

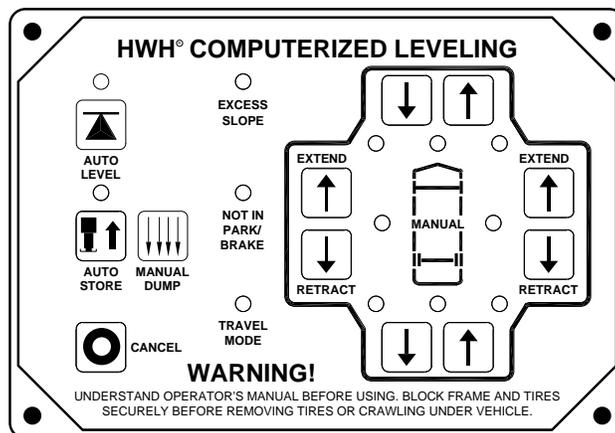


# OPERATOR'S MANUAL

## HWH® COMPUTER-CONTROLLED 725 SERIES LEVELING SYSTEM

### FEATURING:

*Touch Panel Leveling Control*  
*BI-AXIS® Hydraulic Leveling*  
*Straight-Acting Power-Extend/Spring-Retract Jacks*  
*Pilot Air Dump*  
*Universal Platform Level Out Slide-Out*  
*Universal Straight Out Slide-Out*



### HWH CORPORATION

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[www.hwh.com](http://www.hwh.com)

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# OPERATOR'S MANUAL

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## WARNING !

READ THE ENTIRE OPERATOR MANUAL BEFORE OPERATING.

BLOCK FRAME AND TIRES SECURELY BEFORE CRAWLING UNDER VEHICLE. DO NOT USE LEVELING JACKS OR AIR SUSPENSION TO SUPPORT VEHICLE WHILE UNDER VEHICLE OR CHANGING TIRES. VEHICLE MAY DROP AND/OR MOVE FORWARD OR BACKWARD WITHOUT WARNING CAUSING INJURY OR DEATH.

KEEP ALL PEOPLE CLEAR OF VEHICLE WHILE OPERATING LEVELING SYSTEM OR ROOM EXTENSIONS.

KEEP ALL PEOPLE CLEAR OF VEHICLE WHILE DUMPING AIR FROM THE VEHICLE'S SUSPENSION.

DO NOT MOVE THE VEHICLE IF THE VEHICLE IS NOT AT THE PROPER RIDE HEIGHT. CONTACT MANUFACTURER TECHNICAL SERVICE FOR MOVING THE VEHICLE WHEN NOT AT THE PROPER RIDE HEIGHT.

WEAR SAFETY GLASSES WHEN INSPECTING OR SERVICING THE SYSTEM TO PROTECT EYES FROM DIRT, METAL CHIPS, OIL LEAKS, ETC. FOLLOW ALL OTHER APPLICABLE SHOP SAFETY PRACTICES.

IMPORTANT: IF COACH IS EQUIPPED WITH A ROOM EXTENSION, READ ROOM EXTENSION SECTION BEFORE OPERATING LEVELING SYSTEM.

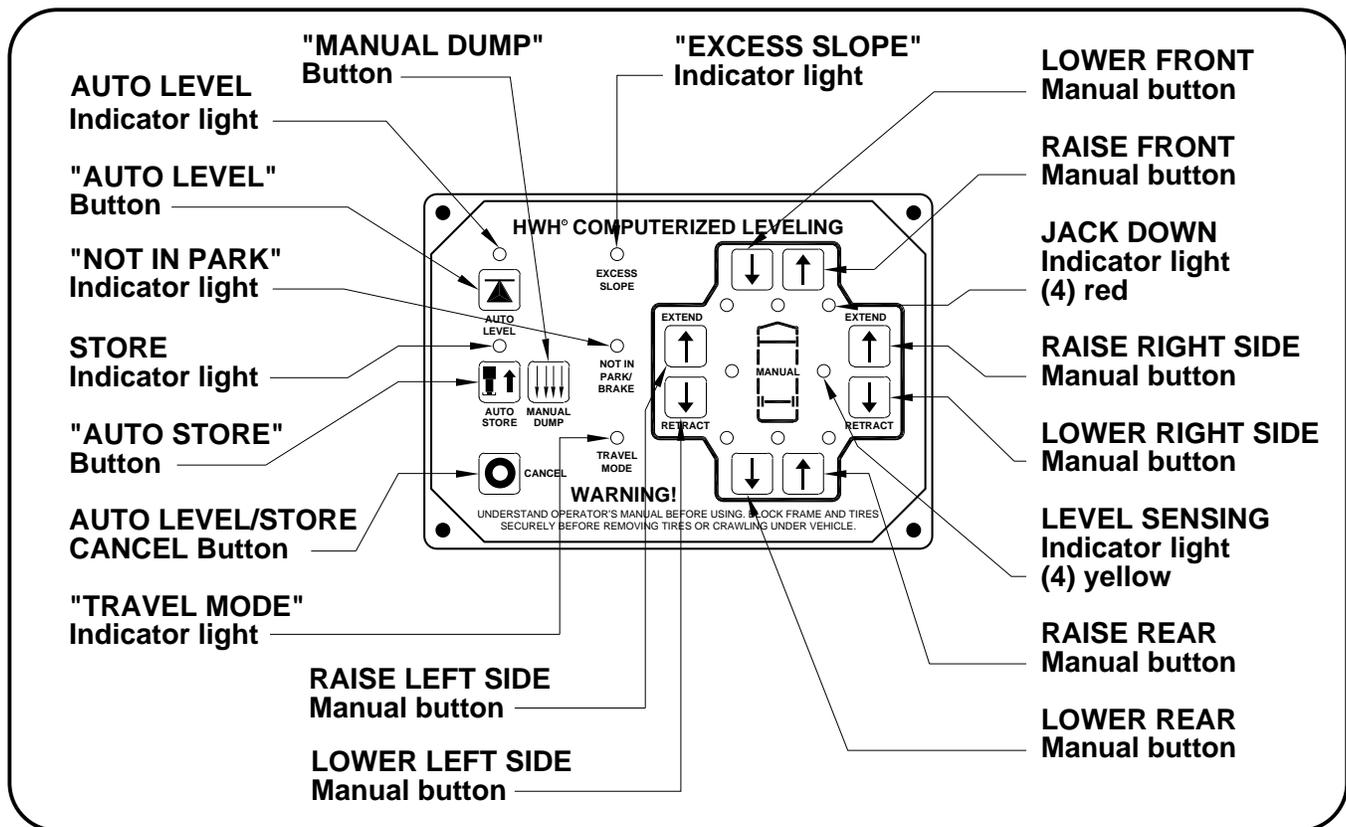
HWH maintains technical and information services at 800-321-3494 or 563-724-3396. Assistance is available Monday thru Friday from 8:00A.M until 5:00P.M. C.S.T.

Technical and information service is also available on-line at [www.hwh.com](http://www.hwh.com).

# CONTROL IDENTIFICATION

## 725 SERIES LEVELING SYSTEM

### COMPUTER-CONTROL



## CONTROL FUNCTIONS

### CONTROL BUTTONS

**"CANCEL" BUTTON:** Push this button to stop any leveling system operation.

**"AUTO LEVEL" BUTTON:** Push this button any time to start the automatic leveling function.

**"AUTO STORE" BUTTON:** Push this button to retract all four jacks at the same time.

**"MANUAL DUMP" BUTTON:** This is a manual button for dumping air from the vehicle suspension.

**EXTEND BUTTONS (UP ARROWS):** These buttons will extend their respective jack pairs to lift the vehicle.

**RETRACT BUTTONS (DOWN ARROWS):** These buttons will retract their respective jack pairs to lower the vehicle.

### INDICATOR LIGHTS

**AUTO LEVEL INDICATOR LIGHT:** This light will flash during the automatic leveling function.

**STORE INDICATOR LIGHT:** This light will flash during the automatic store function.

**"EXCESS SLOPE" LIGHT:** This indicator will light when the leveling system cannot level the vehicle.

### INDICATOR LIGHTS (CONTINUED)

**LEVELING LIGHTS:** The four yellow indicating lights are level sensing indicators. When a yellow light is on, it indicates that its side, end, or corner of the vehicle is low. No more than two lights should be on at the same time. When all four yellow LEVEL lights are out, the vehicle is level.

**WARNING LIGHTS:** The four red lights surrounding the yellow level indicators are jacks down WARNING lights. They are functional only when the ignition is in the "ON" or "ACC" position, the system is on, and the jacks are extended 1/4 to 1/2 inch.

**"NOT IN PARK/BRAKE" LIGHT:** This indicator will light when the hand/auto brake is not set and the "AUTO LEVEL" button is being pushed.

**"TRAVEL MODE" LIGHT:** This indicator light will be on when the ignition is on, when the jacks are retracted and there are no red WARNING lights on.

**MASTER "JACKS DOWN" WARNING LIGHT:** This is a light mounted in the dash separate from the touch panel. It will be on when any one or more jacks are extended and the ignition is "ON".

**BUZZER:** This is a jacks down warning. It will sound if the master "JACKS DOWN" warning light is on.

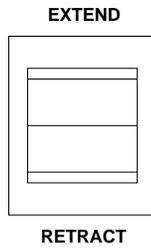
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# CONTROL IDENTIFICATION

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## ROOM CONTROL SWITCH



The ROOM CONTROL SWITCH is a two position momentary switch. Pressing the switch in the EXTEND POSITION will extend the room. Pressing the switch in the RETRACT POSITION will retract the room. Releasing the ROOM CONTROL SWITCH will halt the operation of the room.

