REDFOOT®

LEVELLING

Installation and Operations Manual
Effective June 2023

Before starting the installation, check the content of all boxes received against the picking slip which is attached to the outer of the main carton. Please call Redfoot® Levelling immediately if there is a discrepancy!

WARNING!

This is a 12VDC System **DO NOT** connect to your 24Volt House Battery

Warning:

REDFOOT Levelling does not permit use of our levelling system to be used as a 'Tyre Jack" solution. Do not use the levelling system as a vehicle jack when changing tyres. Use the proper vehicle jack supplied with the vehicle in accordance with the manufacturer's instructions. Jack Stands shall be always in use as the primary support when wheels are off the ground for long durations.

IMPORTANT

Modification of any factory-supplied item may result in the denial of all warranty claims.

Call Redfoot Levelling Technical Support prior to any modifications. Redfoot Levelling offers full installation support for authorised approved Installers only. End user installers must read and accept our Warranty and Terms and Conditions on the Invoice issued with this purchase.

Danger:

With any hydraulic application, holding position on a cylinder must be done with safety in mind. Failure in the system may cause the jack(s) to retract or extend suddenly. When working under or near the vehicle, always use jack stands of appropriate rating to support the weight of the vehicle.

Installers Please Note

This document is to be supplied to the End User (left in Vehicle after installation) to guide them through operating the system. End users can find these sections from Page 19 onwards.

Contents

Tools Required for Installation

- Ratchet, sockets, and spanner set
- Wire cutters / crimpers
- Electric drill and bits
- Screw gun bits
- Welding equipment (if welding leg or bracket in place)

Additional Items Required for Installation

- **#4 AWG (5.19mm Dia)** (to connect battery +12V positive to the pump) *
- **#4 AWG (5.19mm Dia)** ground wire (to connect battery -12V ground to pump) *
- **#4 AWG (5.19mm Dia)** ring terminals
- Loom clips (to secure harnesses and hydraulic hoses to the vehicle)
- Self-tapping screws or pop rivets
- Cable Ties
- 8 -9 litres Dexron III Automatic Transmission Fluid (Common ATF)
- Thread locking fluid to secure foot bolts to cylinders.

* Note: These items must be # 2 AWG (6.54mm Dia) if cable run is greater than 3.6 meters.

Installing the Cylinders

Determine where the cylinders will be mounted. The cylinders must be mounted to the chassis frame, as close as possible to the front and rear axles. We advise that to optimize departure clearance, mount the cylinders within 1 meter of each axle.

Secure the cylinders brackets in place according to the bracket mounting drawings.

2.2 DRILLS ON THE CHASSIS

Installation of auxiliary equipment onto the chassis must be done using the factory drilled holes whenever possible.

- **It is strictly forbidden to drill holes into the side member flaps, with exception to what is indicated in Chapter 3.3 - Paragraph "Choosing the type of connection".**

When new holes must be made for specific applications (installation of shelves, corner shelves, etc.), these must be drilled into the upright rib of the side member and must be thoroughly de-burred and bored.

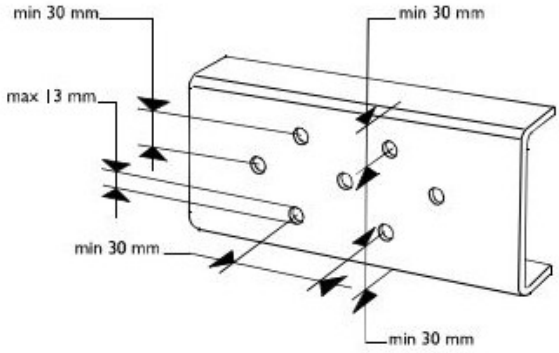
Hole position and size

The new holes must not be drilled into the areas subjected to greater stresses (such as spring supports) or where the side member section varies.

Hole diameter must be suited to sheet metal thickness but cannot exceed 13 mm (unless otherwise stated). The distance of the axis of the holes from the edge of the side member must not be less than 30 mm; in the same way, the axes of holes must not be less than 30 mm from each other or from other existing holes.

The holes must be offset as in Figure 2.

The original hole layout must be maintained when moving spring supports or crossbars.



Bolt the cylinders to the bracket using the supplied nuts and washers. The cylinders must be installed with a minimum of 200mm of ground clearance. See Installation chart below. In any case, the bottom of the footpad should be no lower than any other item mounted on the vehicle.

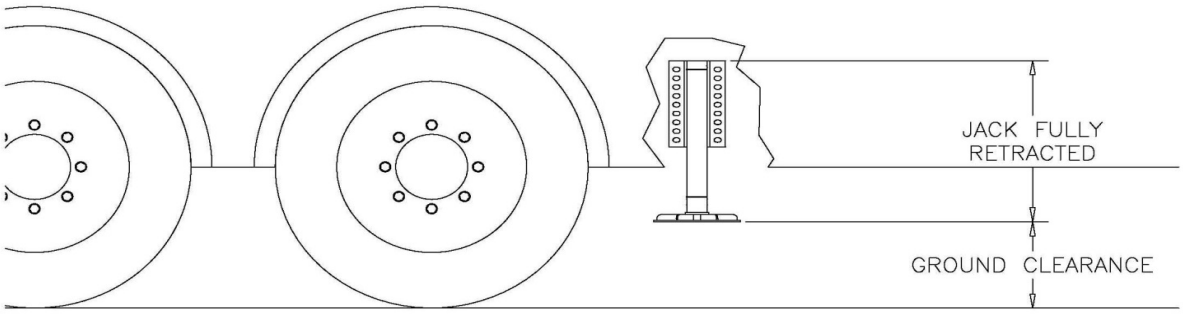
On some extremely low vehicles there is provisions to mount lower than the 200mm as recommended, as long the foot does not impede the departure clearance angle.

Pay attention to the angle of departure for the chassis when mounting the rear cylinders – and the angle of approach when mounting the front cylinders.

Reference Chart for Installing Jacks:

The foot/pad must be mounted with-in the range suggested (see chart below) for proper operation of the system. Retract the cylinders fully (cylinder up).

Ground clearance is determined by measuring from the bottom of the cylinders foot to the ground (cylinders retracted fully) with 200mm minimum of ground clearance

