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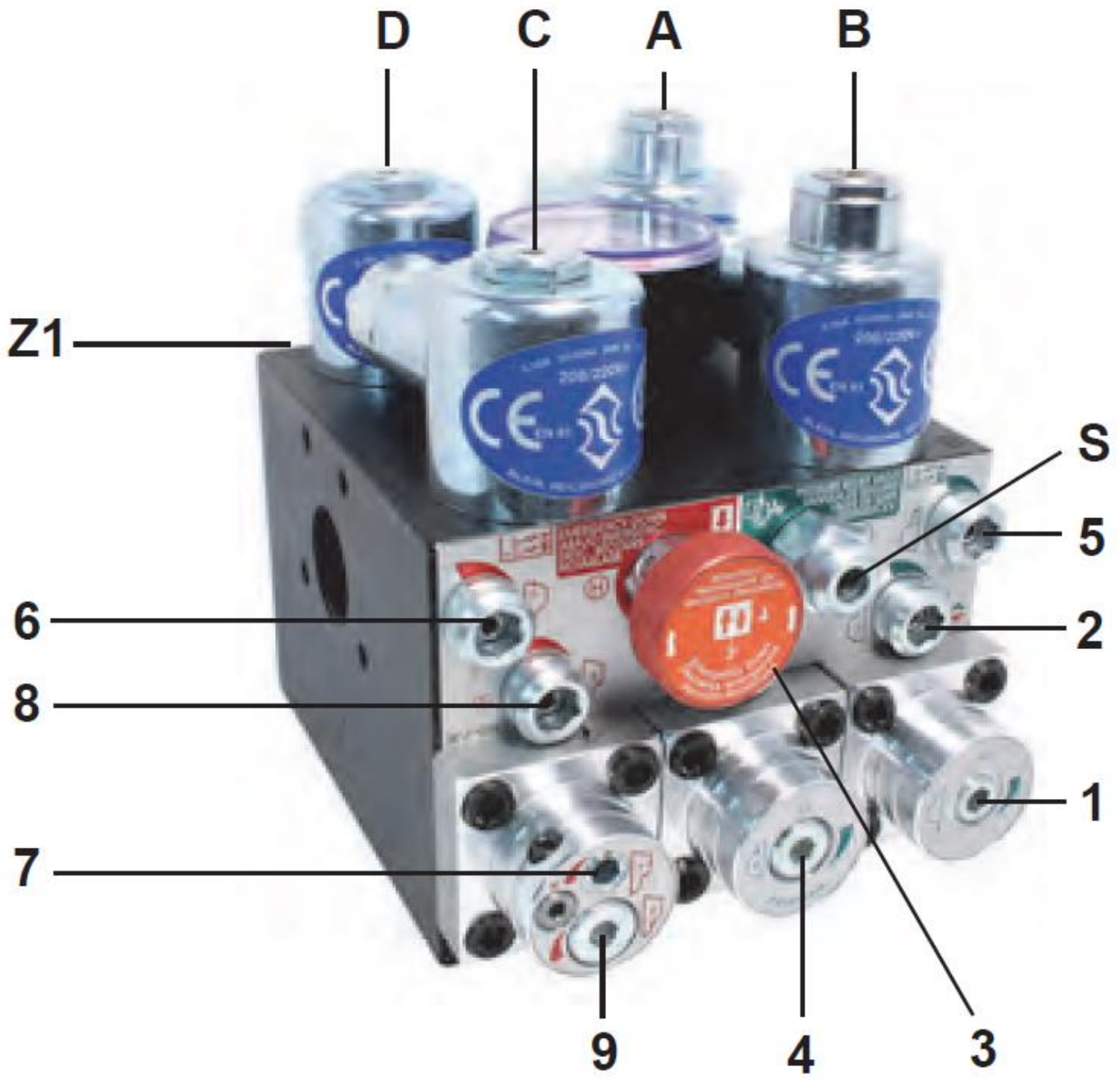
UC601 CONTROL SYSTEM OPERATION, ADJUSTMENT, & TROUBLE SHOOTING MANUAL For BLAIN EV100 HYDRAULIC VALVE