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# CONTROL IDENTIFICATION

## PUMP RUN TIME

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### PUMP RUN TIME

Pump motors used with HWH leveling systems and room extension systems come in 3 different diameters; 3", 3.7" and 4.5". Contact the vehicle manufacturer or HWH for help with identifying the motor size. **It is important that any time the pump runs for more than four minutes with a 3" motor; or six minutes with a 3.7" or 4.5" motor that the motor is allowed to cool for thirty minutes before continuing. Continuous operation of the pump motor without allowing the motor to cool can damage the motor.** For cold weather information see "COLD WEATHER OPERATIONS" below.

The HWH systems with a computer processor monitor the pump run time and will turn the pump off if the run time exceeds a specified time. This time can vary with different systems. Due to available electronics or system design, the pump run time programs will also vary. Leveling systems and room extensions that are not controlled by a system processor have no pump run time protection. **DO NOT run the pump more than four or six minutes without allowing the pump motor to cool for thirty minutes.**

#### SYSTEM VARIATIONS FOR PUMP RUN TIME

Some systems with rooms run the rooms separate from the system processor. These systems do not monitor pump run time when operating the rooms. **DO NOT run the pump more than four or six minutes without allowing the pump motor to cool for thirty minutes.**

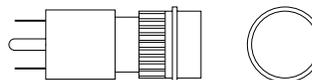
Some systems can be turned back on immediately after the processor turns the pump off. **DO NOT turn the system back on or run the pump without allowing the pump motor to cool for thirty minutes.**

When operating some leveling systems manually or operating the room extensions, the pump will turn off and back on while pushing the control button when the pump run time has been exceeded. **DO NOT continue without allowing the pump motor to cool for thirty minutes.**

With some systems, when the processor has turned the pump off because the run time has been exceeded, power to the HWH system must be turned off and back on before the system will operate. With motorized vehicles, turn the ignition off and back on. With non-motorized vehicles, turn the master power switch for the HWH system off and back on. **DO NOT continue without allowing the pump motor to cool for thirty minutes.**

Some HWH systems are equipped with a lighted reset switch. If the processor turns the pump off because the run time has been exceeded, the light in the reset switch will turn on. The system will not operate until the reset switch is pushed.

**DO NOT continue without allowing the pump motor to cool for thirty minutes.**



LIGHTED RESET SWITCH

**No matter what HWH system is on the vehicle, the pump should not be ran for more than four minutes (3" motors) or six minutes (3.7" or 4.5" motors) without allowing the pump motor to cool for thirty minutes. Continuous operation of the pump motor without allowing the motor to cool can damage the pump motor.**

Contact HWH corporation to get specific information about the system in this vehicle.

## COLD WEATHER OPERATIONS

HWH leveling and room extension systems are designed to function in cold weather down to 0 degrees Fahrenheit. Below freezing (32 degrees Fahrenheit) the jacks or rooms will operate slower than usual.

For operation in temperatures dropping below -20 degrees Fahrenheit, it is necessary that the system is equipped with oil designed for extreme cold weather application such as a synthetic oil. (Contact HWH for recommendations.)

**DO NOT run the pump motor continuously. It is important that any time the pump runs for more than four minutes with a 3" motor; or six minutes with a 3.7" or 4.5" motor that the motor is allowed to cool for thirty minutes before continuing. Continuous operation of the pump motor without allowing the motor to cool can damage the motor.** Continuous operation of the pump with slow moving jacks or rooms in cold weather, without allowing the pump motor to cool will cause the pump motor to burn up and damage the pump assembly.

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# OPERATING PROCEDURES

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## GENERAL INSTRUCTIONS

Maintain adequate clearance in all directions for vehicle, room extensions, awnings, doors, steps, etc. Vehicle may move in any direction due to jacks extending or retracting, settling of the jacks or the vehicle, equipment malfunction, etc..

If parking on soft ground or asphalt paving, a wood block or pad should be placed under each jack.

Press the "CANCEL" button or turn the ignition switch "OFF" at any time to stop the operation of the system.

Any time a hydraulic leveling process is interrupted, it is recommended to retract the jacks according to the JACK RETRACTION Section and then restart the leveling process.

If the hand / auto brake is not set when the "AUTO LEVEL" button is pressed, the "NOT IN PARK/BRAKE" light will come on. When the "AUTO LEVEL" button is released the "NOT IN PARK/BRAKE" light will go out. The Automatic Leveling function will not start.

**WARNING: DO NOT MOVE THE VEHICLE IF ONE OR MORE JACKS ARE EXTENDED TO THE GROUND.**

## PREPARATION FOR TRAVEL

**IMPORTANT:** Before traveling, the red jack warning lights must be off the "TRAVEL MODE" light must be on and the vehicle should be at the proper height for travel. If lights are not correct for travel, retract jack as described in the JACK RETRACTION Section.

If the jacks are retracted but a red "WARNING" light is lit the system needs to be serviced.

Any room extension or generator slide should be fully retracted before traveling.

**WARNING: DO NOT MOVE THE VEHICLE WHILE THE LEVELING JACKS ARE STILL IN CONTACT WITH THE GROUND OR IN THE EXTEND POSITION. THIS VEHICLE IS EQUIPPED WITH STRAIGHT-ACTING JACKS. MOVING THE VEHICLE WITH THE LEVELING JACKS EXTENDED CAN CAUSE SEVERE DAMAGE TO THE JACKS AND OR THE VEHICLE AND CREATE A DRIVING**

**HAZARD. DO NOT RELY SOLELY UPON WARNING LIGHTS. IT IS THE OPERATOR'S RESPONSIBILITY TO CHECK THAT ALL JACKS ARE FULLY RETRACTED INTO THE STORE/TRAVEL POSITION AND THE VEHICLE IS AT THE PROPER RIDE HEIGHT FOR TRAVELING. CONTACT MANUFACTURER TECHNICAL SERVICE BEFORE MOVING A VEHICLE THAT IS NOT AT PROPER TRAVEL HEIGHT.**

If the jacks cannot be retracted according to the JACK RETRACTION Section, retract the jacks according to the MANUAL JACK RETRACTION Section. The system should then be checked.

**NOTE:** If the vehicle is parked or stored with the jacks extended for an extended period of time and the jacks fail to retract completely, extend the jacks back down to the ground then retract the jacks again.

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# OPERATING PROCEDURES

## 725 SERIES LEVELING SYSTEM

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### AUTOMATIC HYDRAULIC LEVELING (HWH TOUCH PANEL CONTROLS)

1. Place transmission in the recommended position for parking the vehicle and set parking brake. Turn the coach engine off. Turn the ignition to the "ACCESSORY" position.

**NOTE: One or two yellow level indicator lights on the leveling system touch panel can be on anytime the vehicle ignition is in the ON or ACC. position and the park brake is set.**

2. At this time, the operator may want to check the jacks and place a pad under each jack if the ground will not support the vehicle.

**WARNING: PRIOR TO PUSHING THE "AUTO LEVEL" BUTTON THE OPERATOR MUST BE SURE THAT ALL PERSONS AND OBJECTS ARE CLEAR OF THE VEHICLE. AIR WILL BE EXHAUSTED FROM THE VEHICLE SUSPENSION AND THE VEHICLE WILL LOWER IMMEDIATELY AFTER THE "AUTO LEVEL" BUTTON IS PUSHED.**

3. Press the "AUTO LEVEL" button one time. The AUTO LEVEL light will start to flash. The system will begin to dump air from the vehicle suspension. After approximately 25 seconds, the leveling process will begin.

**IMPORTANT: During the Automatic Leveling procedures, pushing the "AUTO LEVEL", "AUTO STORE" or the "CANCEL" button on the HWH touch panel will stop the automatic leveling function.**

When a jack extends approximately 1 inch, it's individual red warning light on the touch panel will come on. The touch panel "TRAVEL MODE" light will go out. If the ignition is in the ON position, the warning buzzer will sound.

**AUTO LEVEL SEQUENCE:** During the automatic leveling sequence, after the system has extended the appropriate jacks to level the vehicle and has turned the yellow level indicator lights off, the system will then stabilize the vehicle.

**STABILIZE SEQUENCE:** The stabilize sequence is part of the Auto Level sequence. Each jack has a pressure switch. The switch will turn on when the jack extends to the ground and lifts the vehicle slightly. Jacks that have lifted the vehicle for leveling should have pressure switches that are on.

The stabilize procedure is a specific sequence where the computer checks the jack pressure switches. If the switch is on, the jack is already stabilizing the vehicle. If the switch is not on, the computer turns the pump and valve on for that jack until the pressure switch turns on.

The sequence starts with the right rear jack. If the pressure switch is not on, the system will extend the jack as necessary. If the switch is on (or when it comes on) the system will check the left rear jack pressure switch, extending the jack if necessary. If the left rear switch is on (or when it comes on), the system will recheck the right rear (extending if necessary) then recheck the left rear (extending if necessary). After checking and rechecking both rear jacks, the system then checks the front jacks. The system checks both front jacks at the same time. If either pressure switch is not on, the system will turn the pump on and open the valves for both front jacks. When both front pressure switches are on, the system turns the pump and front valves off.

The slight lift experienced during the stabilizing procedure normally is not sufficient to cause a level issue for the motor home. However, a feature of the single step leveling system is the manual leveling buttons will function anytime the ignition is in the ON or ACC. position and the park brake is set. If desired, the operator can use the UP ARROWS (extend jacks) that correspond to any lit yellow level indicator light to "bump" the vehicle up slightly to turn that yellow indicator light off.

