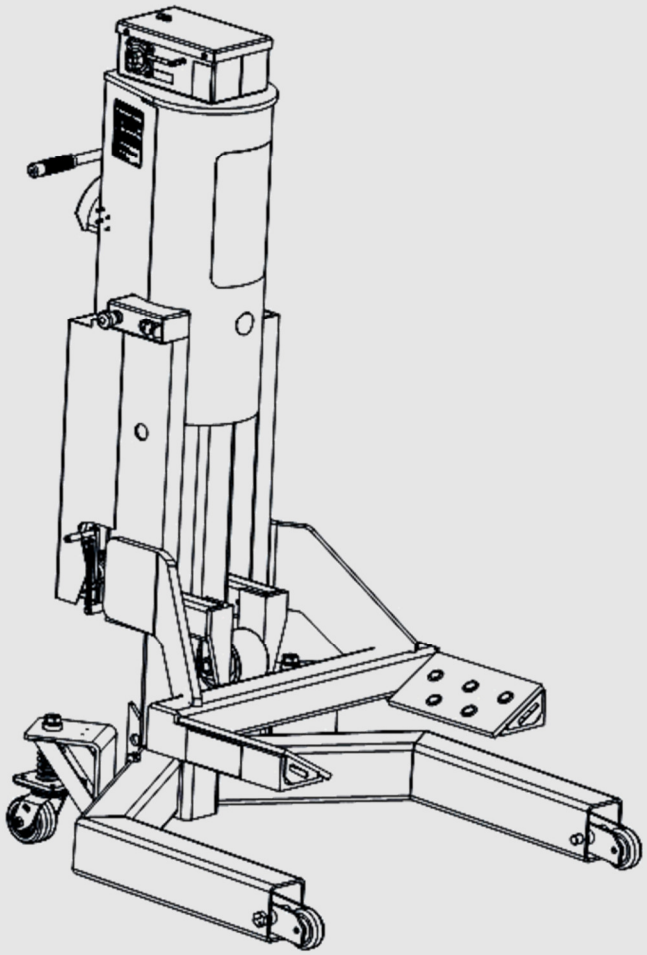
MAHLE

MAHLE CWL-20E

EN

Operation Manual
Wireless wheel lift system



Patents pending

EVERY PERSON WHO OPERATES THIS EQUIPMENT NEEDS TO KNOW AND UNDERSTAND ALL OF THE INFORMATION IN THIS MANUAL – FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY OR DEATH.

READ THIS MANUAL CAREFULLY AND RETAIN FOR YOUR RECORDS

Contents

1. Safety Regulations

1.1 Warnings

⚠ Failure to follow all of these safety instructions can lead to severe injury or death from a sudden loss of the load. Contact the manufacturer at the numbers or address printed on the back cover of this manual if you have any questions.

⚠ **Anyone who operates this jack must read and understand all the instructions and warnings provided with this jack before being allowed to use it.** All operators must be careful, competent, trained, and qualified in the safe operation of the jack. The owner (or other responsible individual) must ensure that any operator observes the proper safety procedures for using this jack at all times. If the operator does not read well or is not fluent in English, the owner / manager must read and review the instructions and warnings in the manual with the operator in the operator's native language to be sure that the operator will use the jack properly.

⚠ **The owner / manager must keep this manual for future reference**, and make sure the warning labels on the jack are legible and intact at all times. Replacement labels and manuals are available from the manufacturer. Call the manufacturer using the contact information on the back cover of this manual if you have any questions.

⚠ **Make sure the load does not exceed the maximum capacity of the lift.** Maximum capacity is 10,000 lbs. / 4,540 kg. per lift. Never use the lift system to raise or support more than maximum capacity per lift. Never use a lift as a stand to support more than maximum capacity per lift.

⚠ **NEVER modify the product in any way.** Modifications (other than those explicitly discussed in this manual – e.g., use of optional small wheel adapters) may cause the lift to perform improperly, resulting in injury or death.

⚠ **Always use lift on a hard level surface, capable of sustaining the load.** Be sure surface is clean and free of debris, cracks, and chips.

⚠ **The lift system is designed to lift over-the-road vehicles with rims of at least 21 inches in diameter** (14 inches in diameter if the manufacturer supplied optional adapters are used). NEVER use the lift system on vehicles with rims *less* than 21 inches in diameter (14 inches if adapters are used).

⚠ **Use the lifts only in pairs of 2 or 4 lift units,** on the opposite ends of the same axle. Never lift using a single unit.

⚠ **NEVER use the lift system to raise a vehicle by the frame or structural member.** The lift is designed to be used only beneath the vehicle tires.

⚠ **DO NOT raise one end of a vehicle if the opposite end is supported by stands or another lifting device.** When using two lift units to raise one end of a vehicle, the opposite end of the vehicle must be in contact with the ground, transmission in neutral and parking brake released.

⚠ **To prevent tipping, never raise or lower just one side of a vehicle.**

Fig. 1: Warnings

⚠ **DO NOT place hands, feet, other body parts, or clothing on or near the lift table**. There are potential pinch points that can injure hands and fingers or possibly grab clothing and pull body parts into pinch points.

⚠ **NEVER stand under the lift or vehicle when it is being raised or lowered.**

⚠ **NEVER operate lift system from a distance that the work area is not plainly visible,** another room, or from under the vehicle.

⚠ **NEVER use the lift system in conjunction with any other equipment used to raise a vehicle.**

⚠ **Never use blocks, adapters, or accessories that have not been provided by the manufacturer**, or cribbing devices of any kind with this lift system.

⚠ **To reduce the risk of fire,** do not operate equipment in the vicinity of open containers of flammable liquids (gasoline).

⚠ **To reduce the risk of electric shock**, do not use on wet surfaces or expose to rain.

⚠ **NEVER raise the lift system or an individual lift when an automatic pin is partially or fully inserted**. If a lift raises against an inserted pin, stop raising immediately.

⚠ **NEVER use the manual operation procedure as a normal operation to raise or lower a vehicle**. The manual operation procedure is intended for use only when the normal controls are not functioning.

⚠ **NEVER use the lift system as a wheel dolly** for the removal of tires.

⚠ **Always keep the covers closed on the lift units.**

⚠ **Do not operate equipment with a damaged cord** or if the equipment has been dropped or damaged – until it has been examined by a qualified serviceman.

⚠ **If an extension cord is necessary**, a cord with a current rating equal to or more than that of the equipment should be used. Cords rated for less current than the equipment may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.

⚠ **Adequate ventilation** should be provided in the work area.

⚠ **Keep hair, loose clothing, fingers, and all parts of body away** from moving parts.

⚠ **Use only as described** in this manual. Use only manufacturer's recommended attachments.

⚠ **ALWAYS WEAR SAFETY GLASSES.** Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.

⚠ **Do not operate the lift system with air containing excess moisture or particulate matter.**

⚠ **NEVER allow the lift system to be used unless all warning labels** and instructional decals are in place and legible.

⚠ **NEVER use this jack to lower a vehicle if the vehicle was raised using another lifting device or devices**. The vehicle should be lowered with the same equipment that was used to properly raise it (read and follow the warnings and instructions for this other equipment).

⚠ **Always use caution while operating this device** and remain mindful of how the device and load will react during operation of this device.

⚠ **Do not let cord or hose hang** over edge of table, bench, or counter or come in contact with hot manifolds or moving fan blades.

⚠ **Never use the cord to pull the plug** from the outlet. Grasp plug and pull to disconnect.

⚠ **Failure to understand and obey this warning may result in personal injury or death.**

2. Foreword

2.1 From the manufacturer

Thank you for your purchase. To complement the offering of A/C, fluid and nitrogen service equipment, MAHLE Service Solutions has partnered with Gray Manufacturing to provide the highest quality hydraulic and pneumatic equipment available for the professional service technician. This equipment adheres to high standards promised in the MAHLE guarantee including the assurance of innovation and reliability that comes with the Gray Manufacturing name. Please contact MAHLE Service Solutions' customer service at (800) 468-2321 or tech.mss@us.mahle.com with any comments or questions.

3. Symbols Use

3.1 Signal words

Signal words call attention to a safety message or messages, or a property damage message or messages, and designate a degree or level of hazard seriousness. Signal words used in this manual include:

Keyword	Probability of occurrence	Severity of danger if instructions not observed
DANGER	**Immediate** impending **danger**	**Death** or **severe** injury.
WARNING	**Possible** impending **danger**	**Death** or **severe** injury
CAUTION	Possible **dangerous situation**	**Minor** injury
NOTICE	Possible **damage to property**	**Possible property damage**

4. FCC Part 15 Statement for User's Manual

4.1 Operation of equipment

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

WARNING! *Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.*

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

5. Responsibilities

5.1 Receiving inspection

Before attempting to operate this equipment, thoroughly read and understand this manual. Completely remove all tape and packaging. Inspect the equipment immediately upon delivery. If shipping damage is evident, inform the delivering carrier immediately and contact the manufacturer using the contact information on the back cover of this manual.

5.2 Owner and/or operator responsibilities

All personnel involved in the use and operation of this lift system must be careful, competent, trained, and qualified in the safe operation of this equipment and its proper use when servicing motor vehicles and their components. It is the responsibility of the employer, owner, and/or manager to ensure that all personnel working with and around the lift system know what they are doing, both during normal operation and in emergency situations. To ensure all personnel are properly trained and qualified, the following items must be done prior to using the lift system:

- All personnel must know and understand all instructions and warnings before working with or around these lifts. “All personnel” includes operators as well as people working on or in the vicinity of vehicles raised by the lift system.
- All personnel must read and understand the contents of the owner’s manual. If any personnel are illiterate or not fluent in English, the employer, owner, and/or manager must read and discuss the instructions and warnings with them in a language they understand, making sure that all personnel know this information and observe the proper procedures for use of these lift units.
- The employer, owner, and manager are responsible for maintaining the manual and all on-product labeling. Labeling should be legible and intact at all times. The manual must be readily available to all personnel. Contact the manufacturer to receive replacement labeling. Replacement (or extra) copies of the manual are available from the manufacturer.
- The employer, owner, and/or manager must enforce safe work practices with the lift system in order to ensure that personnel not only know how to use the lifts safely, but also that they actually **do** what they should.
- As part of training, the employer, owner, and/or manager should have all personnel practice normal and emergency operating procedures without loads prior to using the lift system to raise loads.