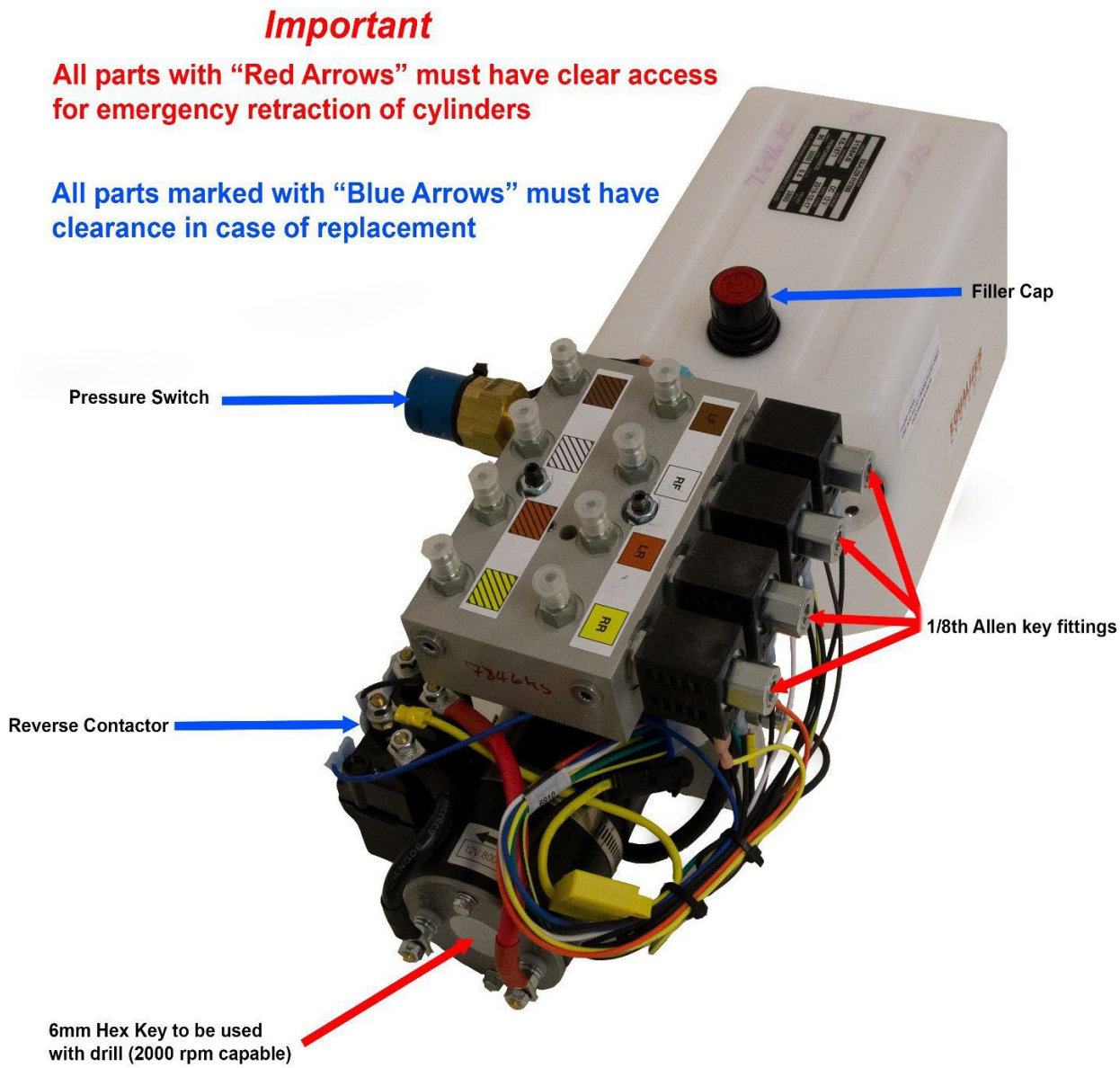


When in doubt call Redfoot Levelling (07) 3286 1199.

Installing the Pump

The pump must be mounted in a location that is reasonable to route all the hydraulic hoses to the manifold. It must be accessible for filling the reservoir and monitoring the fill level. Take note if the unit is equipped with the manual override option.

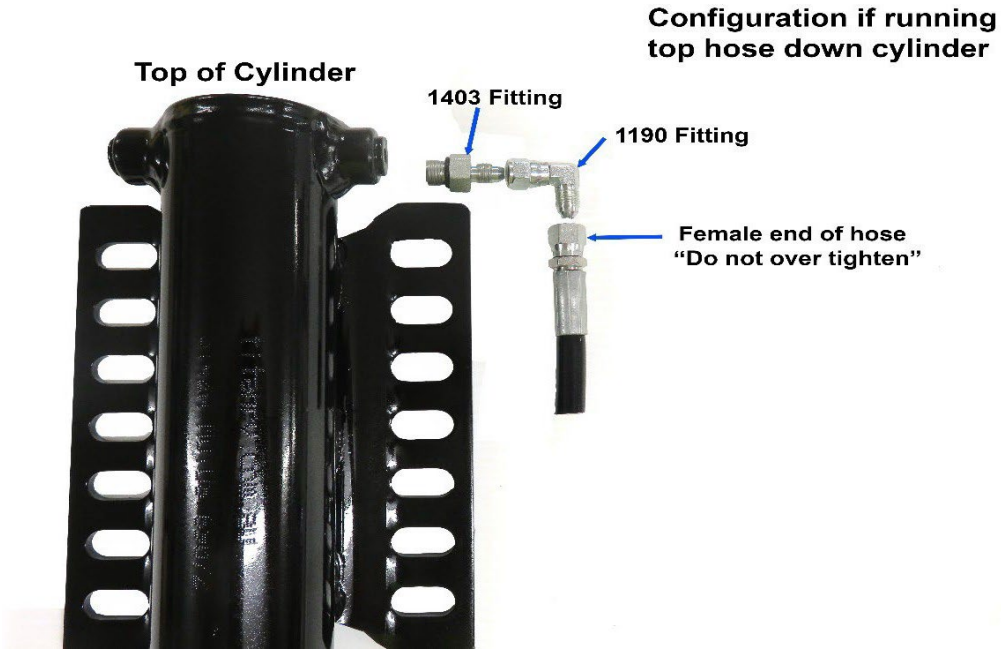
The pump handle, cartridge valves and directional valves must be accessible to manually override the system. If the pump is equipped with the manual override screw on the end of the motor, then be sure to allow access to that end of the pump. In most applications, a side storage compartment will provide the ideal location. An additional mounting box or tray may be used on other style vehicles.

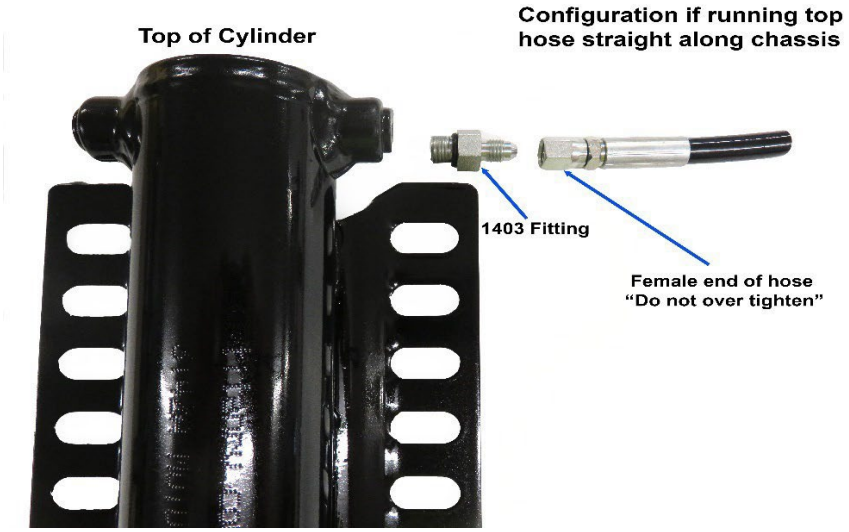


Installing the Fittings

Install the hydraulic adaptor fittings in the top and bottom of each jack and install the fittings into the manifold. The straight thread O-ring side always goes to the cylinder or manifold. The tapered side will get the hose attached to it.

When installing straight fittings into the leg or manifold, tighten to 15 lbs-ft. When using 1124 fittings, turn until finger tight, position correctly, then tighten the jam nut to 15 lbs-ft.





Installing the Hoses

Install the hydraulic hoses according to the diagram on page 8 & 9. Route the hoses clear of all hot exhaust components and pinch points in the suspension/chassis system. Attach the hoses to the manifold and jack fittings.