**EXCESS SLOPE SITUATION:** In the event the jacks are unable to level the coach, the "EXCESS SLOPE" light will come on. Excess slope is when one or two jacks extend fully without turning the yellow level light out. The system will not stabilize the vehicle if the "EXCESS SLOPE" light comes on. One or more jacks may not be extended. The system will shut off, leaving the "EXCESS SLOPE" light on. The "EXCESS SLOPE" light will remain on for two minutes if the ignition is in the "ON" or "ACC" position.

Retract the jacks and move the vehicle to a more level position or level the vehicle as close as possible according to the MANUAL HYDRAULIC OPERATION section. The "AUTO STORE" button will function if the "EXCESS SLOPE" light is on. The manual UP and DOWN arrow buttons will function with the "EXCESS SLOPE" light on. The "AUTO LEVEL" button will NOT function if the "EXCESS SLOPE" light is on.

5. Turn the ignition switch to the "OFF" position.

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# OPERATING PROCEDURES

## 725 SERIES LEVELING SYSTEM

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### JACK RETRACTION (HWH TOUCH PANEL CONTROLS)

**WARNING:** THE OPERATOR MUST BE SURE THAT THERE ARE NO OBJECTS UNDER THE VEHICLE AND THAT ALL PEOPLE ARE CLEAR OF THE VEHICLE.

**NOTE:** When the jacks are stored with the ignition in the ON position, the warning buzzer will sound until the jacks have retracted to the STORE position. If desired, the jacks can be stored with the ignition key in the accessory position. This will eliminate the warning buzzer while the jacks are retracting.

The "AUTO STORE" button will function if the "NOT IN PARK/BRAKE" light is on.

It is recommended to retract any room extensions before retracting the jacks.

1. Start the engine and press the "AUTO STORE" button. The store indicator light will flash. The vehicle should start to return to proper ride height. The front jacks will retract for 5 seconds before the rear jacks will begin to retract. As each jack retracts, its red WARNING light will go out. The system will automatically shut down 1 minute after the four individual red "WARNING" lights are out. If any one red "WARNING" light does not go out, the system will continue to store for fifty minutes, then shut down regardless of the "WARNING" lights condition.

**NOTE:** When traveling thermal expansion may cause a jack to extend slightly. When the "AUTO STORE" button has been used to retract the jacks, the system will automatically retract any jack that extends due to thermal expansion.

**IMPORTANT:** If power to the system is interrupted after starting a store procedure with the touch panel, the store procedure should be reinitiated and the jacks should be completely retracted with all four red WARNING lights out prior to traveling.

**IMPORTANT:** During the Automatic Store procedures, pushing the "AUTO LEVEL", "AUTO STORE" or the "CANCEL" button on the HWH touch panel will stop the automatic store function.

**WARNING:** DO NOT MOVE THE VEHICLE WHILE THE LEVELING JACKS ARE STILL IN CONTACT WITH THE GROUND OR IN THE EXTEND POSITION. THIS VEHICLE IS EQUIPPED WITH STRAIGHT-ACTING JACKS. MOVING THE VEHICLE WITH THE LEVELING JACKS EXTENDED CAN CAUSE SEVERE DAMAGE TO THE JACKS AND OR THE VEHICLE AND CREATE A DRIVING HAZARD. DO NOT RELY SOLELY UPON WARNING LIGHTS. IT IS THE OPERATOR'S RESPONSIBILITY TO CHECK THAT ALL JACKS ARE FULLY RETRACTED INTO THE STORE/TRAVEL POSITION AND THE VEHICLE IS AT THE PROPER RIDE HEIGHT.

2. The vehicle can be moved as soon as the red warning lights are out, the jacks are in the STORE/TRAVEL position and the green "TRAVEL" light is on, if the vehicle is at the proper ride height for traveling.

**IMPORTANT:** If a red warning light and buzzer come on while traveling, the jacks should be checked as soon as a safe parking location is found.

3. If jacks cannot be retracted by the above procedure see MANUAL JACK RETRACTION Section.

# OPERATING PROCEDURES

## MANUAL HYDRAULIC OPERATION

1. Place transmission in the recommended position for parking the vehicle, and set the parking brake. Turn the ignition to the "ACCESSORY" position.
2. Place pads under the jack feet if the ground will not support the vehicle on the jacks.
3. Push the "DUMP" button. Wait until all air is exhausted from the vehicle suspension.
4. The vehicle may be leveled using the manual EXTEND (UP ARROW) buttons on the right half of the panel. If a yellow LEVEL SENSING light is on, that side, end or corner of the vehicle is low. It is best to level the vehicle side to side first, if needed, before front to rear.

Jacks will extend (or retract) in pairs to raise (or lower) a side or end of the vehicle.

Any jack not used for leveling can be extended to the ground. This provides additional stability against wind and activity in the vehicle. Jacks used to stabilize the vehicle after leveling is complete should lift the vehicle slightly after touching the ground.

**IMPORTANT: Do not continue to push an EXTEND button for more than ten (10) seconds after that pair of jacks are fully extended.**

5. When leveling is completed, turn the ignition switch to the "OFF" position.

## MANUAL JACK RETRACTION

The solenoid valves on the power unit valve assembly are equipped with a manual valve release. Use the manual valve release for retracting only if the "AUTO STORE" button on the control panel will not retract the jacks for travel.

**NOTE: Assemblies can have different combinations of large and / or small valves.**

**WARNING: KEEP AWAY FROM THE WHEELS, DO NOT CRAWL UNDER THE VEHICLE, KEEP A SAFE DISTANCE IN FRONT AND REAR OF THE VEHICLE. THE VEHICLE MAY DROP AND/OR MOVE FORWARD OR BACKWARD WITHOUT WARNING AS THE VALVE RELEASE IS OPERATED.**

1. Locate the manual valve release on each solenoid valve. The solenoid valves are located on the power unit/valve assembly.

2. Allow clearance for the vehicle to lower.

**Large and small valves will be equipped with a valve release cam. The cam might be rotated in any direction on the valve. Pushing the release cam in the wrong direction may damage the valve.**

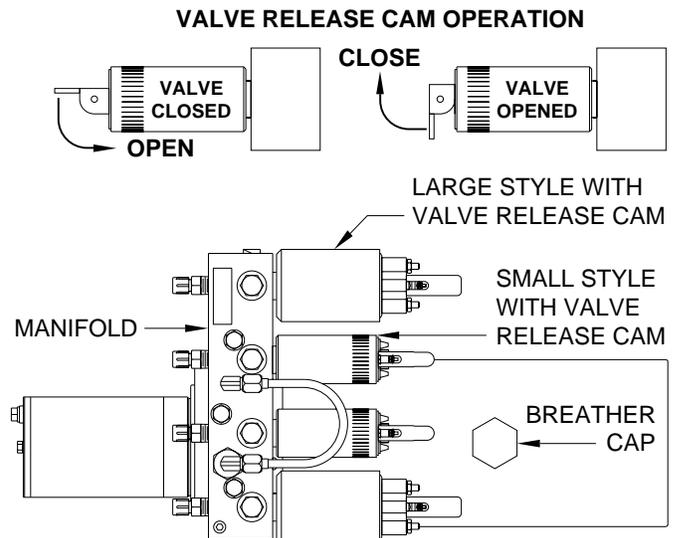
3. Retract the front jacks by slowly opening the two center valves.

4. Repeat the process for the rear jacks by opening the two outer valves.

5. Check that all four jacks are now retracted.

6. Close the valves by moving the valve release cam to the closed position.

7. The system should now be repaired before using again.



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# OPERATING PROCEDURES

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## ROOM EXTEND PROCEDURE - LEVEL OUT ROOM

**IMPORTANT:** Room controls are provided by the vehicle manufacturer. Refer to the vehicle manufacturer for information concerning the room controls. The following information is basic room operating information. Read this information carefully before operating the rooms.

**NOTE:** The park brake must be set before a room can be extended or retracted.

**WARNING:** OPERATING A ROOM WITH ANY ROOM LOCKING, CLAMPING OR MANUAL RETRACTING DEVICES ATTACHED OR ENGAGED CAN CAUSE PERSONAL INJURY AND VEHICLE DAMAGE. IT IS THE OPERATOR'S RESPONSIBILITY TO ENSURE THAT ALL ROOM LOCKING, CLAMPING OR MANUAL RETRACTING DEVICES ARE DETACHED OR DISENGAGED BEFORE OPERATING THE ROOM.

It is recommended to complete the Leveling Procedure before operating room extensions.

1. The ignition must be in the OFF position to operate the room.
2. Unlock all room-locking devices.

**NOTE:** If a MANUAL RETRACT DEVICE is attached to the room or has been used, remove it before extending the room.

**WARNING:** KEEP PEOPLE AND OBSTRUCTIONS CLEAR OF ROOM WHEN OPERATING.

**NOTE:** Make sure there is adequate clearance to fully extend the room.

3. To extend the room, press and hold the ROOM CONTROL switch in the "EXTEND" position until the room is fully extended and has dropped to the level out position. The pump should automatically shut off several seconds after the room is fully extended and down.

**NOTE:** During normal operation of the room, do not reverse direction of the room until the room is fully extended. If necessary, the direction of the room may be reversed, but watch for binding of the room. If the direction of the room has been reversed, DO NOT re-extend the room until the room has been fully retracted, the room may not drop to the level out position.

