

Prepared exclusively for Newmar

AutoLevel[™] Installation - Troubleshooting & Warranty Guide

Includes Manual & Automatic 4-Point Leveling Systems

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Newmar 4 Point Installation

!!! Make sure that all hydraulic lines, power cables and wire harnesses are clear of hot exhaust and chassis pinch points. All of these items must be securely fastened to the chassis with wire ties.

Jack / Pump Installation

Step 1: Determine where the jacks will be mounted. The front jacks will be mounted to the drop wall. The rear jacks will be mounted as close as possible to the rear axels.

Step 2 (Jacks): The jacks <u>must</u> be installed with a **minimum of 7 to 8 inches of ground clearance**. In any case, the bottom of the footpad should be no lower than any other item mounted on the coach. Pay particular attention to the angle of departure for the chassis when mounting the rear jacks and the angle of approach when mounting the front jacks.

Step 3 (Controller): The controller must be mounted to the underside of the coach or in the basement (if available). The controller **must** be mounted as close to center (side to side) of the coach as possible and as close to center between the jacks (front to rear). The controller has a label with mounting instructions for proper orientation. The mounting directions <u>must</u> be followed for the Auto-Level sensor to operate properly (harnesses exiting the controller towards the rear of the coach).

Step 4 (Pump): Install the pump kit on the coach. The pump must be mounted in a location that is reasonable to route all of the hydraulic hoses to the manifold. It must be accessible for filling the reservoir and monitoring the fill level. Take note if the unit is equipped with the manual override option. The cartridge valves and end of the motor <u>must</u> be accessible, if manual override is needed. In most applications, a side storage compartment or the engine compartment will provide the ideal location. An additional mounting box may be used.

Step 5 (Fittings): Install the hydraulic hose fittings in the top and bottom of each jack and install the JIC O-ring fittings into the manifold. The fitting should be installed in the manifold <u>finger tight</u>. Rotate the fitting to the desired orientation, and <u>then</u> tighten the 9/16" jam nut. **Care must be taken to ensure that the fitting is tight in the manifold, but not overly tight as to compromise the o-ring seal.**

Step 6 (Hoses): Install the hydraulic hoses. Route the hoses clear of all hot exhaust components and pinch points in the suspension/chassis system. Attach the hoses to the manifold and jacks according to the hose connection chart below. Secure the hydraulic hoses with wire ties to the chassis.

Installation of Hoses to the Manifold

Jack Leg

Manifold Connection

Left Front-TOP	T-1 Brown Solid
Left Front-BOTTOM	B-1 Brown Stripe
Right Front-TOP	T-2 White Solid
Right Front-BOTTOM	B-2 White Stripe
Left Rear-TOP	T-3 Orange Solid
Left Rear-BOTTOM	B-3 Orange Stripe
Right Rear-TOP	T-4 Yellow Solid
Right Rear-BOTTOM	B-4 Yellow Stripe

Connections: Keypad / Controller / Pump Assembly

!!! Most harnesses used in the system are communication cables. Avoid headaches! It is very important that all connections for the pump and control panel harnesses are tight and physically sound **!!!**

Step 7 (Keypad/Controller harness): Fasten the keypad mount in the desired location. Note: Keypad is not weather resistant. Attach the supplied wire harness between the keypad and the location of the controller (see step # 3 above). This harness will connect between the in-board 4-pin (J1) connector on the keypad and the (1ea.) mating connector on the controller. Secure the harness with wire ties to the chassis. Refer to the attached diagram.

Step 8 (Dump / Reinflate Circuit): Not present.

Step 9 (Keypad Ignition Disable Circuit): Not present.

Step 10 (Park Brake Ground): Not present.

Step 11 (Pump harness connections): Recall the pump installation from Step 4. Attach the supplied wire harness between the pump and the location of the controller (see step # 3 above). This harness will connect between the pump and the (1ea.) mating connector on the controller. Note the harness "break-outs" for the main harness at the hydraulic pump. There are (3ea) connectors. Plug each connector from the harness into the corresponding connector on the pump. Secure the harness with wire ties to the chassis. Refer to the attached diagram.

