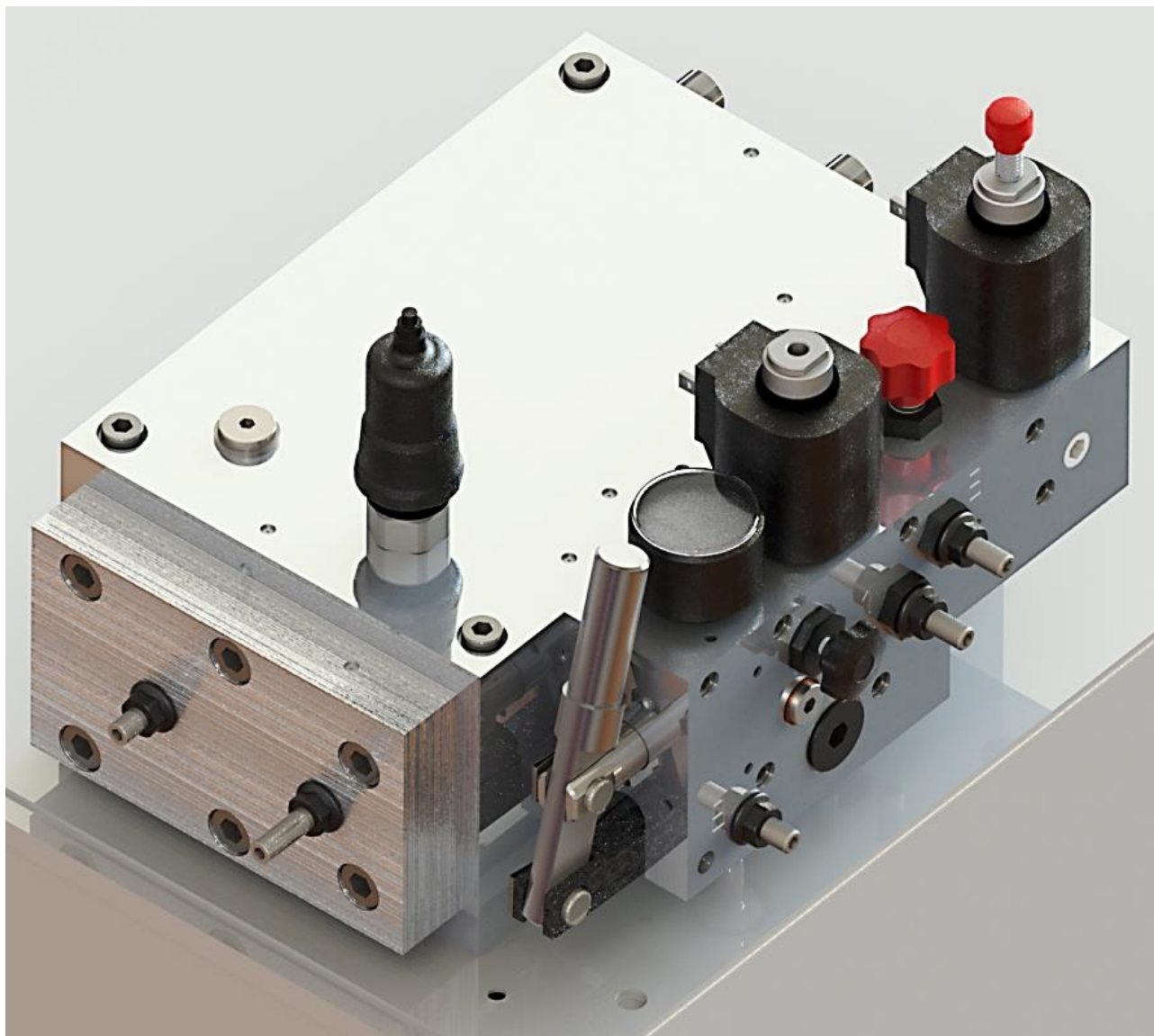


OPERATIVE INSTRUCTIONS FOR HI-600 PUMP UNIT



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1 General Introduction

This manual is integral part of the manual D860MGB. The only different chapters are listed below

4.5. Electrical connection of the valve group

The HI valve (see Figure 1) entails the following electro-valves:

EVD = Downward travel electro-valve

EVE = Emergency downward travel electro valve

The EVD ELECTRO-VALVE controls normal downward travel. This electro-valve should be powered only during downward travel throughout the entire run.

EVE ELECTRO-VALVE this electro-valve is used for emergency downward travel. By powering the coil, the hydraulic valve will allow the slow speed downward travel of the car.

