



# OPERATOR'S MANUAL

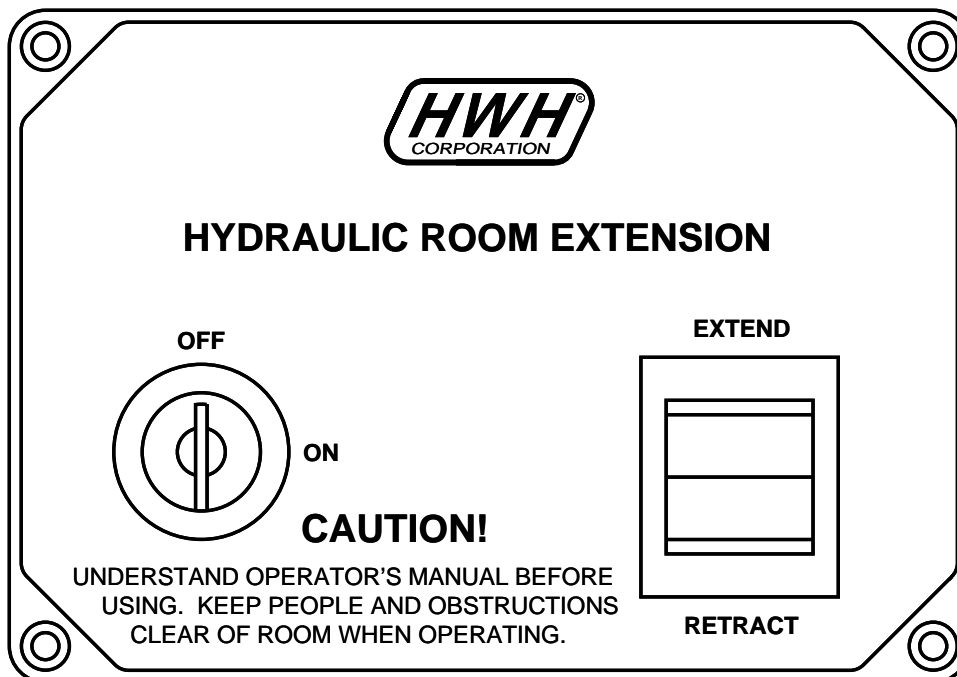
## HWH® HYDRAULIC SPACEMAKER® ROOM EXTENSION SYSTEMS

### **FEATURING:**

*Two Room Extensions*

*Two Step Assemblies*

*Auxiliary Hand Pump*



### **HWH CORPORATION**

(On I-80, Exit 267 South)

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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'S MANUAL BEFORE OPERATING.**

**KEEP PEOPLE AND OBSTRUCTIONS CLEAR OF ROOM OR STEP WHEN OPERATING. ANY OBJECT OBSTRUCTING ROOM OR STEP MOVEMENT MAY BE CRUSHED CAUSING INJURY OR DEATH AND VEHICLE DAMAGE.**

**NEVER PLACE HANDS OR OTHER PARTS OF THE BODY NEAR HYDRAULIC LEAKS. OIL MAY PENETRATE SKIN CAUSING INJURY OR DEATH.**

**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.**

## HOW TO OBTAIN WARRANTY SERVICE

### **THIS IS NOT TO BE INTERPRETED AS A STATEMENT OF WARRANTY**

HWH CORPORATION strives to maintain the highest level of customer satisfaction. Therefore, if you discover a defect or problem, please do the following:

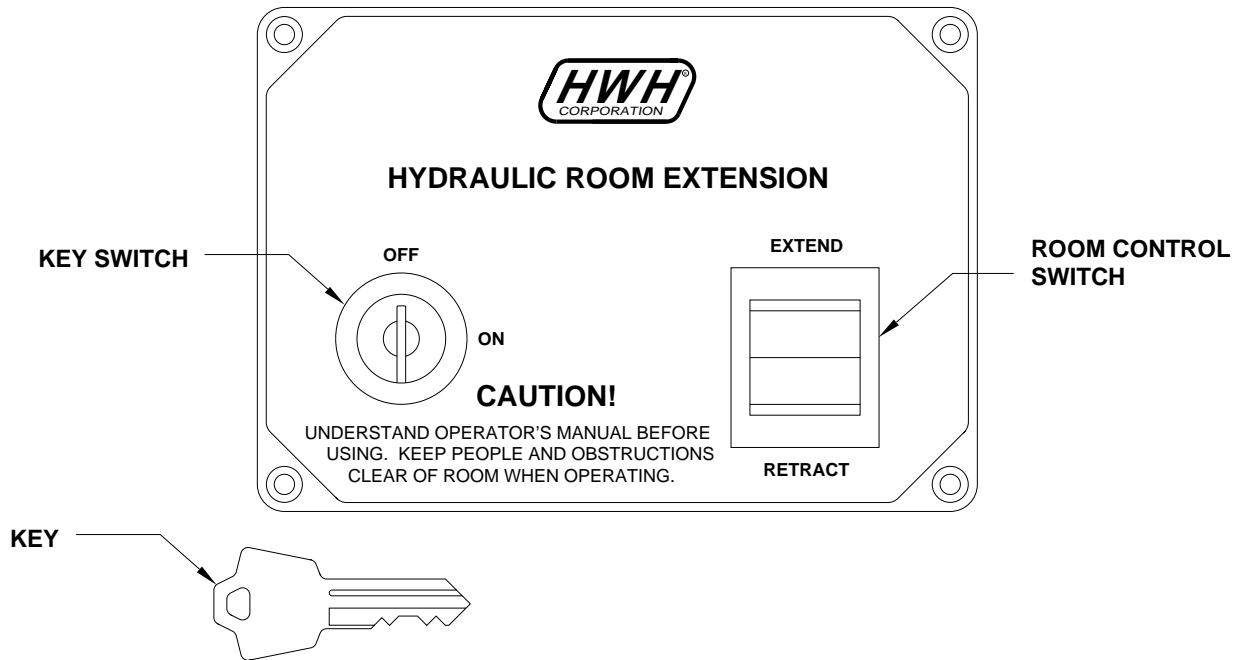
**FIRST:** Notify the dealership where you purchased the vehicle or had the leveling system installed. Dealership management people are in the best position to resolve the problem quickly. If the dealer has difficulty solving the problem, he should immediately contact the Customer Service Department, at HWH CORPORATION.

**SECOND:** If your dealer cannot or will not solve the problem, notify the Customer Service Department:  
HWH CORPORATION 2096 Moscow Rd. Moscow IA. 52760  
(563) 724-3396 OR (800) 321-3494. Give your name and address, coach manufacturer and model year, date the coach was purchased, or the date of system installation,

description of the problem, and where you can be reached during business hours (8:00 a.m. till 5:00 p.m. c.s.t.). HWH CORPORATION personnel will contact you to determine whether or not your claim is valid. If it is, HWH CORPORATION will authorize repair or replacement of the defective part, either by appointment at the factory or by the authorization of an independent service facility, to be determined by HWH CORPORATION. All warranty repairs must be performed by an independent service facility authorized by HWH CORPORATION, or at the HWH CORPORATION factory, unless prior written approval has been obtained from proper HWH CORPORATION personnel.