The harness from the keypad to the controller is routed. You should have no disconnected plugs.

The harness from the pump to the controller is also routed. All of the connections at the pump should be completed, **except the power and ground connections at the pump**, which are completed next.

Power connections for Bi-Rotational Motor

These motors can be identified by the presence of two motor solenoids.

Step 12 (Pump -12volts): Attach a #4 gauge wire (#2gauge if the run is over 12ft.) between the negative 12volt terminal on the battery and the ground stud on the pump. This is the preferred method of grounding. If grounding the pump to the chassis, the connection must be sound, free of paint and not susceptible to corrosion. <u>It is not</u> acceptable to allow the pump mounting bolts to be the sole grounding connection.

Step 13 (Pump +12volts): Attach a #4 gauge wire (#2gauge if the run is over 12ft.) between the positive +12volt terminal on the battery and the **common posts on the motor solenoids**. This supply may be fused at the source with a 120-amp. circuit breaker. This +12volt supply must be a dedicated and isolated circuit (not shared with other devices), and must be constant, non-switched +12volt.

Appropriate gauge wire must be used. Proper grounding is essential

Purging for Bi Rotational units - 4 function units only

This procedure <u>must</u> be performed with the initial installation & running of hydraulic system, following installation of the pump assembly and jacks.

This procedure applies ONLY to MH-4 systems that are equipped with the bi-rotational pump.

All electrical and hose connections must be completed before the purging process.

You must follow this procedure **strictly**. ANY deviation from the process will cause the purging process to become difficult and time consuming.

- 1. Fill the reservoir with ATF (Dexron III preferred).
- 2. Remove the fitting that is installed into port G-1 or attach a hose to the coupler. **Place into a <u>clean</u> container**. This will allow retract side air to escape to atmosphere.
- 3. Run the pump to <u>extend</u> the jacks(s). Maintain the fluid level in the reservoir between ¹/₄ and ¹/₂ full. <u>Do not allow reservoir to run empty</u>. If jacks(s) will not fully extend, crack loose the upper hose(s) at the jack(s) and run pump to extend until air is expelled. Use caution the air/hydraulic fluid will be under 2250 psi. Retighten the hoses and complete the extension of the jack(s). Maintain the fluid level as described above.
- 4. Reinstall the fitting into G-1 or remove the hose attached to the coupler. (See #2 above)
- 5. Run the pump to <u>retract</u> the jack(s). Maintain the fluid level as above. <u>Do not</u> fill to full until after the legs are fully retracted.
- 6. **IMPORTANT** If fluid in reservoir appears to be aerated (foaming), allow unit to sit until foam dissipates (approx. 5- 10 minutes).
- 7. Fully extend and retract jack(s) a <u>minimum</u> of 3 times. <u>Allow any foam in the oil</u> to dissipate as needed. Maintain the fluid level in the reservoir as needed.

Additional Notes regarding Purging of the Bi Rotational Pump

- <u>Never allow the reservoir to go empty</u>. Maintain the fluid level at least ¹/₄ full all the time. The reservoir fluid level will be greatest when all jacks are fully retracted; the reservoir fluid level will be lowest when all jacks are fully extended.
- !! <u>Being patient helps</u> !! It does no good to run the pump and try to move the jacks when the reservoir is full of foam. Pumping foam will only reintroduce air into the system and will prolong the process unnecessarily.
- !! <u>We want the air out</u> !! Allowing the air to dissipate thru the reservoir and maintaining the reservoir fluid level will get things working faster.