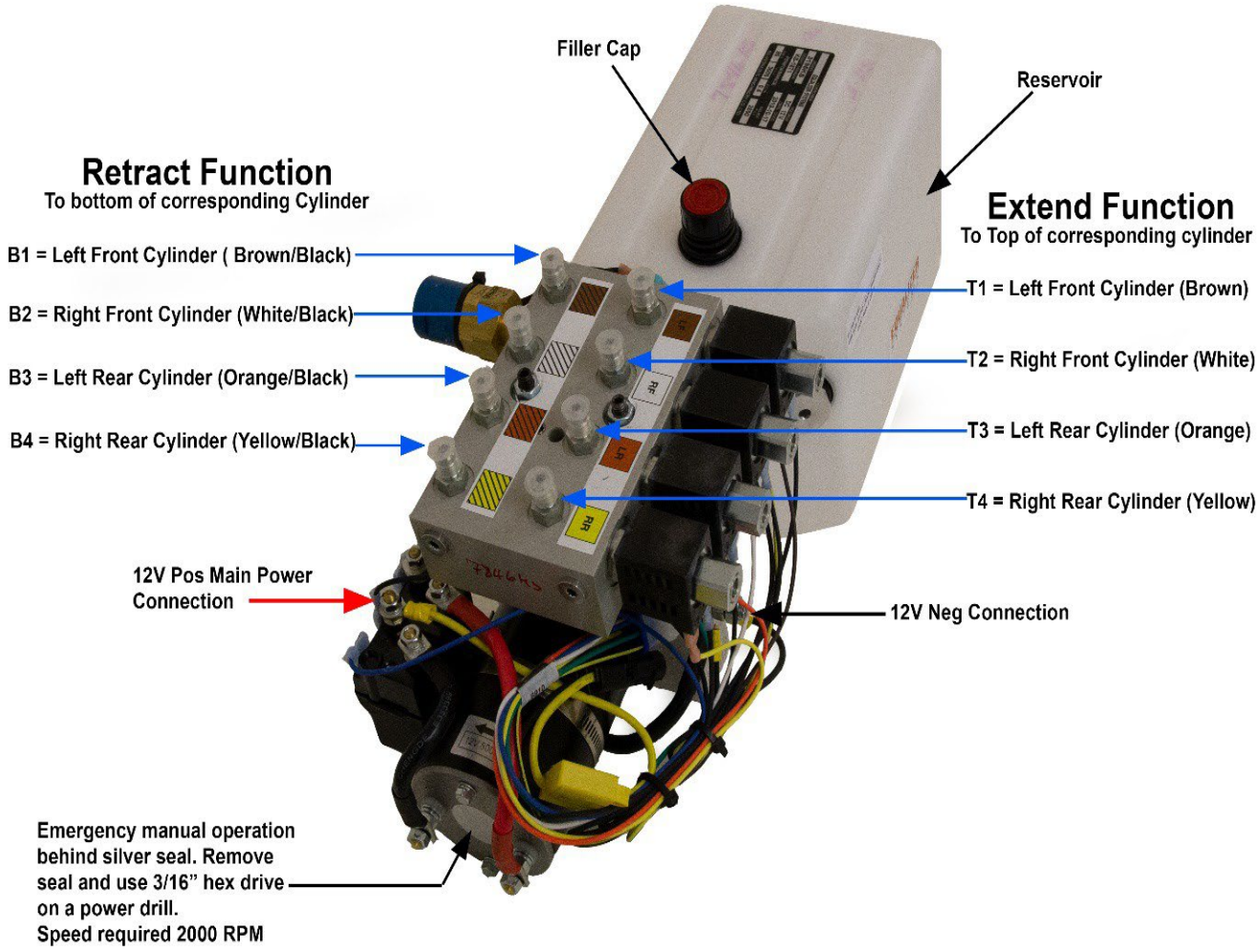
Tighten to 15 lbs-ft. Secure the hydraulic hoses with wire ties or loom clamps to the chassis. Care should be taken to not kink or twist hoses. The minimum bend radius is 6 inches.

Secure the hydraulic hoses with wire ties or loom clamps to the chassis. Incorrect plumbing will cause operating problems at start-up.

Installation of Hoses to the Manifold

Jack Leg	Manifold Connection
Left Front-Top	T-1 Brown Solid
Left Front-Bottom	B-1 Brown Stripe
Right Front-Top	T-2 White Solid
Right Front Bottom	B-2 White Stripe
Left Rear-Top	T3- Orange Solid
Left Rear-Bottom	B3- Orange Stripe
Right Rear-Top	T-4 Yellow Solid
Right Rear-Bottom	B-4 Yellow Stripe

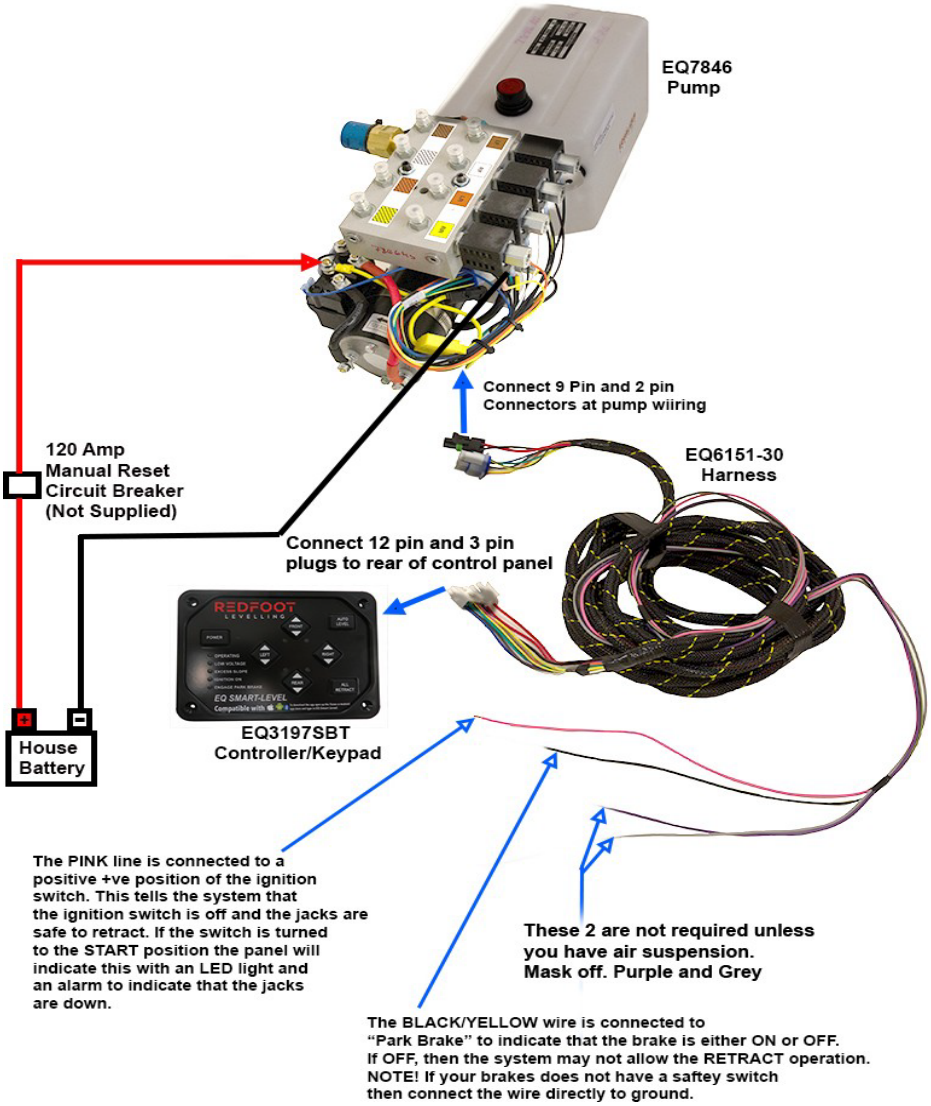
Left side = Passenger Side of Vehicle
Right side = Drivers Side of Vehicle



Wiring Harness

Route the wire harness from the pump assembly to the area where the control panel is to be mounted. The harness needs to be routed away from moving objects, sharp edges, and high heat sources. Use wire ties and or loom clamps to secure in place.

