

WARNING

For maximum stability during use of the PowerPlus Leveling Systems, all levelers and wheels must be in contact with the ground. NEVER use levelers to change tires or to perform under chassis work of any type. Lifting tires off the ground creates an unstable condition in which the vehicle can roll. Use only the vehicle manufacturer's recommended jacking device and wheel chocks for changing tires. MECHANICAL SYSTEMS / inc. cannot be held responsible for injuries or damage resulting from misuse of this leveling system.

Keep all persons away from the vehicle when operating the leveling system.



NOTE: UP means retract and DOWN means extend referring to the action of the levelers. i.e. When the levelers are going UP (retracting) the vehicle is going down. Conversely, when the levelers are going DOWN (extending) the vehicle is going up.

IMPORTANT: When using the Manual Switches always use 2 to 3 second pulses per jack and rotate around the vehicle with a 3 or 4 levelers system or between the jacks in a 2 levelers system. Damage may occur if 2 or more jacks are operated, under load, at the same time.

1. To Extend Levelers

- A. Choose a site as level as possible to minimize the extent of leveling. As you pull up to your site, visually survey the ground for variances in terrain, rocks, etc.
- B. When you have come to a complete stop, place the vehicle transmission in "PARK".

- C. **APPLY PARKING BRAKE AND CHOCK THE WHEELS SECURELY. DO NOT attempt to operate levelers while the vehicle is in neutral.**
- D. Turn the vehicle's ignition to "Accessory" or in the case of a towable unit turn the power source "ON".
- E. The vehicle engine may also be running during the leveling cycle if the battery power is low.
- F. Press down on one of the leveler switches and the levelers will begin lowering toward the ground. The corresponding red light on the control panel will illuminate. The leveler will reach the ground in about 15 seconds.

IMPORTANT: Always extend ALL levelers to a position about 1 inch above the ground before actually extending any one of them to the ground to level the vehicle except as noted below.

5th Wheelers & Towables – Press "DOWN" for the front levelers to extend to the ground then alternate 3 second pulses of the DOWN switches until the front the unit is high enough for separation. Pull the tow vehicle forward. Press the "UP" switches alternating with 3 second pulses until the front of the vehicle is low enough to allow the rear levelers to reach a vertical position and continue below.

- G. To level the vehicle, place the spirit level provided on a flat surface within view of the control panel.
- H. Watch the spirit level while operating the jacks. Press one or two jack switches "DOWN".
- I. If one corner of the unit is low, the bubble in the spirit level will be off-center toward one corner. In this case, operate the appropriate jack until that corner is even with an adjacent corner (the bubble will move directly to the right, left, top or bottom of the center circle) to neutralize the twist of the vehicle frame.
- J. If one side of the vehicle is low (the bubble in the spirit level is directly to the right, left, top or

bottom of the center circle), operate the appropriate jacks together to raise the low side.

On four jack systems, it is possible after leveling the vehicle for one jack to no longer be in contact with the ground. In this event, that jack should be extended gently to the ground without changing the level status of the vehicle.

It is also possible for a leveler to reach its maximum height limit during leveling. If this occurs, you may retract the jack(s) on the high side or corner of the unit instead of extending the jack(s) on the low side. If two jacks reach the maximum height limit while the other two are off the ground this indicates that the vehicle is on a slope that is too extreme for the system to completely level the vehicle. Spacer blocks may be placed under one or two jacks or you may choose to find a more appropriate parking area.

CAUTION

Be sure that all four wheels and levelers are in contact with the ground at the end of the leveling sequence for full stabilization.

NOTE: If a leveler reaches its maximum load limit or maximum height limit, or if too many jacks are being operated at one time under a load, the circuit breaker will interrupt the power to the system for approximately 30 seconds. If this should happen, wait for the circuit breaker to reset, retract any jacks that may be at full extension and resume the leveling process, operating just one jack at a time. When operating jacks individually, be sure to alternate between adjacent jacks, extending or retracting each jack just two to three seconds at a time to avoid frame twist.

K. Turn the vehicle ignition or power source to "OFF".

2. To Retract Levelers

- Visually check the area around and under the vehicle for foreign objects.
- Warn all persons to clear the surrounding area during the leveler retraction cycle.
- Check to see that the **wheels are securely chocked** to prevent any unexpected roll.

- Make sure the vehicle parking brake is applied and the vehicle transmission selector is in the "PARK" position. (DO NOT attempt to retract levelers while vehicle transmission is in "N".)
- Turn the ignition to "Accessory" or activate power source.