Operation

Manual Operation

- **Power On:** Push and release the POWER keypad button to engage power. The LED next to the POWER button should be lit RED when power is on.
- Planting the Jacks: Using the DOWN ∇ keypad button, extend each jack until they contact the ground (this is referred to as "planting" the jacks). Front jacks will work in tandem (If either LF or RF DOWN ∇ or UP Δ keypad buttons are pressed, BOTH front jacks will respond). As you extend the jacks, an LED light positioned on the keypad will indicate the jacks are out of the "stowed" position. Rear jacks may be operated individually. Do not manually overextend individual jacks. This may cause unwanted stress on the coach or the jacks.
- Leveling the Coach: Use a bubble level on a flat surface in the <u>center</u> of the coach as a reference. Level the vehicle by using DOWN ∇ or UP Δ keypad buttons until the vehicle is level. Rear jacks may be operated individually or in pairs as long as they are operated in the same direction; front jacks will operate in tandem. Do not attempt to lift the vehicle off of the tires. The keypad may be left on once level has been achieved. The keypad will enter "sleep mode" after five minutes of inactivity.
- **Retracting the Jacks:** The Equalizer System provides the ability to retract the REAR jacks using the ALL RETRACT button or the UP Δ button for each individual jack. ONLY the REAR JACKS will automatically retract and return to stowed position when the ALL RETRACT button is pressed and released. The pump will run in retract mode until all of the jacks are fully stowed (plus an additional 5 seconds) up to a maximum of 60 seconds. You may stop the ALL RETRACT by pressing <u>any</u> button on the keypad. The FRONT jacks will remain extended when ALL RETRACT is pressed to continue support of the trailer. The front jacks must be retracted manually by using either the RF or LF UP Δ button.

AutoLevel[™] Operation

- Setting the Null: Null is the term used to indicate "levelness" of the coach. The null has been preset from the factory. If the coach is not level following an attempt to Auto Level, you will need to reset the null. To set the null, push and release the POWER keypad button to engage power. The LED next to the POWER button should be lit RED when power is on. Level the coach by deploying jacks manually (using the DOWN ∇ keypad button, extend each jack until the coach is level), or by simply parking the coach on a level site. You do not need to have jacks deployed to set the null. Use a bubble level on a flat surface in the center of the coach as a reference. Once the coach is level, turn the POWER off at the panel. Depress and hold the AUTO-LEVEL keypad button. Continue to hold the AUTO-LEVEL button and press and release the POWER button and listen for a series of beeps. After the panel has beeped 5 to 6 times, release the AUTO-LEVEL button (the keypad will continue to beep as long as the AUTO-LEVEL button is held). The new null has been set and the panel will maintain this setting. Pressing and releasing the ALL RETRACT button will retract the rear jacks to the stowed position.
- **Power On:** Push and release the POWER button to engage power. The LED next to the POWER button should be lit RED when power is on.
- AutoLevel[™]: Press the AUTO-LEVEL button and release. The system will send out a continuous series of beeps, the 'OPERATING' LED will flash RED to let you know Auto Level is operating and will automatically level the coach. When completed, the keypad will signal a successful level with a dual-level tone. The keypad may be left on once level has been achieved. The keypad will enter "sleep mode" after five minutes of inactivity.
- **Retracting the Jacks:** The Equalizer System provides the ability to retract the REAR jacks using the ALL RETRACT button or the UP Δ button for each individual jack. ONLY the REAR JACKS will automatically retract and return to stowed position when the ALL RETRACT button is pressed and released. The pump will run in retract mode until all of the jacks are fully stowed (plus an additional 5 seconds) up to a maximum of 60 seconds. You may stop the ALL RETRACT by pressing <u>any</u> button on the keypad. The FRONT jacks will remain extended when ALL RETRACT is pressed to continue support of the trailer. The front jacks must be retracted manually by using either the RF or LF UP Δ button.

Note: There are specific instances when manual extension of one (or more) jack is inhibited (deny tone when DOWN ∇ is depressed). This situation is caused by the 'anti-twist' protocol in the software contained in the control box. Simply stated, the 'anti-twist' protocol denies jack extension if the system senses that a specific corner of the coach is approximately 3 degrees higher than the rest. You will be able to extend other jacks to overcome the slope. *If the system incorrectly senses excessive slope, this can be overcome by re-setting the null. This will allow manual extension of all jacks. Remember to re-set the null after manually leveling the coach.*

Helpful Hints

- Front jacks will work in tandem. If either LF or RF DOWN ∇ or UP Δ keypad buttons are pressed, BOTH front jacks will respond.
- The ALL RETRACT function will only affect the rear jacks. The fronts will always be retracted by using the UP Δ buttons.
- Do not allow excessive motion in the coach during the Auto-Level[™] operation (don't move around in the coach). This could cause the system to level improperly.
- Your AutoLevel[™] is a microprocessor-controlled system. <u>Proper and adequate</u> <u>battery voltage and permanent chassis ground are essential.</u>
- Your system may be equipped with a manual override option. Refer to the procedure for proper operation of this option. It is usually better to review this procedure <u>prior</u> to its actual use, rather than having to learn a new procedure in difficult environments.