The end with the 9 pin and 2 pin connector goes to the pump assembly. See the drawing for the lay out. Connect the harness connectors to the matching connectors at the pump assembly.



Chassis Interface Connections

****Required****

Keypad Ignition Disable Circuit: Note the “break-outs" near the end of the keypad harness. The Pink wire must receive a +12 VDC Input when the ignition key is in the “on” position. Connect this wire to the ignition positive. This will make the wire "hot” and will inhibit cylinder extension when the vehicle ignition key is in the on (engine run) position.

This also provides for a “cylinders down” warning in the event of a jack drifting from the stowed position during travel. This connection is required. **Failure to make this connection may create an unsafe condition and may void the warranty.**

****Required****

(Park Brake Ground): The **Black w/ Yellow** wire must receive a **Ground Input.** This **Black w/ Yellow** wire is designed to connect to the park brake switch so that it is connected to ground when the brake is applied and disconnected from ground when the brake is released. Contact your chassis manufacturer to verify park brake wire connection and location. If a park-brake signal is not available; this **Black / Yellow** wire must be grounded to a permanent chassis ground. The connection to a park brake switch is optional. If this input is not connected to the park brake switch or to ground, AUTO-LEVEL will be continuously denied. Also, the engage park brake light will be on if the panel is powered up or the key is in the on (engine run position).

***Note: If Black/Yellow is connected to a park brake switch (as in above step) and the pink is connected (as in above step), an automatic “all retract” will be initiated if the key is turned on (engine run position) and the park brake is released.**

Suspension deflate/Inflate: If chassis is equipped - There are two additional wires that break out from the harness near the keypad (if supplied). The grey wire provides a 12 VDC positive output for 2 minutes when the auto level button is pressed. This may be used to deflate the chassis air suspension. The Purple wire will provide a 2 minute 12 VDC positive output when the all-retract is pressed. This may be used to inflate the chassis air suspension. The Chassis must be equipped with an electric dump/inflate system for this interface. Check with the chassis manufacturer for the availability of this and the chassis side of this interface. If the chassis is not equipped or it is not to have this option, tape the 2 wires back to prevent shorting (do not use).

Pump harness connections: Attach the supplied wire harness between the pump and the location of the controller. This harness will connect between the pump and the mating connector on the controller. Note the harness breakouts for the main harness at the hydraulic pump. There are (2) ea. Connectors for the jacks. There may be other connectors if the pump unit will also be running slide-outs.

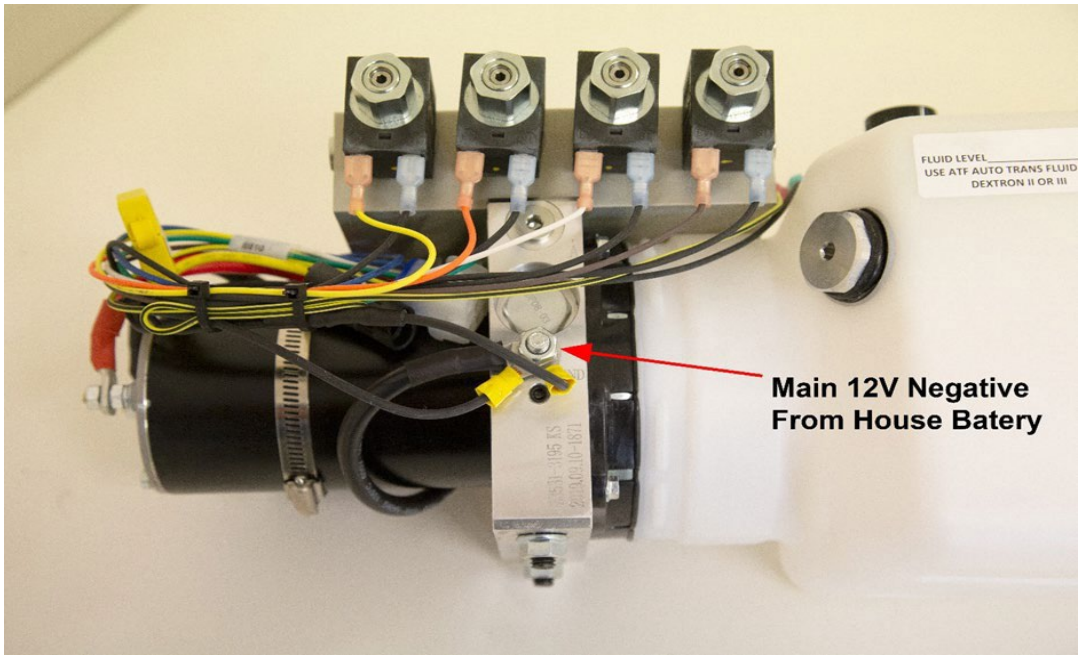
If slides are involved, contact Redfoot Levelling for direction on this. Plug each connector from the harness into the corresponding connector on the pump. Secure the harness with wire ties or loom clamps to the chassis. You should have no disconnected plugs (unless the vehicle is not equipped with chassis air ride). All the connections at the pump should be completed- **Except the power and ground connections at the pump, which are completed next.**

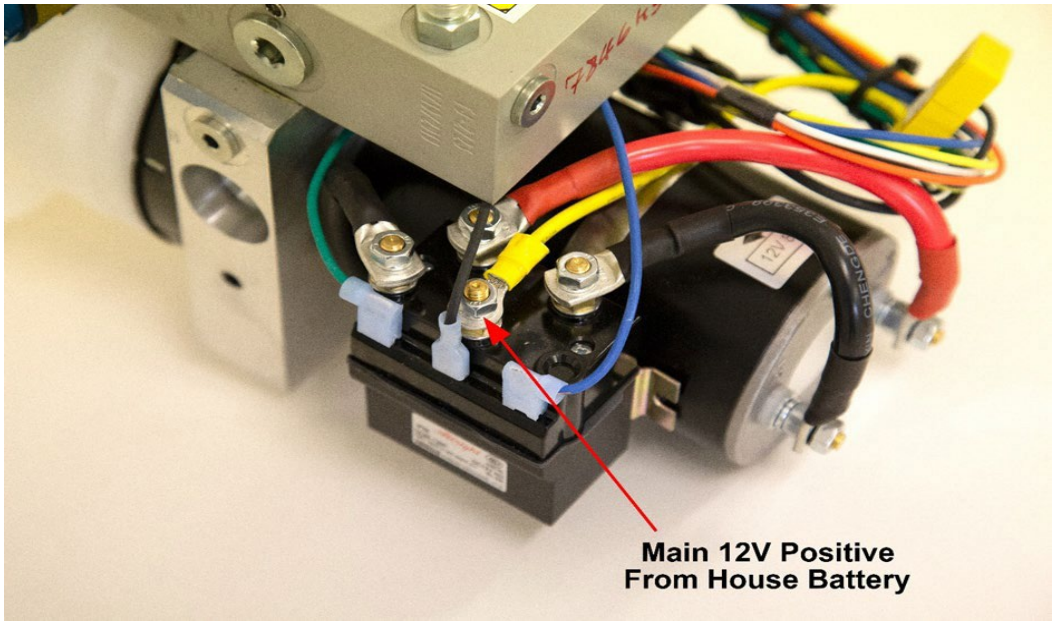
Power Connections:

Attach **#4 AWG (5.19mm Dia)** (#2 gauge if the run is over 12 feet - 3.6 meters) between the +12V terminal on the house battery and the battery post at the motor solenoid on the pump. The solenoid post will generally have a yellow fused wire attached to it that supplies power to the controller. This battery connection should be fused/circuit breaker at the source with an 80 to a 120-amp circuit breaker. This
+12V supply must be a dedicated and isolated circuit (not shared with any other device) and must be constant, non-switched +12V.