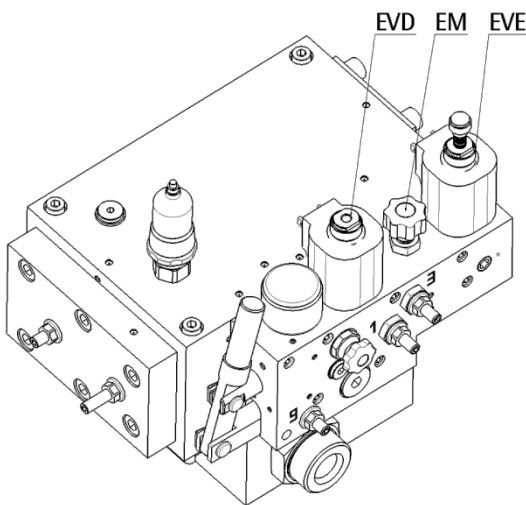


Figure 1

8.1. General information

The valve group is adjusted and tested in the factory together with shut-off valve, motor pump group and inverter.

When the regulation has been completed, a diagram is prepared which reproduces the speed behaviour during upward and downward travels. This diagram (see Figure 2) is supplied together with its pump unit. The identification plate (see figure 3) lays on the

pump unit cover and shows the valve drawing, all the regulation points, the description of the electro-valves and the data needed to identify the installation. In case, for different reasons, it is necessary to readjust the valve or inverter, previously check that:

- all the electrical connections have been carried out correctly.
- the oil in the tank is the advised one and its temperature is between 18 and 30°C.

