

VERIFIER TRAILER INSPECTION SYSTEM *USER GUIDE*



The future of trailer testing offered by LITE-CHECK

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VERIFIER TRAILER INSPECTION SYSTEM DESCRIPTION

Lite-Check's VERIFIER Trailer Inspection System is the industry's first full-featured digital inspection system for collecting, organizing, storing and printing complete trailer inspection reports. Utilizing TMC recommended practices and FHWA guidelines, DOT compliant reports are generated immediately upon capturing electric, air and ABS data after one easy pass around a trailer.

- VERIFIER Trailer Interface
 Provides controlled inputs and measures lighting, air and ABS systems.
- VERIFIER Tablet
 Enables the technician to control, collect, organize and transmit all inspection and diagnostic data.
- VERIFIER Cloud
 Securely stores inspection reports received from the tablet, allowing them to be viewed, printed, or saved from any smart device with internet access.

The Lite-Check VERIFIER Trailer Inspection System is the culmination of 25 years of providing industry-leading trailer diagnostics designed to increase inspection reliability and reduce time and cost per inspection while increasing both trailer availability and road readiness. We look forward to continuing to be the one-stop shop for all your trailer diagnostic and inspection needs.

Cautions

- Block vehicle wheels from movement before releasing brakes.
- **Do not weld** while the tester is connected to the trailer.
- The VERIFIER 1020 needs a clean isolated power supply; use a 12-volt battery or LITE-CHECK 313S Regulated Power Supply.
- Do not lengthen existing power cord on the tester. Lengthening the power cord will cause a power drop. Attach the tester power cord directly to a 12-volt battery or a regulated power supply.
- If the VERIFIER 1020 does not turn on and the power source is good, check for reversed polarity of the power cable.
- The emergency air **must be applied before the service brakes** will operate. This prevents brake compounding.
- POWERING-DOWN of the VERIFIER 1020 will cause the air to the trailer to be released. For example, applied service brakes will release and spring brakes will be engaged. Restarting the LITE-CHECK Application on the tablet will also cause this result.

Table of Contents

US	SER GUIDE COVER	1
1 VERIFIER TRAILER INSPECTION SYSTEM DESCRIPTION		
2	Cautions	3
3	SYSTEM COMPONENTS 3.1 Optional Accessories	5 5
4	System Component Descriptions	6
5	Trailer Interface Overview	7
6	VERIFIER Trailer Interface and Tablet Setup	8
7	Tablet DOT Mode Features7.1 Performing an Inspection97.2 A Note on Thresholds11	9
8	Bluetooth Tire Tool (Accessory) 8.1 Procedure For Taking Measurements	12 12 12
9	Tablet Diagnostic Mode Features	13
10	LITE-CHECK Recommended Operation Procedures 10.1 Air	14
11	Lite-Check Cloud 11.1 Viewing and Finding Reports	17 17
12	Troubleshooting - Trailer Interface and Tablet 12.1 To Disconnect and Re-Connect the TABLET with the Trailer-Interface	17 18 18
13	Warranty, Contact and Service	19
Inf	formation	
14	Shipping LITE-CHECK Products	20

SYSTEM COMPONENTS

The VERIFIER Trailer Inspection System ships with the following items:

- 1 Lite-Check VERIFIER Trailer Interface
 - 1 7-way cable with 7-way plugs on both ends
 - 2 3/8" air lines with gladhands on one end
 - 2 Quick disconnect air connectors (male and female for tester and air lines)
 - 1 Air filter regulator to provide clean 120 PSI air pressure
 - 1 Protective Cover
- 1 Lite-Check Tablet with Charger and Cable

Please inspect the shipment when it arrives for any missing or damaged items

Optional Accessories

These additional items are available from LITE-CHECK:

- Mobile Tester cart (20016)
- Tire tool (18093)
- Power supply (18085)

Remember: Power to the tester must be **regulated** to protect the trailer's ABS electronics and ensure consistent tester performance.

Power Warning: The Lite-Check VERIFIER Trailer Interface monitors the current flow through the ground circuit to aid in identifying various fault conditions. Care should be taken to ensure that the Trailer Interface's power source is not grounded to the trailer being tested. When testing or inspecting tractor-trailer combination units, <u>DO NOT</u> use the battery on the tractor as a power source for the VERIFIER Trailer Interface.

System Component Descriptions



VERIFIER Trailer Interface:

Microprocessor controlled high-precision machine used to connect to electric, air and ABS systems of semi-trailers.



VERIFIER Tablet:

Used to guide the technician through the inspection process and remotely operate the VERIFIER Trailer Interface. Collects inspection results including air, electric, ABS diagnostic data, photographs, and technician's notes in an organized format.