This lift system is **not** a product that personnel can just “figure out” on their own. This lift system has been designed to be easy to use, but it requires thoroughly trained and knowledgeable personnel to use it safely. Failure to operate this lift system according to the warnings and instructions can result in **severe injury** or **death**.

It is highly recommended that the lift system be operated using only clean and dry air. Any particulate matter or moisture in the air can cause poor performance of the pneumatic valves and/or lead to premature failure of the valves. If the air system supplying air to the lift system delivers air with particulate matter or moisture, a compressed air dryer and filter should be added.

6. Specifications

6.1 CWL-20E

Model CWL-20E	US units	Metric units
Maximum capacity (each lift)	10,000 lb	4,540 kg
Maximum air pressure	160 psi	11.0 bar
Minimum air pressure for rated capacity	150 psi	10.3 bar
Minimum air pressure	85 psi	5.9 bar
Minimum wheel diameter (w/o adapters)	19 in	48.3 cm
Minimum wheel diameter (w. adapters)	16 in	40.6 cm
Maximum tire to fender clearance	8 in	20.3 cm
Weight per lift	610 lb	445.4 kg
Adapter weight	22 lb	10 lb
Ground pressure for each lift (max. load)	275 psi	19.3 kg/cm^2
Width	41.6 in	105.7 cm
Depth	45.25 in	115.0 cm
Height (lowered)	53.25 in	135.3 cm
Height (raised)	77.25 in	196.2 cm
Charger voltage required	120VAC / 60Hz	120VAC / 60Hz

7. Product Description

7.1 Component identification

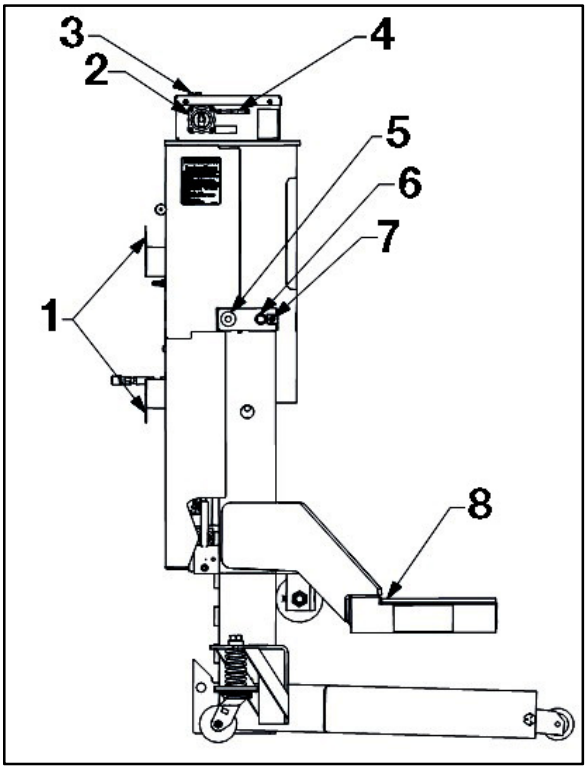


Fig. 2: CWL-20E side view

1 Hose brackets
2 Master on/off switch
3 Status indicators
4 Screen communication antenna
5 Emergency stop button
6 Communication button
7 Manual raise/lower toggle switch
8 Lift table

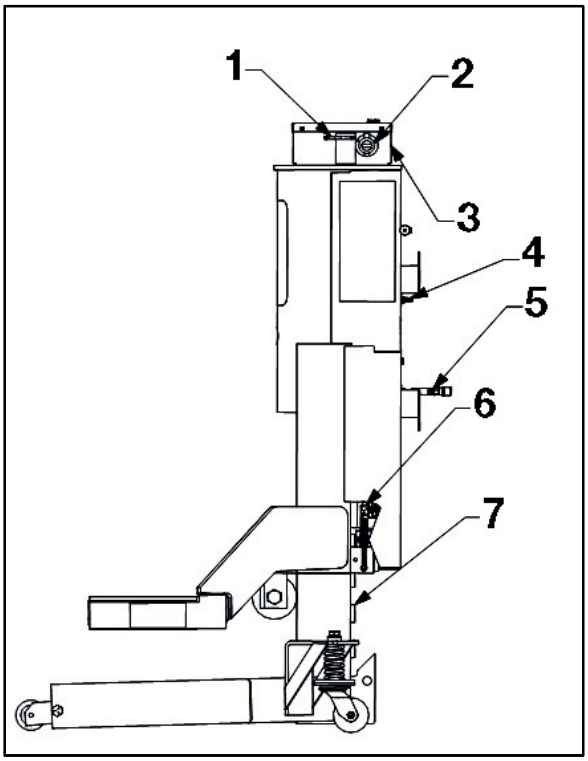


Fig. 3: CWL-20E side view 2

1 Lift communication antenna
2 Charger inlet
3 Electronics enclosure
4 Air inlet
5 Air hose
6 Down stop handle
7 Down stop lug

8. Operation

8.1 Preparing the work area

It is important that the surrounding area be properly chosen and prepared before raising a load.

1. Use the lift system only on hard surfaces capable of safely supporting the load. The surface must be strong enough to support the weight of the lift units and the vehicle being raised. The ground pressure for each lift unit (at maximum load) is 275 psi (19.3 kg/cm^2). The ground pressure listed is an approximation and may be higher under some conditions. Hot asphalt can become soft and should be avoided to prevent property damage or an unsafe situation.
2. Use the lift system only on level, even surfaces. A level surface is considered to be 3° slope or less. A surface with 3° slope is equivalent to a 5% grade or 5/8 in. (15.9 mm) rise or drop per horizontal foot (304.8 mm) (See Fig. 4 below. Note also that for each degree of slope a surface rises or drops 0.210 in. (5.33 mm) per horizontal foot (304.8 mm)). The surface must also be free of ripples, ridges, depressions, holes, or any undulation (e.g., a seam in a concrete floor) that would cause only part of the lift unit's footprint to be in contact with the floor.

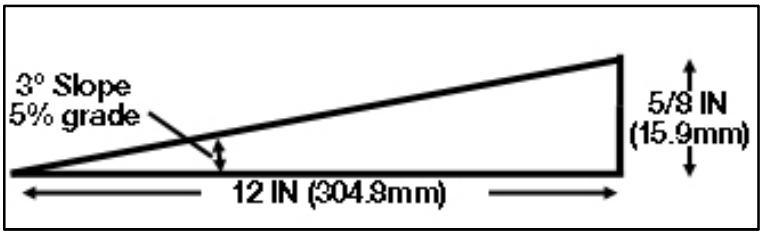


Fig. 4: Slope of ground under lift

3. Make sure there is adequate clearance above the highest point of the vehicle (including things like vehicle exhaust pipes, air dams, etc.) so the vehicle does not contact any overhead objects when raised (e.g. ceiling/roof structural components, duct work, hanging lights, heating/AC units, etc.). The lift system can raise a vehicle as much as 24" (610 mm, but the vehicle will extend vertically above this. The height of the lift unit alone (at maximum lift height) is 77 1/4" (1,962 mm).
4. Clear the work area (especially the area underneath the lift unit) of any unnecessary personnel, tools, equipment and other materials. No unauthorized personnel should be allowed in the work area where the lifts are being used.
5. If the lift system is used outdoors the operator assumes all risk. Understanding that these are portable lifts, it is foreseeable that they can and will be used outdoors.

⚠ **WARNING!** If lift units are used outdoors the following conditions must be met:

⚠ Do NOT use lift units when wind speeds or gusts exceed 20 mph to avoid tipping or loss of load.

⚠ Do NOT leave lift units unattended when used outdoors to avoid inadvertent operation by untrained operators and unforeseen changes in weather conditions.

⚠ Do NOT use lift units outdoors when precipitation of any type is falling or expected during the time the units will be used. There is a risk of electric shock if lift units are used while precipitation is falling.

⚠ Do NOT charge lift units while outdoors. Only charge lift units while indoors to avoid risk of electric shock.

⚠ If these conditions cannot be met, move the vehicle and lift units (separately) to an indoor area where the lifting operation can be performed safely.

⚠ **WARNING!** NEVER attempt to move or reposition a lift unit when a vehicle is raised on the lift unit.

8.2 Prepare the vehicle

1. The vehicle's wheels (or rims; not the tires) should be at least 19 inches in diameter or else they could fall through the cradle of the lift table (for example, if the tires deflate). For wheels 16 to 19 inches in diameter refer to the "Optional adapters" section on page 25.
2. Check that the tires on the vehicle are properly inflated and are in road-worthy condition. Make sure the weight on any single tire does not exceed the rated capacity of its lift unit, as the total weight of the vehicle may not be evenly distributed across all lifted tires. Also, be sure to consider the weight carried by unsupported axles (i.e. a set of 4 lift units used to raise a vehicle with three axles).

8.3 Prepare the lift units

It is important to prepare the lift units so they can be used safely together.

1. Make sure the lift system is appropriate for the type and weight of the vehicle to be lifted. Determine that it is safe to raise the vehicle by calculating the weight of the vehicle and the load applied to each lift unit when the vehicle is raised. NEVER exceed the rated capacity of an individual lift unit. Also, the lift system is to be only used in sets where lift units are positioned on opposite ends of the same axle–NEVER as a single lift unit or on only one side of a vehicle.
2. Before each use, you should inspect each lift unit for any visible signs of wear or damage. See the “Structural Inspection” section on page 21 for details about how to inspect the lift unit.