If the engine is started the Jack Down Buzzer alarm will sound. This is a safety feature alerting the operator that the vehicle should not be moved until the levelers are fully stowed.

5th Wheelers & Towables – Press the FRONT switches "UP", to retract the front jacks slightly. Press the REAR switches "UP" and fully stow the rear jacks. Then press FRONT switches "DOWN" to raise the front of the trailer to allow re-hitching. Press the FRONT switches "UP" to fully stow the front levelers alternating in 2 to 3 second pulses.

- Retract the levelers by pressing the switches on the control panel "UP". All levelers may be retracted simultaneously to eliminate frame twist. If levelers are retracted one at a time, be sure to retract each jack for only two to three seconds at a time, rotating the order of the jacks to minimize frame twist.

IMPORTANT: NO individual leveler should be completely retracted all at one time. Alternate or rotate the retraction of the levelers, 2 to 3 seconds at a time, until all levelers have cleared the ground

- When the levelers have reached their uppermost limit, the red position indicator light will go out. Release the retract switch.
- Turn OFF the ignition or power source when all of the levelers are retracted to their travel position.

The Power Plus control panel has a built-in warning system. When each jack is extended from the stowed position, its red indicator light illuminates to indicate the jack is not in a stowed position.

There is also a sonic alarm kit that is provided, which, when installed, provides an audible alarm to indicate that one or more of the jacks is extended. The intent of this alarm as well as the red indicator on the control box is to warn the operator not to drive away with the jacks DOWN. All levelers MUST be fully retracted before the vehicle is driven away.

Despite this feature, visually check the levelers while outside checking the sewer and electrical plugs.

NOTE: The Power Plus Control Console is a convenience and aid to the owner/operator of the Power Plus Leveling System. The owner/operator should not rely solely upon the warning system. It is the owner/operator's responsibility to visually check that all levelers are up before moving the vehicle. MECHANICAL SYSTEMS/inc. is not liable for any damages that might result from a malfunction or owner/operator misuse of the warning system.

5. Helpful Hints

- A. Unless the batteries are known to be fully charged, the vehicle engine should be running during the leveling operation sequence.
- B. If the vehicle is parked on asphalt or soft ground, use larger pads under the levelers. An 8" to 12" square 3/4" thick plywood piece makes an ideal pad, providing enough flexibility to ensure stability.
- C. In the unlikely event of a malfunction, extending or retracting the other levelers may free the problem leveler so it can be tied up out of the way until it can be repaired.
- D. The levelers should be cycled once or twice every 3 months, or whenever the vehicle is used, to keep them in operating condition.

6. Owner Maintenance Items

- A. Make sure the electrical wiring is routed to avoid sharp edges of undercarriage components and heat producing portions of the vehicle or generator exhaust system.
- B. Keep the 12-volt battery system charged. If it is necessary to start the engine prior to operating the

Power Plus Basic Levelers, it could be an indication that there is a battery drain or non-sufficient charging of the battery.

- C. Check the entire charging system. Battery problems can also breed leveler problems.

- D. Keep the electronic components clean and dry. Periodically check that all wiring connections are tight and free of corrosion, especially the battery connection.
- E. The following maintenance checklist should be employed before, during and after any extended use of the leveling system.

7. Owner Maintenance Check-Off List for Power Plus Levelers

- Condition of battery terminals
- Battery electrolyte level
- Visually inspect all levelers
- In order for the leveling units to operate properly, levelers should be periodically checked for dirt buildup and cleaned.

NOTE: When inspecting each leveler, check if any wires have been pulled down or pulled loose during the previous trip.

8. Lubrication & Cleaning

The gear housing of the Jack assemblies are packed with Lubriplate 1200-2 extreme pressure lithium grease. Field maintenance/replacement of this grease should not be required for the first three years of use. Thereafter it should be inspected and/or repacked by a competent technician.

Caked mud or salt should be removed using a cold water spray. Extend each leveler to within approximately 1" of the ground. Wash with a pressure washer or hose and then rinse. Allow to air dry and then apply lubricant. External moving parts should be protected and lubricated with a dry film lubricant. On SWING levelers use dry silicone spray at pivot points of retract arms including the swivel bolts. On SCISSOR levelers use dry silicone spray at all four pivot points.

EMERGENCY RETRACT INSTRUCTIONS and CAUTION

PowerPlus Basic systems have an emergency retract plug installed at the control panel.

This will allow you, the operator, to retract any jack(s) in almost any emergency situation. However, caution must be used when utilizing this device. The instructions must be read in full before attempting this procedure.

NOTE: On the PowerPlus Basic systems check the circuit breaker, power and battery connections for corrosion.