$\frac{3}{4}$ " EV

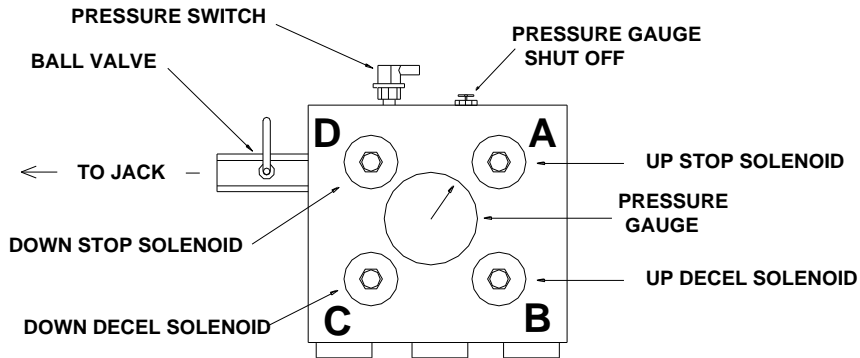


EV 100

BLAIN EV100 3/4 VALVE

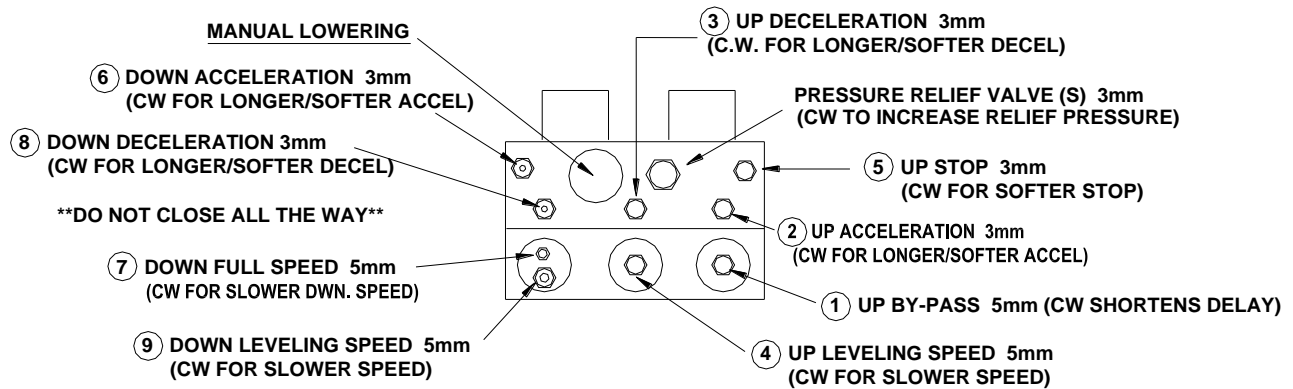


EV-100 3/4" VALVE



DOWN ADJUSTMENTS

UP ADJUSTMENTS



INITIAL FACTORY SETTINGS EV100 3/4"

UP TRAVEL

#1, Up Bypass	Level with Flange Face	5 mm Socket key
#2, Up Acceleration	All the Way 'In' Then 1.5 Turns 'Out'	3 mm Socket key
#3, Up Deceleration	All the Way 'Out'	3 mm Socket key
#4, Up Leveling	Level with Flange Face	5 mm Socket key
#5, Up Soft Stop	All the Way 'In' Then 1.5 Turns 'Out'	3 mm Socket key
#S, Relief Valve	Model 60S, 70S = 850psi; Model 80S = 650psi	3 mm Socket key

DOWN TRAVEL

#6, Down Acceleration	All the Way 'In' Then 1.5 Turns 'Out'	3 mm Socket key
#7, Down Full Speed	Level with Flange Face Then 1.5 Turns 'In'	5 mm Socket key
#8, Down Deceleration	All the Way 'In' Then 1 Turns 'Out'	3 mm Socket key
#9, Down Leveling Speed	Level with Flange Face	5 mm Socket key

Note: The valve adjusting screws are metric.