⚠ **WARNING!** If you see any signs of wear or damage, or if there is any indication that the lift unit is not performing normally, immediately take it out of service and contact the manufacturer. NEVER use a lift unit that appears damaged in any way.

3. Before each use, make sure the battery is fully charged (see the “Charging the batteries” section on page 17 of this manual). If the battery has not been given time to fully charge, charge the battery before use. Failure to fully charge the battery before use can reduce the life of the battery.
4. Transport the lift units to the work area by wheeling them manually. A lift unit should be wheeled to the work area over smooth, level surfaces avoiding any obstacles or unsafe situations.

⚠ **WARNING!** Jolting caused by the lift unit’s wheels catching on uneven surfaces can cause physical strain and personal injury.

5. Position the lift units so the lift pads cradle the tires at opposite ends of the same axle. Make sure the lift pads cradle the tires evenly and are parallel with the wheel and tire. Position the lift pads under the tire so the lift table tube contacts the tire (see Fig. 5).

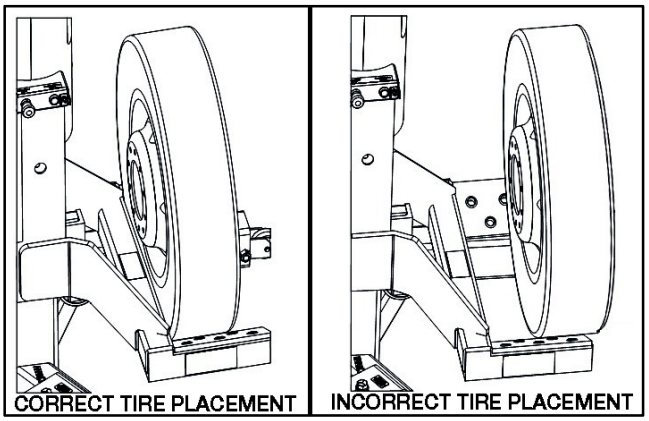


Fig. 5: Position lift table tube against tire

6. Connect an air hose from a compressed air source to one of the lifts. The air hose from that lift can be connected to the next lift and so on to daisy chain them all together. The air hose on the last lift can stay wrapped on its hose brackets. If desired, separate air hoses from a compressed air source can be brought in for multiple lifts. In general, performance will increase with the number of air hoses brought in.
7. Place the vehicle transmission in neutral and release the parking brake.

8.4 Lift system initialization

1. Make sure the master on/off switch (see the "Component identification" section on page 8) on each lift unit and the Touch Screen Controller is set to the **OFF** position. Turn the master on/off switch of the Touch Screen Controller to the **ON** position. The Touch Screen Controller will initialize and then the screen shown below will appear on the touch screen. (NOTE: All screens shown in this manual are simplified versions of what is actually shown on the display to help clarify button locations and functions.)

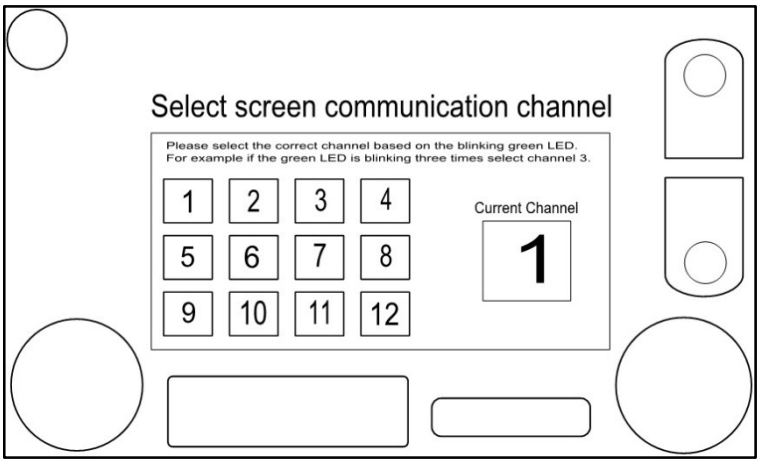


Fig. 6: Selecting screen communication channel

2. Select the desired Touch Screen Controller radio frequency. The most recently used frequency will already be set. If the most recently used frequency is acceptable, a frequency does not need to be chosen and accepted. To choose a new frequency, push the icon corresponding to the frequency desired. All units that will be used together as a lift system to lift a vehicle must be set to the same frequency as the Touch Screen Controller. There are 12 radio frequencies available for use. Refer to Section 11 "Using multiple lifts in the same work area" for more information on selecting the radio settings. When the desired radio frequency is shown, push the **ACCEPT** button to advance to the next screen.

3. Turn the master on/off switch of any lift unit to the **ON** position and then push the Communication Button (see the "Component identification" section on page 8). If the touch screen frequency was changed on the Touch Screen Controller then the touch screen frequency will need to be changed on the lift to match that of the Touch Screen Controller. The lift unit's touch screen frequency will be indicated by the blink pattern shown with the Status Indicators on top of the Electronics Enclosure (see the "Component identification" section on page 8). The number of successive flashes between breaks will be the touch screen frequency that is set on the lift unit. If changing the touch screen frequency on the lift, see section 8.13. If the touch screen frequencies of the lift and the Touch Screen Controller match, then the screen shown below will appear on the touch screen. If nothing happens, the frequencies do not match and will need to be reset so that they do.

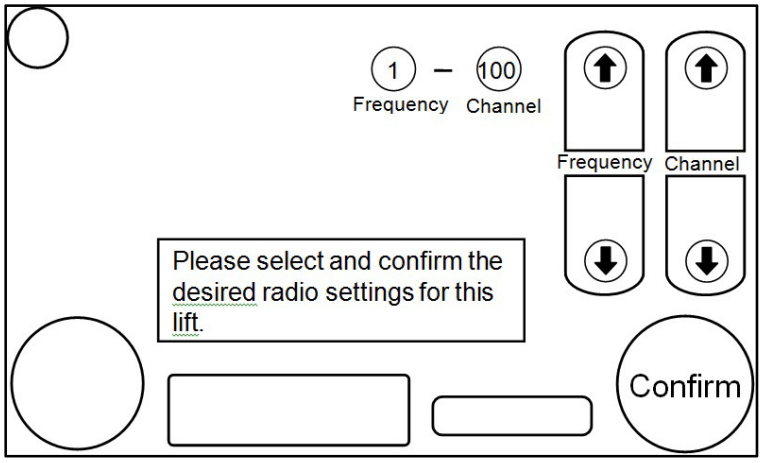


Fig. 7: Select radio settings for lift

4. Select the desired radio settings. The default radio settings will be the settings selected the last time the unit was used. Push the up and down arrows on the right side of the screen to change the radio frequency and/or channel, if needed. All units that will be used together as a lift system to lift a vehicle must be set to the same frequency and channel. There are 12 radio frequencies available for use and the channel can range from 100-120 for each frequency. Refer to Section 11 "Using multiple lifts in the same work area" for more information on selecting the radio settings. When the desired radio settings are shown, push the **CONFIRM** button to advance to the next screen.

5. Read through the Notice that is displayed on the next screen. If the operator agrees with and acknowledges the statements made on the screen, push the **ACCEPT** button to continue setting up the lift system.

6. The display then changes to ask how many lift units will be part of the lift system. Push the button that corresponds with the total number of lift units that will be used in the current lifting system.

7. The display will now appear as shown below with a picture of a vehicle asking for the current lift unit's position relative to the vehicle. Select the round button with a number inside it that matches the current lift unit's position. Once the position is selected the position button will turn green to indicate the selection.

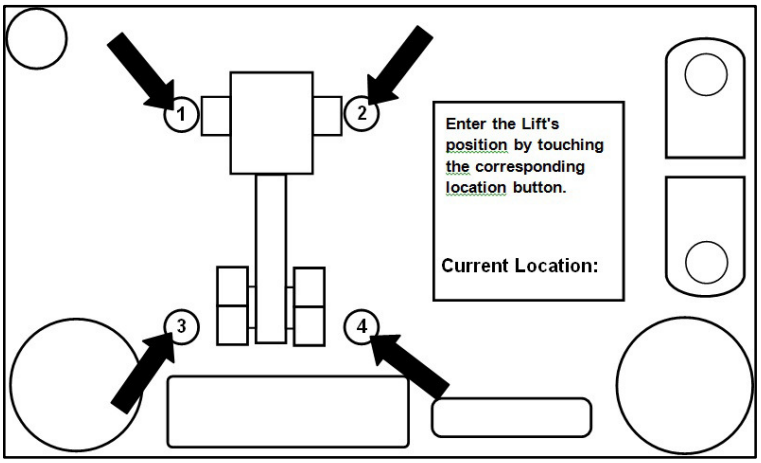


Fig. 8: Enter lift position in relation to vehicle

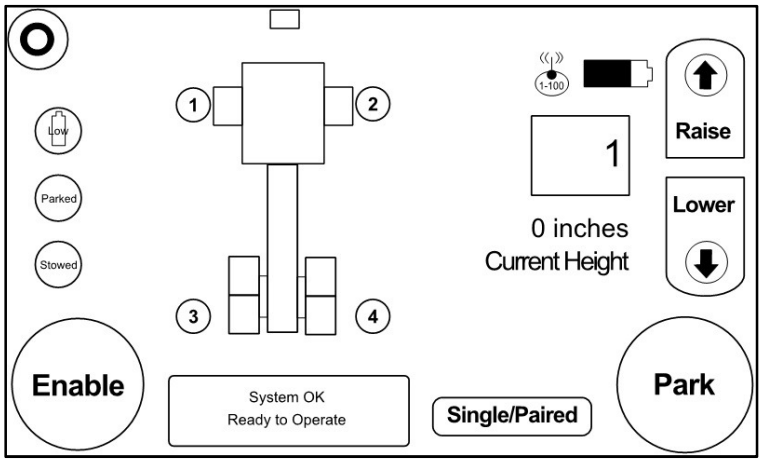


Fig. 9: CWL-20E main screen

8. Now move to the next lift unit (the units can be turned on in any order) and turn the master on/off switch to the **ON** position and then push the Communication Button. The same screen shown for Step (d) above will appear. If the touch screen frequency needs to be changed to meet the frequency of the Touch Screen Controller, see Section 8.13.
9. Select the same radio frequency and channel as was chosen in Step (d) by pushing the up and down arrows on the right side of the screen. When the correct radio settings are shown, push the **CONFIRM** button.
10. The display will now show the same screen as shown in Step (g) above. Select the round button that matches the position of the current lift unit relative to the vehicle. Positions that have already been selected will be shown by a yellow colored button.
11. Repeat Steps (h) through (j) on all remaining units that will be used in the current lifting system.
12. Once all the units in the lifting system are initialized (radio settings and position relative to the vehicle selected) the screen on the Touch Screen Controller will appear as shown below. If any error messages are shown during initialization consult the "Troubleshooting" section on page 26.