**IMPORTANT:** Do not hold the ROOM CONTROL in the "EXTEND" position for more than ten seconds after the room is fully extended and down or stops moving. **If either side of the room stops moving, release the room control immediately. DO NOT force the room. DO NOT reverse direction of the room, contact HWH Customer Service for assistance 1-800-321-3494.**

**NOTE:** Releasing the ROOM CONTROL will halt the operation of the room.

**IMPORTANT:** Do not use a room extension support when the vehicle is supported by the leveling system.

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# OPERATING PROCEDURES - STRAIGHT OUT ROOM

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## ROOM EXTEND PROCEDURE - STRAIGHT OUT ROOM

**IMPORTANT:** Room controls are provided by the vehicle manufacturer. Refer to the vehicle manufacturer for information concerning the room controls. The following information is basic room operating information. Read this information carefully before operating the rooms.

**NOTE:** The park brake must be set before a room can be extended or retracted.

**WARNING:** OPERATING A ROOM WITH ANY ROOM LOCKING, CLAMPING OR MANUAL RETRACTING DEVICES ATTACHED OR ENGAGED CAN CAUSE PERSONAL INJURY AND VEHICLE DAMAGE. IT IS THE OPERATOR'S RESPONSIBILITY TO ENSURE THAT ALL ROOM LOCKING, CLAMPING OR MANUAL RETRACTING DEVICES ARE DETACHED OR DISENGAGED BEFORE OPERATING THE ROOM.

It is recommended to complete the Leveling Procedure before operating room extensions.

1. The ignition must be in the OFF position to operate the room.
2. Unlock all room-locking devices.

**NOTE:** If a MANUAL RETRACT DEVICE is attached to the room or has been used, remove it before extending the room.

**WARNING:** KEEP PEOPLE AND OBSTRUCTIONS CLEAR OF ROOM WHEN OPERATING.

**NOTE:** Make sure there is adequate clearance to fully extend the room.

3. To extend the room, press and hold the ROOM CONTROL in the "EXTEND" position until the room is fully extended. The pump should automatically shut off several seconds after the room is fully extended.

**NOTE:** During normal operation of the room, do not reverse direction of the room until the room is fully extended. If necessary, the direction of the room may be reversed, but watch for binding of the room. If the direction of the room has been reversed DO NOT re-extend the room until the room has been fully retracted.

**IMPORTANT:** Do not hold the ROOM CONTROL in the "EXTEND" position for more than ten seconds after the room is fully extended or stops moving. **If either side of the room stops moving, release the room control immediately. DO NOT force the room. DO NOT reverse direction of the room, contact HWH Customer Service for assistance 1-800-321-3494.**

**NOTE:** Releasing the ROOM CONTROL will halt the operation of the room.

**IMPORTANT:** Do not use a room extension support when the vehicle is supported by the leveling system.

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# OPERATING PROCEDURES

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## ROOM RETRACT PROCEDURE - LEVEL OUT ROOM

**IMPORTANT:** Room controls are provided by the vehicle manufacturer. Refer to the vehicle manufacturer for information concerning the room controls. The following information is basic room operating information. Read this information carefully before operating the rooms.

**NOTE:** The park brake must be set before a room can be extended or retracted.

**WARNING:** KEEP PEOPLE AND OBSTRUCTIONS CLEAR OF ROOM WHEN OPERATING.

It is recommended to retract room extensions before retracting jacks.

1. The ignition must be in the OFF position to operate the room.

2. To retract the room press and hold the ROOM CONTROL in the "RETRACT" position until the room is fully retracted. The pump should automatically shut off several seconds after the room is fully retracted.

**IMPORTANT:** The room must lift before it can retract. If the room will not lift, DO NOT force the room. Refer to the "UNIVERSAL PLATFORM LEVEL-OUT" MANUAL ROOM LIFT AND RETRACT PROCEDURES.

**NOTE:** If you attempt to extend the room before it has been fully retracted, the room may not drop to the level out position.

**NOTE:** Hold the switch to "RETRACT" three or four seconds after the room is fully retracted. This assures proper pressurization of the cylinders. **During normal operation of the room, do not reverse direction of the room until the room is fully retracted. If necessary, the direction of the room may be reversed, but watch for binding of the room. If the direction of the room has been reversed, DO NOT retract the room until the room has been fully extended.**

**IMPORTANT:** Do not hold the ROOM CONTROL in the "RETRACT" position for more than ten seconds after the room is fully retracted or stops moving.

**If either side of the room stops moving, release the room control immediately. DO NOT force the room. DO NOT reverse direction of the room, contact HWH Customer Service for assistance 1-800-321-3494.**

**NOTE:** Releasing the ROOM CONTROL will halt the operation of the room.

3. Engage all room-locking devices.

4. If the room will not retract see the "UNIVERSAL PLATFORM LEVEL-OUT" MANUAL ROOM LIFT AND RETRACT PROCEDURES.

**IMPORTANT:** Room-locking devices should be locked while traveling.

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# OPERATING PROCEDURES

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## ROOM RETRACT PROCEDURE - STRAIGHT OUT ROOM

**IMPORTANT:** Room controls are provided by the vehicle manufacturer. Refer to the vehicle manufacturer for information concerning the room controls. The following information is basic room operating information. Read this information carefully before operating the rooms.

**NOTE:** The park brake must be set before a room can be extended or retracted.

**WARNING:** KEEP PEOPLE AND OBSTRUCTIONS CLEAR OF ROOM WHEN OPERATING.

It is recommended to retract room extensions before retracting jacks.

1. The ignition must be in the OFF position to operate the room.
2. To retract the room press and hold the ROOM CONTROL in the "RETRACT" position until the room is fully retracted. The pump will automatically shut off several seconds after the room is fully retracted.

**NOTE:** During normal operation of the room, do not reverse direction of the room until the room is fully retracted. If necessary, the direction of the room may be reversed, but watch for binding of the room. If the direction of the room has been reversed, **DO NOT** retract the room until the room has been fully extended.

**IMPORTANT:** Do not hold the ROOM CONTROL in the "RETRACT" position for more than ten seconds after the room is fully retracted or stops moving. **If either side of the room stops moving, release the room control immediately. DO NOT force the room. DO NOT reverse direction of the room, contact HWH Customer Service for assistance 1-800-321-3494.**

**NOTE:** Releasing the ROOM CONTROL will halt the operation of the room.

3. Engage all room-locking devices.
4. If the room will not retract see the MANUAL ROOM RETRACT PROCEDURE.

**IMPORTANT:** Room-locking devices should be locked while traveling.

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# OPERATING PROCEDURES

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## GENERATOR SLIDE EXTEND PROCEDURE

**WARNING:** KEEP PEOPLE AND OBSTRUCTIONS CLEAR OF SLIDE WHEN OPERATING.

**NOTE:** Make sure there is adequate clearance to fully extend the slide.

1. **THE PARK BRAKE MUST BE SET FOR THE SLIDE TO OPERATE.**

2. The vehicle ignition must be in the "ACC" or "ON" position.

3. To extend the slide, press and hold the GENERATOR SLIDE CONTROL SWITCH in the "EXTEND" position. When the slide is fully extended, release the GENERATOR SLIDE CONTROL SWITCH.

**NOTE:** There is a GENERATOR SLIDE CONTROL SWITCH in the left front electrical bay.

**IMPORTANT:** Do not hold the GENERATOR SLIDE CONTROL SWITCH in the "EXTEND" position for more than ten seconds after the slide is fully extended or stops moving. **DO NOT FORCE THE SLIDE.**

**NOTE:** Releasing the GENERATOR SLIDE CONTROL SWITCH will halt the operation of the slide.

## GENERATOR SLIDE RETRACT PROCEDURE

1. **THE PARK BRAKE MUST BE SET FOR THE SLIDE TO OPERATE.**

2. The vehicle ignition must be in the "ACC" or "ON" position.

3. To retract the slide, press and hold the GENERATOR SLIDE CONTROL SWITCH in the "RETRACT" position. When the slide is fully retracted, release the GENERATOR SLIDE CONTROL SWITCH.

**NOTE:** There is a GENERATOR SLIDE CONTROL SWITCH in the left front electrical bay.

**IMPORTANT:** Do not hold the GENERATOR SLIDE CONTROL SWITCH in the "RETRACT" position for more than ten seconds after the slide is fully retracted or stops moving. **DO NOT FORCE THE SLIDE.**

**NOTE:** Releasing the GENERATOR SLIDE CONTROL SWITCH will halt the operation of the slide.

4. If the slide will not retract see the MANUAL SLIDE RETRACT PROCEDURE.

# MANUAL ROOM AND GENERATOR SLIDE RETRACT PROCEDURE

(USE ONLY WHEN THE ROOM WILL NOT RETRACT WITH THE ROOM CONTROL SWITCH)

## OVERVIEW

The room can be retracted manually if a hydraulic or electric failure prevents the room from being retracted using the CONTROL SWITCH. For normal retract sequence see the ROOM SLIDE RETRACT PROCEDURES. Refer to the vehicle manufacturer for storage location of the retract device and information for connecting the device to the room.