Tire Tool:

Combination tread depth and air pressure gauge allows tech to take multiple tire measurements quickly and accurately, transmitting them wirelessly to the tablet. Inspection app automatically notes the lowest tread depth as well as the difference between highest and lowest on a single tire.

Trailer Interface Overview



The Lite-Check VERIFIER Trailer Interface has the following components:

Feature	Function
Bluetooth Antenna	For communication with Tablet
USB Port (Internal)	For updating the Trailer Interface firmware
Power Switch	Turns Trailer Interface on and off
Emergency Air Quick Release Service Air Quick Release	For connecting to trailer Emergency Gladhand For connecting to trailer Service Gladhand Indicates your tablet is connected to the tester
Service Air Quick Release	For connecting to trailer Service Gladhand
Bluetooth (Blue LED)	Indicates your tablet is connected to the tester
Air Source	Input: 3/8" line, 120 PSI minimum @10 CFM
7-Way Plug	For connecting to the trailer
Power (Green LED)	Indicates the Trailer-Interface is powered on

VERIFIER Trailer Interface and Tablet Setup

The following steps should be taken to ensure proper setup of the Lite-Check VERIFIER Trailer Interface.

- 1. Mount the unit securely
- 2. Connect the incoming air supply with at least 120 PSI from the compressor through a filtered air regulator set to **NO LESS** than 120 PSI
- 3. Connect the Emergency and Service air lines to the front of the VERIFIER

Warning: The Trailer-Interface has self-calibrating air pressure transducers - IT IS IMPERATIVE THAT THE TESTER ONLY EXPERIENCE ATMOSPHERIC PRESSURE DURING POWER-UP AND REBOOT. This can be achieved by connecting the air lines to the front of the tester, and the regulated supply air must also be connected.. DO NOT CONNECT THE GLADHANDS TO A TRAILER WHEN STARTING THE TRAILER-INTERFACE. Ensure that there are NO air circuits active when the VERIFIER Trailer Interface is reset.

- 4. Connect the VERIFIER Trailer Interface Tester to a 12 Volt, 20 Amp power supply or 12V battery. **Warning:** A 12 volt battery charger cannot be used to power the system. Applied power must be clean (filtered and regulated) and capable of supplying 20 Amps.
- 5. Flip the Power Switch to turn the tester on. The green LED next to the power button will illuminate when the unit is on. **NOTE: A flashing green LED means the air sensor calibration failed. Assure that the air lines are at atmospheric pressure at power up.**
- 6. Turn on the Tablet
- 7. The **Bluetooth** icon should be visible in the upper left corner of the tablet and the blue LED should stop flashing and be solid when connected. If you are connecting to a trailer interface you haven't connected to before, tap on the Bluetooth icon and select your tester from the list of devices. From now on the app should automatically connect if it was launched after the 1020 was powered on. If not look to make sure the correct device is selected.

Reminders

- Do not use a battery charger while the VERIFIER Trailer Interface is in use. Battery chargers are not regulated and may cause damage to the ABS ECU or the tester.
- The VERIFIER Trailer Interface will not operate properly below 11.5 volts
- 120 PSI **regulated air input** is required for proper air operation

Tablet DOT Mode Features

The DOT Mode is used to perform a complete inspection to verify Federal DOT compliance or for preventative maintenance purposes.

Performing an Inspection

- 1. On the tablet, start the Lite-Check DOT app by pressing its icon on the home screen.
- 2. Enter your credentials and tap "OK" to login. After a few moments you should see the tester voltage in the upper left corner of the screen. If not, press the Bluetooth Icon in the upper left corner and select your Trailer Interface from the list.
- 3. If you are resuming a partially completed inspection or verifying repairs made as a result of a recent inspection, tap the three vertical dots in the upper right-hand corner to open the menu and select "Open". Select the inspection to resume from the list based on the trailer ID and the date. To sort by most recent, tap on-screen the arrows beside "Date" until only a single down arrow is displayed. Skip to step #9.
- 4. To start a new inspection, select your shop location from the drop-down list and enter the work order ID (if any).
- 5. Tap on the trailer ID to select the trailer to be inspected. You can scroll through the list or enter the first few characters of the ID to narrow the list to IDs that start with those characters. Alternately, if your trailers have ID barcodes, press "Scan" and read the barcode with the tablet. Notes on barcode scanning:
 - Ensure adequate lighting when scanning
 - The barcode should be roughly centered and fill at least half of the narrowest dimension of the screen
 - If the image is not crisp and clear, retake the picture
 - Ensure the barcode label is clean and legible
 - Ensure the camera focuses on the label if there are nearer or farther items in the frame
 - Supported types are Code 39, Code 128, UPC A, and UPC E (contact Lite-Check if you have other requirements and we may be able to accommodate them)
- 6. If this is a new trailer that has not been added to the cloud yet and you are authorized to add trailers from the tablet, press the "New Trailer" button and enter the trailer configuration information. Pay special attention that the brake type, tire type, and ABS checkbox are correct.
- 7. Select the type of inspection you wish to perform from the drop-down list. Note that the available inspections will vary based on the unit type of the trailer you selected.
- 8. Press "Save" to begin the inspection.
- 9. Most inspections begin at the front of the trailer. Visually inspect the 7-wire connector and the gladhands before making those connections to the Trailer Interface. Then complete the remaining inspection items on the front.