8.5 Touch screen controller to lift communication

After initializing the lift system, the Touch Screen Controller will be communicating with the last lift unit to be initialized. In order to change which lift unit is in communication with the Touch Screen Controller, the Communication Button on the lift (see the "Component identification" section on page 8) can be pushed or the position button on the screen can be pushed. Changing which lift is in communication with the Touch Screen Controller will be necessary when using the single or paired operation, to check the height or status of a specific lift unit, or during a fault condition. If there are signal losses or poor communication between the Touch Screen Controller and the current lift, communication should be switched to the lift nearest the Touch Screen Controller. If poor communication persists, the touch screen frequency should be changed. Typically, if there is poor communication between the Touch Screen Controller and the current lift unit, the lift system will automatically switch which lift unit is communicating with the Touch Screen Controller until it finds a lift unit that will have adequate communication.

⚠ **WARNING**: Do not operate the lift system from a distance that prevents the safe operation of the lift system or from underneath the vehicle or a lift unit. The Touch Screen Controller is capable of communicating with the lift system from far away or in another room. This is dangerous and should not be done. The work area, including the lifts, vehicle, and area under and around the vehicle must be in plain sight at all times of operation. The Touch Screen Controller should not be left unattended and should be locked as described in section 8.7 while not being operated.

8.6 Main operation screen

The screen shown below is the main operation screen. There are several buttons and indicators present on this screen. See the table below for an explanation of each button or indicator on the main screen. Several of these buttons and indicators are also shown on other screens and they perform the same functions on those screens as well. After reviewing this section, proceed to one of the following sections to perform the desired function with the lifting system.

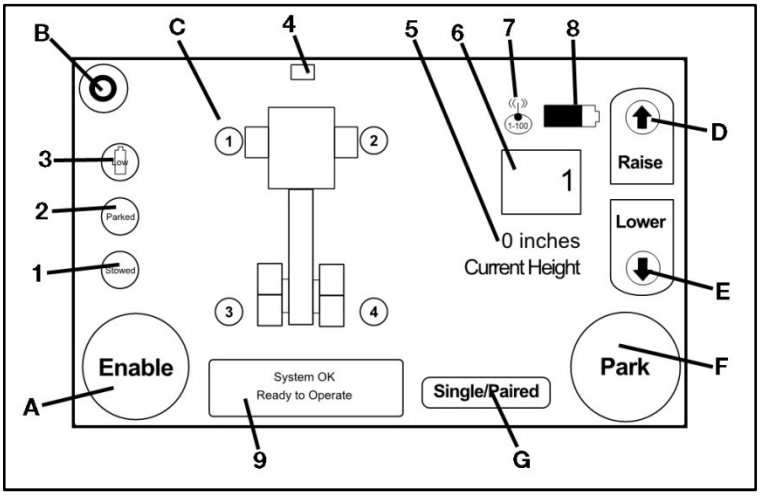


Fig. 10: Screen button/indicator layout

1 Stowed
2 Parked
3 Low battery
4 Position indicator
5 Height
6 Touch screen controller radio settings
7 Lift radio settings
8 Battery charge level
9 Message panels
A Enable
B Options
C Position buttons
D Raise
E Lower
F Park
G Single/Paired

Note: Letters symbolize a button on the screen and numbers symbolize an indicator.

Button/ Indicator #	Name	Function
1	Stowed	Illuminates when all lift units in the system are fully lowered.
2	Parked	Illuminates when all units are parked and the load is supported on the down stop lugs and the lifts are pinned as stands.
3	Low battery	Illuminates when battery voltage drops to a low level while raising or lowering, indicating the battery needs to be charged.
4	Position indicator	Displays the position of the lift unit currently communicating with the Touch Screen Controller.
5	Height	Displays the current height of the lift unit.
6	Touch screen controller radio settings	Displays the radio frequency that the Touch Screen Controller is using.
7	Lift radio settings	Displays the radio frequency and channel that the lift unit is using.
8	Battery charge level	Shows the current charge level of the battery on the lift unit in communication with the Touch Screen Controller. This indicator is only accurate when the lift is not raising or lowering.
9	Message panel	Displays messages indicating system status.
A	Enable	Once pushed, allows the lifting system to raise/lower. Must be pushed before any operation that will raise/lower the system. Button remains ON (green) for 5 seconds after being pushed.
B	Options	Brings up menu with additional functions. See Section 8.11 for details.
C	Position buttons	Pushing a position button establishes communication between the Touch Screen Controller and the lift unit corresponding to that position.
D	Raise	When this button is pushed the lifting system will raise until the button is released. The **ENABLE** button must be pushed and be ON (green) for the system to raise. See Section 8.7.
E	Lower	When this button is pushed, the lifting system will lower until the button is released. The **ENABLE** button must be pushed and be ON (green) for the system to lower. See Section 8.8
F	Park	Park the lift system so the load is mechanically supported on the down stop lugs. See Section 8.10 for more information.
G	Single/paired	Begins Single/Paired operation of the lift system. See Section 8.9 for further details.

8.7 Raising/lowering the vehicle

Once the work area, vehicle, and lift units are prepared, perform the following steps:

1. Position yourself so that you can see as much of the vehicle and as many of the lifts as possible. This is typically several feet away from either end of the vehicle.
2. Push and release the **ENABLE** button. The button color will change from red to green indicating the button is ON. The button will stay ON (green) for 5 seconds after it is released. If no other buttons are pushed during the 5 seconds the button will automatically turn OFF (red) at the end of the 5 seconds.
3. During the 5 seconds that the Enable button is ON (green), push and hold the **RAISE** or **LOWER** button to raise or lower the vehicle.
4. As the vehicle raises or lowers, the height indicator on the screen will update to show the current values.
5. When the vehicle is at the desired height, release the **RAISE** or **LOWER** button.
6. If anyone is going to be working under the vehicle, the lifts should be **PARKED**.
7. Depending on the amount of time the vehicle will remain in the current position, the lift system should be either locked or turned off. If the vehicle will be raised or lowered before the end of the shift, the lift system should be locked by following the steps below. If the vehicle will be left in the raised position longer than 8 hours, turn the master on/off switch on all lift units in the system to the **OFF** position to conserve the batteries.
8. To lock the system, push the **OPTIONS** button (gear shaped button in the top left corner). When the menu appears, select the padlock button in the middle to lock the system. A message will appear showing the system is locked. When ready to unlock the system, return communication to the unit where the lock button was pushed (shown by the flashing yellow position indicator) by pushing the Communication Button and then push the **RESET** button.

⚠ There are several important safety issues to consider when raising a vehicle or whenever a vehicle is in a raised position, including:

⚠ All personnel should be instructed that the system should not be unlocked unless all objects and personnel are out from underneath the vehicle and the vehicle, work area, and lift units are prepared for lifting or lowering.

⚠ If the lift units are to be removed from a raised vehicle, use only stands intended for this purpose. Appropriate stands must be capable of supporting the load and they must be made specifically for high-rise supporting.

⚠ NEVER attempt to climb up, climb on, or get in a raised vehicle. Do not open the vehicle's doors or make adjustments to the exterior when raised, as it could interfere with safe lowering of the vehicle.

⚠ NEVER start the vehicle's motor when it is supported by the lift units or stands. Only start the engine when the vehicle is firmly in contact with the ground and the lift units have been removed from the wheels.

⚠ NEVER attempt to move a vehicle horizontally by any means when it is raised on the lifts. Once the vehicle is raised, it should only be moved up or down. Also, NEVER attempt to move or reposition a lift unit when a vehicle is raised on the lift unit.

⚠ NEVER subject a lift unit to dynamic loading (i.e. "shock loading"). NEVER add objects or other weight to the vehicle once it has been raised on the lift units.

If you experience any problems while raising the vehicle or while it is raised, consult the "Emergency procedures" section on page 19 and/or the "Troubleshooting" section on page 26 of this manual.

8.8 Lowering a vehicle to the ground

⚠ **WARNING!** To avoid serious injury or death, NEVER drive the vehicle off the lifts or attempt to move a vehicle that is elevated by the lift system.

1. Clear the work area under the vehicle of all personnel, tools, and equipment. Make sure there are no obstructions under the vehicle or under the lift tables of the lift system prior to lowering the vehicle to the ground.
2. If the lift system was locked, return communication to the unit where the lock button was pushed (shown by the flashing yellow position indicator) by pushing the Communication Button and then push the **RESET** button. If the lift system was turned off, follow the steps in Section 8.4 to reinitialize the system. If the lift system was **PARKED**, refer to Section 8.10 prior to lowering the vehicle.
3. Position yourself so that you can see as much of the vehicle and as many of the lifts as possible. This is typically several feet away from either end of the vehicle.