Panel Indicator LED's

There are a total of ten (10) LED indicators on the Equalizer Keypad. The function of these LED's is detailed below.

During typical operation, the LED's on the bottom left hand corner of the keypad should NOT be illuminated. The only LED that should light is the 'OPERATING' LED, which should flash during operation.

'POWER'LED	ON Red when power is ON OFF when power is OFF
	FLASH every 5 sec. In Sleep Mode
'JACK' LED (4 each)	ON Red when jack(s) are deployed OFF when jack(s) are stowed
'OPERATING' LED	FLASHING Red w/ Auto Level or All Retract OFF when keypad is idle or 'sleeping'
'LOW VOLTAGE' LED	.ON Red when voltage is below 10.5 volts dc OFF when voltage is above 10.5 volts dc
'ENGAGE PARK BRAKE' LED	not present
'IGNITION ON' LED	not present
'EXCESS SLOPE ' LED	ON Red following an Auto Level attempt, if the system cannot overcome slope
	OFF when slope is not excessive

If the LOW VOLTAGE, ENGAGE PARK BRAKE, IGNITION ON or EXCESS SLOPE LED's illuminate, you have an 'error' condition that <u>must be corrected</u> prior to operating the jacks.

Manual Override for Bi-Rotational Style Pumps*

Your hydraulic pump may be equipped with a bi-rotational motor. You will use a 2000 r.p.m. drill and a 7/16" socket.

Care must be taken to ensure neither the drill nor the socket contact any wires or hydraulic hoses while in use.

To operate your jack(s) using the manual override (with bi-rotational motor):

- 1) The individual cartridge valves are clustered together on the side of the pump manifold. They are labeled 1 thru 4. Locate the screws on the appropriate cartridge valve(s). Using a small flat blade screwdriver, turn the screw(s) clockwise until all the way in**.
- 2) Remove the black plastic cap from the top of the motor. Use a small flat head screwdriver. Place the drill with the 7/16" (11mm) socket on the manual override shaft located at the top of the motor.
- 3) To <u>retract</u> your jack(s) run the drill in the counter-clockwise direction.
- 4) To **<u>extend</u>** your jack(s), run the drill in the clockwise direction.
- 5) When manual override is complete, return the cartridge valve(s) to the normal positions. Reinstall black plastic cap on motor.

*These are identified by the presence of 2 motor solenoids and 2 motor leads

<u>Caution</u>: Following manual override operation, failure to return all valves to normal position may result in one or more jack legs drifting down from their retracted (stowed) position. For cartridge valves, rotate the center screw fully counter-clockwise.

**Note: The normal operating position of the screw in the cartridge valve is the counter-clockwise 'out' position. The <u>only</u> time the valve should be shifted manually is when attempting to operate jack(s) via manual override.

Troubleshooting Guide

Symptom	Possible Cause	Corrective Action	
	Blown fuse at pump harness or in fuse panel	Replace fuse	
	Faulty ground or power wire	Trace and repair or replace	
Keypad will not turn on	Low Battery Voltage	Charge chassis and/or coach batteries	
	Defective Keypad or Controller	Call Equalizer Tech Support	
	Defective Keypad harness	Trace and repair or replace	
	Low Battery Voltage to Pump	Charge chassis and/or coach batteries	
	Faulty electrical connection	Trace and repair or replace	
Keypad turns on – Jacks will not operate	Defective Keypad or Controller	Call Equalizer Tech Support	
	Defective pump motor or solenoid(s)	Check and replace as needed	
	Other system defect	Call Equalizer Tech Support	
	Low Battery Voltage to Pump	Charge chassis and/or coach batteries	
	Error LED on Keypad	Correct error condition	
	System Null not set	Set Null	
Jacks will retract but will not extend	Anti-Twist Software Protocol has been Initiated	Lower opposite side of coach and/or Re-set Null and Level Coach	
	Defective extend motor solenoid	Check and replace as needed	
	Defective Keypad or Controller	Call Equalizer Tech Support	
	Faulty electrical connection	Trace and repair	
	System Defect	Call Equalizer Tech Support	

