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GMV EN3010 Valve Block Instruction Manual (also applies to most settings for ER3100)

Notes

- A. Eye protection **MUST** be worn before dismantling the valve block
- B. When making settings or taking pressure readings ensure the pressure gauge shutoff valve is open.
- C. Before removing any hydraulic part, close the ball shut off valve, remove the handle, then press the button on the top of VMD until the pressure gauge reads zero.
- D. Although the restrictors can be turned 12 turns, they are only effective over a small area depending on hole size. Therefore turn in fully clockwise then out approximately 8 ½ to 10 turns (2 mm to 0.7mm hole) to the beginning of the regulating zone – when the small hole is uncovered.
- E. The adjusting operation should be carried out when the installation stage is complete.
- F. To obtain correct setting, follow the sequence below
- G. The suggested distances between the slowing point and floor level are as follows (does not apply to ER3100 – see separate instruction manual)

Car speed	C-E (upwards)	G – I (downwards)
Up to 0.3m/s	250mm	350mm
0.31 to 0.40m/s	350mm	450mm
0.41 to 0.50m/s	450mm	550mm
0.51 to 0.6 m/s	600mm	700mm
0.61 to 0.7m/s	800mm	900mm
0.71 to 0.8m/s	1000mm	1100mm

With these settings the car covers 150mm at levelling speed before stopping

1. PRESSURE RELIEF VALVE (SAFETY VALVE)

Remove the cap and screw out the adjuster No 1 until no spring resistance is felt and then screw back in 2 complete turns. Close the main shutoff valve and put in an 'up' call. Screw in No 1 until the pressure gauge reads the correct calculated relief pressure. Turn the power off. Tighten the locking nut and fit the cap. Open the main shut off valve and turn the power back on to resume normal operation of the lift.

The correct relief setting pressure = Full Load Static Pressure x 1.4 (This may vary for special conditions - refer to BS5655 Part 2 Clause 12.5.2)

2. ACCELERATION

Screw in the adjuster No 4 completely, then screw out 7 complete turns. Enter an up call and screw out until the desired acceleration is achieved. This adjustment may need to be finely tuned after the other adjustments have been made. (Adjustments are made in small increments).

3. SLOW / LEVELLING SPEED UP AND DOWN

Slow speed adjustment is common for both up and down directions is via the adjuster No 2. Screwing OUT increases the speed and IN decreases the speed. The full adjustment is achieved after screwing out approximately 6 mm. screwing out further has no effect. The correct levelling speed is approximately 1/6 of high speed.

4. UP HIGH SPEED

The maximum speed setting is achieved by screwing out the adjuster No 8 just until no spring pressure is felt and then screwed back in one complete turn. Enter an up call and after the acceleration phase is completed there should be no sound of oil dumping back to the tank. Final adjustment is made by screwing in the adjuster for the required speed if this is to be less than the maximum. Note – this causes a larger generation of heat, probably requiring the addition of a heat exchanger, as well as being energy inefficient.

5. DOWN HIGH SPEED

For balanced valve operation the down high speed and the up high speed should be approximately equal within 0.05m/s. Screwing in the No 9 adjuster provides an increased down speed.

If it is not possible to achieve the same down speed as up speed, e.g. with very long pipe lengths, top motor room, then proceed as follows:-

Turn screw 5 (rupture valve test function) fully clockwise. This causes the car to travel down at its maximum possible speed. This proves that the system is capable of running at the required speed. Note - the rupture valve will probably trip - increase the system pressure with the hand pump to reset the rupture valve. Turn screw 5 fully anti clockwise.

If the required speed or higher has now been achieved then the spring inside the VRFP valve should be replaced with a stronger spring obtainable from Gartec. (1 1/4" valve blocks only - using the spring from 1 1/2 and 2" valve blocks)

6. RUPTURE VALVE

The rupture valve is set in the factory to trip at down high speed x 1.3 (by using the chart on the GMV Rupture Valve data sheet for determining the X dimension). To check the operation, send the car to the top floor with full load, then screw in No 5 adjuster fully and enter a down call. The rupture valve should operate after approx. 1.5m travel. If the rupture valve does not operate, the X dimension needs to be adjusted. Remove the cover and screw in the adjuster until the rupture valve operates. Screw out No 5 adjuster completely and check that the rupture valve does not operate under normal conditions. Repeat the procedure as necessary.