Attach a **#4 AWG (5.19mm Dia)** (#2 gauge if the run is over 12 feet - 3.6 meters) between the -12V terminal on the house battery and the ground stud on the pump. This ground stud is located on the port plate on the pump. This is the preferred method of grounding. If grounding the pump to the chassis, the connection must be sound, free of paint and not susceptible to corrosion. The battery connection to the frame must also be of **#4 AWG (5.19mm Dia)** gauge or larger cable. It is not acceptable to allow the pump mounting bolts to be the sole grounding connection.

Secure the harness with wire ties or loom clamps to the chassis.





EQ Smart-Level Control Panel Programing

After the system is fully installed the control panel must be programed for operation. Failure to do this will result in a failed or improper Auto-Level. There are basically two program settings, the orientation setting and the null setting that must be done in the following order.

Orientation Setting:

This process cannot be completed until after the system has been connected to power and the control panel has been mounted and all electrical harness connections have been completed. This process teaches the control panel where the front of the vehicle is and how the control panel is mounted (vertical or horizontal). If this process in not performed correctly the processor will not know where the front of the vehicle is.

It is possible that without doing this process it may work on a level floor/shop environment however when at sites where the system needs to operate specific legs for leveling, it is highly likely that it will operate the improper legs. Once this process is properly completed the setting will be “retained” in the control panel and should not ever need to be done again.

With the control panel off, press and hold the all-retract button then while holding it press the power button, release both buttons. The power light will start blinking and you will hear a rhythm beeping, also the 4 jacks down indicator lights will be on. Next the orientation is selected by pressing one of the manual control arrows. The specific one is determined by how the panel is mounted (see examples below). You will select up arrow if the panel is mounted vertically and down arrow if it is mounted horizontal. The specific one is the one that most relates to the front of the vehicle.

Examples:

If the panel is mounted vertically in a cabinet wall so that when you are looking at it, you are facing the rear of the vehicle then you would press the up arrow for the rear jacks.

If the panel is mounted vertically in a cabinet wall so that when you are looking at it, you are facing the front of the vehicle then you would press the up arrow for the front jacks.

Note: if you are not clear on this process check our web site for video and/or call Redfoot Levelling for assistance.

Purging the Cylinders of Air

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

1. Fill pump reservoir to full approx. 1 to 1 ½ inch from top with automatic transmission fluid, the multipurpose or any of the Dexron/Mercon fluids will work.
2. Using the manual switch for the front jacks extend the front jacks until they make ground contact. Do not lift the vehicle. If the vehicle is on a lift the jacks may be fully extended. Note: extend is the arrow pointing down.
3. Press all retract switch. After the front jacks have fully retracted and the pump shuts off check the reservoir fluid. Refill to full approx. 1 to 1 ½ inch from top.
4. If the fluid in the reservoir is aerated or foamed up, allow time for foam/air to dissipate before continuing. Allow 10 minutes for foam and air to dissipate.
5. Using the manual switch for the rear jacks extend the rear jacks until they make ground contact. Do not lift the vehicle. If the vehicle is on a lift the jacks may be fully extended.
6. Press all retract switch. After the rear jacks have fully retracted and the pump shuts off check the reservoir fluid. Refill to full approx. 1 to 1 ½ inch from top.
7. If the fluid in the reservoir is aerated or foamed up, allow time for foam/air to dissipate before continuing. Allow 10 minutes for foam and air to dissipate.
8. Using manual switches extend to full extension of front and rear jacks. At this point jacks may be allowed to lift the vehicle. Allow 10 minutes for foam and air to dissipate.
9. Press all retract switch. After the jacks have fully retracted and the pump shuts off check the

reservoir fluid. Refill to full approx. 1 to 1 ½ inch from top. Allow 10 minutes for foam and air to
dissipate

10. Check fluid level. Fill to full 1 to 1 ½ inch from top.
11. Repeat steps 7 through 10.

Manual Override

This pump is equipped with a manual override. Locate the 4 valves on the side of the manifold. Locate the screws recessed in the end of the appropriate cartridge valves. Using a 1/8th Allen Key, turn the screw(s) clockwise until seated in.

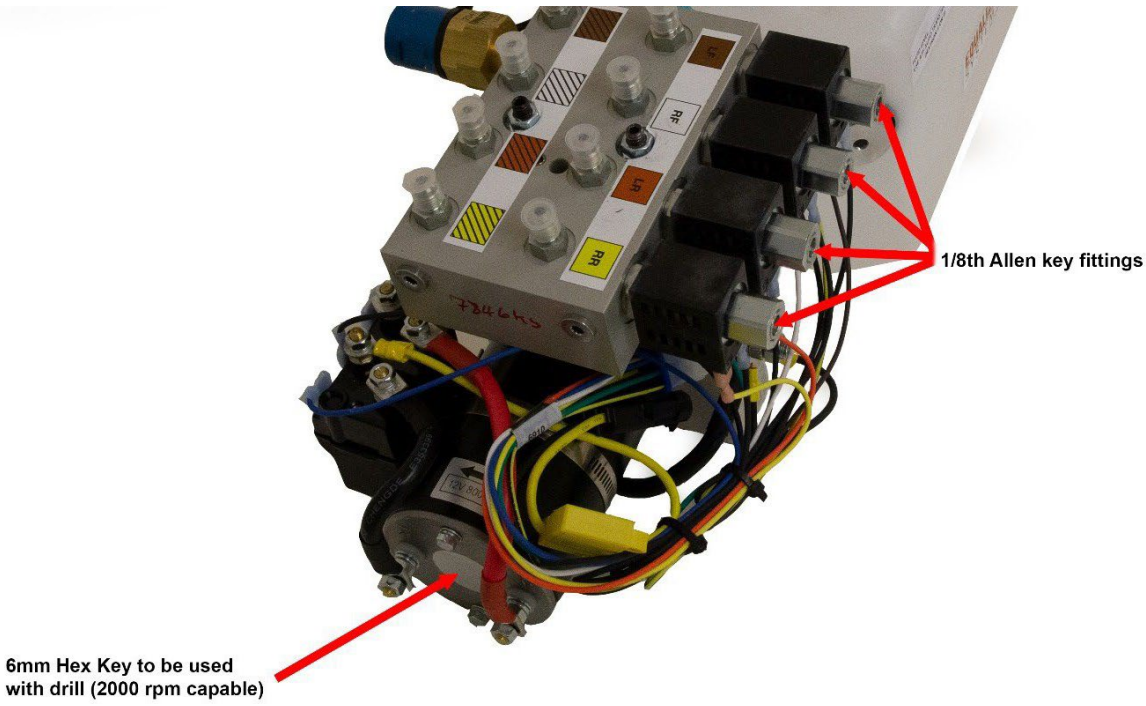
Remove the silver sticker on the front of the motor to reveal a hex key fitting. Using the appropriately sized hex key and a drill capable of 2000 RPM (minimum).