## CONTROL IDENTIFICATION

### ROOM OPERATOR'S PANEL

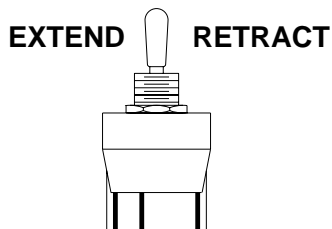


## CONTROL FUNCTIONS

**KEY SWITCH:** The KEY SWITCH controls power to the ROOM CONTROL SWITCH. When the KEY SWITCH is in the "ON" POSITION the room can be operated, and the key cannot be removed. When the KEY SWITCH is in the "OFF" position the room cannot be operated, and the key can be removed.

**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.

## STEP CONTROL TOGGLE SWITCH



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

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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 three 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 three 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 three or six minutes without allowing the pump motor to cool for thirty minutes.**

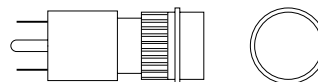
Some systems can be turned back on immediately after the processor turns the pump off. **DO NOT turn the system back on or run the pump without allowing the pump motor to cool for thirty minutes.**

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 three 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 three 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..

## PREPARATION FOR TRAVEL

Any room extension or step system should be fully retracted before traveling.

**WARNING: THE VEHICLE SHOULD NOT BE MOVED IF ONE OR MORE ROOMS OR THE STEP SYSTEMS ARE EXTENDED.**

If the rooms cannot be retracted according to the "ROOM RETRACT PROCEDURE" Section. refer to "AUXILIARY HAND PUMP OPERATION". If the room cannot be retracted with the hand pump, refer to "MANUAL ROOM RETRACTION PROCEDURES".

If a step cannot be retracted according to the "STEP RETRACT PROCEDURE" section, refer to the "MANUAL STEP RETRACT PROCEDURE" page. The step cannot be retracted with the hand pump.

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# OPERATING PROCEDURES

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## ROOM EXTEND PROCEDURE

**WARNING:** OPERATING THE ROOM WITH ANY ROOM-LOCKING DEVICES LOCKED OR THE MANUAL-RETRACT WINCH ATTACHED CAN CAUSE PERSONAL INJURY AND VEHICLE DAMAGE. IT IS THE OPERATOR'S RESPONSIBILITY TO ENSURE THAT ALL ROOM-LOCKING DEVICES AND THE MANUAL RETRACT WINCH ARE DISENGAGED BEFORE OPERATING THE ROOM.

1. Unlock all room-locking devices.

**NOTE :** If the MANUAL RETRACT WINCH is attached to the room 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.

**2. THE PARK BRAKE MUST BE SET FOR THE ROOM TO OPERATE.**

3. Turn the room control panel key switch to "ON".
4. To extend the room, press and hold the ROOM CONTROL SWITCH in the "EXTEND" position until the room is fully extended.

**NOTE:** Hold the switch to "EXTEND" three or four seconds after the room is fully extended. 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 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 SWITCH 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 switch 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 SWITCH will halt the operation of the room.

5. Turn the room control panel key switch to the "OFF" POSITION.

## ROOM RETRACT PROCEDURE

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

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

2. Turn the room control panel key switch to "ON".
3. To retract the room press and hold the ROOM CONTROL SWITCH in the "RETRACT" position until the room is fully retracted.

**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 SWITCH 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 switch 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 SWITCH will halt the operation of the room.

4. Turn the room control panel key switch to the "OFF" POSITION.
5. Engage any room-locking devices.
6. If the room will not retract see the MANUAL ROOM RETRACT PROCEDURE.

**IMPORTANT:** Room-locking devices, if so equipped, should be locked while traveling.

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# OPERATING PROCEDURES

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## STEP EXTEND PROCEDURE

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

**WARNING:** OPERATING A STEP WITH ANY 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 STEP LOCKING, CLAMPING OR MANUAL RETRACTING DEVICES ARE DETACHED OR DISENGAGED BEFORE OPERATING THE STEP.

Refer to vehicle manufacturer for proper sequence of room extension and leveling system operation.

1. There may be a master power switch that must be on to operate the step. Refer to the vehicle manufacturer for information concerning a master power switch.

2. Unlock all locking devices.

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

**WARNING:** KEEP PEOPLE AND OBSTRUCTIONS CLEAR OF STEP WHEN OPERATING. STEP AND HANDRAIL WILL UNFOLD AFTER STEP IS FULLY EXTENDED.

**NOTE:** Make sure there is adequate clearance to fully extend and unfold the step and handrail.

3. To extend the step, press and hold the STEP CONTROL in the "EXTEND" position until the step is fully extended and unfolds the lower part of the assembly and handrails.

**NOTE:** Hold the control to "EXTEND" three or four seconds after the step is fully extended. This assures proper pressurization of the cylinders.

**IMPORTANT:** Do not hold the STEP CONTROL in the "EXTEND" position for more than ten seconds after the step is fully extended or stops moving. **If either side of the step stops moving, or the step and handrail seem to be binding, release the step control immediately. DO NOT force the step. If direction of movement is reversed, be careful to not damage the steps or handrail. Contact HWH Customer Service for assistance 1-800-321-3494.**

**NOTE:** Releasing the STEP CONTROL will halt the operation of the step.

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# OPERATING PROCEDURES

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## STEP RETRACT PROCEDURE

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

**WARNING:** KEEP PEOPLE AND OBSTRUCTIONS CLEAR OF STEP WHEN OPERATING. LOWER STEP AND HANDRAIL WILL FOLD UP BEFORE THE STEP STARTS TO RETRACT.

Refer to vehicle manufacturer for proper sequence of room extension and leveling system operation.

1. There may be a master power switch that must be on to operate the step. Refer to the vehicle manufacturer for information concerning a master power switch.
2. To retract the step press and hold the STEP CONTROL in the "RETRACT" position until the step is fully retracted. The lower step and handrail will fold up before the step starts to retract.

**NOTE:** Hold the switch to "RETRACT" three or four seconds after the step is fully retracted. This assures proper pressurization of the cylinders.

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

If either side of the step stops moving, or the step and handrail seems to be binding, release the step control immediately. DO NOT force the step. If the direction of movement is reversed, be careful to not damage the step or handrail. Contact HWH Customer Service for assistance 1-800-321-3494.

**NOTE:** Releasing the STEP CONTROL will halt the operation of the step.

3. Engage any locking devices.
4. If the step will not retract see the MANUAL STEP RETRACT PROCEDURE.

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



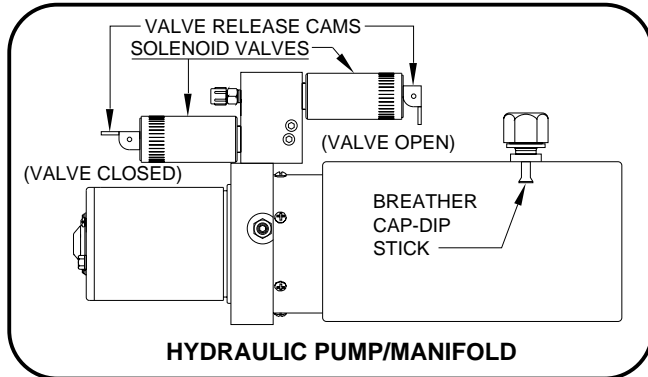
# OPERATING PROCEDURES

## "UNIVERSAL STRAIGHT OUT" ROOM EXTENSION MECHANISM

### MANUAL ROOM RETRACTION PROCEDURES

1. Determine which extend and retract solenoid valves are assigned to the room. Manually open both valves by moving the valve release cams to the open position. See the HYDRAULIC PUMP/ MANIFOLD diagram.