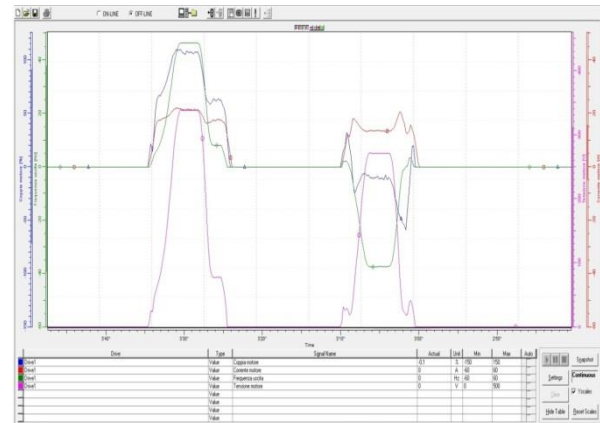


Figure 2

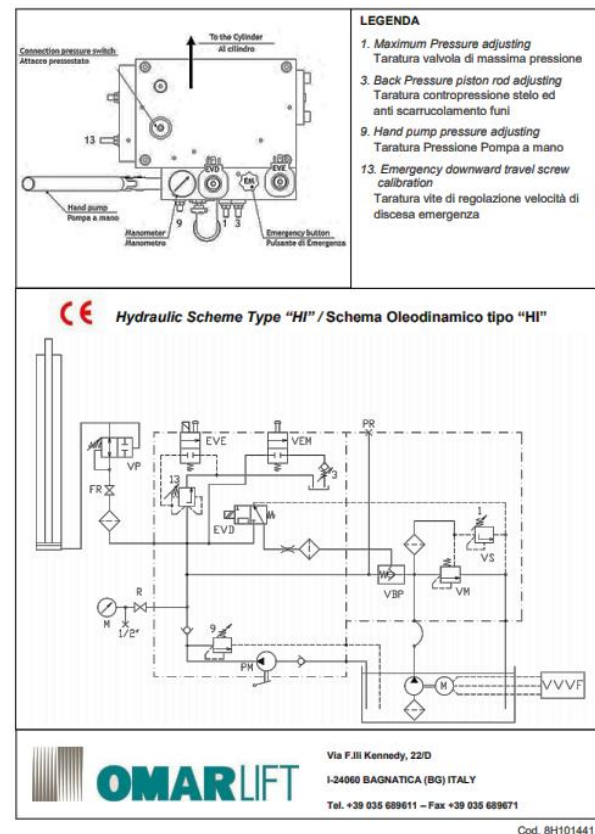
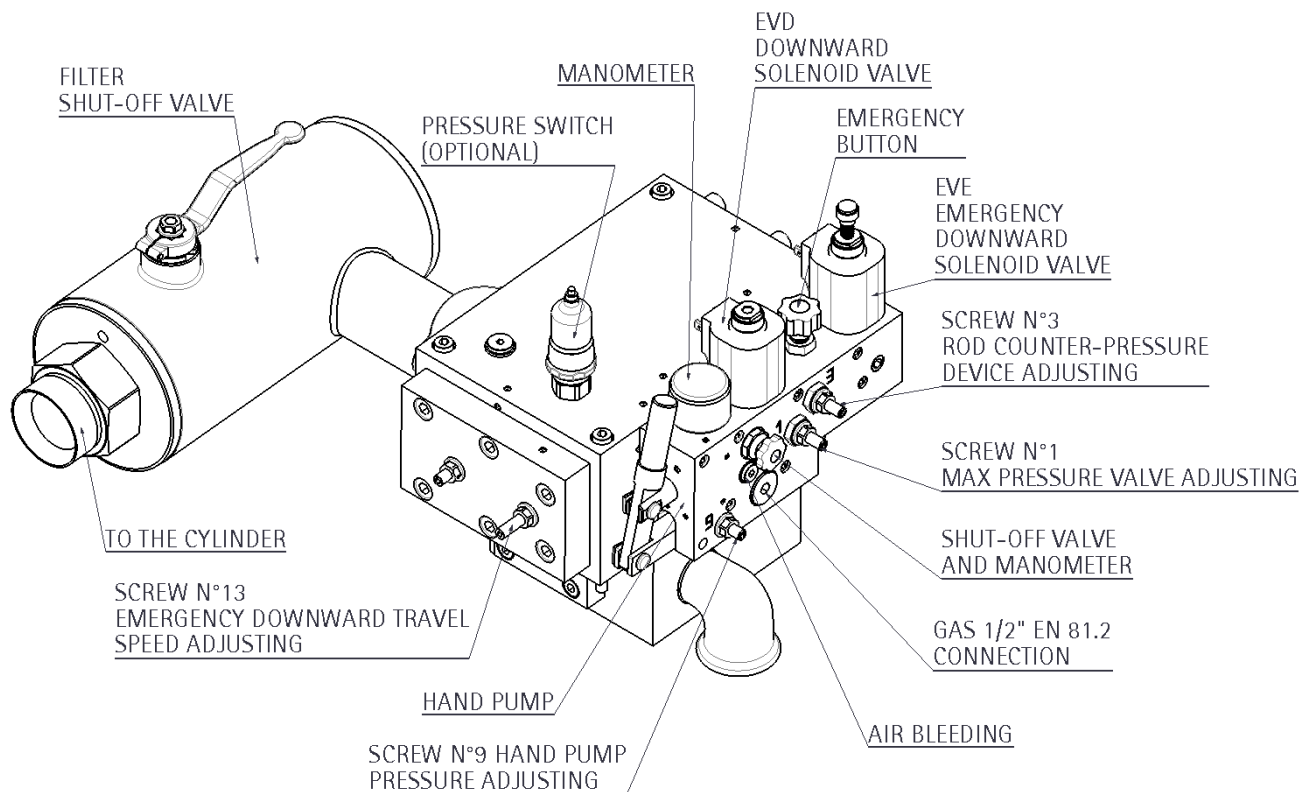


Figure 3

8.2. Adjusting and regulations of HI valve



SCREW	DESCRIPTION	REGULATIONS
N° 1	Adjusting of the max pressure valve	Screw to increase max pressure. Unscrew to decrease max pressure.
N° 3	Rod counter-pressure and rope anti-loosening device adjusting	Screw not to make the rod drop in emergency. Unscrew to make the rod drop in emergency.
N° 9	Hand pump pressure adjusting	Screw to increase the hand pump adjusting pressure. Unscrew to decrease the hand pump adjusting pressure.
N° 13	Emergency downward travel speed adjusting screw	Screw to decrease the emergency downward travel speed. Unscrew to increase the emergency downward travel speed.

Table 1

8.2.1 Over-pressure valve calibration: screw n.1



The over-pressure valve has to be adjusted with a pressure 1,4 times the max. static pressure with a full load. (Higher values, corresponding max to 1,7 times, are also admitted, only if this possibility has been taken into account during the project phase).

The max pressure is reached only when the piston is in upper end position or when the main line valve is closed.

- Close the shut-off valve of the main line and open the manometer valve.
- Unscrew the screw no. 1 and discharge the possible pressure with the red manual emergency button.
- Start the motor in up direction.
- Screw the screw no. 1 until the max wanted pressure value is reached and stop the motor.
- Discharge again pressure with the hand button, activate the motor checking that the manometer shows the adjusted pressure, block the nut and stop the motor.