7. DECELERATION

Screw in the adjuster No 3 completely, then screw out 8 complete turns. Enter an up call and screw out for harsher deceleration or in for a softer deceleration. (Adjustments should be made in small increments).

8. MANUAL LOWERING - MINIMUM RAM PRESSURE VALVE (2:1 roped applications only)

The manual lowering valve (VSMA) to the right of the hand pump (PAM800 type), or part of the hand pump assembly (P81) incorporates a minimum pressure valve to prevent the ram from descending under its own weight should the car become stuck in the guides.

With the car empty and the power switched off, screw in completely the No7 adjuster. Press the red manual lowering button and screw out No7 until the car just begins to move. Then place the car on its pit prop. Press the manual lowering button and screw out No7 until the ram just begins to move, noting the number of turns taken. Screw in No7 half the number of turns noted. Check that the ram does not descend under its own weight. The pressure gauge should read approximately 5 bar. Remove the pit prop and check that the empty car descends on operation of the manual lowering valve.

9. Manual Lowering – Direct Acting lifts pre 2000 – VSMA valve not fitted

The manual lowering is carried out by pressing the button on the top of the down solenoid valve VMD

10. HAND PUMP RELIEF VALVE

Close the main shutoff valve and open the pressure gauge shutoff valve. Remove the cap of the adjustment screw No 11 and set to the correct pressure (< max. working pressure x 2.3). Replace the cap and remove the pressure from the block by gently pressing the manual lower button. Slowly hand pump to the operating pressure and open the main shut-off valve.

11. SETTING MINIMUM PRESSURE SWITCH (if fitted)

Set the switch to open at 5 bar with decreasing pressure.

With ball shut off valve closed, increase the pressure, then decrease with the hand lowering push button.

12. SETTING MAXIMUM PRESSURE SWITCH (if fitted)

Set the switch to open at higher than maximum dynamic pressure, but lower than relief valve pressure setting.

With ball shut off valve closed, increase the pressure, then decrease with the hand lowering push button

13. SETTING LOW HYSTERESIS SWITCH - LOAD WEIGHING FUNCTION (if fitted)

Set to suit application e.g.

80% of full load static pressure for bypass

110% full load static pressure for overloaded - door close inhibit

With ball shut off valve closed, increase the pressure with the hand pump to operating point.

Note - two types are available a. Normally Open - close with rising pressure.

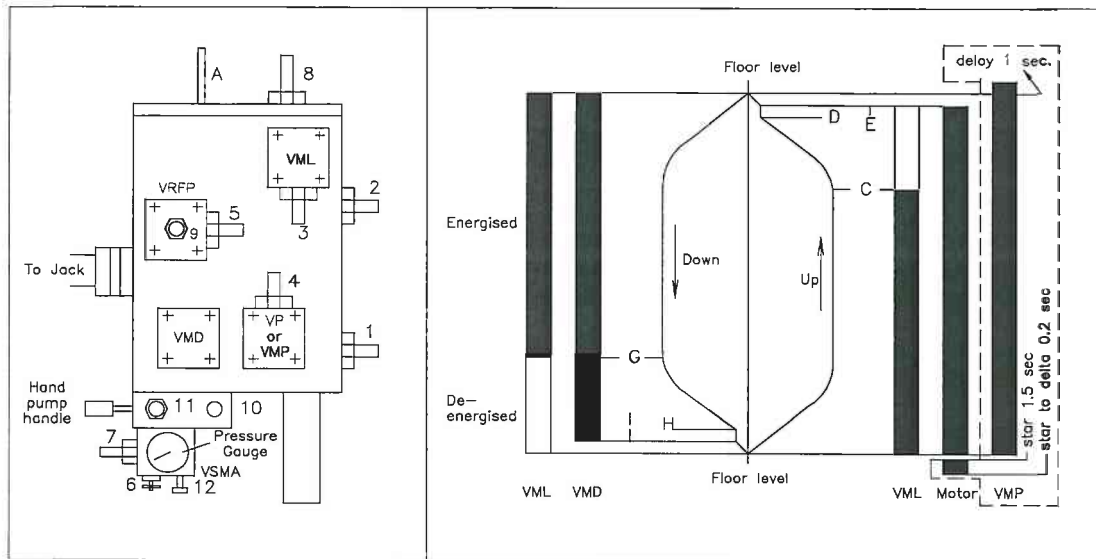
b. Normally Closed - open with rising pressure