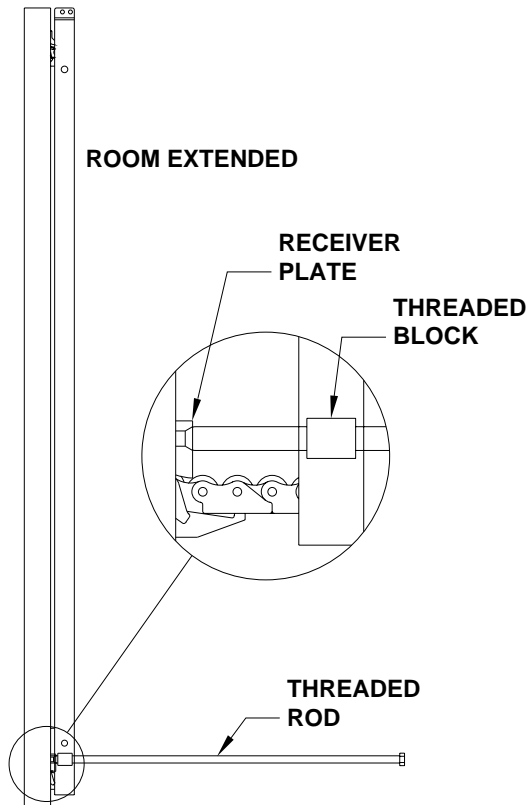
**IMPORTANT: ONLY MOVE THE RELEASE CAM IN THE DIRECTION SHOWN. MOVING THE CAM IN THE OPPOSITE DIRECTION CAN DAMAGE THE VALVES.**



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.

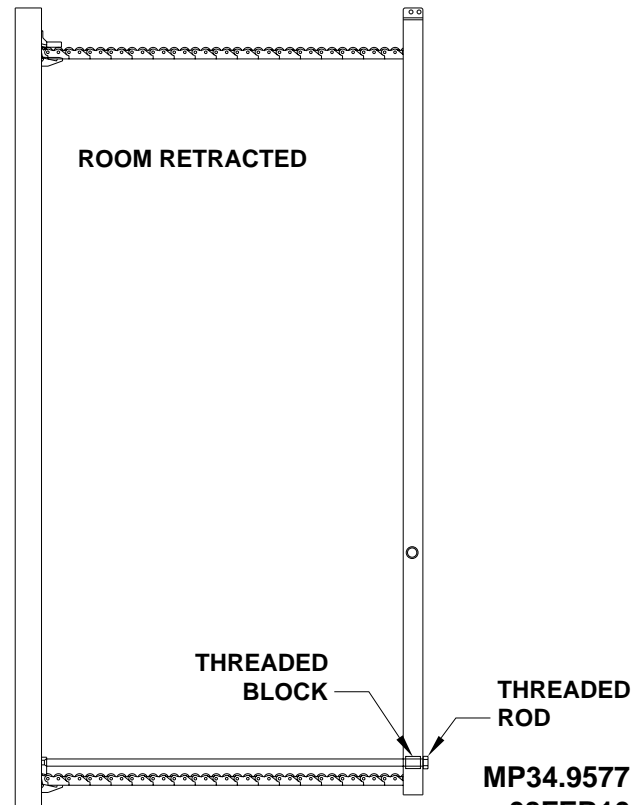
6. Repeat steps 4 and 5 alternating from mechanism to mechanism rotating each threaded rod 12 complete turns until room is sealed. (DO NOT exceed 15 ft.lbs) Make sure the room does not bind.

**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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# OPERATING PROCEDURES

## MANUAL STEP RETRACT PROCEDURES

If the system is equipped with an auxiliary pump run switch or an auxiliary hand pump, refer to the "OPERATING PROCEDURES" pages for the pump run switch or hand pump before using the manual step retract procedure. Use this procedure if a step control switch does not work only if the main pump or hand pump will not retract the step.

**WARNING: KEEP AWAY FROM PINCH POINTS OF STEPS AND HANDRAIL WHILE FOLDING STEPS. PINCH POINTS CAN CAUSE SERIOUS INJURY.**

1. Locate the correct valves for the step being retracted. Contact vehicle manufacturer for location.
2. Open the EXTEND and RETRACT solenoid valves for the step. Move the valve release cams to the open position.
3. Lift the bottom step up and fold it back onto the main step assembly. The handrail(s) should fold to the retract position at the same time.

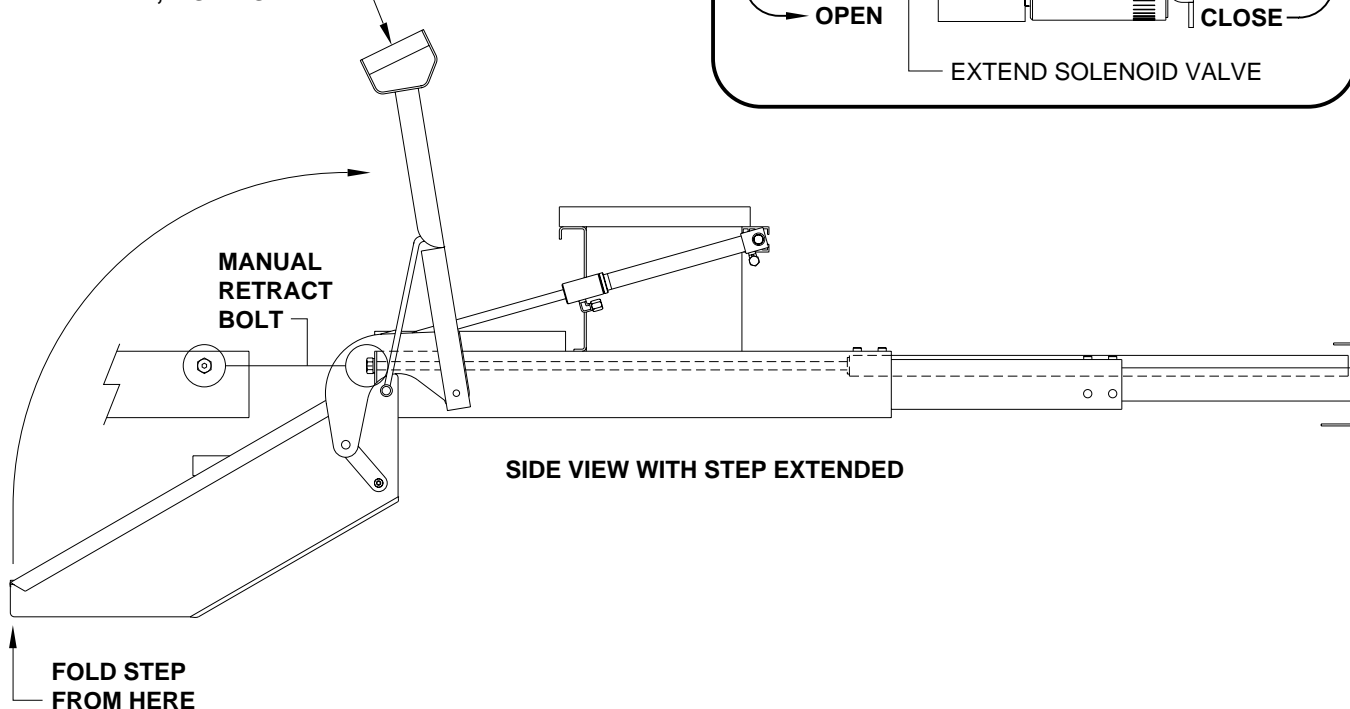
**IMPORTANT: ONLY MOVE THE RELEASE CAM IN THE DIRECTION SHOWN. MOVING THE CAM IN THE OPPOSITE DIRECTION CAN DAMAGE THE VALVES.**

4. It may be possible to simply push the step back in. If not, use the manual retract bolt on the front of the step. Use a 13/16 wrench or 1/4" allen wrench to slowly turn the bolt clockwise until the step is retracted. DO NOT use an impact wrench.