4. Push and release the **ENABLE** button. The button color will change from red to green indicating the button is ON. The button will stay ON (green) for 5 seconds after it is released. If no other buttons are pushed during the 5 seconds, the button will automatically turn OFF (red) at the end of the 5 seconds.
5. During the 5 seconds that the Enable button is ON (green), push and hold the **LOWER** button to lower the vehicle.
6. Release the **LOWER** button when the vehicle is lowered to the floor and the lift tables no longer contact the tires. This condition will be indicated when the **STOWED** indicator turns blue.
7. Place the vehicle's transmission in gear (or park) and engage the vehicle's parking or air brake.
8. Move the lift units away from the work area and turn the master on/off switch to the **OFF** position. This will ensure the lift units are ready to be synchronized for lifting in the future and conserve the batteries while the lifts are not in use.
9. Completely recharge each lift unit and the Touch Screen Controller after use.

8.9 Single/paired operation

In some situations it may be desirable to place only one wheel or one axle on stands instead of placing the entire vehicle on stands. The lift system features a special mode of operation called single/paired mode to allow this. The system can be placed in single/paired mode at any height.

1. If only one wheel of the vehicle will be placed on a stand, establish communication with the lift unit that is positioned on that wheel of the vehicle. If one axle will be placed on stands, establish communication with one of the lift units on the ends of the axle to be supported.
2. Push the **SINGLE/PAIRED** button on the main operation screen shown in Section 8.6.
3. A screen will appear asking whether the system will be operated in single mode or paired mode. If only one wheel will be supported on stands push the **SINGLE** button. If one axle will be supported on stands push the **PAIRED** button. Pushing the **EXIT** button will return to the main operation screen.
4. The screen shown below (paired mode is shown in this example, single mode would be similar) will be displayed on the lift unit where single or paired mode was initialized. All other lift units will be locked out from operation and show a screen indicating this condition.

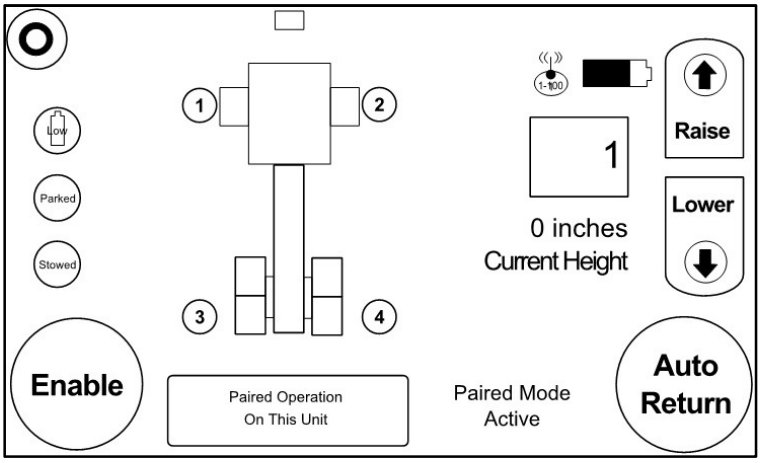


Fig. 11: Paired mode operation

5. All the buttons shown function in the same way as described in Section 8.6. The vehicle can be raised or lowered as needed to place stands and support the vehicle. The distance the vehicle can be raised or lowered is limited while in single or paired mode.
6. When all work has been completed that required the wheel/axle to be supported on a stand(s), move the lift unit(s) back into position under the wheels. Push and release the **ENABLE** button and then within 5 seconds push and release the **AUTO RETURN** button. The lift(s) that was raised or lowered in single or paired mode will automatically adjust its height to match the other units in the system and support the vehicle.
7. Once the lift(s) has adjusted its height to match the rest of the system, all the screens will return to the screen shown in Section 8.6. The system will now operate as a whole with all lift units raising or lowering together.

8.10 Park mode

If desired, the load on the lift table can be transferred from the air cylinder to the mechanical down stop system by activating Park mode. Park mode also automatically pins the lifts so that they act as stands. The following steps explain how to activate Park mode.

1. Follow the steps in Section 8.7 to position the vehicle at the desired working height.
2. Push and release the **ENABLE** button and within 5 seconds, push and release the **PARK** button. The lift system will now lower until the down stop catch pawl is supported on the down stop lug and the pin is inserted on all lift units in the system.

⚠ **NOTE**: The lifts will only park if they are all above the same down stop lug. If they are not all above the same down stop lug, the “park window error” will be indicated and the lifts will have to be Raised or Lowered until all the lifts are above the same down stop lug.

3. Once all the units in the system have Parked, the **PARKED** indicator will turn blue. The **LOWER** button will also disappear since the vehicle will need to be raised off the down stop lugs before it can be lowered.
4. To exit Park mode, simply push and release the **ENABLE** button and then within 5 seconds push and hold the **RAISE** button until the **PARKED** indicator light turns off. The vehicle can now be raised or lowered normally.

8.11 Options

The **OPTIONS** button displays additional buttons that are normally hidden from view on the screen. Pushing the **OPTIONS** button displays a panel on the left side of the screen that includes the **LOCK** button and the **ABOUT** button. To hide the panel that is displayed when the **OPTIONS** button is pushed, push the **OPTIONS** button again.

The **LOCK** button is used as described in Section 8.7 to lock the system from operating. Pushing the **ABOUT** button brings up a screen showing the contact information for the lift manufacturer and the software versions currently installed. To exit the About screen, push the **ABOUT** button again.

8.12 Status indicators

Shown below are the functions of the Status indicators during operation of the lift system.

LED Color	LED State	Meaning
Green	Solid	• The lift is set up
Green	Blinking	• This lift is in communication with the touch screen controller
Red	Solid	• There is a fault in the system
Red	Blinking	• There is a fault with this lift unit

8.13 Changing the touch screen frequency on the lift units

1. In order to change the touch screen frequency on a lift unit, the Communication Button must be held while the master on/off switch is turned to **ON**.
2. When the Status Indicators rapidly flash, the Communication Button should be released.
3. When the Status Indicators stop rapidly flashing, the lift unit is ready to change frequency. The current frequency is indicated by the blink pattern shown with the Status Indicators.
4. The number of successive blinks between breaks is the current frequency.
5. Push the Communication Button to advance the frequency to the desired frequency. Each push of the button advances the frequency by one. If the Communication Button is pushed when the frequency is on 12, the frequency will jump back to 1.
6. Make sure the desired frequency is chosen by observing a full blink pattern. Once the desired frequency is chosen, hold the Communication Button until the Status Indicators rapidly flash and then release the Communication Button.
7. After the Status Indicators stop flashing, the frequency is set and the lift is ready to be initialized. The frequency blink pattern will continue to be indicated until the Communication Button is pushed to initialize the lift unit.

9. Battery Information

9.1 Battery type (lift unit)

Each lift unit is equipped at the factory with a 12V SLA type battery with F1 terminals. These batteries are designed for the usage conditions experienced on the lift unit. If the battery needs replaced, use only the same type of battery supplied by the manufacturer.

9.2 Battery type (touch screen controller)

Each touch Screen Controller is equipped at the factory with a 14.8V Li-ion battery. These batteries have been selected to match the usage conditions found on the Touch Screen Controller. It is recommended that these batteries be replaced by the manufacturer.

9.3 Charging the batteries

The batteries should be charged after each use to ensure the longest possible battery life and to avoid service interruptions. The batteries used on all models can be charged before they are completely discharged and not develop a “memory”. The battery life and level of charge will be greatly improved if the batteries are charged before they are deeply discharged.

⚠ **NOTICE:** Only use the supplied battery charger to charge the batteries. The supplied battery charger is designed for the type of batteries used on the lift units. Use of a charger not designed for the type of batteries on the lift units may cause under or overcharging that will reduce the life and capacity of the batteries.

The lift unit’s on-board battery charger is located inside of the enclosure as shown Fig. 12. The Touch Screen Controller’s on board battery charger is inside of the Touch Screen Controller. To charge either battery, a suitable extension cord (see table below for proper cord selection) should be connected to the battery charger cord socket located on the left side of the enclosure for the lift and on the edge of the Touch Screen Controller. Always use a grounded extension cord with a plug style that matches the plug for the battery charger cord socket. Inspect the condition of the cord and plug and only use if they are free of defects. All lift units and the Touch Screen Controller should be able to charge simultaneously on the same circuit powered by a 20 Amp circuit breaker.

The battery charger provided on each lift unit and the Touch Screen Controller is a “smart” charger. The battery charger automatically goes through several different stages of charging to properly charge the batteries. The battery charger can be left plugged in indefinitely without harming the batteries.

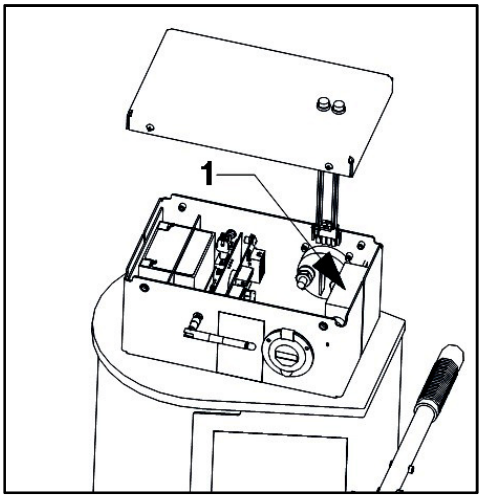


Fig. 12: Battery charger location

1 Battery charger

Minimum Extension Cord Characteristics			
Length	25	50	100
Wire Size (AWG)	16	14	12

⚠ **WARNING!** The following warning statements are important for safe use of the batteries and the battery chargers:

⚠ Use these batteries and battery chargers with this lift system only—NEVER use the batteries and the battery chargers for any other purpose. NEVER use an unapproved power source other than the battery to power the lift or Touch Screen Controller.