	Low battery voltage	Charge chassis and/or coach batteries	
Jacks will extend but will not retract	Incorrect hose connection at pump or jack	Trace and repair	
	Defective retract motor solenoid	Check and replace as needed	
	Defective Keypad or Controller	Call Equalizer Tech Support	
	System Null not set	Set Null	
	Controller installed improperly or has moved	Check controller orientation	
Autol ovol TM will not lovol	Error LED on Keypad	Correct error condition	
AutoLevel will not level	Damaged or defective Keypad harness	Call Equalizer Tech Support	
	Defective Keypad	Call Equalizer Tech Support	
	Other System Defect	Call Equalizer Tech Support	
	Low battery voltage	Charge chassis and/or coach batteries	
	Excessive vehicle motion during leveling sequence	Reset Control Panel and re-try	
	System Null not set	Set Null	
AutoLevel™ stops mid-cycle	Damaged or defective Controller	Check and replace –	
	Damaged or defective Keypad harness	Call Equalizer Tech Support	
	Other System Defect	Call Equalizer Tech Support	
	Defective Pressure Switch or wiring	Trace and repair or replace	
Jack LED's on panel stay on	Defective Keypad Harness	Trace and repair or replace	
	Hydraulic fluid leak or level low	Repair leak and/or refill reservoir	
	Defective Keypad	Call Equalizer Tech Support	

	Low battery voltage	Charge chassis and/or coach batteries
Hadron lie annan in an an 4ine	Blown fuse or breaker in fuse panel	Replace fuse or reset breaker
Hydraulic pump inoperative	Faulty electrical connection	Trace and repair
	Defective pump motor or solenoid	Replace
	Air in hydraulic system	Purge air
Jack(s) bleed down from	External fluid leak	Trace and repair
leveled position or stowed position	Defective valve in pump	Clean or replace valve
	Defective jack	Replace jack
Jack(s) are jerky when	Air in the system	Purge air
retracting	Fluid level low	Check fluid level and add as necessary
	Low Battery Voltage at Pump	Charge chassis and/or coach batteries
Jack(s) will not retract from full extension	Low battery voltage or poor ground to Keypad	Charge chassis and/or coach batteries and ensure proper grounding
	Damaged or defective harness from Keypad to pump	Trace and repair
	Fluid level low	Check fluid level and add as necessary

Avoid headaches! Always ensure & verify proper charge on the batteries!

Proper and adequate grounding of the pump is essential!

90% of the phone calls we receive are found to be a discharged battery or poor ground!

If your problem is not listed or persists,

call Equalizer Systems at (800) 846-9659.

Equalizer Systems Limited Warranty Policy

RV or Vehicle Manufacturer Installed Systems or Components:

1. Only warranty claims with prior written or verbal authorization from Equalizer Systems will be recognized, all other claims will be denied.

2. Equalizer Systems warrants slide out and leveling system components for a period of three years from the date of original sale of the vehicle. This warranty covers defects in material and workmanship only. Equalizer Systems is not liable for any damage due to abuse, neglect, misuse, negligence, misapplication, error of operation, accidental or purposeful damage or damage due to an "act of God" such as, wind or rain damage, flood, lightning or other natural occurrence of the like. Equalizer Systems limited warranty is applicable to the Equalizer Systems components only and does not apply to the vehicle, apparatus or property to which it is attached. Warranty parts will be shipped at no charge if an Equalizer Systems representative authorizes the repair. Purchased components used in authorized warranty repairs will be reimbursed at the original purchase price.