5. Close both step solenoid valves.

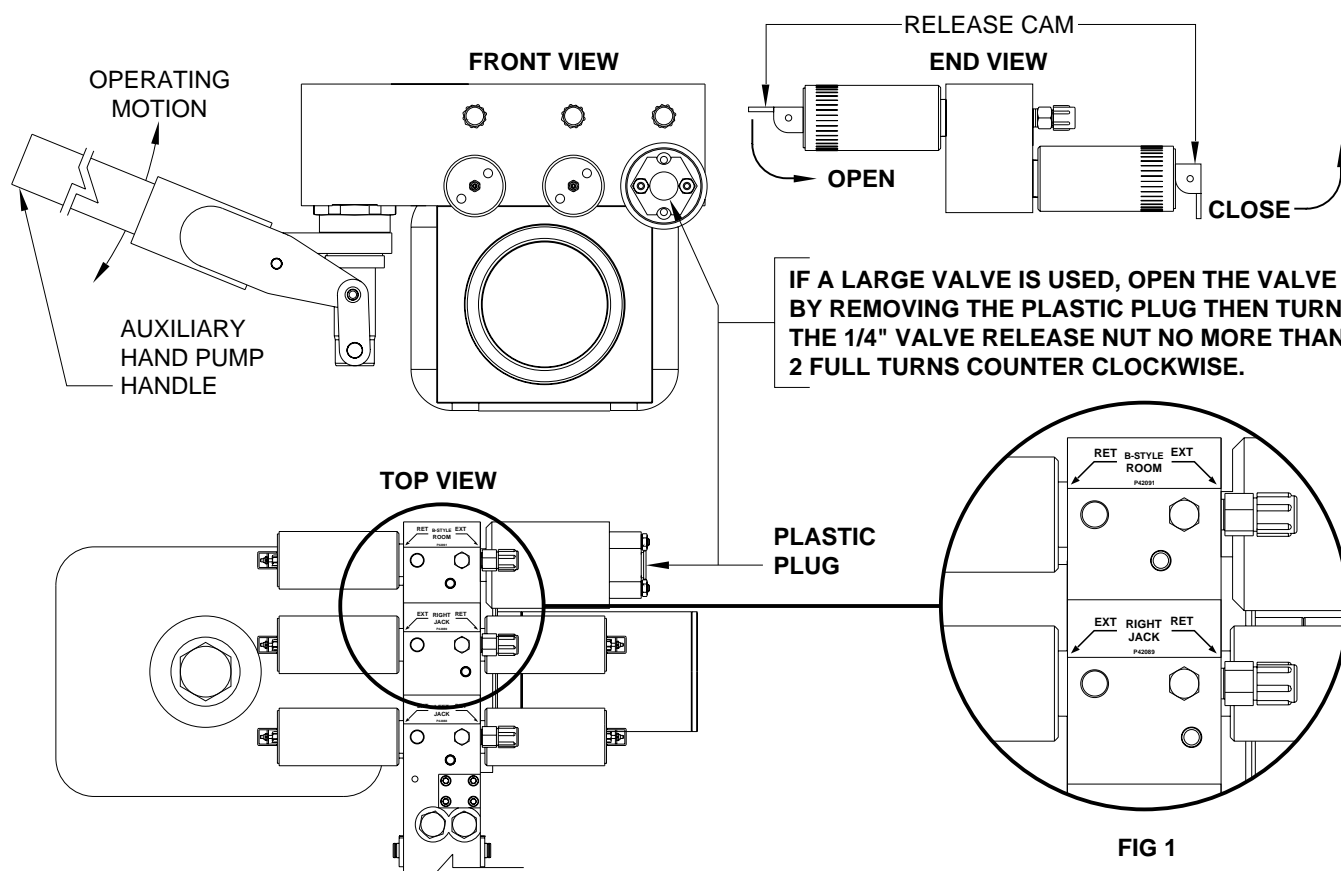
**IMPORTANT: THE MANUAL RETRACT BOLT MUST BE TURNED COUNTERCLOCKWISE UNTIL IT IS BACK TO THE OPERATE POSITION. TURN THE BOLT COUNTERCLOCKWISE UNTIL IT STOPS BUT DO NOT OVERTIGHTEN IT. THE RETRACT BOLT MUST BE TURNED BACK TO THE OPERATE POSITION BEFORE THE STEP CAN BE EXTENDED.**

HANDLE ASSEMBLIES  
MAY HAVE 1, 2 OR NONE



# OPERATING PROCEDURES

## AUXILIARY HAND PUMP OPERATION



**NOTE:** Each hydraulic function requires a pair of solenoid valves one each for the extend and retract procedures. The number of functions and the items controlled by each pair of solenoid valves will vary for each system. The diagrams shown on this page represent a (3) function system of (2) jacks and (1) room as indicated by the labels shown in FIG 1. Use the labels specific to your system when following these procedures. Room control solenoid valves may be located at the synchronizing cylinder, not on the pump manifold.

The auxiliary hand pump can be used to extend or retract the landing gear, jacks or room extensions anytime the pump will not function.

The auxiliary hand pump is a two stage pump that will produce enough pressure to extend the landing gear and lift the vehicle as well as retract the landing gear. When operating the auxiliary pump to lift the vehicle or when the jacks are fully retracted, the pump handle will seem to "snap" as the pump goes to the second stage. The pumping action will be easier at first as the second stage starts to create more pressure.

**NOTE:** The hand pump will swivel to any position which will ease the operation of the hand pump.

To operate the auxiliary hand pump, open the appropriate solenoid valve. Insert the hand pump handle into the handle receptacle and move the handle in an up and down motion.

**NOTE:** If a room cannot be retracted using the auxiliary hand pump, see "MANUAL ROOM RETRACTION PROCEDURES".

**WARNING:** THE VEHICLE SHOULD BE SUPPORTED BY AUXILIARY STANDS OR SECURELY HITTED TO THE TOW VEHICLE BEFORE OPENING ANY VALVES.

The auxiliary hand pump may work easier if only one valve is open at a time. **Be careful to not twist the vehicle if only one solenoid valve is open.**

**IMPORTANT:** FOLLOW THE "SET UP" AND "PREPARATION FOR TRAVEL" PROCEDURES WHEN USING THE AUXILIARY HAND PUMP.

It is recommended to operate the auxiliary hand pump occasionally to check its operation.