Description of Valve Adjustments

Up Travel

1. **Up Bypass:** – When the pump is started, and solenoids A and B energized, the unloaded car should remain stationary at the floor for a period of 1 to 2 seconds before starting upwards. The length of this delay is determined by the setting of adjustment 1. 'In' (clockwise) shortens the delay, 'out' (c-clockwise) lengthens the delay.
 2. **Up Acceleration:** – With the pump running and solenoids A and B energized as in 1, the car will accelerate according to the setting of adjustment 2. 'In' (cw) provides a softer acceleration, 'out' (ccw) a quicker acceleration.
 3. **Up Deceleration:** – When solenoid B is de-energized and solenoid A remains energized,, the car will decelerate according to the setting of adjustment 3. 'In' (cw) for a softer deceleration, 'out' (ccw) for a quicker deceleration.
 4. **Up Leveling:** – With solenoid A energized and solenoid B de-energized as in 3, the car will move at its leveling speed according to the setting of adjustment 4. 'In' (cw) for slower leveling speed, 'out' (ccw) for faster up leveling speed.
 5. **Up Stop:** – At floor level, solenoid A is de-energized with solenoid B remaining de-energized. Through a time relay the pump should run approx. 1 second longer to allow the car to stop smoothly by valve operation according to the setting of adjustment 5. 'In' (clockwise) provides a softer stop, 'out' (c-clockwise) a quicker stop..
- S **Relief Valve:** 'In' (clockwise) produces a higher, 'out' (c-clockwise) a lower maximum pressure setting. After turning 'out', open manual lowering H for an instant.

Important: When testing relief valve, close ball valve gradually.

Down Travel

6. **Down Acceleration** – When solenoids C and D are energized, the car will accelerate downwards according to the setting of adjustment 6. 'In' (clockwise) provides a softer down acceleration, 'out' (c-clockwise) a quicker acceleration.
7. **Down Speed** – With solenoids C and D energized as in 6 above, the full down speed of the car is according to the setting of adjustment 7. 'In' (clockwise) provides a slower down speed, 'out' (c-clockwise) a faster down speed.
8. **Down Deceleration** – When solenoid C is de-energized whilst solenoid D remains energized, the car will decelerate according to the setting of adjustment 8. 'In' (clockwise) provides a softer deceleration, 'out' (c-clockwise) a quicker deceleration. Attention: Do not close all the way in! Closing adjustment 8 completely (clockwise) may cause the car to fall on the buffers.
9. **Down Leveling** – With solenoid C de-energized and solenoid D energized as in 8 above, the car will proceed at its down levelling speed according to the setting of adjustment 9. 'In' (clockwise) provides a slower, 'out' (c-clockwise) a faster down levelling speed.

Initial Valve Adjustments

Do not adjust valve until elevator is completely installed !

Pressure Relief Valve Adjustment

1. The relief valve has been factory preset but may need to be adjusted to meet local code requirements.
2. The relief pressure should be 125% of the maximum working pressure. Determine the maximum working pressure by loading car to capacity (950 or 1000 lbs.) then call the elevator to the top floor. Note the gauge pressure reading as the car is moving at full speed. Multiply this pressure by 1.25 to obtain the pressure relief setting.
3. To set the pressure relief valve (S): Close the shut-off valve. Start the motor then turn adjustment screw clockwise to increase and counterclockwise to decrease relief pressure.

Quick Valve Adjustment Procedure (If Necessary)

The following steps are based on an empty car (except 7) and the valve adjustments are set to Inclinator factory defaults as shown on page 3.

SOLENOID COILS

During adjustment of the EV 100 valve, instead of making a full floor to floor travel to check operation much time can be saved by removing the securing nuts of the coil and switching to deceleration or to acceleration by lifting or replacing the appropriate coil by hand, allowing several adjustment corrections during one car travel between floors.