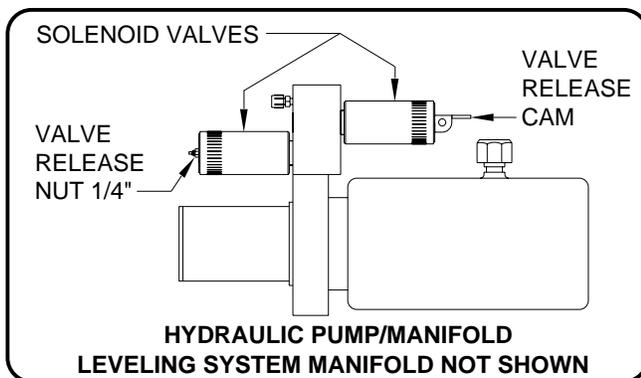
**IMPORTANT:** If the vehicle is not equipped with a winch, DO NOT use other pulling devices to retract the room. Follow steps 2 and 3 and try pushing the room in. Contact the vehicle manufacturer or HWH Customer Service at 1-800-321-3494 or 563-724-3396 for assistance.

**WARNING:** A MANUAL RETRACT WINCH PROVIDED BY HWH IS EQUIPPED FOR MANUALLY RETRACTING THE ROOM ONLY. IT IS NOT TO BE USED FOR LIFTING OR ANY OTHER APPLICATION. HIGH FORCES ARE CREATED WHEN USING A WINCH, CREATING POTENTIAL SAFETY HAZARDS. FAILURE TO FOLLOW ALL WARNINGS AND INSTRUCTIONS MAY CAUSE FAILURE OF THE MANUAL RETRACT WINCH OR CONNECTIONS RESULTING IN DAMAGE OR PERSONAL INJURY. MAINTAIN A FIRM GRIP ON THE WINCH HANDLE AT ALL TIMES. NEVER RELEASE THE HANDLE WHEN RATCHET LEVER IS IN THE OFF POSITION AND THE WINCH IS LOADED. THE WINCH HANDLE COULD SPIN VIOLENTLY AND CAUSE PERSONAL INJURY. CHECK THE WINCH AND STRAPS FOR DAMAGE OR WEAR, AND CHECK FOR PROPER RATCHET OPERATION ON EACH USE OF THE WINCH. DO NOT USE IF DAMAGED OR WORN.

1. Retract jacks following the LEVELING SYSTEM RETRACT PROCEDURE.

**NOTE :** When manually retracting the room, it is recommended the jacks are retracted before retracting the room.

2. Locate the HYDRAULIC PUMP and/or MANIFOLD unit. Some systems may have a remote manifold.



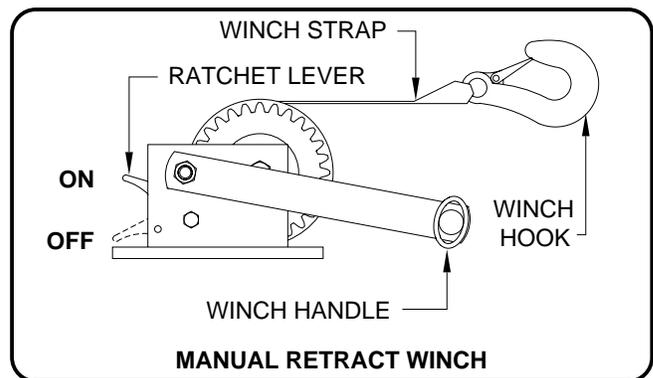
3. Open Nut Style Solenoid Valves by slowly turning the valve release nut counter clockwise using a 1/4" nut driver.

**IMPORTANT:** Only open the valves enough to retract the room. DO NOT turn the release nuts more than 4 and 1/2 turns. Turning the nuts more could damage the valves.

Open Cam Style Solenoid Valves by following the instructions located on the last page of this manual MP84.9999.

**NOTE:** The room may move slightly as the SOLENOID VALVES are opened and internal pressure is released.

4. Locate the MANUAL RETRACT DEVICE and connect it to the room according to the vehicle manufacturer's instructions. To extend a WINCH STRAP firmly grasp WINCH HANDLE, place RATCHET LEVER in its OFF position, and slowly rotate the WINCH HANDLE counter clockwise, keeping a firm grip on the handle. When enough WINCH STRAP is extended, place the RATCHET LEVER in its ON position and slowly rotate the WINCH HANDLE clockwise until the RATCHET LEVER locks.



5. Slowly winch the room in by turning the WINCH HANDLE clockwise. The RATCHET LEVER should produce a loud, sharp, clicking noise.

**NOTE:** Winching the room in quickly will raise pressure in the hydraulic fluid and make winching more difficult.

**WARNING:** OPERATE THE MANUAL RETRACT WINCH BY HAND POWER ONLY. IF THE WINCH CANNOT BE CRANKED EASILY WITH ONE HAND IT IS PROBABLY OVERLOADED. IF WINCHING BECOMES TO DIFFICULT STOP AND CHECK FOR OBSTRUCTIONS/RESTRICTIONS ON THE ROOM AND ROOM EXTENSION MECHANISM.

6. When the room is fully retracted, engage the room locking devices. Leave the retract winch engaged and the solenoid valves open.

**WARNING:** THE ROOM EXTENSION SOLENOID VALVE RELEASE MUST BE IN THE OPEN POSITION WHEN THE MANUAL RETRACT WINCH IS ENGAGED.

7. The system should be repaired before using again.

**NOTE:** After repairs are made, when closing the VALVE RELEASE NUTS, do not over tighten the nuts.

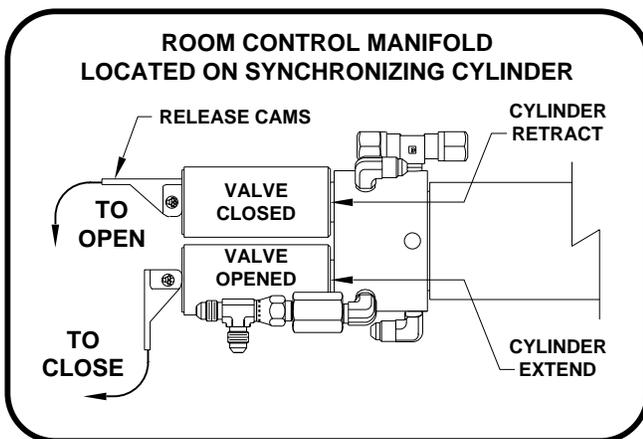
# OPERATING PROCEDURES

## "UNIVERSAL PLATFORM LEVEL-OUT" ROOM EXTENSION MECHANISM MANUAL ROOM LIFT PROCEDURES

**NOTE: Manual room lift procedures must be done before manual room retraction procedures.**

1. Determine which synchronizing cylinder controls the room. Manually open the valve release cams for the extend and retract solenoid valves by moving the cams to the "VALVE OPENED" position as shown.

**IMPORTANT: RELEASE CAM MIGHT BE ROTATED TO ANY DIRECTION ON THE VALVE. MAKE SURE TO MOVE THE RELEASE CAMS IN THE CORRECT DIRECTION. INCORRECT MOVEMENT OF THE CAMS CAN DAMAGE THE VALVES.**



If the pump manifold is equipped with an auxiliary hand pump, you may be able to retract the room by opening only the room retract valve (as labeled by the wiring harness) and operating the hand pump, refer to the **AUXILIARY HAND PUMP OPERATION** page for instructions on the use of the hand pump and valves equipped with a release cam. If the room cannot be retracted with the hand pump, it will be necessary to use the lift bolts and room retract screws.

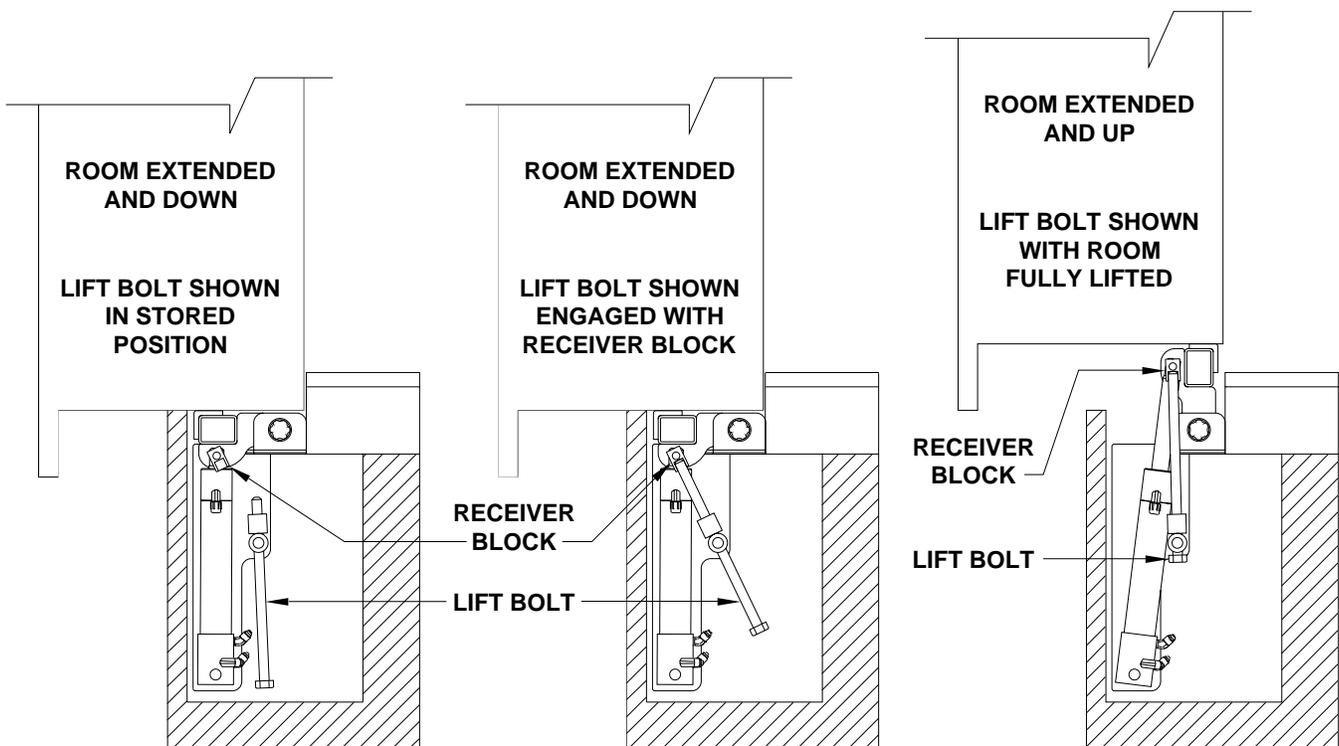
**NOTE: There may be more than one platform lift cylinder assembly. There is a manual lift bolt for each assembly. All lift bolts must be used to lift the room.**