In case the given pressure needs to be decreased, discharge the pressure with the hand button, unscrew the screw no. 1 and repeat the adjusting.

8.2.2 Rod counter-pressure and rope anti-loosening calibration: screw no. 3

In indirect acting installations, the activation of the emergency button has not to cause the rope loosening when the car is blocked. For this reason, it is necessary that, inside the circuit, there is a remaining pressure higher than the pressure generated by the weight of the rod, the pulley and the ropes. This pressure is generated by screw no. 3: screw, it increases; unscrew, it decreases. The value of the counter-pressure which opposes the rod down travel is about 6/8 bar.

- Adjust the counter-pressure as follows (see Figure. 5):

- Close the main shut-off valve and discharge pressure with the hand button. The remaining pressure on the manometer corresponds to the rope anti-loosening counter-pressure.
- If the pressure value needs to be increased or decreased, screw or unscrew the screw no. 3 accordingly.

- If the input pressure needs to be verified:

- Increase the pressure in the circuit with the hand pump.
- Discharge the pressure with the hand button and read the remaining pressure.
- If necessary, repeat the previous operations until the wanted counter-pressure is reached.

To fully actuate the hand button, remember that its pin must be placed at the appropriate seat (see Figure 10).

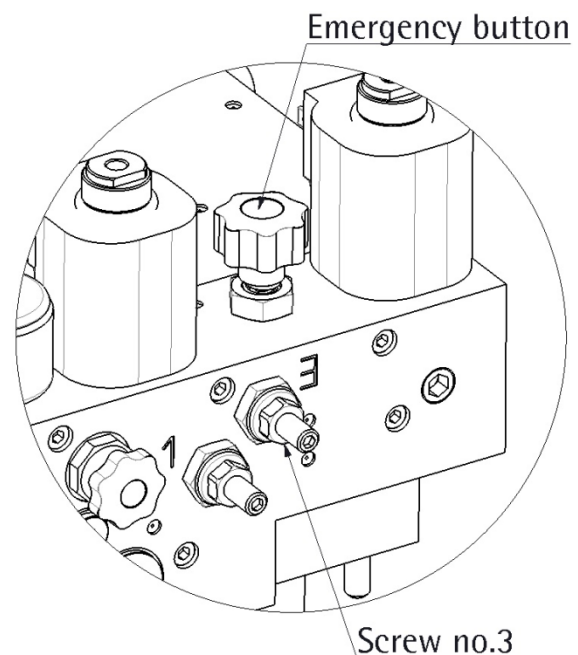


Figure 5

8.2.3 Calibration of the hand pump pressure: screw n°9

The hand pump has its own safety valve which has to be adjusted at 2,3 times the max static pressure. The adjusting is carried out through screw no. 9: screw, the max pressure increases, unscrew, it decreases (see Figure 6).

In case there are difficulties in activating the hand pump, close the main shut-off valve, unscrew the screw shown on figure 6 (air bleeding) using CH5 allen wrench and quickly activate the hand pump's lever till oil flows out from screw's seat .

Now tighten it.

- Act on screw no. 9 to adjust at the right pressure and activate the hand pump lever. The adjusting pressure of the hand pump is the max one reached and shown on the manometer.
- Discharge the pressure with the emergency hand button.

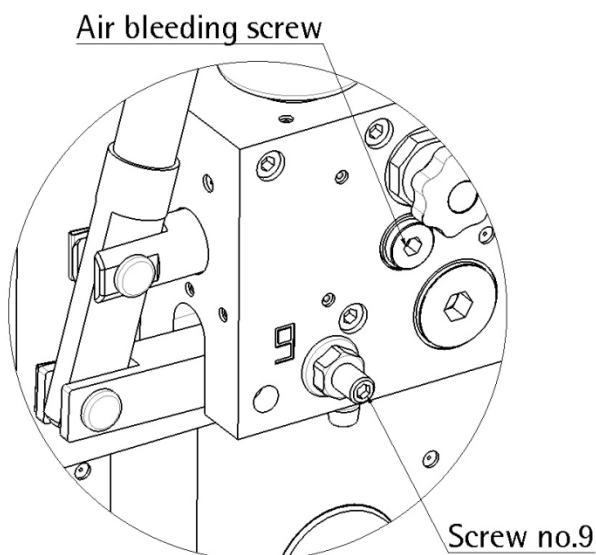


Figure 6

8.2.5 Emergency downward travel screw calibration: screw n°13

Screw or unscrew the screw no.13 (see Figure 7) in order to increase or decrease the emergency downward travel speed.