Once removed from the solenoid tube the energized coil may begin to overheat after about 10 secs. If the coil becomes too hot to hold, it should be replaced, back over the solenoid tube and any further adjustment carried out with the elevator making normal floor to floor runs.

Adjustment No. 1 Pilot pressure setting

Disconnect coil A. Energize Motor (pump).

If the car moves upwards turn No. 1 'out' until the car stops. If the car does not move, turn No. 1 'in' until the car begins to move, then turn No. 1 'out' until the car stops.

DO NOT UP-LEVEL WITH THIS ADJUSTMENT !

Adjustment No. 2 Up acceleration

Reconnect coil A. Energize Motor and A and B coils (normal 'up' call).

Observe the up acceleration. If it is too quick, turn No. 2 'in' ½ turn. If it is too long, turn No. 2 'out' ½ turn. Repeat until acceleration is satisfactory.

Adjustment No. 3 Up deceleration

With coil B still disconnected. Energize Motor and coil A (normal 'up-level' call).

The car will travel upwards at levelling speed. Turn No. 3 'in' until the car starts to up level faster, then turn No. 3 'out' until the original levelling speed is observed. Reconnect coil B and place a normal up call. Observe the deceleration of the car. If it is too long, turn No. 3 'out' ¼ turn; if it is too short, turn No. 3 'in' ¼ turn. Repeat until deceleration is satisfactory.

Adjustment No. 4 Up leveling

Disconnect coil B. Energize Motor and coil A (normal 'up-level' call).

With adjustment No. 4 level with the face of the flange the car will up level. If the leveling speed is too fast, turn No. 4 'in' until the speed is as required. If the speed is too slow turn No. 4 'out'.

Note: Setting the up Leveling speed too slow when elevator car is empty can cause the elevator car to stall with weight in the car. Always adjust the up leveling speed with a full capacity load.

Adjustment No. 5 Up soft stop

Disconnect coil A. Energize Motor.

The car should not move. Turn No. 5 'in' until the car starts upwards then turn No. 5 'out' until the car stops. Reconnect coil A. Energize Pump-Motor and A. The car will travel upwards at levelling speed. Lift A coil by hand briefly and observe the stopping of the car. If the stop is too hard turn No. 5 'in' ¼ turn. If the stop is too soft, turn No. 5 'out', ¼ turn. Repeat until the stop is satisfactory.

S Pressure relief valve

Turn S screw 'out' until about 2 mm of the screw head is showing. Close the ball valve in the cylinder line and open the manual lowering H to lower valve pressure down to zero. Place an up call, energizing motor and coils A and B. The relief pressure will show on the pressure gauge. To increase the relief valve setting, turn S 'in'.

To decrease the relief valve setting, turn S 'out', then open the manual lowering for ½ second with the pump still running to release locked in pressure, before observing the pressure gauge reading.

Adjustment No. 6 Down acceleration

Turn No. 6 all the way 'in'. Place down call (coils C and D energized).

The car will not move. Turn No. 6 'out' slowly until the car accelerates downwards. If the acceleration is too long, turn No. 6 'out' ¼ turn. If it is too short, turn No. 6 'in' ¼ turn.

Adjustment No. 7 Down full speed

Place down call (coils C and D energized). Observe full down speed. Turn No. 7 'in' for slower, 'out' for faster speed.

Note: Any adjustment to the Down Full Speed adjustment must be done with a full capacity load. A calibrated tachometer is necessary to accurately measure the down speed. The down speed must not exceed 40fpm with a full capacity load per *ASME A17.1-2016/CSA B44-16 section 5.3.1.10.2*.

Note: The rupture valve must be re-adjusted after any change to the Down Full Speed adjustment.

Adjustment No. 8

Place down call (coils C and D energized).

As the car approaches full speed, remove coil C by hand briefly from the solenoid and observe the deceleration of the car. If the deceleration is too long, turn No. 8 'out' ¼ turn; if it is too short, turn No. 8 'in' ¼ turn. Repeat until deceleration is satisfactory.