Note – with the ER3100 version of the valve block the function of the pressure switches is built into the pcb, reading the pressure measured by the pressure transducer to operate two relays. Relay contacts perform the same function as the pressure switches.

14. SETTING SOFT STOP (applicable to 1 ½" and 2" valve blocks only)

Adjust restrictor **S** on VMP valve to obtain a jerk free stop. (the adjuster is not fitted due to available space on 1 ¼" valve blocks – a fixed 0.45mm restrictor is fitted).

Schematic drawing of EN3010 Valve block - Basic Version

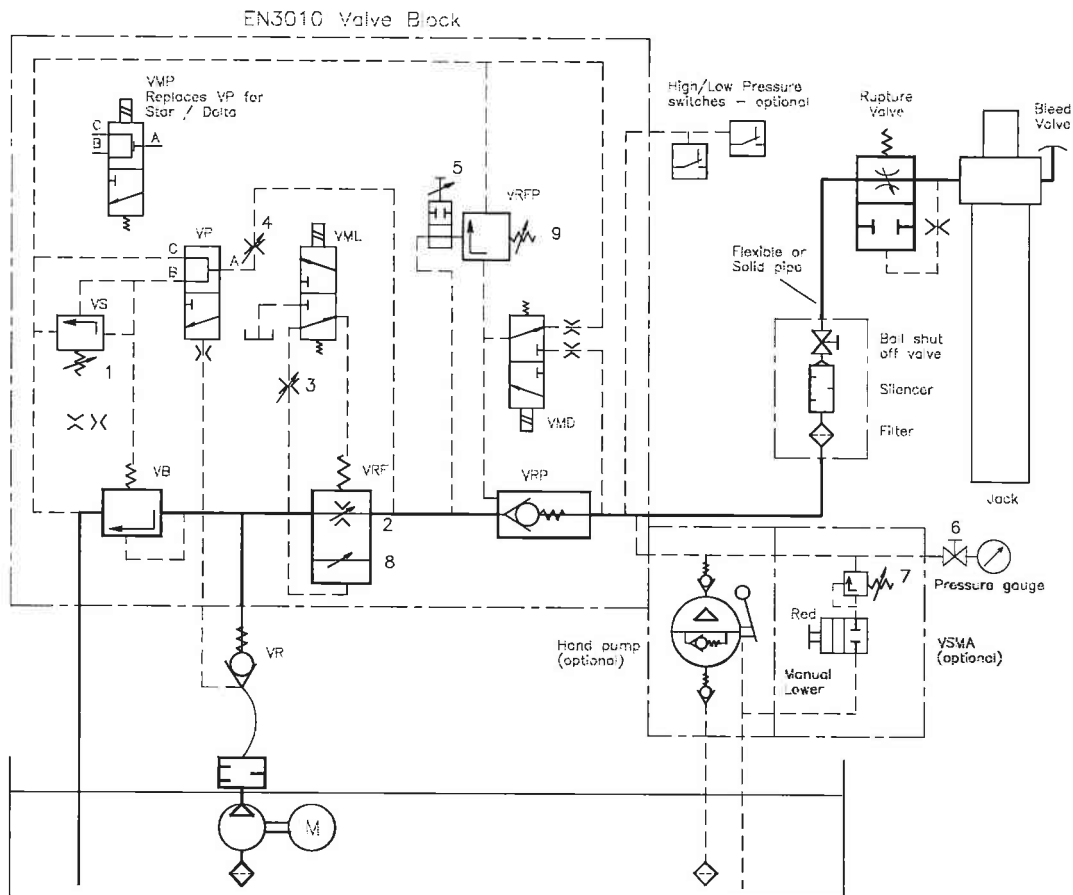


2 speed with star/delta motor starting
(see GMV manual for ER3100, Soft Stop and 2CH versions)
Shown with PAM 800 Hand Pump to 2000.