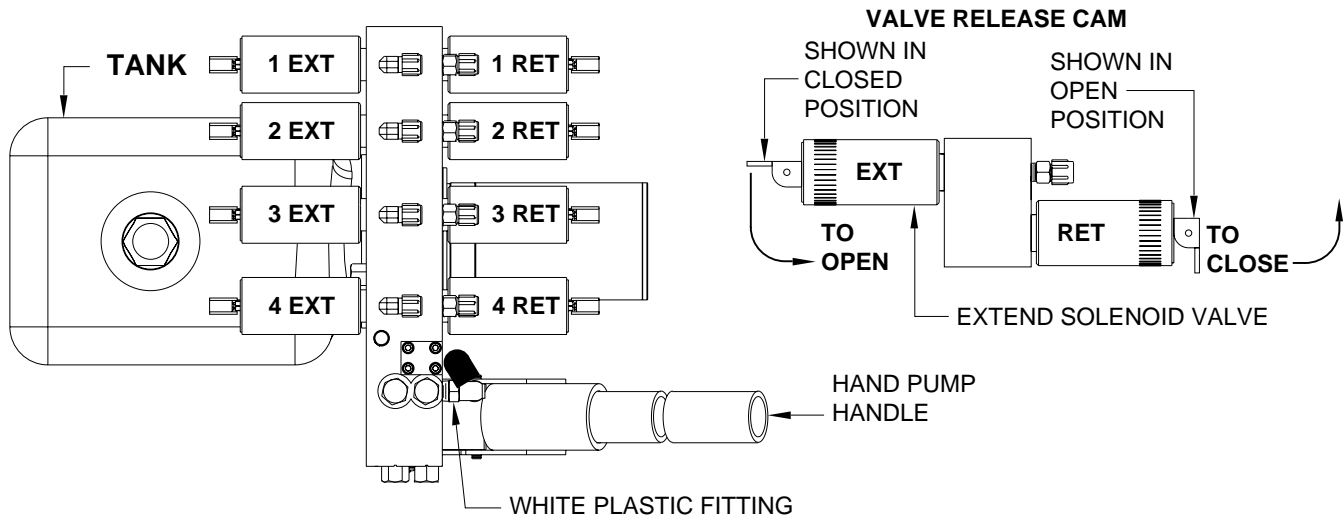
**IMPORTANT:** ONLY MOVE THE RELEASE CAM IN THE DIRECTION SHOWN. MOVING THE CAM IN THE OPPOSITE DIRECTION CAN DAMAGE THE VALVES.

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## MAINTENANCE

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### PRIMING THE HAND PUMP



1. To prime the hand pump, open one extend and one retract valve using the valve release cams
2. Make sure the valves opened are for the same function, such as 1 EXT and 1 RET.
3. Make sure the tank is full. Although there should be no loss of fluid, make sure the fluid level does not drop more than 1 inch.
4. Pump the hand pump 8 to 10 times. You may be able to see the fluid, flow through the white plastic fitting.
5. Close both valves. Then try to extend or retract the desired room according to the "AUXILIARY HAND PUMP OPERATION" page.
6. Repeat as necessary until the hand pump will function properly.

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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.

Any HWH hydraulic equipment, including jacks, slide-outs and steps should be fully retracted before checking fluid level. 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. Fluid level should be between the bottom of the dipstick and the center mark.

**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.

## ROOM EXTENSIONS AND STEP MECHANISMS

The HWH room and step 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.

The systems 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.

Operate the hand pump occasionally. Refer to "PRIMING THE HAND PUMP" if necessary.