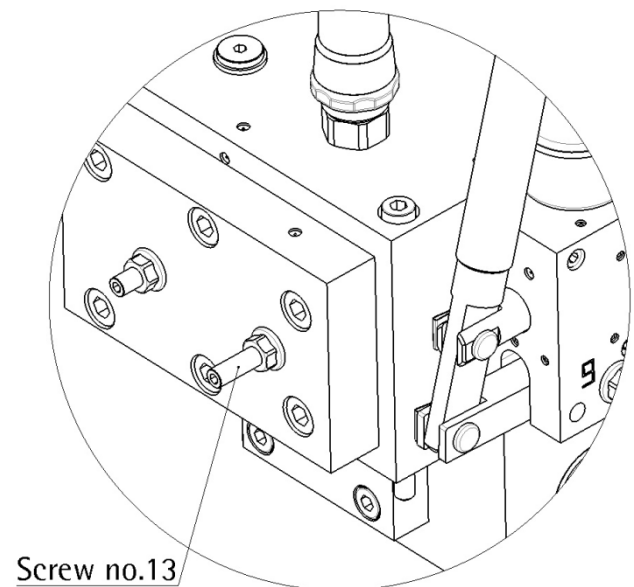


Figure 7

10 Maintenance

10.2.3 Losses inside the valve group

When the installation is motionless at floor and the electro-valves are disconnected, the load pressure involves the part of the valve shown in Figure no. 8 with crossed lines.