⚠ DO NOT expose the battery chargers to rain or snow.

⚠ To reduce risk of damage to electric plug and cord, pull by the plug rather than the cord when disconnecting the extension cord from the battery charger cord socket.

⚠ NEVER smoke or allow an open spark or flame in the vicinity of the battery.

⚠ Make sure cord is located so that it cannot be stepped on, tripped over, or otherwise subjected to damage or stress.

⚠ DO NOT attempt to service the battery chargers — there are no serviceable items inside these units.

⚠ Use of an attachment not recommended or sold by the battery charger manufacturer may result in a risk of fire, electrical shock or injury to persons.

⚠ DO NOT operate the battery charger if it has received a sharp blow, been dropped, or otherwise damaged in any way. Contact the manufacturer using the contact information on the back of this manual.

⚠ DO NOT disassemble the battery charger. If it is in need of repair contact the manufacturer using the contact information on the back of this manual.

⚠ Unplug the battery charger from an outlet before attempting any maintenance or cleaning.

⚠ NEVER charge a frozen battery.

⚠ Be extra cautious to reduce the risk of dropping a metal tool onto the battery. It might spark or short-circuit the battery or other electrical parts that may cause an explosion.

⚠ Do not allow battery acid to contact skin, clothing, or eyes. Avoid touching eyes while working near battery. Wear complete eye protection and clothing protection. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters an eye, immediately flush with cold running water for at least 10 minutes and get medical attention.

9.4 Battery life

Keeping the batteries properly charged will extend the service life of the batteries. Repeated deep discharging of the batteries will damage the batteries, reduce service life, and reduce the performance of the lift unit. It is recommended to charge the batteries as often as possible, especially over a weekend, to maintain the uptime of the lift system and ensure the longest service life possible from the batteries. The Touch Screen Controller does not have a battery charge level indicator so it is necessary to charge it often to ensure uninterrupted service.

10. Emergency Procedures

10.1 Emergency stop

In the event that the system must be stopped immediately, the *lift system* has an emergency stop button provided on each lift (see the "Component identification" section on page 8). It is red in color and simply needs to be pushed in on any lift unit to halt a vehicle lift or lowering that may be in progress. The normal emergency stop condition, or "E-Stop", message on the display will communicate with all lift units synchronized in the system to halt all at once. After the situation is assessed and it is determined that it is safe to continue lifting or lowering, the emergency stop button originally pushed in can be pulled back out and the **RESET** button pushed to reset the system. The **RESET** button must be pushed after establishing communication with the lift that the emergency stop button was activated on.

In the unlikely event that the system would lose communication at the same time an emergency stop button is pressed and a lift unit is still moving, simply press the emergency stop button on the lift unit that is still moving. If this fails to stop the lift unit, turn the master on/off switch, located on the right side of the enclosure (see the "Component identification" section on page 8), to the **OFF** position, disconnect the air hose from the air inlet if necessary, and ensure the down stop is in the engaged position by pulling the Down Stop Handle toward the back of the lift unit. If this is the case, one of the valves may be stuck and need to be inspected, cleaned, and/or replaced (see section 12.4 of this manual).

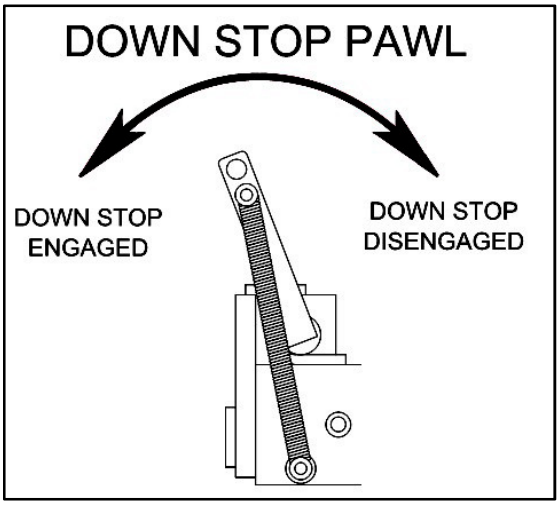


Fig. 13: Down stop pawl positions

10.2 Manual lowering

⚠ Manual operation is intended for use when the normal controls are not functioning, and is NOT to be used for normal operation.

Any time the controls are found to not be functioning while a vehicle is already raised, the vehicle may be lowered to the ground using the following steps:

1. Station a person at each lift unit.
2. Ensure that the master on/off switch, located on the right side of the enclosure (see the "Component identification" section on page 8), is in the **ON** position.
3. Each person must prepare to hold the manual raise/lower toggle switch down while the Communication Button is held in (see the "Component identification" section on page 8).
4. Each person should simultaneously hold the Communication Button and Manual Raise/Lower Toggle Switch to initiate lowering (see the "Component identification" section on page 8).
5. Coordinate lowering by individually stopping and starting, if necessary, in order to keep the lifts at the same height.

If one or more lift unit(s) does not move down initially, it may be resting on a down stop lug. Slightly raise the lift to clear the down stop lug. The lift is manually raised by holding the manual raise/lower toggle switch up while the Communication Button is held in. Once the lift is clear of the down stop lug, lowering can resume.

11. Using Multiple Lifts in the Same Work Area

11.1 Adjusting lift communication frequency

If you have 4 or more lift units in the same work area, it is possible to use them for separate lifting applications (e.g., lifting two different vehicles at the same time). Each set of lift units designated to work together to lift a particular vehicle is considered a lift system. Different lift units could be used in different lift systems at different times. For example, two units may be used as a lift system to raise the front end of a vehicle one day and those same two lift units might be used as part of a 4-unit lift system on another day. When using multiple lift systems in the same work area:

1. Identify the lift units to be used together in the lift system.
2. Before raising the vehicle, make sure each lift unit in the lift system is fully lowered and the master on/off switch is turned to the **OFF** position. This will ensure that the lift system will know exactly how many lift units are part of the lift system and they will all be prepared to work together.

⚠ **WARNING!** Failure to turn the master on/off switch to the **OFF** position could cause individual lift units to retain incorrect settings from previous lifts or to retain incorrect information from their use in previous lift systems.

3. During the lift system initialization (see Section 8.4) make sure to select the same frequency for the Touch Screen Controller and the lift units for the touch screen communication and the same radio frequency and channel for all lift units for lift communication. Also, check the radio settings of all other lift units in the work area that are not part of the current lift system to make sure that no other lift systems (or any other individual lift units) are using the same frequency for touch screen communication or the same frequency and channel for lift communication.
4. More than one lift system can operate on the same frequency as long as each system uses a different channel. Once a frequency is found that allows for operation with minimal signal loss faults, it is recommended to use this frequency for all systems unless multiple frequencies give satisfactory performance. Multiple Touch Screen Controllers cannot use the same frequency to operate separate lift systems.

NOTE: The wireless feature complies with Part 90 of the FCC Rules. Operation is registration-free and there are no licensing requirements for the end user.

12. Maintenance and Inspection

⚠ **WARNING** - The owner must inspect, or appoint a knowledgeable person to inspect the jack for signs of corrosion and / or excessive wear. Visual inspection should be made before each use of jack, checking for abnormal conditions. Regular inspections should be made weekly for daily use and monthly for intermittent use. Each jack must be inspected immediately if subjected to an abnormal load or shock. Any jack which appears to be damaged in any way, is found to be badly worn, or operates abnormally shall be removed from service until necessary repairs are made. Contact the manufacturer using the contact information printed on the back cover of this manual.

12.1 Structural inspection

Equipment must be removed from service and inspected for damage immediately if subjected to an abnormal shock or load. Failure to heed this warning may result in personal injury and / or property damage.

⚠ It is critical that each lift unit be inspected regularly for any signs of wear or damage that might affect its ability to perform lifts safely. Any lift unit that appears to be damaged in any way, is found to be badly worn, or operates abnormally must be removed from service until necessary repairs are made. Contact the manufacturer (using the contact information on the back cover of this manual) if you need to have a lift unit serviced or if you have any questions about how to address any wear or damage observed on a lift unit.

⚠ The employer, owner, and/or manager are responsible for maintaining the lift units in good, serviceable condition. Employees must be trained on how to inspect lift units. **Before each use** of a lift unit, the operator must visually inspect the lift unit for any abnormal conditions. Any lift unit subjected to an abnormal load or shock must be immediately removed from service and given a thorough inspection. The employer, owner, and/or manager must inspect (or appoint a knowledgeable person to inspect) each lift unit regularly. **Regular inspections** should be made **weekly** (if the lift unit is used daily) or **monthly** (if the lift unit is used only intermittently). Regular inspections should include the following:

⚠ To prevent serious injury or death from a falling vehicle, all inspection and maintenance procedures must be performed **after** the jack has been removed from service. Position the lifts so you have clear access to all sides of the lift for inspection and service.

- Inspect the lifts for any cracks, chips, or signs of excessive wear. Visually inspect the welds.
- Raise and lower the lift through its full range (up and down)—it should move smoothly. If the lift stutters when raising or lowering (i.e., it moves in a jerky fashion) the slide pads may need to be re-lubricated. Refer to the “Periodic lubrication” section on page 22.
- Inspect the slide pad contact surfaces on the base post for damage, such as gouging, warping, etc.
- All controls should operate smoothly and freely.
- Inspect the down stop pawl to make certain it rotates forward and backward freely. If the pawl does not move freely, it may need to be greased. Refer to the “Periodic Lubrication” section of this manual.

⚠ If any irregularities or problems are detected during an inspection, the stand must be removed from service immediately and repaired. Contact the manufacturer using the contact information on the back cover of this manual.

12.2 Maintenance instructions

⚠ **WARNING** - All inspection and maintenance procedures must be performed after the jack has been removed from service. Failure to do this may result in personal injury and/or property damage.