# HYDRAULIC LINE CONNECTION DIAGRAM ROOMS 1 AND 2 UNIVERSAL STRAIGHT OUT TWO STEP MECHANISMS

ROOM 1

EXTEND ROOM TO CHECK OIL LEVEL

SEE HYDRAULIC LINE CONNECTION DIAGRAM  
UNIVERSAL STRAIGHT OUT ROOM EXTENSION

ROD END  
CONNECTION - A

CAP END  
CONNECTION - B

## VALVE FUNCTION

1E - ROOM 1 CYLINDER EXTEND  
ROOM RETRACT

1R - ROOM 1 CYLINDER RETRACT  
ROOM EXTEND

2E - ROOM 2 CYLINDER EXTEND  
ROOM RETRACT

2R - ROOM 2 CYLINDER RETRACT  
ROOM EXTEND

3E - STEP 1 CYLINDER EXTEND  
STEP 1 EXTEND

3R - STEP 1 CYLINDER RETRACT  
STEP 1 RETRACT

4E - STEP 2 CYLINDER EXTEND  
STEP 2 EXTEND

4R - STEP 2 CYLINDER RETRACT  
STEP 2 RETRACT

NOTE: ACTUAL POSITION  
OF ROOMS AND STEP  
MAY VARY

SEE HYDRAULIC LINE CONNECTION DIAGRAM  
STEP MECHANISM

STEP 2 RETRACT STEP TO CHECK OIL LEVEL

ROOM 2

EXTEND ROOM TO CHECK OIL LEVEL

SEE HYDRAULIC LINE CONNECTION DIAGRAM  
UNIVERSAL STRAIGHT OUT ROOM EXTENSION

ROD END  
CONNECTION - A

CAP END  
CONNECTION - B

VALVE RELEASE  
LEVERS

AUXILIARY HAND  
PUMP

VALVE RELEASE  
LEVERS

ROD END  
CONNECTION - A

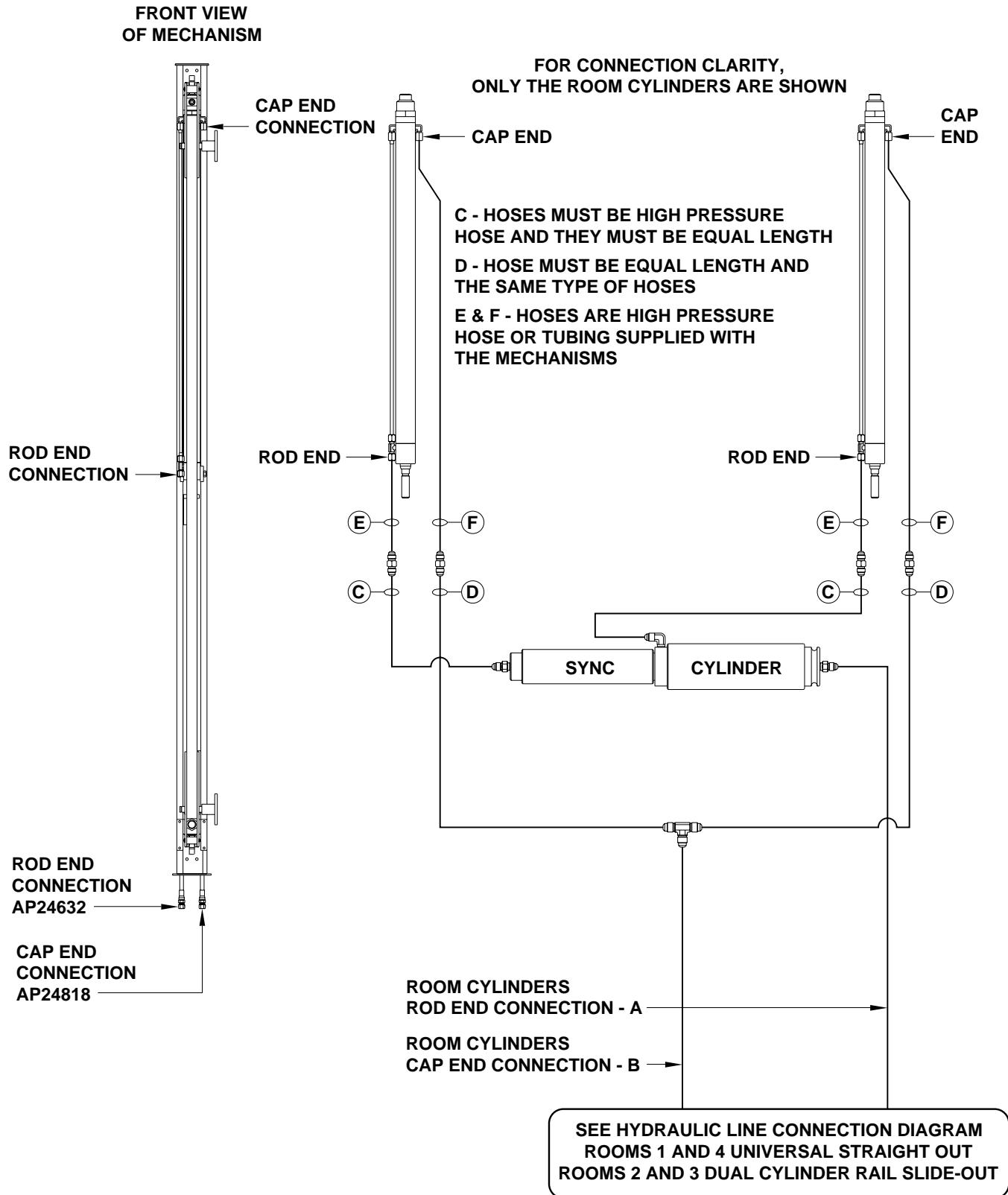
CAP END  
CONNECTION - B

SEE HYDRAULIC LINE CONNECTION DIAGRAM  
STEP MECHANISM

STEP 2 RETRACT STEP TO CHECK OIL LEVEL

# HYDRAULIC LINE CONNECTION DIAGRAM

## UNIVERSAL STRAIGHT OUT ROOM EXTENSION



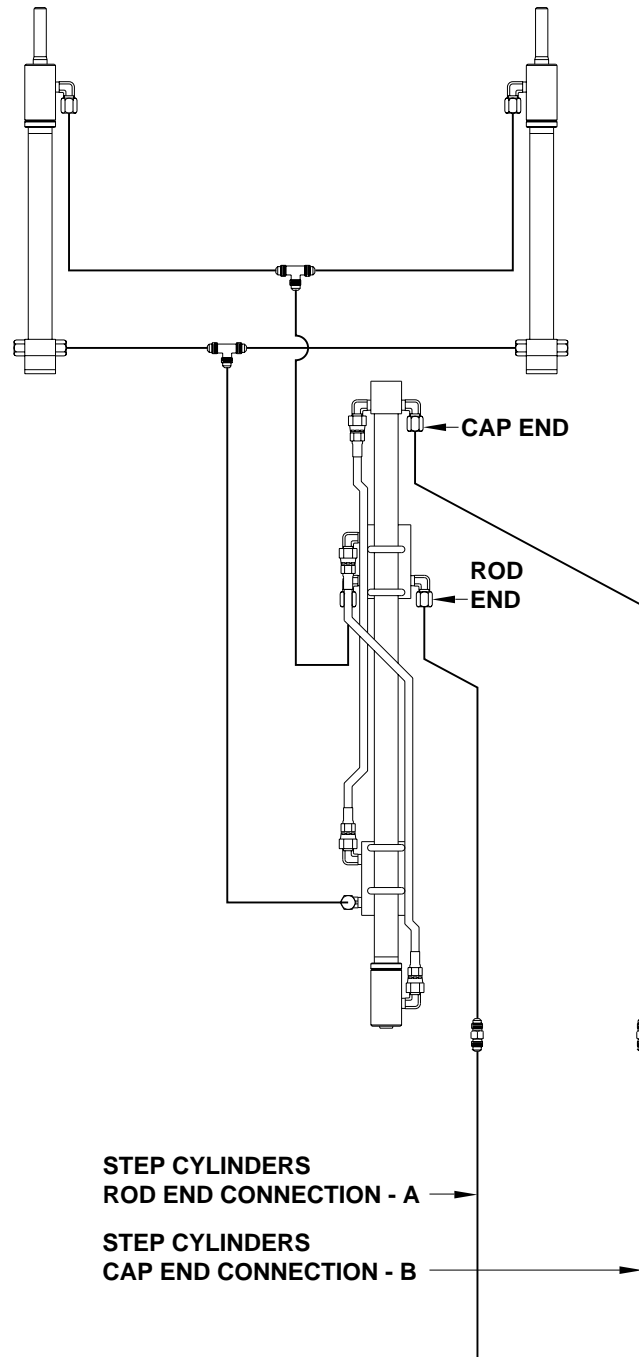
CYLINDER EXTEND - ROOM RETRACT  
CYLINDER RETRACT - ROOM EXTEND  
CHECK OIL LEVEL WITH ROOM EXTENDED

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## HYDRAULIC LINE CONNECTION DIAGRAM STEP MECHANISM

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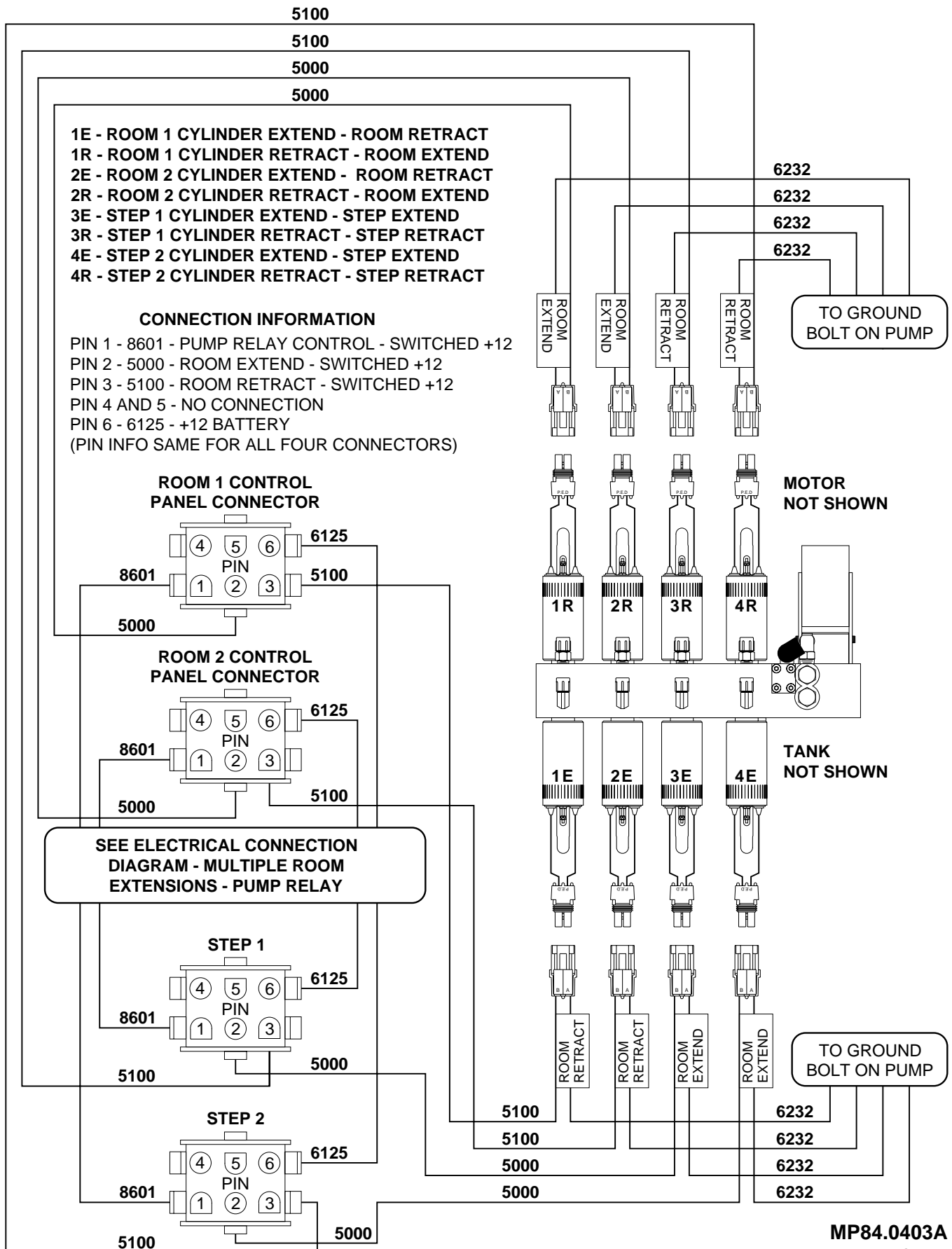