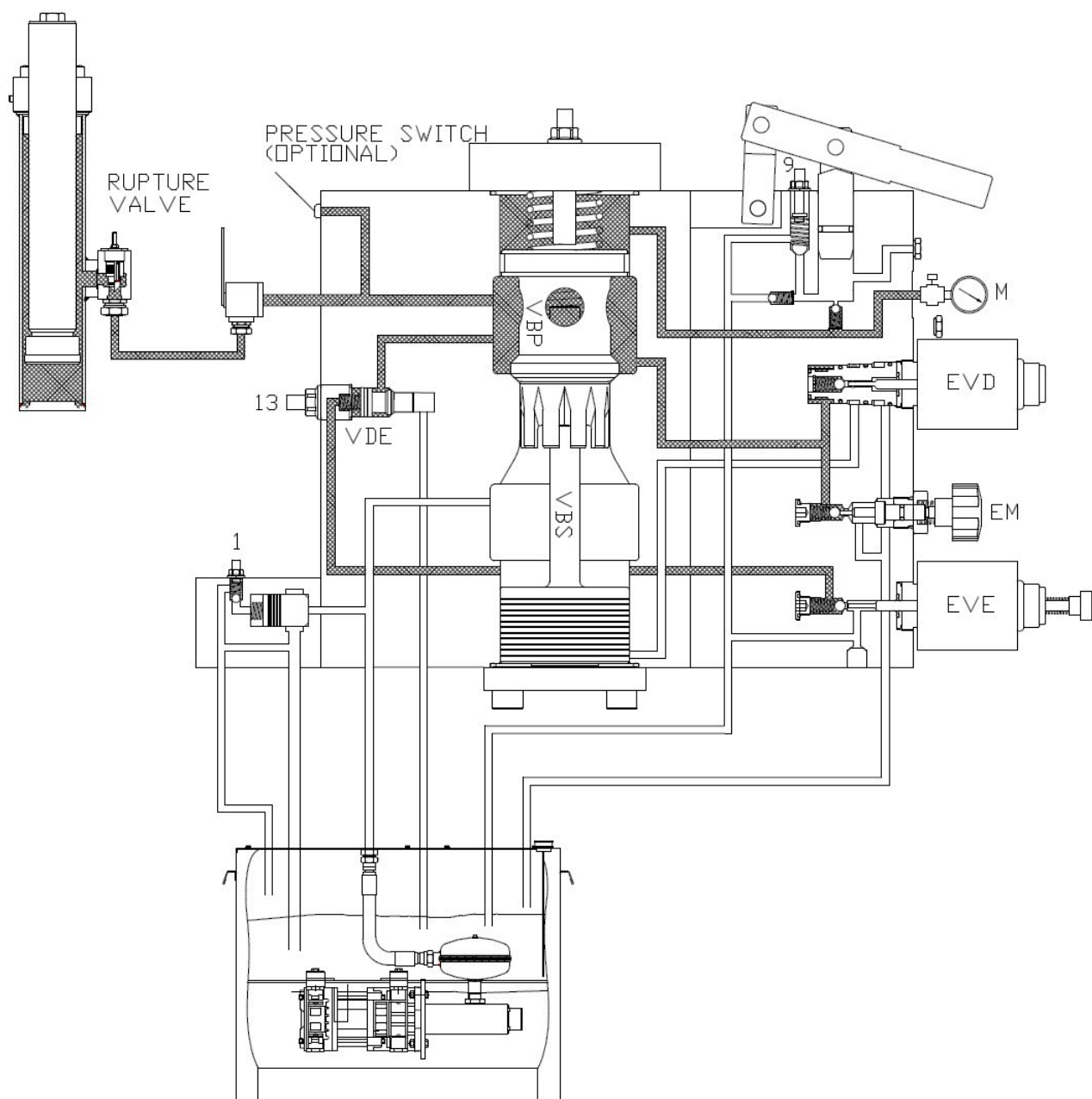


Figure 8

The valve sealing is proved as follows:

- When the valve temperature is the same as the room temperature, close the main line shut-off valve and increase the pressure, using the hand pump, until twice the static pressure.
- If there are no losses in the valve, pressure keeps constant or decreases slowly, not more than 5/6 bar during the first 3/4 minutes and tends to settle;
- If there are losses in the valve, pressure decreases rapidly, more than 5/6 bar during the first 3/4 minutes and goes on decreasing up to the static pressure value.
- The valve components which can be involved in possible losses are the following:

a) Hand pump.

The hand pump sealing is assured by a ball. Activate the hand pump, leave the lever against the valve and wait for some minutes to check the sealing. In case of losses, the lever goes back automatically. Repeat the test for some times to be sure that the loss is not caused by dirt particles laying between seat and ball. If necessary, replace the hand pump.

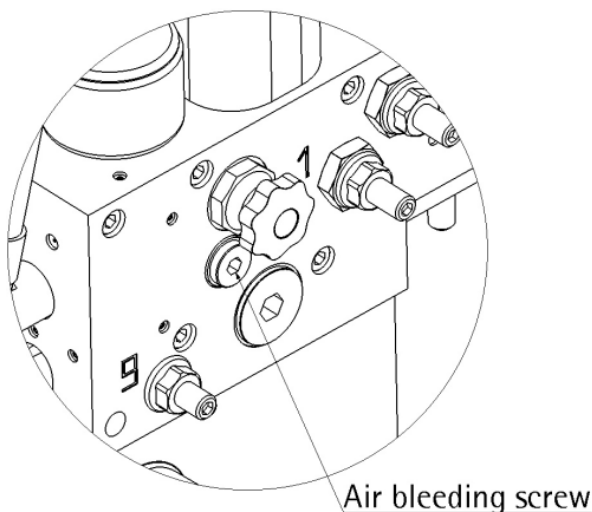


Figure 9

b) Hand emergency valve VEM.

The sealing of the hand pump is also assured by a ball whose working can be jeopardised by dirt laying between seat and ball. Carry out a first check by removing the moving half-cover of the tank and look under the valve. Every time the emergency button is activated, an oil outflow will be noted. This outflow has to stop when the button is left. In case this does not happen, there can be losses from the emergency valves or losses from the electro-valve EVD which has the same discharge point.



The following checks, including the ones explained at point c), have to be carried out with pressure inside the valve. Consequently, operate very carefully.

Check the emergency valve (see Figure 10) sealing, by unscrewing completely the emergency group starting from the hexagon. Dry well the oil remained inside the hole and check that no further oil comes out from the ball.

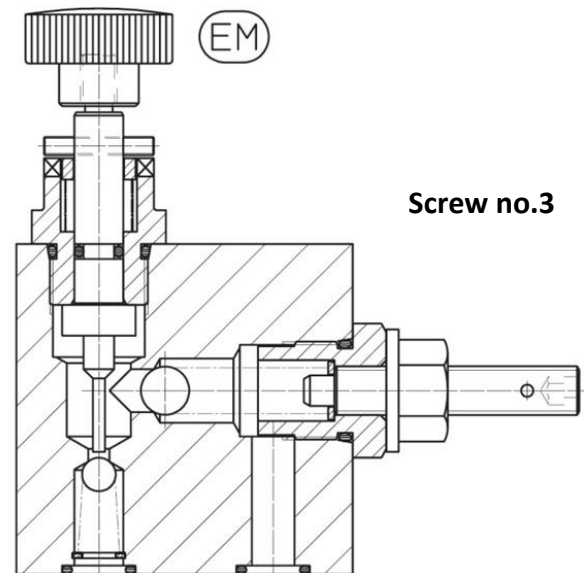


Figure 10



point.