- All warning and capacity labels should be readable and complete. Wash external surfaces of lift, labels, and decals with a mild soap solution. DO NOT allow water to get into the Electronics Enclosure or onto any of the electronics or wiring. Contact the manufacturer for replacement labels as needed.
- Clean and lubricate the surfaces the slide pads slide upon with good quality lithium grease. Refer to the "Periodic lubrication" section below.
- Inspect battery terminal connections to make sure they are clean and residue free.
- Lubricate the down stop catch pawl and check that it rotates forward and backward freely. Refer to the "Periodic lubrication" section below.
- Inspect structure for damage to contact surfaces, excessive wear, damaged or cracked welds and/or any abnormal conditions that could affect performance of the lifts (See "Structural inspection" section).
- Inspect the String Pot String for kinks, abrasion, or damage of any kind. Gently wipe off any grease, oil, or other contaminants from the string. Do not allow the string to snap back into the string pot.

12.3 Periodic lubrication

ℹ If a lift is slower than normal while lifting/lowering, a chatter/vibration or squeaking sound is present, or a lift seems to have more resistance than normal, this typically indicates the need to re-lubricate the lift. In most environments, this re-lubrication should occur monthly. If additional assistance is needed, contact the manufacturer for further instructions.

Lubricate all rotating and sliding portions of the jack monthly as shown in Fig. 14.

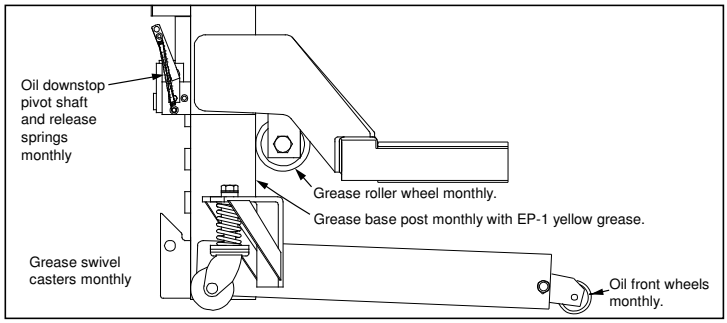


Fig. 14: Lubrication points

12.4 Valve cleaning and inspection

If the pneumatic valves seem to be sticking open or closed, or functioning improperly, they should be inspected and cleaned by following the steps below. The lift must be off, fully lowered, and disconnected from any compressed air source during inspection. If any foreign material is found in a valve or the valve manifold, a filter should be installed in the air supply line. Contact the manufacturer for any replacement parts or further information.

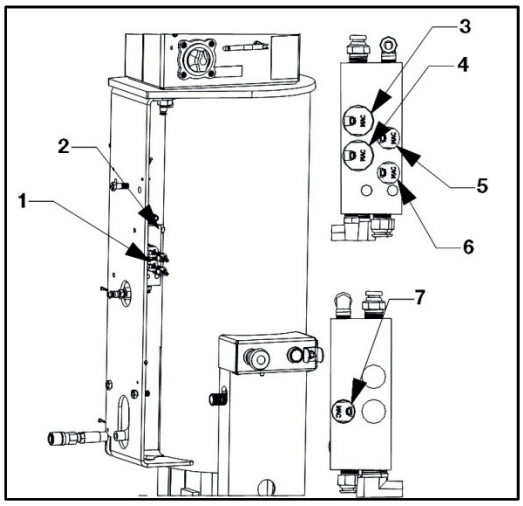


Fig. 15: Valve location component identification

1 Valves
2 Valve manifold
3 Exhaust valve
4 Raise valve
5 Pin insertion valve
6 Down stop disengage valve
7 Down stop engage/pin extraction valve

1. Inspect the valves' wires. If there is any damage, bare wire, or broken or loose connection, repair or replace the wire.
2. Remove the suspect valve. They have a wrench flat for installation and removal. The surrounding valves may need to be removed to gain access to the suspect valve. Do not use tools on the plastic cap on top of the valves.
3. Inspect the seals for cuts, abrasion, or damage of any kind. Replace any damaged seals.
4. Inspect the valve for any damage or foreign material. Manually shift the valve by pushing the spool from the bottom to aid in inspection. Clean any foreign material by brushing it away. Replace with a new valve if any damage is noticed.
5. Replace valve being careful not to damage the seals when inserting into the valve cavity. The valves must be put back into the cavity from which they came.

12.5 Lift table adjustment

The lift system has a 1/2-13 hex head cap screw mounted inside the top weldment to allow the lift table to be raised or lowered slightly. The cap screw has been adjusted at the factory to provide 1/4" to 5/16" of clearance between the bottom of the lift pads and the floor.

To raise or lower the lift table, follow the lift table adjustment steps below:

1. Place the lifts on a level floor in a suitable open area.
2. Raise both lifts onto their lowest downstop.
3. Loosen the jam nut and turn the cap screw a few turns in the required direction. Clockwise raises the lift table, counterclockwise lowers it. (See Fig. 13 for identification.)

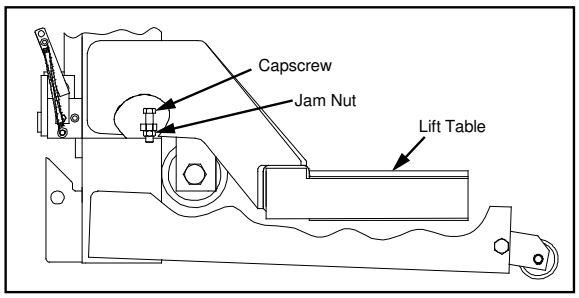


Fig. 16: Lift table clearance adjustment

4. Tighten the jam nut.
5. Lower the lift to its lowest position and check the lift table height above the floor.

Repeat the adjustment as needed until each lift has a minimum of 1/8" clearance between the lift table bottom and the floor. With the lift table resting on the floor, the lifts may not easily move around the shop floor.

12.6 Sensor adjustment

If the pin sensors or down stop sensor get out of adjustment, they will need to be readjusted (see Figure 7). The sensors can be adjusted by removing the tape and using a .050” hex key to loosen the set screw in the sensor. A hex key may be included inside the control box. Use the red LED on the sensor to aid in the adjustment of the sensor. When adjusting the down stop sensor, the down stop needs to be engaged with the base post and not with a down stop lug. When adjusting the pin inserted sensor, the pin needs to be fully inserted into a pin hole. When adjusting the pin retracted sensor, the pin needs to be fully retracted. The sensor should be left at the center of the range that the LED is lit. The set screw on the sensors should be tightened to a maximum of 1.5 in-lbs.

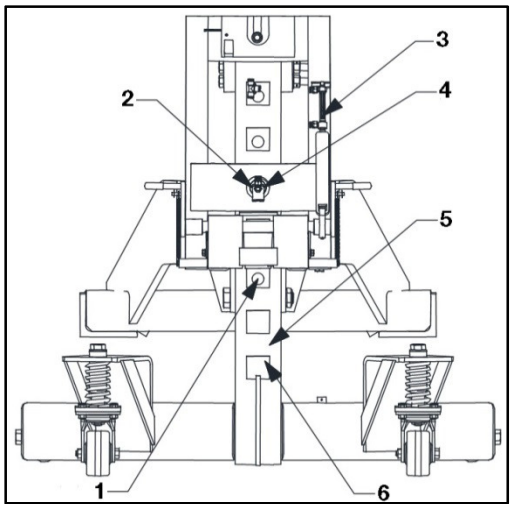


Fig. 17: Sensor adjustment

1 Pin hole
2 Pin retracted sensor
3 Down stop sensor
4 Pin inserted sensor
5 Base post
6 Down stop lug

12.7 Electronic components

The electrical system is powered by a 12 VDC battery with a 5 Ah rating. This electrical system does not need any routine maintenance, but does have a 3 Amp blade fuse located on the circuit board inside the Electronics Enclosure.

⚠ Always disconnect the battery from the system before changing fuses. Failure to heed this warning may result in personal injury and/or property damage.

⚠ Always replace a blown fuse with the same size and type. An improper replacement could damage the equipment.

12.8 Control box removal

The electronics enclosure can be removed from the lift. Remove the screws holding the lid and carefully lift the lid a few inches from the box being careful so that the LEDs' wires do not get damaged. Do not allow the lid to hang by the LEDs' wires. Take note of where and how everything is connected so that they can be properly reconnected during reinstallation. Taking a picture for reference may be helpful. The LEDs' wire harness can be disconnected from the control board if desired or necessary. Remove the nuts holding the electronics enclosure to the lift and disconnect the wire connectors from the board. Gently feed the wiring harnesses out of the bottom of the box while lifting the box off of the lift. Reattach the lid if the electronics enclosure is to be stored, transported, or shipped. Ensure the wiring harnesses and hardware are connected correctly when the electronics enclosure is reinstalled.