To Retract: Run the drill in the counterclockwise direction. To
Extend: Run the drill in the clockwise direction.

Caution!

Following manual override operation, failure to return all the valves to normal position may result in one or more of the jacks drifting down from their retracted position. Ensure all screws recessed in the of the cartridge valves have been screwed tight in the counterclockwise direction.

Another method can be done by the use of a 12V Battery and Jumper Cables. Please contact Redfoot Levelling for assistance with this.



Keypad Indicator LED's

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

POWER LED	Red when power is ON
	OFF when power is OFF
	FLASH every 1 sec. in sleep mode
JACK LED	Red when jack(s) are deployed
	OFF when jack(s) are stowed
OPERATING LED	ON Red w/Auto-Level or All Retract
	OFF when keypad is idle or sleeping
LOW VOLTAGE LED	ON Red when voltage is below 10.5 VDC
	OFF when voltage is above 10.5VDC
ENGAGE PARK BRAKE LED	ON Red when park brake is not set

	OFF when park brake is set
IGNITION ON LED	ON Red when ignition is in the ON position
	OFF when ignition is off
EXCESS SLOPE LED	ON Red following an Auto-Level attempt, if system cannot overcome slope
	OFF when slope is not excessive

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

- It is imperative that the **Ignition On** light operates as described. If not, then a possible unsafe condition may exist.

Setting the Null:

Null is the term used to indicate the levelness of the vehicle. The null has been preset at the factory. If the vehicle is not level following an attempt to Auto-Level, you will need to level it and reset the null. To set the null, push and release the Power button on the Keypad to engage power. The LED light next to the Power button should be RED when the power is on. Level the vehicle by deploying jacks manually, or by simply parking the vehicle on a level site.

You do not need to have the jacks deployed to set the null. Use a bubble level on a flat surface in the center (or close to) of the vehicle as a reference. Once the vehicle is level, turn the power off at the panel. Depress and hold the Auto-Level button and press and release the Power button and listen for a series of beeps. After the Keypad has beeped 5 to 6 times, release the Auto- Level button (the Keypad will continue to beep if the Auto-Level button is held). The new null has been set and the panel will maintain this setting.
Press and release the All Retract button to retract the jacks to the stowed position.

Auto-Level Operation – Keypad 3197SBT

Power On:

Push and release the Power button to engage power. The LED light next to the Power button should be RED when power is on. You will need to have the ignition key in the “off” position to extend the jacks. If you attempt to extend all jacks with the Auto-Level button, you will hear a deny tone from the keypad if the ignition key is in the improper position.

Auto-Level:

Press the Auto-Level button and release. The system will send out a continuous series of beeps and the “Operating” LED will flash RED to let you know Auto-Level is operation and will automatically level the vehicle. When completed, the Keypad will signal the successful completion with a dual-stage tone. The Keypad may be left on once level has been achieved. The Keypad will enter “sleep mode” after five minutes of inactivity.

Please note – Your jacks will only work in pairs, 2 x front, 2 x rear, 2 x left, 2 x right. In an Auto Level situation your jacks should work in the following sequence.

1. Both front jacks will extend first, they will push and lift the vehicle slightly. The system will pause for a moment.

   They may come down at different levels, this is normal.

2. Both rear jacks will extend and follow the same sequence as the front.
3. Once all four jacks have pressure, the system will go into what is known as the “Dance Mode”, this will continue until your vehicle is levelled.
4. The system will shut off and your vehicle should be level.

Retracting the Jacks

Use the All Retract button to retract the jacks prior to travel.

The Redfoot Smart Levelling System does provide the ability to retract the jacks using the UP buttons for each pair of jacks. However, these buttons are not intended to be used for retracting the jacks to their stowed position prior to travel.

The individual Up arrows are to be used only for retracting the jacks to help level the vehicle. The All Retract button must be pressed to ensure the system is ready/safe for travel. All jacks will automatically retract and return to stowed position when the ALL RETRACT button is pressed and released. The pump will run in retract for approximately 5 seconds after the last jack has been fully retracted, or until a time limit of 90 seconds has been reached.

It is always the responsibility of the vehicle operator to visually confirm that the jacks are fully retracted and safe for travel.

Manual Operation

Power On: Push and release the Power Keypad button to engage power. All lights will come on then most will go out. The LED light next to the Power button should be lit RED when power is on. If you have installed the ignition disable circuit (step 8 Keypad Ignition Disable Circuit- Page 9), you will need to have the ignition key in the "off" position to extend the jacks.

If you attempt to extend individual jacks by pressing the Down Keypad buttons or all the jacks with the Auto-Level button, you will hear a "deny" tone from the keypad if the ignition key is in the improper position.

Planting the Jacks: Manual Down

Using the Down Keypad button, extend the jacks until they contact the ground (this is referred to as "planting" the jacks). As you extend the jacks, an LED light on the Keypad will indicate the jacks are out of the "stowed" position.

Retracting the Jacks: Manual Up

Using the Up Keypad button, Retract the jacks until they are fully retracted. **Please note** – The lights in the diamond will not go out until All Retract is pushed.

Note:

There are specific instances when manual extension of jacks is inhibited (deny tone when Down is depressed). This situation is caused by the 'anti-twist' protocol in the software installed in the Controller. Simply stated, the 'anti-twist' protocol denies jack extension if the system senses that a specific corner of the vehicle is approximately 3 degrees higher than the rest. You will be able to extend the other jacks to overcome the slope. *If the system incorrectly senses excessive slope, this can be overcome by re-setting the null. This will allow manual extension of all jacks.*

Levelling the vehicle/ bus/ specialty vehicle:

Use a bubble level on a flat surface in the center (or close to) of the vehicle. Level the vehicle by using the Down or Up Keypad buttons until the vehicle is level.

Do not attempt to lift the vehicle's tyres off the ground. The Keypad may be left on once level has been achieved. The Keypad will enter "sleep mode" after five minutes of inactivity.

Helpful Hints

- If your vehicle is equipped with air suspension, it is recommended to start your vehicle and allow the chassis air to build before pressing All Retract. This will ensure adequate air supply to the chassis air valves.
- Do not allow excessive motion in the vehicle during the Auto-Level operation (do not move around in the vehicle). This could cause the system to level improperly.
- The Auto-Level is a microprocessor-controlled system. Proper and adequate battery voltage and permanent chassis ground are essential.
- Your system may be equipped with a manual override option. Refer to the procedure for proper operation of this option. It is usually better to review this procedure prior to its actual use, rather than having to learn a new procedure in difficult environments.
- If the system has not been used (with the jacks stowed) for over 24 hours, it is recommended that you engage the All Retract button prior to travel in order to re-pressurize the system.
- A lubricant, like T9 by Boeing Aircraft, may be used to clean and lubricate the cylinder shafts/rods. Contact our office on (07) 3286 1199 to order a pressurised can.

Basic Troubleshooting for Auto Level

Keypad/Controller 3197SBT

Control Panel (Keypad)

Often the keypad is condemned as defective when it is not. The keypad is nothing more than switches and lights. The keypad communicates with the controller (back of keypad panel). Often, a complaint on the keypad is an issue with the controller or another item- such as wiring.