If oil losses are detected through the ball, the whole down travel block needs to be replaced or repaired - see the following c)

c) Downward travel electro-valve EVD.

The sealing ball of the down travel valve (see Figure 11) can remain lightly open and loose oil.



The following checks must be carried out without pressure inside the valve. It shall be therefore necessary to close the main line shut-off, unscrew screw no. 3 (rod counterpressure) and press the manual emergency button in order to lower the pressure to zero.

The reasons why the downward travel valve may not properly work are the following:

- Small metal particles or dirt have got inside the coil between the tube and the cursor delaying or preventing the return movement of the coil cursor. It is necessary to remove the coil, unscrew the mechanical part of the EVD and shake it backwards and forwards with the hand to insure that the inside piston is free. If not, replace it.
- The EVD coil button has got caught after having been manually activated with a screwdriver and the coil cursor cannot return to its resting position. In this case it is necessary to remove the coil, unscrew the mechanical part of the EVD and push its piston completely back.
- Some metal particles lay between the ball and the sealing seat preventing the closing or damaging the sealing seat of the EVD valve. To check the EVD electro-valve sealing it is necessary to remove the coil, unscrew the mechanical part of the coil, remove the pin and the EVD aluminium valve.

At this point it is necessary to inspect the EVD valve and then proceed in the following way:

- Remove the seeger which blocks the spring and the ball in the lower part of the EVD valve.
- Inspect the ball seat and if it appears grooved or faulty, attempt to repair it by repositioning the ball in its proper place and clinching it by using a proper punch.

Warning: do not hammer strongly because the seat is in aluminium,



subject to change without notice!

and may break through. If possible, replace the balls used to clinch the seats.

- Reassemble all the components properly, reassemble the EVD valve in its seat, the pin and the coil.



Reactivate the valve pressure by opening the shut-off valve and verify that there are no losses underneath the valve.



If oil losses are detected it will be necessary to replace the EVD valve or the whole downward travel block.

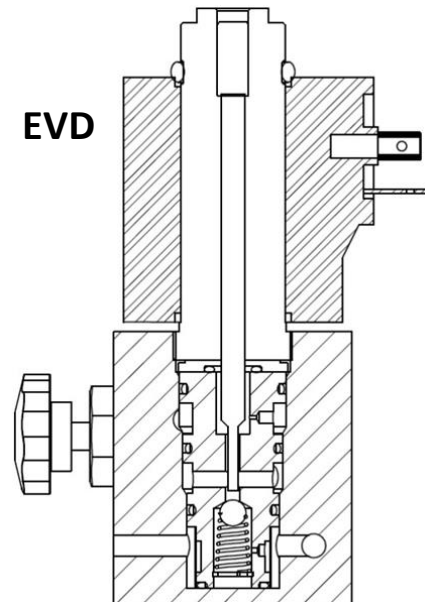


Figure 11

d) Electrical emergency electro-valve EVE

The sealing of the hand pump is also assured by a ball whose working can be jeopardised by dirt laying between seat and ball. Carry out a first check by removing the moving half-cover of the tank and look under the valve.

Every time the emergency button is activated, an oil outflow will be noted. This outflow has to stop when the button is left. In case this does not happen, there can be losses from the emergency valves or losses from the electro-valve EVD which has the same discharge point.

The following checks, including the ones explained at point c), have to be carried out with pressure inside the valve. Consequently, operate very carefully.

Check the emergency valve (see Figure 12) sealing, by unscrewing completely the emergency group starting from the hexagon. Dry well the oil remained inside the hole and check that no further oil comes out from the ball.

