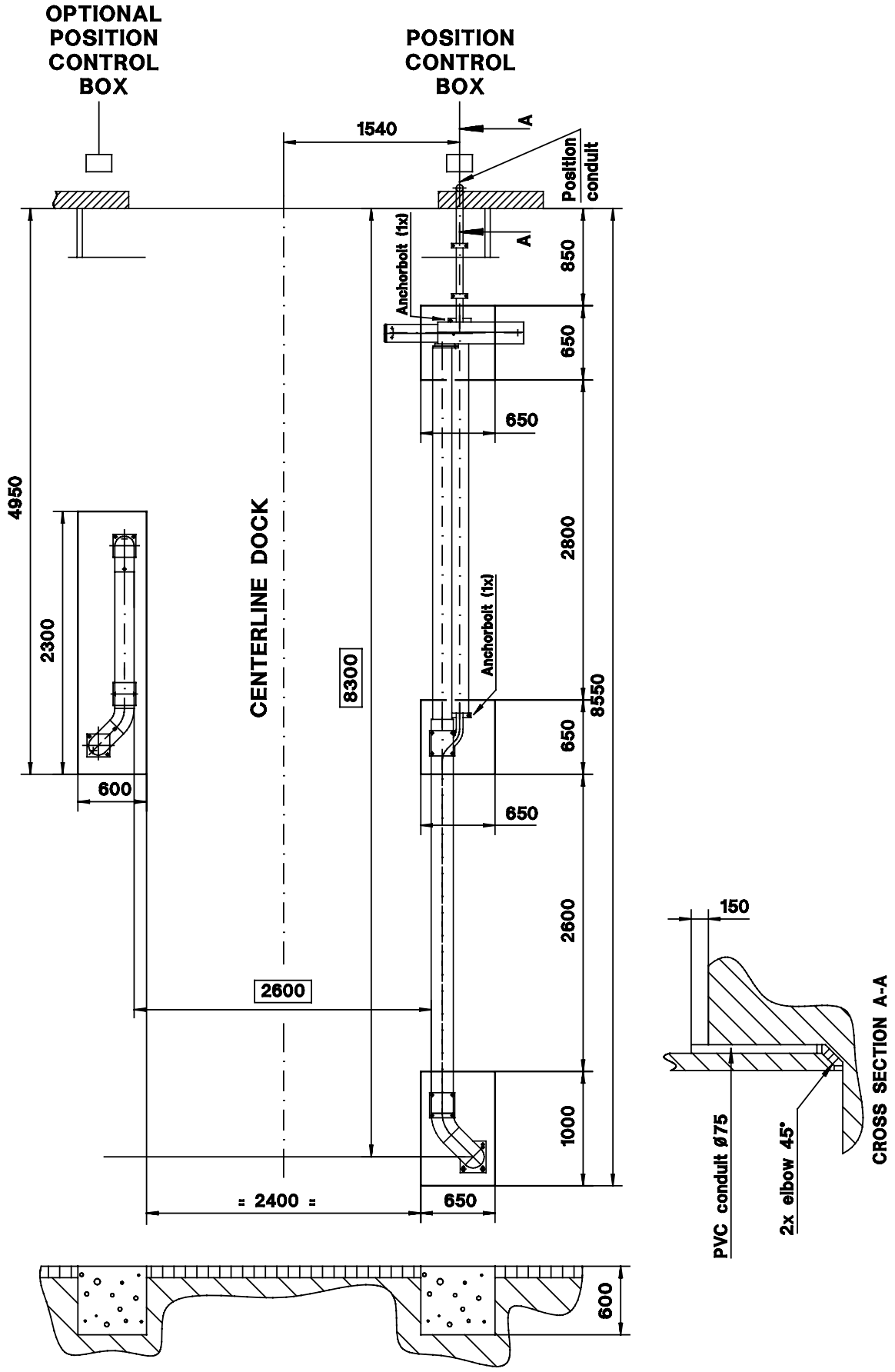


FIG. J - FOUNDATION INSTRUCTION (LEFT MODEL)