2. Use a 13/16 wrench or socket to rotate the lift bolt(s) clockwise until they are seated in the receiver block. **DO NOT USE AN IMPACT WRENCH TO TURN LIFT BOLTS.** Continue to turn the bolt(s) until the room is completely lifted. When there are multiple lift bolts, alternate evenly between all lift bolts, turning each bolt two or three complete turns each time. **Turning one lift bolt without alternating may cause the room to bind.**

3. Leave the valves opened and refer to the next page for room retract procedures.

**IMPORTANT: If at any stage something is not understood or if the room begins to bind DO NOT force the room, contact HWH Customer Service for assistance 1-800-321-3494.**

**DO NOT RETRACT LIFT BOLT UNTIL YOU HAVE READ "EXTENDING ROOM AFTER SERVICE" ON NEXT PAGE.**



# OPERATING PROCEDURES

## "UNIVERSAL PLATFORM LEVEL-OUT" ROOM EXTENSION MECHANISM MANUAL ROOM RETRACT PROCEDURES

**NOTE: Manual room lift procedures must be done before manual room retraction procedures.**

1. Start both threaded rods until resistance is met, one for the front and one for the rear mechanism should be provided.

**NOTE: To access the threaded plates refer to vehicle manufacturer.**

2. **Do Not use an impact wrench.** Using wrench provided, a personal wrench or a tire iron with a 1-1/8" opening rotate either mechanism's threaded rod clockwise 6 complete turns.

3. Move to the other room extension mechanism, rotate the threaded rod clockwise 12 complete turns.

4. Return to the first room extension mechanism and rotate the threaded rod clockwise 12 complete turns. Repeat steps 3 and 4 alternating from mechanism to mechanism rotating each threaded rod 12 complete turns until room is sealed. (DO NOT exceed 15 ft.lbs) Make sure the room does not bind.

**IMPORTANT: If at any stage something is not understood or if the room begins to bind DO NOT force the room, contact HWH Customer Service for assistance 1-800-321-3494.**

**NOTE: Leave the solenoid valves open, the lift bolts and threaded rods in place until the room has been serviced.**

### EXTENDING ROOM AFTER SERVICE

1. **Room lift bolts should not be retracted yet.** Push and hold the room switch to "RETRACT" for 5 to 10 seconds.

**IMPORTANT: DO NOT EXTEND THE ROOM UNTIL THE ROOM HAS BEEN SERVICED. ANY SOLENOID VALVES LEFT OPEN SHOULD BE CLOSED. THE THREADED RODS SHOULD BE COMPLETELY REMOVED BEFORE ROOM IS FULLY EXTENDED.** If there is not enough room to remove both threaded rods completely, alternate backing the threaded rods out and slightly extending the room. Be careful to not extend the room so far that the threaded rods impact the coach wall or the mechanism.

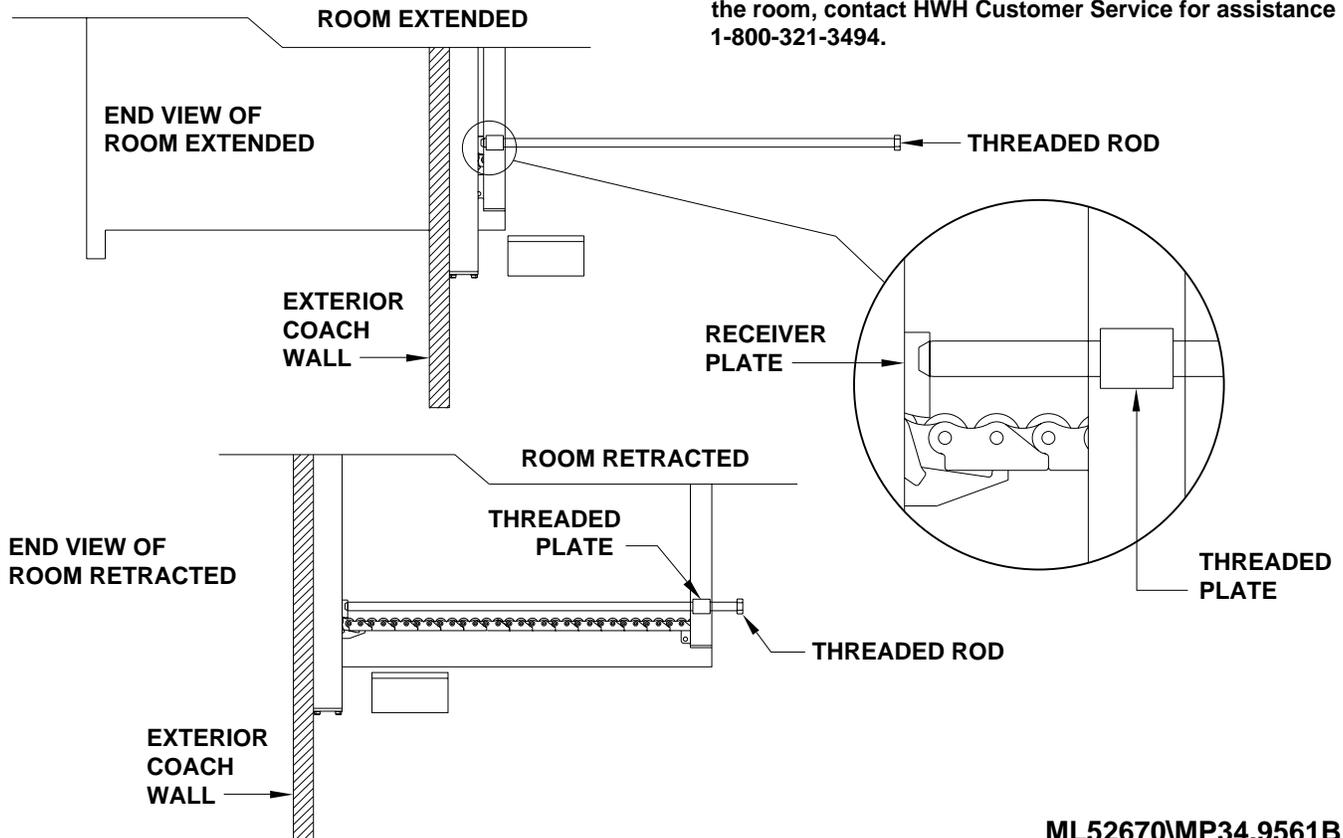
2. Push the room switch to "EXTEND" until the room is within 1 inch of being fully extended. Threaded rods should be completely removed at this time. **Do not allow room to bind.**

3. Retract all lift bolts completely. If room starts to drop, alternate between lift bolts evenly while turning lift bolts.

4. After lift bolts are retracted, push room switch to "EXTEND" until room is fully extended and down. If room dropped while retracting lift bolts, push room switch to "EXTEND" for 5 to 10 seconds.

5. Retract room with room switch.

**IMPORTANT: If at any stage something is not understood or if the room begins to bind DO NOT force the room, contact HWH Customer Service for assistance 1-800-321-3494.**



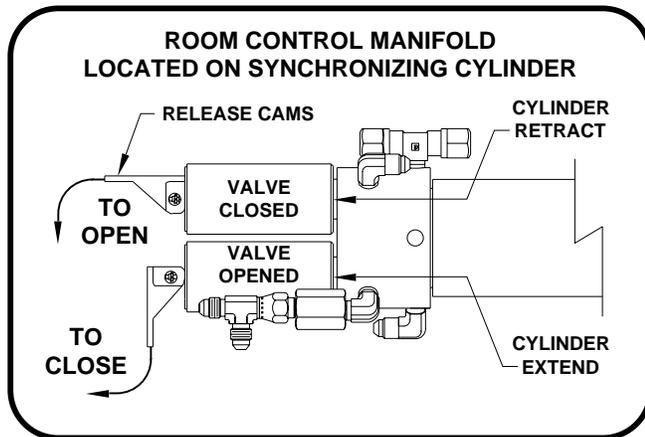
# OPERATING PROCEDURES

## "UNIVERSAL STRAIGHT OUT" ROOM EXTENSION MECHANISM

### MANUAL ROOM RETRACTION PROCEDURES - VALVES WITH RELEASE CAMS

1. Determine which synchronizing cylinder controls the room. Manually open the valve release cams for the extend and retract solenoid valves by moving the valve release cam to the open position.