- 10. Tap "Save" to proceed, then press the "Run Tests" button to begin automated testing of all light circuits and the ABS system. The "info" button for each test can be selected to see results in real time.
- 11. If you leave the "Run Air Leak Test" box checked, charging of the trailer's emergency tank and service air lines will begin upon completion of the ABS test. **Note that this will release the spring breaks and the trailer will roll if it was not properly chocked!** Once the air pressure in the emergency system stabilizes (above the minimum value of 100 PSI) the background air leak test will begin automatically. It will run for 60 seconds and record the starting pressures and air leak rate for both emergency and service systems.

Note the following:

- The progress of the background air leak test may be monitored via the status messages at the bottom of the screen.
- If the air pressure has not stabilized above 100 PSI by the time the inspection reaches the Air Brakes screen, the test will be canceled. It may be performed manually in Diagnostic Mode or repeated in DOT mode by completing the current inspection, then loading the results by selecting "Previous" in step #3 and repeating the automated tests.
- Because the ABS ECU vents a small amount of air when power is applied, the Brakes and Aux lights may not be switched on during the 60-second window of the air leak test itself. Those lights can be activated before and after that time (while the air system is charging or once the test has completed).
- Switching to Diagnostic Mode while the background air leak test is in progress is not recommended and will cancel the background airleak test.
- 12. You may proceed with the inspection before the automated tests complete by pressing "Save". Note, however, that visual inspection of lights will be disabled until the electrical and ABS tests finish. This usually takes approximately 90 seconds.
- 13. Each subsequent screen will be one of three types:
 - **Inspection Screen:** for each item in the list, select "Good," "OOS" (out of service), or "N/A" (not applicable). The numbers in blue superscript are the TMC PMI inspection codes, for reference.
 - **Lights Screen:** a screen allowing specific trailer lights to be turned on and off for visual inspection. Tap the light icon to turn the light circuit on, and tap again to turn it off.
 - **Tires Screen:** a screen showing all the tires on the trailer. It may be necessary to scroll the screen if there are several axles. Only the tires on the left or right side will be active, depending on your inspection point, but previously entered values will be visible for all tires. Select any tire icon to enter its air pressure, tread depth, and condition in the pop-up dialog. The currently active tire will be highlighted in red. If you have the Bluetooth tire pressure and tread depth gauge, see Bluetooth Tire Tool.
 - Air Brakes Screen: the screen allowing entry of measured values for brake pad/shoe thickness and applied brake stroke, if applicable. Select the left or right side of each axle to bring up the corresponding dialog and enter values. For drum brakes, press the "Service" button to activate the brakes and measure the movement of the slack adjuster rod. Press it again to release the brakes.

LITE-CHECK VERIFIER TRAILER INSPECTION SYSTEM

- 14. On any of these screens you may press the "Note/Pic" icon at the bottom of the screen to enter a note and/or take a picture for a specific item in the list. If you select "General", you can optionally check the OOS box to mark an item that was not explicitly listed as OOS. Notes and pictures appear in the final inspection report.
- 15. To move to a specific part of the inspection at any time, select "Overhead View" from the menu then select the location you wish to visit (front, left, rear, right, undercarriage, and top). If you loaded a previous inspection you can go to any point for review, but if this is a new inspection you cannot select a point beyond your current progress, you must advance in sequence around the trailer.
- 16. After the last screen (Top), a report summary will be displayed showing ABS details and a list of OOS items, including notes and pictures if any. You may tap "Submit" to send the report to the Lite-Check Cloud for secure storage, reporting, analytics, viewing, and printing, or tap "Modify" to go back and repeat tests or modify selections and entered values

A Note on Thresholds

The threshold at which measured values are considered out of service may be specified for tire pressure, tread depth, brake pad/shoe thickness, and air leak rate (both emergency and service). Any values less than the specified threshold will be considered OOS and marked as such on the report (except, of course, for air leak, where values greater than the threshold are OOS).