See the end of this document for current P81 Hand Pump settings

- | | | | |
|----|---|------|-------------------------------------|
| 1 | Pressure relief valve adjustment | VP | Bypass valve |
| 2 | Levelling speed adjustment | VMP | Star delta solenoid valve |
| 3 | Deceleration adjustment | VMD | Down valve - solenoid operated |
| 4 | Acceleration adjustment | VML | Levelling valve - solenoid operated |
| 5 | Rupture valve testing screw | VRFP | Down speed control valve |
| 6 | Pressure gauge shutoff valve | VSMA | Manual lowering device (2:1) |
| 7 | Manual lower valve minimum pressure adjuster | | |
| 8 | Up high speed adjustment | | |
| 9 | Down high speed adjustment | | |
| 10 | Hand pump air bleed screw | | |
| 11 | Hand pump relief valve adjustment | | |
| 12 | Manual Lower push button (red) | | |
| C | Lift well slowing switch (up direction)
This switch must be located so that the levelling distance (D-L) will be in the order of 100 to 200 mm | | |
| G | Lift well slowing switch (down direction) located as C | | |
| E | Floor stop signal (up direction) | | |
| I | Floor stop signal (down direction) | | |

Hydraulic Circuit GMV EN3010 Valve Block - basic version
 (see GMV main manual for ER3100, Soft Stop and 2CH versions)



VRP	Check valve	1	Pressure relief valve adjustment
VB	Bypass spool valve	2	Levelling speed adjustment
VML	Levelling valve - solenoid operated	3	Deceleration adjustment
VMD	Down valve - solenoid operated	4	Acceleration adjustment
VS	Pressure relief valve	5	Rupture valve testing screw
VRF	Flow regulator spool valve	6	Pressure gauge shutoff valve
VR	Check valve	7	Min. pressure adjustment (2:1)
VRFP	Down speed control valve	8	Up high speed adjustment
VP	Bypass valve	9	Down high speed adjustment
VMP	Star delta solenoid valve		
VSMA	Manual lowering device (2:1)		

Valves are manufactured with a safety factor 0.6 for a maximum static pressure of 45 bar

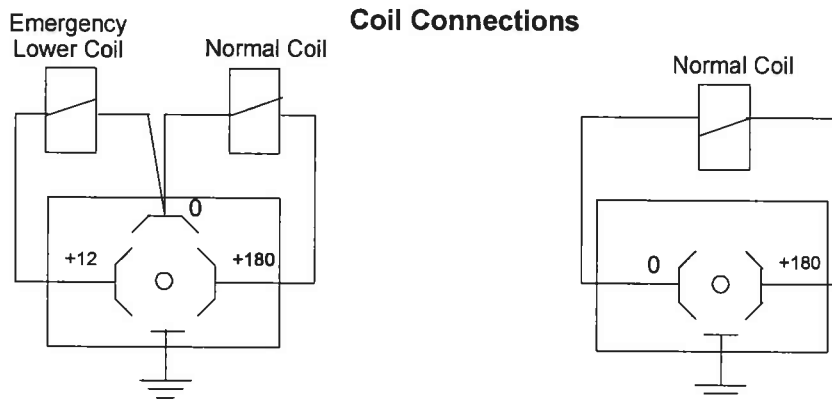
TROUBLE SHOOTING GUIDE FOR GMV 3010 TYPE VALVE