3. Labor and freight expenses due to warrantable parts defects or workmanship will be reimbursed for a period of one year from the date of original sale of the vehicle. Freight expenses will either be prepaid by Equalizer Systems or reimbursed at the UPS Ground rate only. Any additional shipping charges or requirements are the obligation of the vehicle owner or service center performing the warranty repair. The owner or service center's obligation may include overseas shipping charges, border fees, brokerage fees and any other additional fee of the like.

4. Warranty labor will be reimbursed only for claims that have prior written or verbal authorization from an Equalizer Systems representative. Warranty labor compensation is required to correspond with the "Warranty Parts Replacement Time Guideline" published by Equalizer Systems. Any warranty repair not listed on this guideline will require prior authorization from an Equalizer Systems representative. A reasonable time allowance will be determined by the Equalizer Systems representative. Any warranty repair that is not listed on this guideline that is performed without prior authorization will be denied without exception. Time associated with learning about the repair or excessive diagnostic and installation time will not be reimbursed. Warranty labor will be reimbursed at the authorized service center's published shop rate if the rate is reasonable for that region. Overtime labor will not be reimbursed without exception.

RV or Vehicle Manufacturer Installed Systems or Components (continued):

5. Labor, parts and freight credit (if applicable) will be sent after the parts are tested and the warranty claim is validated. Returned parts that are found to be in normal operating condition are not warrantable and will be charged to the owner or service center. Equalizer Systems reserves the right to charge back the service center for labor claim payments previously submitted if the installation of the warranted part is found to be inadequate at a later date.

6. Claims will be denied if the date submitted is greater than 30 days from the repair date.

7. Prior authorization is required before parts may be sent back to Equalizer Systems. A Return Authorization Number required for items to be accepted.

8. Complete systems are not warranted unless authorized by an Equalizer Systems representative. There are absolutely no exceptions to this clause.

9. This warranty begins upon the original sale date of the vehicle and is transferable, with limitation, to subsequent owners upon furnishing the original sale date of the vehicle and proof of purchase. Only the remainder of the three year parts warranty is applicable. Warranty labor and freight are only applicable to original owner of the vehicle.

10. Equalizer Systems is not liable for loss of time, manufacturing costs, labor material, loss of profits, direct or indirect damages incurred by the vehicle manufacturer.

11. Excessive warranty labor resulting from inadequate access to the Equalizer Systems product will not be reimbursed.

12. Equalizer Systems will not pay a markup on warranty parts unless required by law.

13. Travel expenses, hotel, telephone, fuel or any other expenses of the like are not covered under warranty.

Replacement Parts:

1. Replacement parts are warranted under the same guidelines listed above for the remainder of the original warranty or 90 days, whichever is longer. Proof of warranty repair date and original vehicle purchase date are required.

2. No additional warranties, expressed or implied, are authorized by Equalizer Systems

3. This warranty voids all previous issues. Questions concerning this warranty should be directed to:

Equalizer Systems(800) 846-9659P.O. Box 668(574) 264-3437Elkhart, IN 46515(574) 266-6083 fax

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1130 6689BR	1716	2605	1444	1735	2547	1122	2047	PART #	ΗΥD	
PUMP HARNESS (NOT SHOWN)	CARTRIDGE VALVE MANUAL OVERRIDE	MOTOR MTE BIRDT	HD PLATED SOLENDID	DIAGNOSTIC TIP	MANIFOLD BIRDT 4 FUNCTION	#4 JIC X #4 D-RING MALE	PRESSURE SWITCH 1000 PSI	DESCRIPTION	RAULIC COMPONENTS	HOSE IDENTIFICATION B = RETRACT FUNCTION B1 = LEFT FRONT JACK BROWN/BLACK B2 = RIGHT FRONT JACK ORANGE/BLACK B4 = RIGHT REAR JACK VELLOW/BLACK 5 4 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6
4 4	4	1	N	N	1	ω		QTY		
										T = EXTEND FUNCTION T4 = RIGHT REAR JACK VELLOW T3 = LEFT REAR JACK ORANGE T1 = LEFT FRONT JACK WHITE T1 = LEFT FRONT JACK BROWN







BIRDTATIONAL WIRING CONFIGURATION