Adjustment No. 9 Down leveling speed

Disconnect coil C. Place down call (D energized).

Observe down leveling speed. Turn No. 9 'in' for slower, 'out' for a fast down leveling speed.

Note: The manually operated down speed and the D coil operated down leveling speed are the same.

Much time can be saved by removing the appropriate coil from time to time during the adjustment procedure rather than allowing the car to move between two floors while adjusting individual controls. By doing this one can make several adjustments & corrections.

Warning: If the coil is removed from the solenoid valve, it overheats after approximately 10 seconds. The maximally permitted temperature of the coil amounts to 120°C (see I below).

- A. Firstly, place the appropriate allen key in the adjustment that needs to be changed.
- B. Put the elevator into operation.
- C. Raise the appropriate coil by hand and observe the reaction of the elevator.
- D. Make the adjustment accordingly.
- E. Place the coil bac`k over the solenoid tube, until the elevator has again reached its speed.
- F. Raise the coil again in order to test how the elevator functions with the new adjustment.
- G. Repeat this process as long as it is necessary. Normally, this process can be repeated 2 to 5 times during one car travel between floors. When the coil is energized, it should be held in the hand. Energized coils shouldn't be left to one side, otherwise its overheating may not be felt.
- H. If the coil becomes too hot to hold, it must be replaced back over the solenoid tube and any further adjustment carried out with the elevator making normal floor to floor runs.
- I. Place a steel bolt, approximately 14-17 mm in diameter and 50 mm in length, or a tool through the coil to slow the rate of heating.

PRELIMINARY TROUBLE SHOOTING INITIAL INSTALL

UP PROBLEMS

1. With Power off, ensure that all wires are secured inside the Pump Control Enclosure.
2. Pressure Gauge should read the working pressure (make sure it is turned on).
3. Make certain Ball Valve is open.
4. If all of the above is working, go to Troubleshooting procedure for “up travel” on the following pages.

DOWN PROBLEMS

1. With Power off, ensure that all wires are secured inside the Pump Control Enclosure
2. Make certain Ball Valve is open.
3. Rupture Valve is installed with the arrow pointing away from jack.
4. Pressure gauge has a reading.
5. Start trouble shooting procedure for “Down Travel” on the following pages.

TEMPERATURE SENSOR

There is a temperature sensor in the motor windings that will open at when the motor is overheated.

EV100 TROUBLE SHOOTING - UP TRAVEL

Problem	Possible Cause	Recommended Action
No Up-Start (Elevator remains at floor)	Test: Turn adjustment 5 all the way in. If the elevator now starts upward the problem is at Solenoid A	
	Solenoid A not energized or voltage too low.	See Note I below.
	Solenoid A tube not screwed down tight.	Tighten Solenoid A Tube
	Solenoid valve A : Dirt or damage between needle AN and seat AS .	Clean or change needle and seat.
	Adjustment 2 is not open enough.	Turn Adjustment 2 out (ccw).
	Adjustment 1 is turned out too far. Not enough pilot pressure.	Turn Adjustment 1 in (cw) with the pump running.
	Pressure relief valve (S) is set too low.	Set pressure relief higher.
	Adjustment 8 turned too far in. (Car setting on pit floor)	Turn adjustment 8 out (ccw)
Up-Start, but no Full Speed	Test: Turn adjustment 3 all the way in. If the elevator now travels upward at full speed, the problem is at solenoid B .	
	Solenoid B not energized or voltage too low.	See Note I below.
	Solenoid B tube not screwed down tight.	Tighten solenoid B tube.
	Solenoid valve B : Dirt or damage between needle AN and seat AS .	Clean or change needle and seat.
Up-Start too hard	Adjustment 1 turned in too far.	Turn Adjustment 1 out (ccw).
	Adjustment 2 turned out too far.	Turn Adjustment 2 in (cw).
	O-Ring UO on Bypass Valve U is leaking.	Change O-Ring – See EV Sys. Leakage.
No Deceleration into leveling speed	Solenoid B does not de-energize	Lift coil to check magnetic pull. See Note I below.
	Adjustment 3 turned in too far.	Turn out adjustment 3. Turn in adjustment 2.
	O-Ring UO on Bypass Valve U is leaking.	Change O-Ring – See EV Sys. Leakage.
Decelerates into leveling speed but over-shoots floor level	Solenoid A is de-energized too late.	Lift coil to check pull. See Note I below.
	Adjustment 5 turned in too far.	Turn adjustment 5 out (ccw).
	Adjustment 1 turned in too far.	Turn adjustment 1 out (ccw).
	Up leveling speed too fast.	Turn adjustment 4 in (cw).
Elevator stops before reaching the floor (no leveling)	Solenoid A and B reversed.	Swap solenoids A and B .
	Up leveling speed too slow.	Turn adjustment 4 out (ccw).
	Middle O-Ring FO on flange 4F is leaking.	Change O-Ring – See EV Sys. Leakage.
	Relief Valve set too low.	Set pressure relief valve higher.