SEE HYDRAULIC LINE CONNECTION DIAGRAM  
ROOMS 1 AND 2 UNIVERSAL STRAIGHT OUT  
TWO STEP MECHANISMS



# ELECTRICAL CONNECTION DIAGRAM

## ROOM EXTENSION MANIFOLD CONNECTIONS

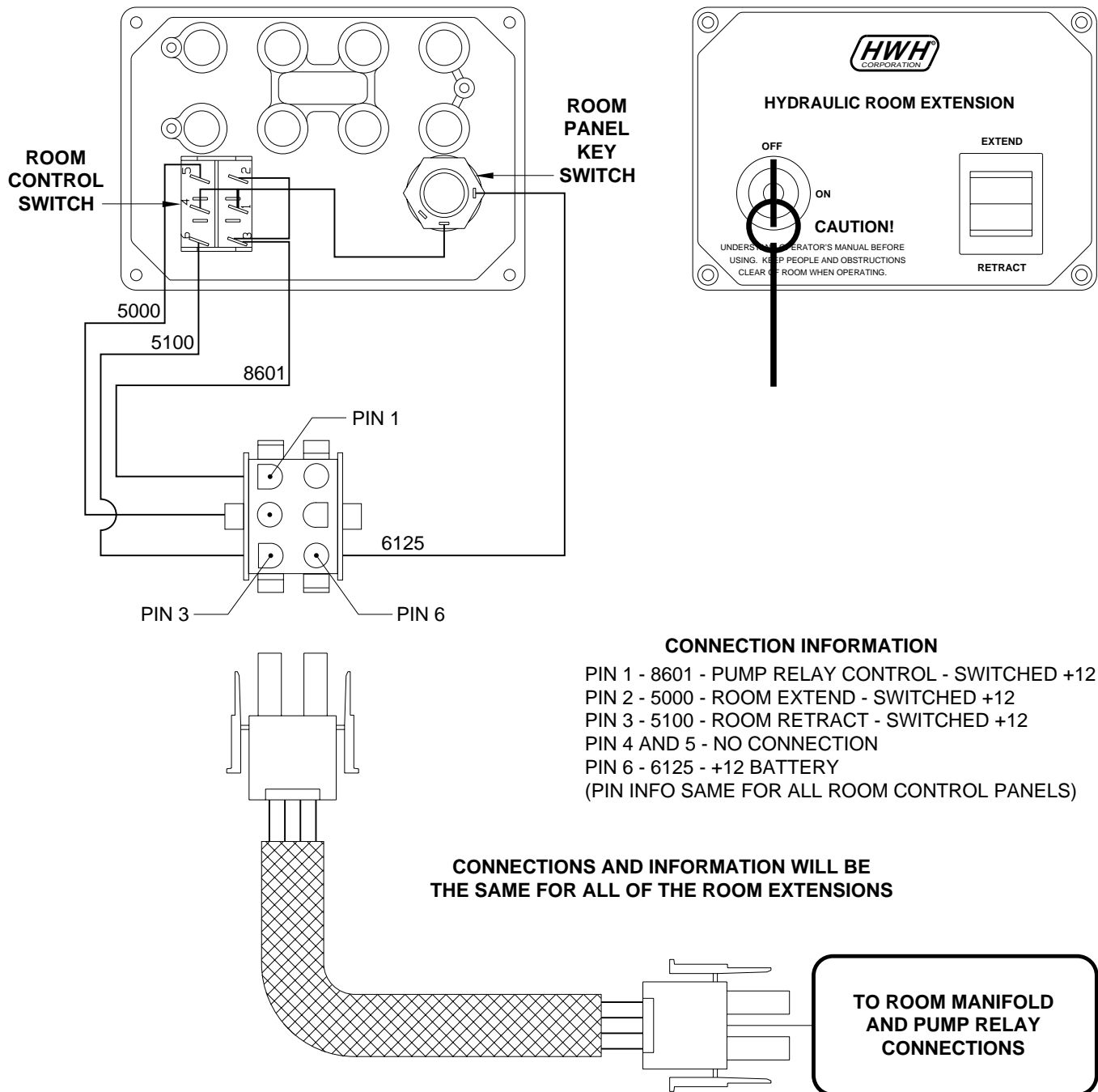




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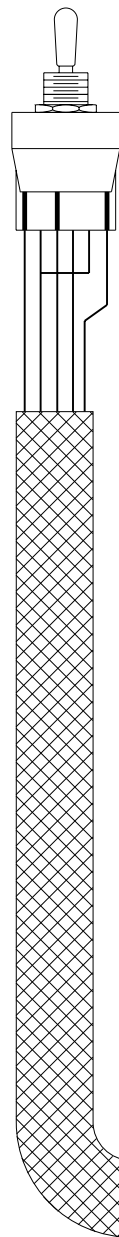
# ELECTRICAL CONNECTION DIAGRAM

## ROOM CONTROL PANEL

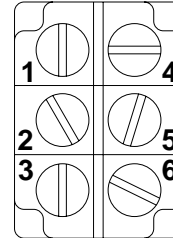


# ELECTRICAL CONNECTION DIAGRAM

## STEP CONTROL TOGGLE SWITCH



### SWITCH CONNECTIONS

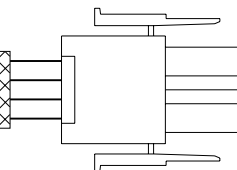


- 1 - BLACK - 5000 - STEP EXTEND - SW. +12
- 2 - RED - 6125 - +12 BATTERY
- 3 - BLACK - 5100 - STEP RETRACT - SW. +12
- 4 - BLACK - 8601 - PUMP CONTROL - SW. +12
- 5 - RED - 6125 - +12 BATTERY
- 6 - BLACK - 8601 - PUMP CONTROL - SW. +12