	Fault	Control Element	Rectification Procedure
1	Valve block leaking oil to surface.		<p>Ensure all lock nuts on the block are tight.</p> <p>Ensure all fixing screws are tight.</p> <p>Seals - If after above two procedures oil is still leaking change all seals and 'O' rings on valve bases.</p>
2	Car will not maintain floor level (i.e. loss of pressure).	<p>VMD</p> <p>VRP</p> <p>VSMA (2:1 only)</p> <p>Hand-pump</p> <p>Head seal on ram</p>	<p>Remove solenoid. Ensure knob movement is 4-5 mm. Check and clean valve and ensure ball bearing is in good condition and well seated.</p> <p>Dismantle VRP valve and check condition of piston and bore. Also check condition of washer and if worn, replace.</p> <p>Dismantle and check condition of valve cleaning where necessary. Ensure ball bearing is in good condition and well seated.</p> <p>See separate fault finding section</p> <p>Check for leakage, if this is the problem carefully replace head seal set.</p>
3	Lift will not ascend with full load.	VS	Adjust calibration screw No.1.
4	The start of car is delayed in up direction.	VP	Adjust screw No.4. If this fails dismantle valve, clean filters and orifices. Check 'O' rings. Check for smooth movement of piston in bore, if this is the problem replace complete VP valve.
5	The start of car is delayed in down direction.	VMD	Clean filters and orifices of VMD valve.
6	Down speed too slow	<p>VRF</p> <p>VRFP</p>	<p>Adjust screw No 9.</p> <p>Check condition of piston and bore - clean filter and orifice and check 'O' ring.</p>
7	System only functioning in high speed in both directions.	<p>VML</p> <p>VRF</p>	<p>Check adjustment screw No. 3 (it should be open approximately one turn). Clean filters and orifices and check 'O' rings.</p> <p>Check that the piston has not jammed itself in open position. Clean and check for smooth movement.</p>
8	System only functioning in low speed in both directions.	<p>VML</p> <p>VRF</p>	<p>Check manual operation by using push-button on top of valve. Check solenoid coil voltage.</p> <p>Clean filters and orifices and check 'O' rings. Ensure travel of solenoid core is approx. 0.5 mm.</p> <p>Check VRF piston has not jammed, if so, clean and check for smooth movement.</p>
9	Car will not start in the down direction	VRFP	Piston and spring inserted up side down - piston should be nearest the valve block body.
10	The car does not always stop at floor level in down-		Firstly check car is approaching floor in low speed.

	ward direction (i.e. the car passes the floor and then re-levels, or at bottom floor operates the over travel limit switch.	VMD VRFP VRP VRF	Clean filter and orifice and check seals. Ensure smooth movement of solenoid core. Ensure ball bearing is in good condition and well seated. Ensure screw No.5 is open. Ensure smooth movement of piston in bore. Clean filters and orifices and check 'O' rings. Check for smooth operation. Screw 8 unscrewed too far allowing the rear of VRF to contact the side plate. Setting for maximum speed Unscrew screw 8 until it feels slack then screw in 1 complete turn clockwise.
11	Car judders at levelling speed before stopping	Lift Levelling speed too low Slowing Point Tank Ram	Check DBG dimension, guide alignment, guide and shoe lubrication turn screw 2 anti-clockwise to increase speed This may effect floor levelling Check location Increase viscosity of the oil in the system to provide more lubrication to ram Rub ram surface with steel wool at position where ram passes through the seal at occurrence of judder
12	Power Unit noisy		Pump strainer too close to pump - slacken Jubilee clip them slide back 5 mm. Worn pump - replace
13	Car runs up at varying speeds No consistency in up speed	VP/VMP	Check that the springs are fitted correctly Check for foreign matter on seats of valve
14	Car runs up slowly and pump is noisy Dynamic pressure similar to static pressure	Pump	Check motor current, pump is probably faulty Dynamic pressure should be at least 3 bar more than static pressure
15	Hand pump not pumping	Hand pump	a. Bleed the hand pump b. with ball shut off closed, repeatedly pump then operate manual lower valve to clear air / dirt
16	Jerk start after Aux level motor operation	Aux level motor	Ensure that VMP is not energised when motor starts There should always be a delay between subsequent operations of the lift. a. If it is soft stop, the off delay in the controller may not have timed out) b. If it is ER3100 this can be achieved by setting a delay with the Offset function if there is no delay built into the lift controller.