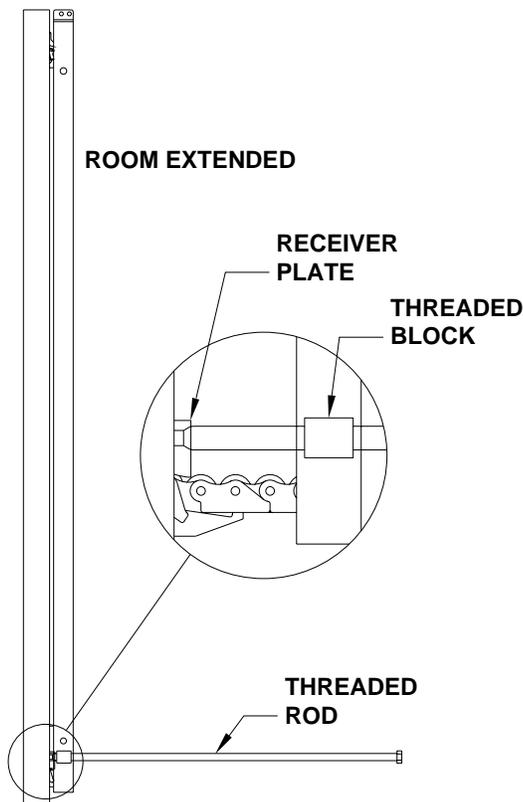
**NOTE: The valve release cam might be rotated in any direction on the valve. Pushing the release cam in the wrong direction could damage the valve.**



2. Start both threaded rods until resistance is met, one for the front and one for the rear mechanism should be provided.

**NOTE: To access the threaded blocks refer to vehicle manufacturer.**

3. **Do Not use an impact wrench.** Using wrench provided, a personal wrench or a tire iron with a 1-1/8" opening rotate either mechanism's threaded rod clockwise 6 complete turns.



4. Move to the other room extension mechanism, rotate the threaded rod clockwise 12 complete turns.

5. Return to the first room extension mechanism and rotate the threaded rod clockwise 12 complete turns.

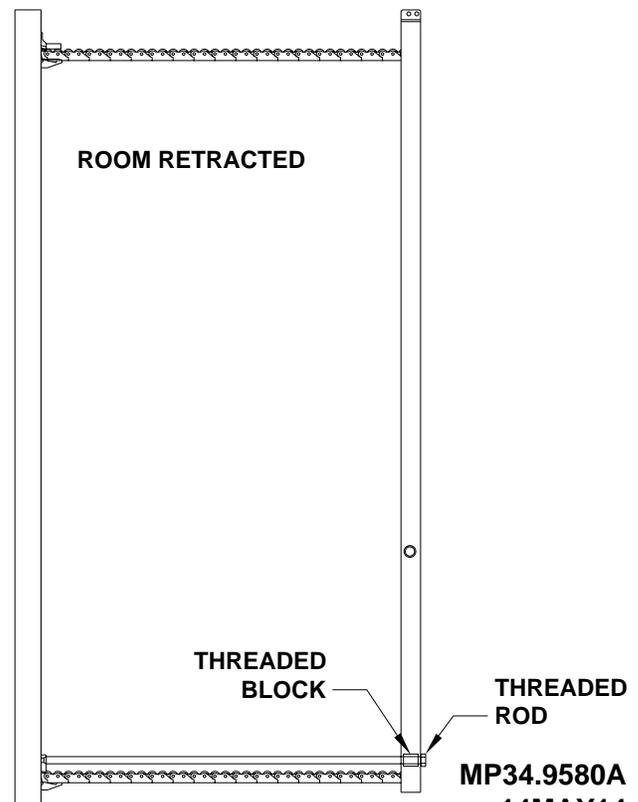
6. Repeat steps 4 and 5 alternating from mechanism to mechanism rotating each threaded rod 12 complete turns until room is sealed. (DO NOT exceed 15 ft.lbs) Make sure the room does not bind.

**IMPORTANT: If at any stage something is not understood or if the room begins to bind DO NOT force the room, contact HWH Customer Service for assistance 1-800-321-3494.**

**NOTE: Leave the solenoid valves open and the threaded rods in place until the room has been serviced.**

**IMPORTANT: DO NOT EXTEND THE ROOM UNTIL THE ROOM HAS BEEN SERVICED. ANY SOLENOID VALVES LEFT OPEN SHOULD BE CLOSED AND THE THREADED RODS SHOULD BE COMPLETELY REMOVED.**

**NOTE: If there is not enough room to remove both threaded rods completely, alternate backing the threaded rods out and slightly extending the room. Be careful to not extend the room so far that the threaded rods impact the coach wall or the mechanism.**



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# MAINTENANCE

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## OIL LEVEL

All maintenance should be done as part of the normal servicing of the coach.

The oil level should be checked when the vehicle is first purchased and then once every two years. More often if there is an oil leak in the system.

All jacks and the gen slide should be completely retracted before checking the oil level. Rooms with a USO mechanism, level out or straight out, should be fully extended to check the oil level. The HWH step, if so equipped, should be fully retracted. The oil reservoir is part of the pump / manifold assembly. The oil level is checked and filled through the breather cap. Clear any dirt away from the breather / filler cap before removing.

The oil level should be within one inch of the top of the reservoir. Most breather caps have a dipstick.

**NOTE: Overfilling the tank can cause leakage of oil through the breather cap.**

**FLUID:** HWH Specialty Hydraulic Oil is recommended. In an emergency Dexron automatic transmission fluid can be used. **NOTE:** Dexron automatic transmission fluid contains red dye and can cause staining should a leak occur. **DO NOT USE** brake fluid or hydraulic jack fluid. Use of these can damage seals.

## ELECTRICAL SYSTEM

The batteries should be in good condition and fully charged. Weak batteries can cause erratic operation. Battery cable terminals and battery posts and connections should be kept clean.

All electrical connections, especially ground connections, should be clean, tight, free from corrosion and protected from weathering.

## JACKS

There are very few user serviceable parts on the jacks. The jacks require very little maintenance. If the jacks are extremely dirty with caked on mud they should be washed.

If extremely dirty, the jack rods should NOT be wiped. The jack rods do not need to be oiled or sprayed with anything. See ML47149 for proper maintenance of all jacks.

## ROOM EXTENSIONS

The HWH room mechanisms need no maintenance. **DO NOT** grease or lubricate any parts of the HWH mechanism.

Any visible mechanism can be kept clean by washing with water. Refer to the vehicle manufacturer for correct maintenance of the room seals.

## VISUAL INSPECTION

Periodically inspect the system for oil leaks and damaged or missing parts, such as pivot bolts or springs. Check the hydraulic lines and wiring for damage and wear. Check that the jacks do not interfere with any parts of the vehicle when they are in the "STORE" position.

The system will operate better if kept clean and free from caked on mud or ice.

## OPERATIONAL CHECK

Review the OPERATOR MANUAL. Run the system according to the SYSTEM OPERATION Section. Note any abnormal operation.

Review the "JACK RETRACTION" Section. Make sure the jacks will fully retract to the "STORE" position. Jacks should not interfere with any of the coach when in the "STORE" position.

Check that all lights work according to the "INDICATOR LIGHT" Section. Correct function of the red "WARNING" light is important.

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## MAINTENANCE

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### NOT IN PARK/BRAKE CHECK

**WARNING: WHEN MAKING THIS CHECK, BLOCK THE COACH WHEELS SECURELY SO THE COACH CANNOT ROLL FORWARD OR BACKWARD.**

Apply the brake so the coach cannot roll. Turn the ignition to the "ACC" or "ON" position. Release the parking brake. Push the "AUTO LEVEL" button. The "NOT IN PARK/BRAKE" indicator light should come on while the "AUTO LEVEL" button is pushed. Release the "AUTO LEVEL" button and set the park brake. The leveling system should now function.

If any of the above checks or inspections reveal a problem or if there are other problems or questions, consult a qualified RV repair center, your vehicle or coach manufacturer, or HWH CORPORATION for service or repair.

### WINTER WEATHER DRIVING

Anti-icing / deicing agents when splashed on your vehicle, continue to absorb moisture from the air even after they have dried. This can facilitate corrosion of metallic components, such as HWH jacks.

To help reduce the corrosion of jacks after exposure to anti-icing / deicing agents, thoroughly wash jacks with warm soapy water.

# INSTRUCTION SHEET

## SENSING UNIT MAINTENANCE/SERVICE

### REMOTE MOUNTED "POTTED" ELECTRONIC SENSING UNIT

## SENSING UNIT ACCURACY TOLERANCE

The sensing unit has an accuracy tolerance of  $\pm 5.4$  inches front to rear and  $\pm 1$  inch side to side on a 36 foot vehicle. Typical leveling results will be better.

## SENSING UNIT ADJUSTMENT / WITH ADJUSTING ENHANCEMENT

Level the vehicle by placing a bubble level in the center of the freezer floor or upon whichever surface within the vehicle that is to be level. It is best if the level is placed close to the mounting area of the sensing unit. Using the Leveling System and the bubble level, ignoring the yellow LEVEL lights on the Touch Panel, level the vehicle until the bubble is centered.

With the vehicle level according to the bubble level, if there are no yellow lights lit on the Touch Panel, the sensing unit is properly adjusted. If there are yellow LEVEL lights lit on the Touch Panel, manual adjustments to the Sensing Unit are needed.