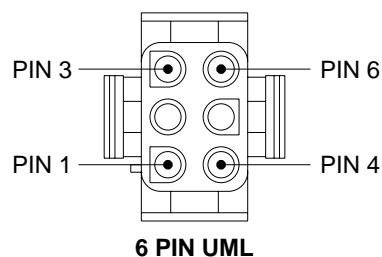
### CONNECTOR INFORMATION

- PIN 1 - 8601 - PUMP RELAY CONTROL - SWITCHED +12
- PIN 2 - 5000 - ROOM EXTEND - SWITCHED +12
- PIN 3 - 5100 - ROOM RETRACT - SWITCHED +12
- PIN 4 AND 5 - NO CONNECTION
- PIN 6 - 6125 - +12 BATTERY
- (PIN INFO SAME FOR BOTH STEP CONTROL CONNECTORS)

**CONNECTIONS AND INFORMATION WILL BE  
THE SAME FOR BOTH OF THE STEP MECHANISMS**



**TO ROOM MANIFOLD  
AND PUMP RELAY  
CONNECTIONS**



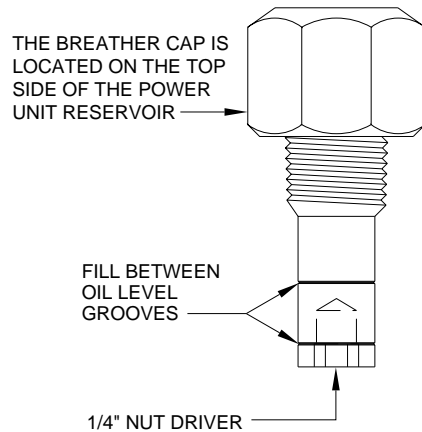
# INFORMATION/INSTRUCTION SHEET

## HYDRAULIC SOLENOID VALVE

### IDENTIFICATION - MANUAL OPERATIONS - REPLACEMENT

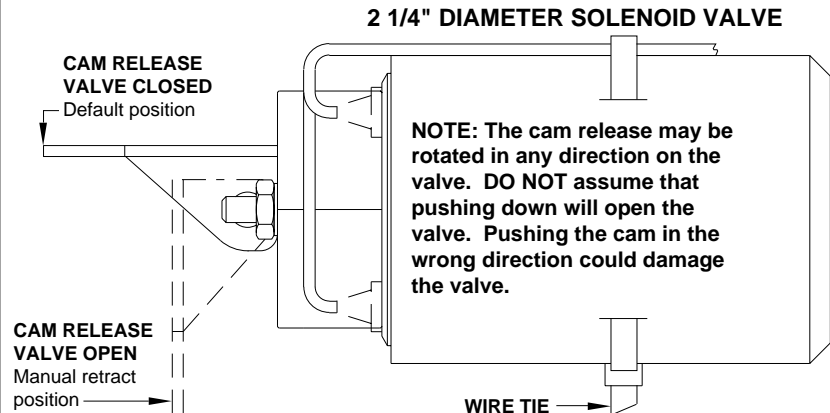
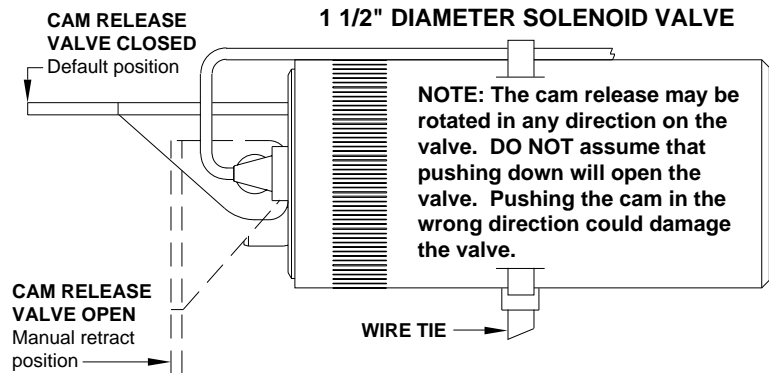
REPLACEMENT VALVES WILL HAVE A VALVE RELEASE CAM

#### BREATHER CAP W/NUT DRIVER

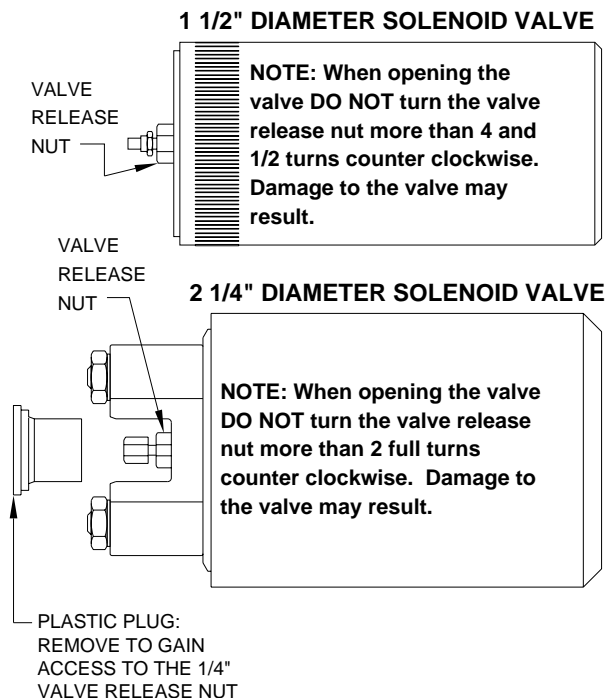


**IMPORTANT:** PRIOR TO REMOVING THE BREATHER CAP, EITHER TO CHECK THE OIL LEVEL OR TO USE 1/4" NUT DRIVER, CLEAN ANY DEBRIS FROM THE TOP OF THE RESERVOIR. BEFORE RETURNING THE BREATHER CAP TO THE RESERVOIR, REMOVE ANY PAINT CHIPS OR OTHER DEBRIS FROM THE DIPSTICK INCLUDING DEBRIS INSIDE THE 1/4" NUT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

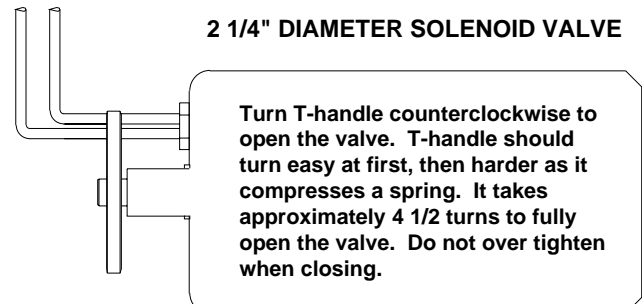
#### SOLENOID VALVES WITH CAM RELEASE



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



#### SOLENOID VALVES WITH T-HANDLE RELEASE



**NOTE: OLD STYLE HEX SHAPED SOLENOID VALVES HAVE NO MANUAL VALVE RELEASE.**