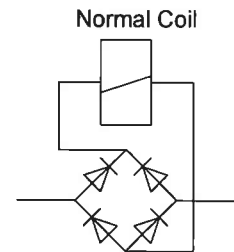
Identifying Coils

Identifying coils - the voltage is moulded into the coil case in the same colour as the coil, i.e. black



This type of coil is fitted by GMV to the down valve VMD
It is usually also supplied by Dewhurst as a spare.

a.c. coils have a built in bridge rectifier
therefore even a good coil will show as
open circuit on a test meter.



d.c. +24 +48 +60 +80 +110 +180
a.c. 110~ 220~ or 230~

The +12 or +24 connection on the left hand side is for emergency lowering from a battery.

The coils still work satisfactorily if the left and right connections are used when it is a double coil assembly. There is a volt drop of only 2 or 3 Volts across the 12 V coil which does not effect operation.

All the above coils are connected via a plug in connector to DIN 40650A.

If the coil has screw connections under a screw down cover and is of square metal section then the hydraulic valve must be replaced along with the coil.

Typical Coil Readings

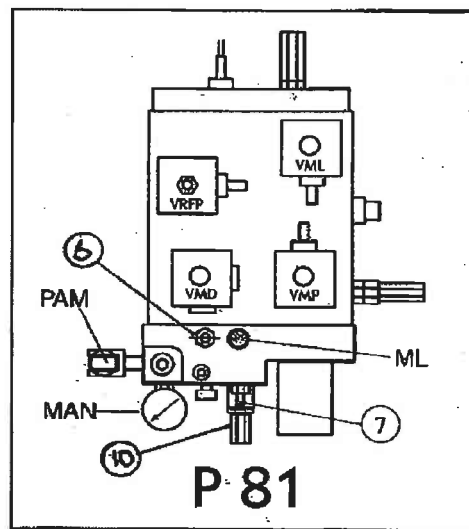
Coil Voltage	Resistance	Amps	Watts
24 d.c.	21 ohms	1.14	27.4
48 d.c.	87 ohms	0.55	26.44
60 d.c.	137 ohms	0.44	26.22
80 d.c.	211 ohms	0.38	30.32
90 d.c.	298 ohms	0.3	27.18
110 d.c.	479 ohms	0.23	25.19
180 d.c.	1,756 ohms	0.11	22.3
110V a.c.	4.5 to 5.5 M ohms	0.255	
230V a.c.	5 to 6 M ohms	.122	
Emergency Lower	In double wound	coils	
*12 d.c.	2.84	4.22	50.7
*24 d.c.	11.35	2.11	50.73

Variations in Setting up when the hand pump and VSMA are integrated into the right hand side of the valve block

To adjust the pressure on VSMA follow the following steps

- 1 Remove the protective cover of the adjusting screw "7".
- 2 Loosen the locknut
- 3 Close the ball shutoff valve "B"
- 4 Press the red manual lowering button "ML"
- 5 Check the pressure gauge reading to be around 5 bar.
If it is 5 bar then go to point 7. If it is less than 5 bar then go to point 6.
- 6 Open the ball shut off valve "B". Tighten screw "7" one turn. Close the ball shut off valve "B".
Repeat points 3, 4 & 5 until the pressure is close to 5 bar, then go to point 7
- 7 Open the ball shut off valve "B"
- 8 Tighten the lock nut , then fit the protective cover
- 9 Close the pressure gauge valve

The VSMA adjustment is now complete



Adjusting the hand pump Pressure Relief Valve

- 1 Remove the protective cover from the hand pump safety valve adjusting screw "10".
- 2 Loosen the lock nut.
- 3 Loosen screw "10" two or three turns.
- 4 Make sure that the pressure gauge shut off is open.
- 5 Close the ball shut off valve "B".
- 6 Using the hand pump handle, increase the pressure on the valve until the pressure gauge reads 2.3 times the full load static pressure. (refer to the test documents)
Example – if the full load static pressure is 35 bar then the pressure gauge should read 81 bar.
- 7 When the pressure is reached then tighten the lock nut. And fit the protective cover
- 8 Open the ball shut off valve.
- 9 Close the pressure gauge valve

The adjustment of the hand pump pressure relief valve is complete.