The ignition (motorized units) or master power switch (towable units) must be on. Remove the "Adjusting Enhancement Cap". **DO NOT LOSE THIS CAP.** There is a small pin beneath the cap. Use a jumper wire with an alligator clip to apply a ground to the pin. This will make the sensing unit very sensitive. The yellow lights may "jump" around while adjusting the sensing unit. Let the lights settle down after each adjustment. Small, gentle turns will work best. Turn mounting screws 1 and 3 to adjust the sensing unit. Turn screws as instructed to turn out all the yellow LEDs. When all the LEDs are out, remove the jumper wire and replace the adjusting enhancement cap. **DO NOT** over tighten.

Move the vehicle to an unlevel position and level the vehicle according to the yellow level sensing lights on the touch panel. Readjust if necessary.

**IMPORTANT: THE SENSING UNIT MOUNTING SPRINGS SHOULD BE COMPRESSED ABOUT 1/2 THEIR FREE LENGTH. SCREW NUMBER 2 SHOULD NOT BE TURNED WHILE ADJUSTING THE SENSING UNIT. AFTER ADJUSTING THE SENSING UNIT, BUMP THE SENSING UNIT TO SEE THAT IT IS SETTLED TIGHT AGAINST ALL THREE SCREW HEADS AND STILL INDICATES THAT THE UNIT IS LEVEL.**

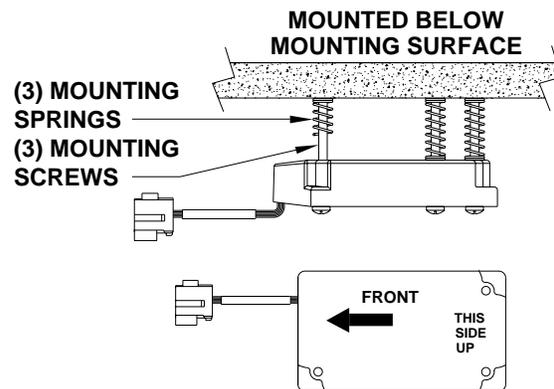
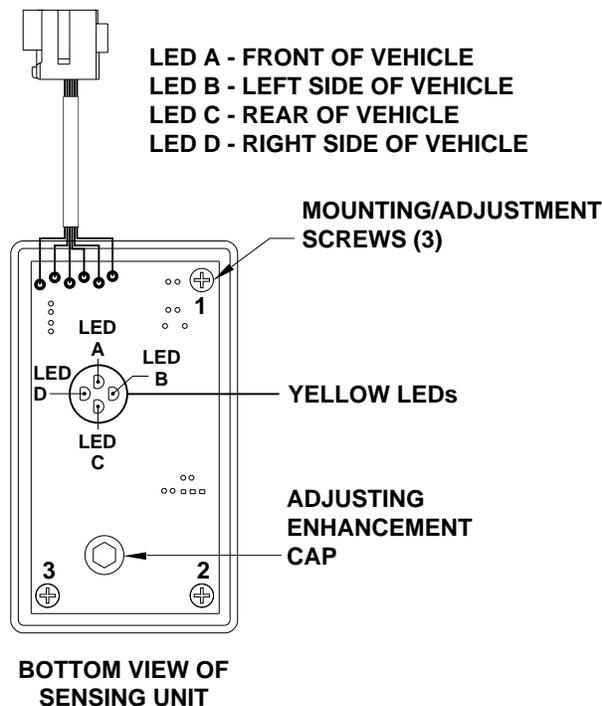
**NOTE: If opposing LED's are lit, there is a problem with the Sensing Unit.**

**If LED (A) is lit: Tighten adjustment screw number 1 until the LED is off.**

**If LED (C) is lit: Loosen adjustment screw number 1 until the LED is off.**

**If LED (B) is lit: Loosen adjustment screw number 3 until the LED is off.**

**If LED (D) is lit: Tighten adjustment screw number 3 until the LED is off.**



# INFORMATION INSERT

## HYDRAULIC SOLENOID VALVE

### IDENTIFICATION - MANUAL OPERATIONS - REPLACEMENT

**REPLACEMENT VALVES MAY HAVE A VALVE RELEASE NUT OR RELEASE CAM**

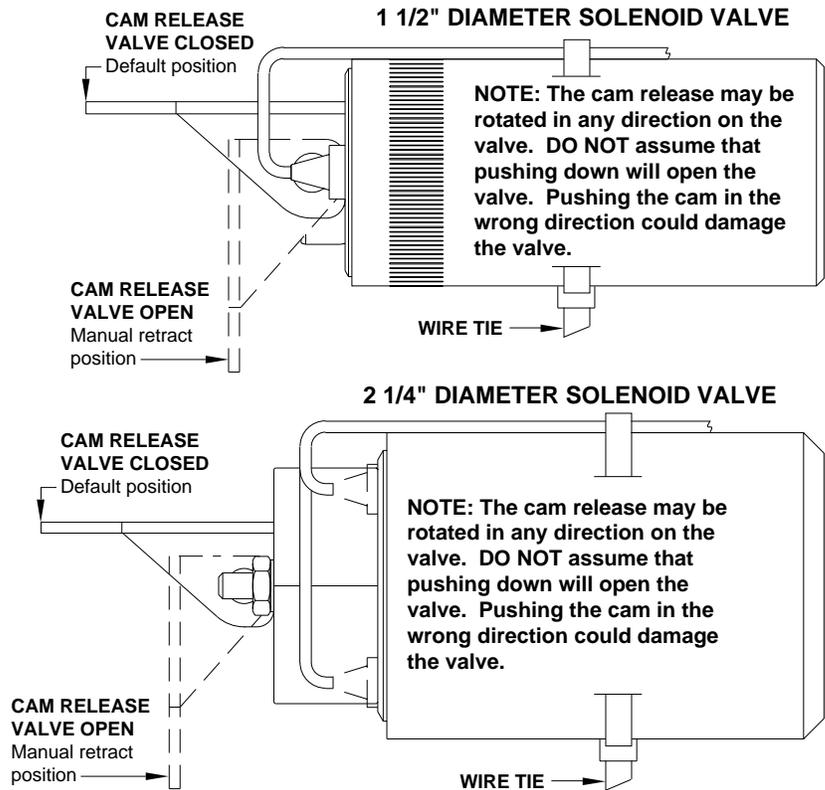
#### SOLENOID VALVES WITH CAM RELEASE

The cam release style valves are direct replacements for all previous styles of HWH hydraulic solenoid valves.

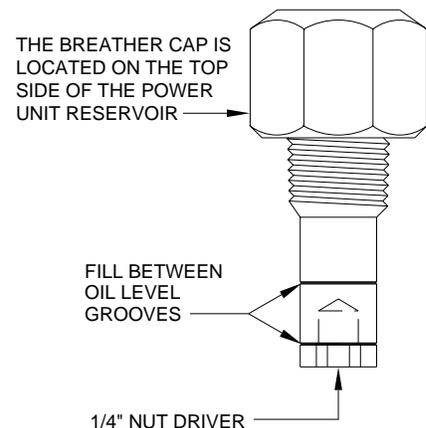
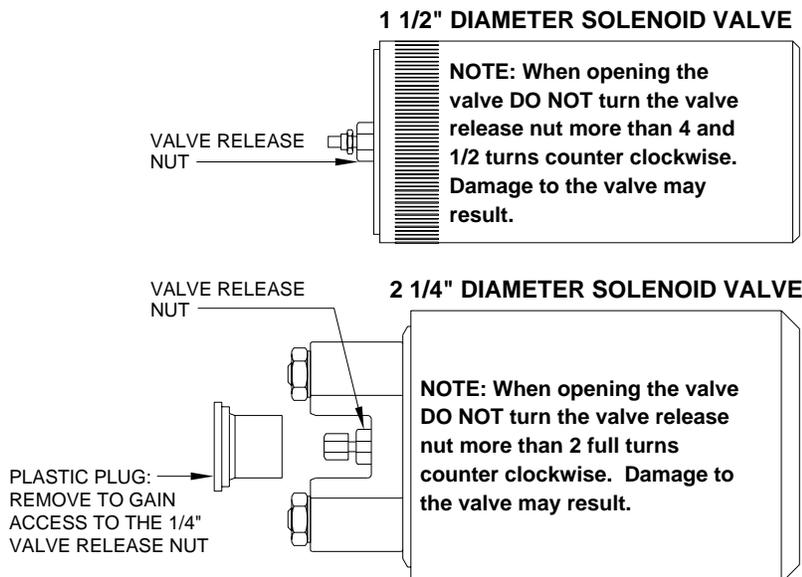
Valve size and voltage are still factors to be considered when replacing any HWH hydraulic solenoid valve. Replace a small style 12 volt valve with a small style 12 volt valve. Replace a large style 12 volt valve with a large style 12 volt valve. This is true for 24 volt valves also.

Valve installation has not changed, simply turn out the old valve, confirm that no o-ring debris has been left in the manifold block and turn in the new valve.

After installing the valve and without creating stress on the wires at the point where they exit the valve body. Use a wire tie to secure the wires to the valve body to keep the wires from being pinched beneath the cam mechanism during operation.



#### SOLENOID VALVES WITH 1/4" NUT RELEASE



**IMPORTANT: PRIOR TO REMOVING THE BREATHER CAP, EITHER TO CHECK THE OIL LEVEL OR TO USE 1/4" NUT DRIVER, CLEAN ANY DEBRIS FROM THE TOP OF THE RESERVOIR. BEFORE RETURNING THE BREATHER CAP TO THE RESERVOIR, REMOVE ANY PAINT CHIPS OR OTHER DEBRIS FROM THE DIPSTICK INCLUDING DEBRIS INSIDE THE 1/4" NUT DRIVER.**