See the topics below for help in determining the true issue. Also note that some applications will not allow extension of the jacks if the key is in the wrong position. Most systems will not allow the extension of the jacks if the key is in the on position. However, there are some that will only allow extension if the key is on.

Also, there is a park brake disable that will deny extension if the park brake is not applied. This park brake disable is not connected in all applications.

Keypad will not power up

Test all incoming power at the 3 pin plug behind the Keypad. If there is no power, (measure with a digital voltmeter at the red and black wires feeding to the controller from the pump), trace power wires at the pump and ensure all plugs are seated correctly.

If in doubt, call Redfoot Levelling for support.

Often, a keypad that will not power up is due to a defective controller or no power or ground to the controller. If there is power and ground to the controller, then the controller is most likely at fault. There will be no way for a tech in the field to determine this for sure (other than replacement) so both a controller and a keypad should be ordered if the wiring is found to be correct.

Keypad powers up then shuts down when other buttons are pressed

This is known as a power reset. This is caused by the voltage to the controller dropping very rapidly to below where the processor can operate. When the keypad is powered back up, the jacks down status LED's will be on. Press All Retract to clear it after the voltage issue is resolved.

Check the battery and the connections from the battery to the pump assembly. Both the positive and/or the ground connections could be at fault. Check the power and ground wires (and their connectors) feeding the controller from the pump assembly.

Keypad powers up, seems to operate, but pump does not come on to extend jacks.

First verify that no disables are on (Key switch or park brake in wrong position). Locate the blue wire at the motor solenoid. Using a digital voltmeter, measure for voltage at the blue wire when extend is attempted. There should be at least 10.5 VDC +. If there is no voltage check the blue wire back thru the harness to the controller. If there is no issue with the blue wire, then the controller is defective. If there is voltage on the blue wire, then the solenoid or the motor may be defective.

Keypad powers up, seems to operate, but pump does not come on to retract jacks.

On Bi-Rotational pumps locate the green wire at the motor solenoid or contactor. Measure for voltage at the green wire when retract is attempted. There should be at least 10.5 VDC+. If there is no voltage check the green wire back through the harness to the controller. If there is no issue with the green wire, then the controller is defective.

If there is voltage at the green wire, then the solenoid or motor may be defective. On Uni-Directional units the blue wire (at the motor solenoid) is connected to the green inside of the pump harness through a diode. Check for voltage at the green and blue wires. There should be at least 10.5 VDC +. If there is no voltage, check the green wire back through the harness. If there is no issue with the green wire and there is no voltage on the green wire during an attempt to retract, then the controller is defective.

Keypad powers up, seems to operate, and pump motor runs -But one or more jack legs do not extend or retract

Locate the manifold valve(s) and coil(s). There is one for each function (jack leg). Locate the proper valve/coil(s) for the leg(s) that do not operate. Each coil will have different colored wires feeding them. Measure voltage across the coil terminals when trying to operate the jack(s) that do not operate.

There should be at least 10.5 VDC+. If there is no voltage check the wire(s) back thru the harness to the controller and the coil ground wire(s). If the wire(s) is good, then the controller is defective. If there is voltage across the two terminals at the coil and the jack(s) do not operate then there is an issue with the coil or valve or other hydraulic control issue.

NOTE All electrical testing of the Auto-Level control circuit must be done using a digital multi-meter. The use of “test lights” is not recommended- as they cannot provide a true voltage reading and could cause damage to the keypad or controller.

Keypad Status Lights

Jack down Status LED’s will not go out –or- Jack down LED’s go out and pump quits prior to jacks being fully retracted

There is a “Jack Status” light near each set of manual up and down arrows that indicate (when illuminated) the jacks are not fully stowed. This issue is created by a problem with the pressure switch circuit. This could be a defective pressure switch, an issue with the controller, or the yellow/black wire from the controller to the pressure switch could be shorted to ground.

To test for this remove the yellow/black wire from the pressure switch and using a digital voltmeter, measure for voltage at the yellow/black wire with the control panel turned on. There should be close to battery voltage (12VDC +). If there is no voltage either the controller is defective, or the yellow/black wire is shorted to ground or it is open. To further verify this, press all-retract button (with the yellow/black wire disconnected and protected from contact with a ground source).

The jack status lights should go out within a few seconds after the pump comes on. If the Jacks Down LEDs do not go out, then you have confirmed that the issue

is with the controller or the yellow/black wire is shorted to ground. To check the pressure switch, check for continuity across the pressure switch terminals with the yellow/black wire disconnected.

If the jacks are extended, you should have continuity (switch is closed). Push the all-retract switch on the keypad and the pressure switch should go open (no continuity) shortly after all the jacks have reached full retraction. If the switch stays closed, then the pressure switch is defective or the pump cannot develop enough retract pressure to trip the switch (this is a rare possibility).

Jack Down status lights come on during travel (see troubleshooting guide)

Generally, this is caused by a loss of fluid pressure in the retract side of the hydraulic circuit. Its most likely cause is an external fluid leak at a hose/fitting connection at a jack leg or slide cylinder. Other than this, its cause may be a defective jack leg or slide cylinder. The retract pressure hold check or valve at the pump may also be a cause. Usually this is not an issue with the keypad, controller, or the pressure switch as they are reporting a possible fault in the retract side of the hydraulic circuit.

Operating light

When Auto-Level or All Retract is pressed, the operating light should come on with a steady pulse (blink) and accompanying beep can be heard from the control panel. It will stop when the process is complete, or a fault has occurred. If there is a fault, other lights will most likely come on as an aid in defining what the issue was.

Low Voltage

This light will come on if the voltage to the controller falls below approximately 10.5 VDC. It will stay on until cleared by a press of any button on the control panel. When this light comes on the pump may shut off as the voltage to the unit has fallen below proper operational limits. The main cause of this is generally weak batteries or poor connections. Check connections: From the battery to the pump (on the positive connection), the battery ground to frame, or the pump ground side.

Engage Park Brake

There is an optional connection to a park brake switch that will turn this light on if the park brake is released. If this is connected the light will be on. If the keypad is powered up and the park brake is released, the light should go out if the park

brake is applied. Not all manufactures of all vehicles connect this to operate. If the park brake is applied and the light is on locate the black wire with the yellow trace. On most units it will exit the harness near to the keypad connection. To test,locate the black wire with the yellow trace. This wire is looking for ground to turn the light off. If this wire is disconnected from ground the light will be on. If the wire is grounded the light should go off.

If the black/yellow wire is connected to ground and the light is on check the wire back to the connector at the controller. If the wire is good and the light will not go out, then the controller is defective. Also note that if this light is on, jacks will not extend from the manual down arrows and Auto-Level will not function. If the wire is not being connected to ground when the park brake is applied, then there is an issue with the chassis side of the circuit.

Ignition ON

This light will be on if the ignition key is turned to the ON (engine run) position and the keypad is powered up. The light should go off when the ignition key is in the off position. To test, locate the pink wire- generally it will break out of the harness near the keypad. It should have 12 VDC + applied to it when the ignition key is on (engine run) position. There should be no voltage to it when the ignition key is in the off position. If this is not correct the issue is with the connection to the chassis harness or switch.

Excessive slope

This light will come on after an unsuccessful attempt of Auto-Level. Basically, it means that the system was unable to level the vehicle to within the specification of .5 degrees front to rear and left to right. Or one or more of the jacks have run out of travel (maximum extension) prior to the vehicle being level within the specified time allowance.