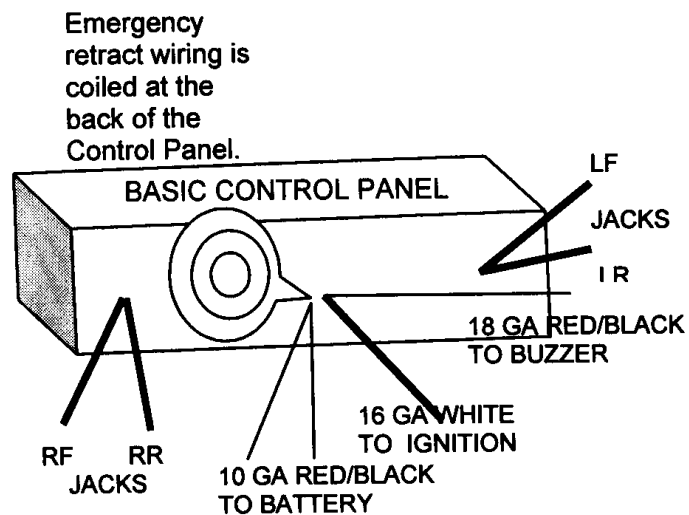
With the vehicle emergency brake ON, vehicle in PARK and wheels CHOCKED. Start engine or power source, then attempt to use the retract switch on the Control Panel. Should Emergency Retract be required follow the procedure below.

PROCEDURE:

1. To use this Emergency Retract cut the tie-wrap securing the red & black set of wires with a black plastic rectangular plug and wire coiled at the back of the Basic control panel.
2. Unplug the cable going to the affected jack from the back of the control panel on a Basic system. All cables should have white tags noting which jack you are dealing with (RR for Right Rear, LF for Left Front, etc.)

CAUTION: You are over-riding the power shut-off, have someone monitor the jack while it retracts. The jack **will not stop automatically** when using the emergency plug. If the jack is allowed to continue running on the Emergency Retract Plug after it has reached the stowed position the jack will be damaged.

3. Gently connect the emergency plug so that it will just make contact with the cable going to the affected jack. Hold together for a 2 to 5 second pulse to reduce the chance of over-retraction.
4. Have someone watch the jack as you raise it.
5. Immediately disconnect the plug when the jack has reached the stow position. On a SWING jack this happens just *short* of horizontal. On a VERTICAL jack this is *less than* 8 inches above the ground. On a SCISSOR jack this is *before* fully collapsed.
6. Contact Mechanical Systems for service.





CAUTION

(PowerPlus Scissor Jack Users)

The PowerPlus electric powered scissor jack was developed **to fit in installations where the vertical mounting clearance to ground is too low to allow use of other vertical rigid or swing jacks.**

The PowerPlus Scissor Jack series fills a specific need in the RV industry, however the following information regarding stability of the scissor jack must be understood and accepted by the user.

The scissor jack mechanism that is used throughout the RV industry relies on the use of gear teeth sections in the mating areas of the two top and two bottom arms to assure a vertical travel while extending or retracting the jacks.

Historically, these jacks have been operated by a hand crank mechanism. This type of mechanism requires close attention by the user while the jack is in operation. This mechanism has been used for years in manual crank jacks with an extremely low rate of field problems.

Due to the type of gear mechanism that the scissor jack utilizes, scissor jacks will not tolerate vehicle movement while the jack pad is in contact with the ground. Vehicle movement of more than one or two inches (such as attempting to drive the vehicle while any jacks are in contact with the ground) could deform the gear teeth on the arms as well as bending other parts making the jack inoperable.

Damage caused by vehicle movement may sound catastrophic, however the jack can be repaired and the most expensive parts of the electric scissor jack are seldom damaged.

PowerPlus scissor jack systems have two major design advantages that could greatly minimize potential damage caused by vehicle movement.

- A. Mechanical Systems has designed a special "Swivel Foot" for the Automatic Scissor Jack systems which will greatly minimize damage to the jack arm gears and assembly. Other jacks used in the industry utilize a rigid footpad assembly, which could damage the jack when used on uneven ground.
- B. Mechanical Systems provides an audible sonic alarm with each system which, when installed, will alert the operator that one or more jacks are down when they start the vehicle or attempt to drive away.

WARNING

PERMANENT DAMAGE TO THE SCISSOR JACK WILL OCCUR IF THE VEHICLE IS MOVED WITH THE FOOT OF THE JACK IN CONTACT WITH THE GROUND.

THIS DAMAGE IS NOT COVERED UNDER THE TERMS OF OUR LIMITED WARRANTY.