NOTE I: For checking the operation of the solenoids, remove the top nut above the coil. By lifting the coil up slightly, the magnetic pull of the coil can be felt. (Do not remove an energized coil from the stem for more than a few seconds, as the coil will overheat and may be damaged).

EV100 TROUBLE SHOOTING - DOWN TRAVEL

Problem	Possible Cause	Recommended Action
No Down Start	Solenoid D not energized or voltage too low.	Lift coil to check magnetic pull. (See Note I).
	Adjustment 6 turned in too far.	Turn out adjustment 6 .
	Adjustment 8 turned out too far.	Turn adjustment 8 in (cw) cautiously, <u>turning in too far will cause elevator to drift down.</u>
	O-Ring UO on Down Valve X is leaking.	Change O-Ring – See EV Sys. Leakage.
No full speed	Solenoid C not energized or voltage too low.	Lift coil to check magnetic pull. (See Note I).
	Adjustment 7 turned in too far.	Turn adjustment 7 out (ccw).
	Adjustment 6 turned in too far.	Turn adjustment 6 out about ½ turn.
No down leveling. Elevator stops before floor level	Power to Solenoids C and D reversed.	Lift coil to check magnetic pull. (See Note I).
	Adjustment 9 turned in too far.	Turn adjustment 9 out (ccw).
	Spring 9F in adjustment 9 is broken.	Replace adjustment 9 complete.
No down leveling. Elevator travels through floor level	Adjustment 8 turned in too far. Filter on adjustment 8 blocked or adjustment 8 is damaged.	Turn out adjustment 8 about ½ turn.
	Adjustment 9 turned out too far.	Turn adjustment 9 in (cw).
	Solenoid valve C : Dirt or damage between needle DN and seat DS .	Clean or change needle and seat.
	Inner O-Ring FO on flange 7F is leaking.	Change O-Ring – See EV Sys. Leakage.
Elevator sinks quickly	Solenoid D tube not screwed down tight	Tighten Solenoid D tube.
	Adjustment 8 turned in too far.	Turn adjustment 8 out (ccw) about ½ turn.
Elevator sinks slowly due to internal leakage (Re-levels)	For possible down leakage points, see EV System Leakage page.	Replace one seal at a time and test before proceeding to the next point of possible leakage, if still necessary.
	Solenoid Valve D : Dirt or damage between needle DN and seat DS .	Clean or change needle and seat.
	O-Ring XO on Down Valve X is leaking.	Replace Down Valve.
	O-Ring VO on Check Valve V is leaking.	Change O-Ring – See EV Sys. Leakage.
	O-Ring WO on Leveling Valve W is leaking.	Change O-Ring – See EV Sys. Leakage.
	Inner O-Ring FO on flange 4F is leaking.	Change O-Ring – See EV Sys. Leakage.
	O-Ring HO of Manual Lowering H is leaking.	Replace Manual Lowering.