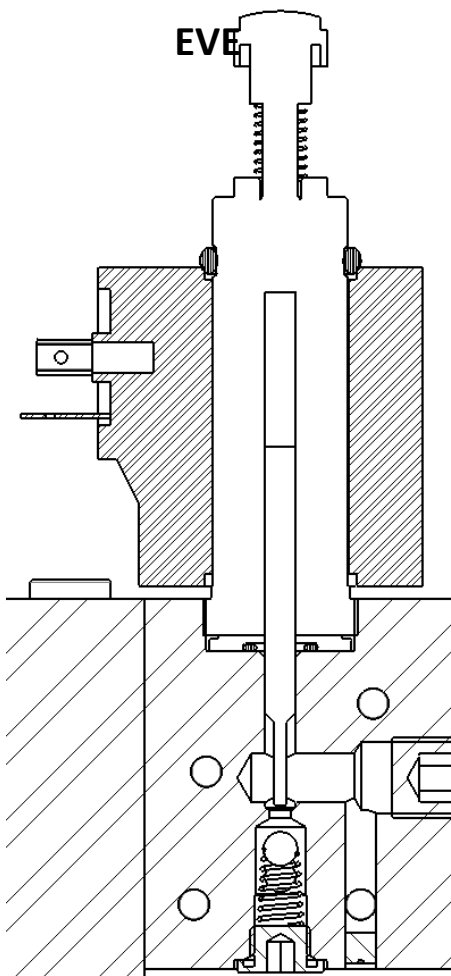


Figure 12



If oil losses are detected through the ball, the whole down travel block needs to be replaced or repaired - see previous c) point.

e) Piloted non return valve VBP



The VBP valve (non-return valve) has to keep the main line closed when the car is motionless. The perfect sealing is guaranteed by a seal laying between the two parts which compose its piston.

This seal wears with the passing of the time and can be damaged by metal particles which engrave it and hinder its sealing because they come between seat and seal.

The closing can also be slowed by the bad running of the VBP piston because of dirt and hindered by the faulty closing of the electro-valve EVD.

Operate as follows to get rid from VBP losses:

- Check that VBP piston runs well and, if necessary, remove dirt and clean with a thin cloth.
 - Check that the electro-valve EVD closes perfectly, when the coil is disconnected (see previous point c).
 - Replace the VBP seal as shown in Figure 13:
- Close the main line shut-off valve.
 - Unscrew the screw n. 3 for rod counter-pressure and take pressure back to zero using the hand maneuver button.
 - Remove the cover to reach VBP piston.
 - Unscrew the screw which holds the two parts of the piston tight and replace the seal laying between them. Be careful to position it in the right way
 - Reassemble all the parts paying attention to the O-Ring which lays between the valve and the cover.

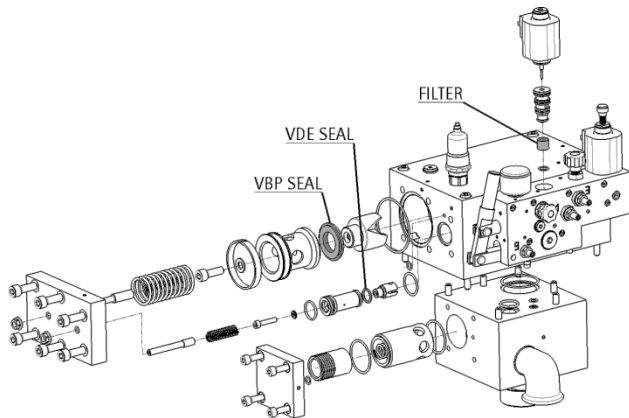


Figure 13

f) Electrical emergency downward travel valve VDE

The VDE valve (non-return valve) has to keep the main line closed when the car is motionless. The perfect sealing is guaranteed by a seal laying between the two parts which compose its piston.

This seal wears with the passing of the time and can be damaged by metal particles which engrave it and hinder its sealing because they come between seat and seal.

The closing can also be slowed by the bad running of the VDE piston because of dirt and hindered by the faulty closing of the electro-valve EVE.

Operate as follows to get rid from VDE losses:

- Check that VDE piston runs well and, if necessary, remove dirt and clean with a thin cloth.
- Check that the electro-valve EVE closes perfectly, when the coil is disconnected (see previous point c).
- Replace the VDE seal as shown in Figure 13:

- Close the main line shut-off valve.
- Unscrew the screw n. 3 for rod counter-pressure and take pressure back to zero using the hand maneuver button.
- Remove the cover to reach VBP piston.
- Unscrew the screw which holds the two parts of the VDE piston tight and replace the seal laying between them. Be careful to position it in the right way

- Reassemble all the parts paying attention to the O-Ring which lays between the valve and the cover.

10.4 Filter cleaning inside valve group

- With a general overhaul or when operation faults occur, clean all filters located on the electro-valves and indicated in Figure 13 on page 10.
- To clean or replace the cartridge of the shut-off valve filter, before closing the shut-off valve, unscrew screw no. 3 and discharge the pressure, then unscrew the bottom of the filter to reach the cartridge.

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