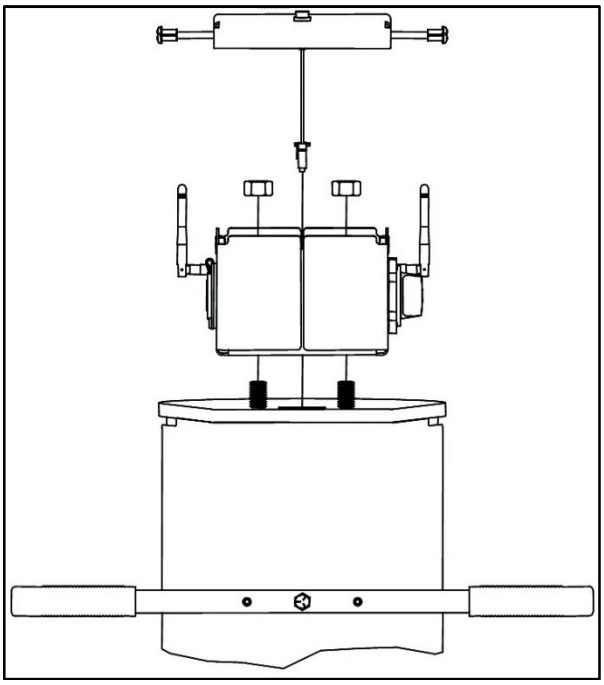


Fig. 18: Control box removal

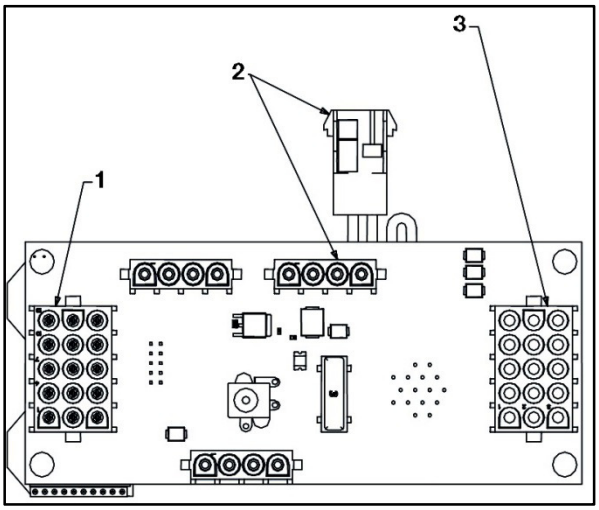


Fig. 19: Control box connections

1 Primary input connection
2 E-stop connection
3 Primary output connection

13. Optional Adapters

- The lift table on each lift is designed to accommodate wheel diameters from 19 inches to 24-1/2 inches—note that these dimensions refer to the wheels or rims and not the tires.
- The optional small wheel adapters must be used for vehicles with wheel diameters between 16 and 19 inches (see Fig. 20).

⚠ **WARNING!** Only use the small wheel adapters in pairs- do NOT use a single adapter on only one lift arm. Using only one small wheel adapter will result in side loading of the lift unit. Also, do not use the small wheel adapters with wheels larger than 19 inches in diameter.

Installing the adapters

Secure small wheel adapters by inserting the hooks into the top row of grip holes and then rest the adapters on the lift arm in the working position (see Fig. 20). After installing the small wheel adapters, follow the instructions in Section 8.

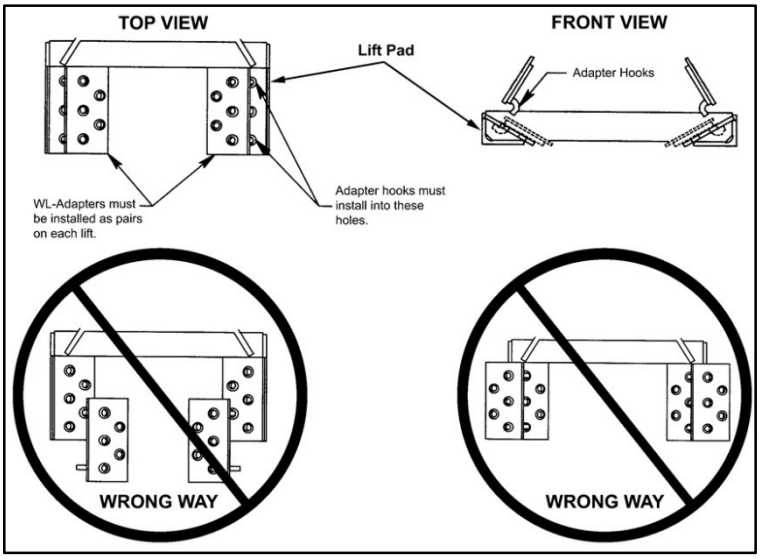


Fig. 20: Optional adapter installation

14. Troubleshooting

The following pages are a list of pre-programmed faults and possible solutions. If the solution listed fails to correct the problem, contact the manufacturer using the contact information on the back cover of this manual. Please have the model number and serial number of your lift unit and Touch Screen Controller available. The lift unit serial number is on a permanently attached plate located on the right caster bracket (See Fig. 21). The serial number of the Electronics Enclosure is on the right hand side panel of the Electronics Enclosure.

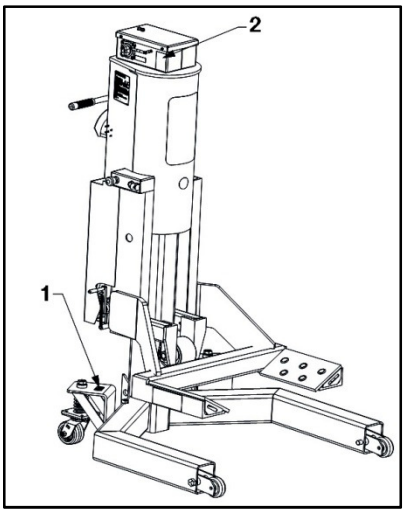


Fig. 21: Serial number locations

1 Lift unit serial number

2 Electronics enclosure serial number

Touch screen message	Meaning	Possible solutions
Recharge needed	• Energy level on one or more lift(s) has dropped below desired minimum – *please recharge before next lift.* • Further use without recharge *could* shorten battery life.	1. Plug extension cord into battery charger cord socket to charge battery.
Max. Allowed Lift Height	• Lift system has reached the maximum height allowed for the present configuration of lifts.	1. Lift system may be lowered from this height.
Feedback Loop	• Lift Table position on one or more lift units is not responding properly to controller commands. • Lift Table speed does not match controller output.	1. Reset the fault. 2. If reoccurs, verify no obstructions with lift table. 3. If no obstructions, check operation of linear position sensor by observing the height readout on the display.
Low Battery	• Energy Level on one or more lift units has dropped to a point where further lifting *will* damage battery. However, vehicle can be lowered. • Identified lift unit(s) *must* be recharged (or swapped to spare battery) before further lifting can take place. **NOTE**: If backup battery is used to finish lift operation, properly charge or replace lift unit battery.	1. Plug extension cord into battery charger cord socket, if 110 VAC is available. 2. If not available: ○ Locate spare 12 VDC battery. ○ Turn **OFF** master on/off switch. ○ Disconnect system powe cables from battery terminals. ○ Remove discharged battery. ○ Install spare battery. ○ Connect system power cables to spare battery terminals. ○ Turn **ON** master on/off switch. ○ Re-synchronize system to continue.
Signal Loss	• Communication from one or more lift units was lost. • Can be caused by outside RF interference and is considered normal. • Communication link needs to be reestablished.	1. Check that the master on/off switch on all lift units in the lifting system is still turned **ON**. 2. Wait a few minutes to see if interference clears and lift system is able to automatically recover. 3. If “Signal Loss” continues to reoccur, turn all lift units **OFF**, select another radio frequency several frequencies away, and re-synchronize the system. More than one lift system can operate on the same frequency as long as each system uses a different channel.
Out-of-Sync	• Lift units heights are not within acceptable synchronization range. • All lift units must be within 3” of each other to operate.	1. Reset the fault. 2. Operate lift system in the opposite direction temporarily to re-synchronize. 3. If unable to re-synchronize, use manual lowering procedure and re-sync at ground level.

Touch screen message	Meaning	Possible solutions
E-Stop	• Red emergency stop button has been pushed IN on one or more lift units. • All red emergency stop buttons must be OUT to operate.	1. Determine cause of activation. 2. Rectify condition and verify ready to operate. 3. Reset Emergency Stop Button and reset the fault.
Too Many to Lift	• Number of lift units on the current radio frequency and channel is more than the operator input during set up. • Another lift system is already operating on the selected radio frequency and channel. • Number of lift units set to a given radio frequency and channel must equal the number input during set up.	1. Find all lift units not intended to be used on current vehicle. 2. If other units are being used on another vehicle, switch channels and re-synchronize. 3. If other units are to be idle, verify all units are **OFF** before synchronizing current system.
Too Few to Lift	• Number of lift units on the current radio frequency and channel is less than the operator input during set up. • Number of lift units set to a given radio frequency and channel must equal the number input during set up.	1. Reset the fault. 2. Find all lift units that are intended to be used and verify the master on/off switch is **ON** and the radio frequency and channel are correctly selected on each lift unit. 3. If all units are **ON** and the radio frequency and channel are correctly selected, turn all **OFF** and restart. Ensure proper number of lifts is input when prompted.
Pin Error	• Pin is not fully retracted during raise. • Pin sensor is not properly adjusted.	1. Check that pin is fully retracting during raise. Inspect air lines and valves if it is not. 2. Check that pin retracted sensor is on when pin is fully retracted. Adjust accordingly if it is not.

Touch screen message	Meaning	Possible solutions
Raise Before Lower	• Down stop catch pawl on at least one lift unit is not retracting properly. • All down stop catch pawls must be fully retracted before lift system will allow vehicle to lower.	1. Raise the vehicle slightly before lowering. This will also clear the error if caused by the lifting system being in Park mode. 2. Lubricate down stop catch pawl.
Park Window Error	• Lifts are not all at a height such that they will park onto the same down stop position.	1. Raise or lower lifts so that they are all above the down stop that is intended to be parked onto.
Park Error	• Down stop catch pawl on one or more lift units in the system did not properly engage a down stop lug when the **PARK** button was pushed. • All units must park on a down stop lug within 20 seconds. • Pin did not insert correctly. • Pin inserted sensor not adjusted properly and did not pick up inserted pin.	1. Raise the vehicle a few inches and try to Park again. 2. Lubricate the down stop catch pawl. 3. Check that the pin inserted correctly. If it did not, ensure that the lift was resting on the down stop lug and inspect the air lines and valve. 4. Check that the Pin inserted sensor is on when pin is inserted. Adjust accordingly if it is not.

15. Maintenance Chart

Action	Date	Details	Person responsible
Receiving inspection			

Action	Date	Details	Person responsible

16. Notes

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