Troubleshooting Guide		
Symptoms	**Possible Cause**	**Solution**
Keypad will not turn on	Blown fuse at pump harness	Replace fuse 20A
	Faulty ground or 12VDC power	Trace and repair
	Low battery voltage - min. 10.8	Charge batteries
	Defective keypad or controller	Call Leveling Jacks Australia
	Defective keypad or controller harness	Trace and repair
Keypad turns on but jacks will not operate	Low battery voltage to pump	Charge batteries
	Faulty ground or 12VDC power	Trace and repair
	Defective keypad or controller	Call Leveling Jacks Australia
	Defective pump motor or solenoid	Replace motor and/or solenoid
	Other system defect	Call Leveling Jacks Australia
Jacks will extend but will not retract	Low battery voltage - min. 10.8	Charge batteries
	Park brake not set	Set park brake
	If bi-rotational pump, bad motor or solenoid	Replace motor and/or solenoid
	Anti-twist software protocol has stopped further action	Lower opposite side of vehicle and/or reset Null and then level vehicle
	Ignition switch in wrong position	Check and change as needed
	Defective keypad or controller	Call Leveling Jacks Australia
	Faulty ground or 12VDC power	Trace and repair
	System defect	Call Leveling Jacks Australia
AUTO Level will not level	System Null is to set	Set Null
	Controller has been set wrongly or has moved	Check controller orientation
	Ignition switch in wrong position	Check and change as needed
	Damaged or defective keypad or controller harness	Call Leveling Jacks Australia
	Defective keypad or controller	Call Leveling Jacks Australia
	Other system defect	Call Leveling Jacks Australia

Troubleshooting Guide		
Symptoms	**Possible Cause**	**Solution**
Auto-Level stops mid-cycle	Low battery voltage - min. 10.5	Charge batteries
	Excessive motion during leveling sequence	Reset keypad and retry
	Damaged or defective controller	Check and change if needed
	Damaged or defective keypad or controller harness	Call Leveling Jacks Australia
	Other system defect	Call Leveling Jacks Australia
Jack LED's on keypad staying on	Defective pressure switch or wiring	Trace/Repair or replace
	Defective keypad/controller or pump harness	Trace and repair or replace
	Defective keypad or controller	Call Leveling Jacks Australia
	Low system pressure caused by fluid leak or low fluid level	Correct fluid level or leak
Hydraulic pump inoperative	Low battery voltage - min. 10.5	Charge batteries
	Blown 20A fuse on pump harness	Replace fuse or breaker
	Faulty ground or 12VDC power	Trace/Repair or replace
	Defective pump motor or solenoid	Replace
Jack(s) bleed down from levelled or stowed position	Air in hydraulic system	Purge/bleed air
	External fluid leak	Trace and repair
	Defective valve in pump	Clean or replace valve
	Defective hydraulic jack/cylinder	Replace hydraulic cylinder
Jack(s) are jerky or noisy when extending or retracting	Air in hydraulic system	Purge/bleed air
	Fluid level low	Check fluid level and top up
Jack's will not retract from extended position	Low battery voltage - min. 10.5	Charge batteries
	Low battery voltage or poor ground	Change batteries/check ground return
	Damaged/Defective harness from keypad to controller or controller to pump	Trace and repair
	Fluid level low	Correct fluid level and add
	Defective pump motor or solenoid	Replace

Product Warranty Guide

Titan Stability Solutions Pty Ltd trading as Redfoot Levelling Solutions

1. Only warranty claims with prior written or verbal authorisation from Redfoot Levelling will be recognised, all other claims will be denied.
2. Redfoot Levelling warrants levelling system components for a period of One year from the date of original sale of the vehicle. This warranty covers defects in material and workmanship only. Redfoot Levelling is not liable for any damage due to abuse, neglect, misuse, negligence, misapplication, error of operation, accidental or purposeful damage or damage due to an "Act of God" such as, wind or rain damage, flood, lightning or other natural causes of the like. Redfoot Levelling limited warranty is applicable to the Redfoot Levelling components only and does not apply to the vehicle, apparatus, or property to which it is attached. Warranty parts will be shipped at no charge if the repair is authorised by Redfoot Levelling representative. Purchased components used in authorised warranty repairs will be reimbursed at the original purchase price. **ALL product prior to return, must be authorised by a Redfoot Levelling representative. Connotes will be supplied for their return unless prior arrangements have been made. Installers must receive the appropriate Scope of Works from Redfoot Levelling prior to the commencement of any work**.
3. Labour and freight expenses due to warrantable parts defects or workmanship will be reimbursed for the period of One year from the date of the original sale of the vehicle. Freight expenses will either be prepaid by Redfoot Levelling or reimbursed at the Road Logistic rate only. Any additional shipping charges or requirements are the obligation of the vehicle owner or service centre performing the warranty repair. The owner or Service Centre's obligation may include overseas shipping charges, border fees, and any other additional fee of the like.
4. Warranty labour will be reimbursed only for claims that have prior written or verbal authorisation from a Redfoot Levelling representative. Warranty labour compensation is required to correspond with the "Warranty parts replacement time guideline" published by Redfoot Levelling. Any warranty repair not listed on this guideline will require prior authorisation from an Equalizer Systems representative. A reasonable time allowance will be determined by the Equalizer Systems representative. Any warranty repair that is not listed on this guideline that is performed without prior authorisation will be denied without exception. Time associated with learning about the repair or excessive diagnostic and installation time will not be reimbursed. Warranty labour will be reimbursed at the authorised service centre's published shop rate for that region. Overtime labour will not be reimbursed without exception.
5. Labour, parts, and freight credit (if applicable) will be sent after the parts are tested and the warranty claim is validated. Returned parts that are found to be in normal operating condition are not warrantable and will be charged to the owner or service centre. Redfoot Levelling reserves the right to charge back the service centre for labour claim payments previously submitted if the installation of the warranted part is found to be inadequate later.
6. Claims will be denied if the date submitted is greater than 30 days from the repair.

7. Prior authorisation is required before parts may be sent back by to Redfoot Levelling. Redfoot Levelling will supply a connote for the return goods.
8. Complete systems are not warranted unless authorised by a Redfoot Levelling representative. There are absolutely no exceptions to this clause.
9. Consideration should be taken regarding the location and protection of Redfoot Levelling's components prior to installation. Please reference our installation manuals for recommended locations and maintenance or visit www.Redfootlevelling.com.au for more information. The failure of any Redfoot Levelling components due to extreme environmental conditions, improper installation or lack of maintenance will not be covered under warranty.
10. Warranty coverage for parts or systems sold by non-authorised resellers (such as live or internet auctions) will be at the discretion of Redfoot levelling.
11. This warranty begins upon the sale date of the vehicle and is transferable, with limitation, to the subsequent owners upon furnishing the original sale date of the vehicle and proof of purchase.
12. Redfoot Levelling is not liable for loss of time, manufacturing costs, labour, material, loss of profits, direct or indirect damages incurred by the vehicle manufacturer.
13. Excessive warranty labour resulting from inadequate access to the Redfoot Levelling product will not be reimbursed.
14. Redfoot Levelling will not pay mark-up on warranty parts unless required by law.
15. Travel expenses, hotel, telephone, fuel, or any other expense of the like are not covered under warranty.
16. All "out of warranty" repairs will have a flat rate inspection fee of $190 Inc GST. There will be an additional charge of $95 Inc GST per hour for repair work carried out beyond the inspection diagnostic

Replacement Parts:

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

No additional warranties expressed or implied are authorised by Redfoot Levelling.

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