Thresholds can be changed on the Lite-Check Cloud by managers.

Bluetooth Tire Tool (Accessory)

The Bluetooth tire pressure and tread depth tool should be paired with the tablet when you receive it. Hold the button down until the LED illuminates to power the tool on. The first time you use the tool, press the Bluetooth icon in the DOT application and select the "Trans-Logik" entry in the list with the serial number matching that on the tool's decal. After a moment you should see a message indicating that the tool is connected, and the icon should appear in the toolbar (unless you are in Diagnostic Mode or the very first screen of the app which has no toolbar). The icon serves as a connection indicator and also opens the calibration dialog for the tool.

Procedure For Taking Measurements

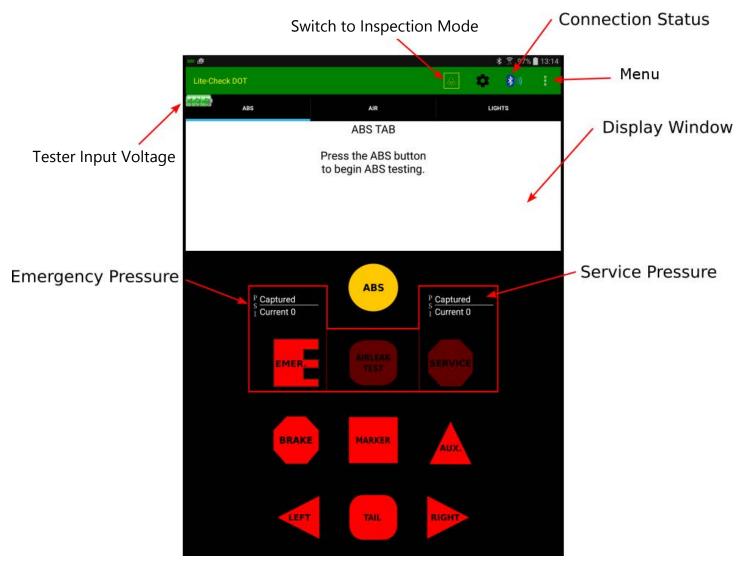
When the left or right tire screen is active and the tool is connected, start with the outside tire on the first axle. Take as many tread depth measurements as desired at various locations on the tire. An audible tone indicates when each measurement is taken, but only the smallest measurement will be stored. Next measure the air pressure for that tire (indicated by a different tone) and the active tire will automatically advance. Repeat the procedure for each tire, advancing from outside to inside, and then to the next axle. To retake measurements for a specific tire, tap it's icon on the tablet screen and a dialog will appear showing the current values. Use the tool to take tread depth and/or pressure measurements and the old values will be replaced. This technique can be used to reset the minimum tread depth value previously measured on a tire.

Tool Calibration

Periodically the tool should be calibrated to ensure accurate measurements. Use the metal calibration cylinder included with the tool in conjunction with a known 100 PSI air source. Press the icon in the toolbar to bring up the calibration dialog and follow the on-screen instructions carefully. Failure to do do will cause erroneous readings from the tool.

Tablet Diagnostic Mode Features

The image and notes below reference the diagnostic mode of the Lite-Check DOT app found on the Lite-Check supplied tablet. Touching the indicated "buttons" will activate the desired function.



NOTE: Only "lit" icons (buttons) are available for use. Above is the "ABS" Tab; notice that the ABS, Emergency and Electric function buttons are illuminated; these buttons are available for use. Selection of any "lit" feature will automatically change the current tab to the feature you are working with.

LITE-CHECK Recommended Operation Procedures

The following pages illustrate the Lite-Check recommended operation procedure. This involves first applying Emergency Air to the trailer to release the spring brakes, then inspecting all of the electrical circuits and ABS.

- 1. If a report is desired, switch back to DOT mode via the icon in the toolbar and enter values for all the fields on the Inspector, Carrier, and Trailer screens that you wish to appear in the report, then switch back to diagnostic mode.
- 2. Select the "EMERGENCY" button to charge the Emergency Air

- 3. Perform **electrical** tests for each circuit on the trailer
- 4. Perform ABS tests
- 5. Return to Air functions to perform the "**LEAK**" test for Emergency, or Emergency and Service
- 6. To submit the gathered data to the Lite-Check Cloud for storage, viewing, or printing, select Submit Report from the menu

Air

- Provides real-time air pressure on both Emergency and Service air systems
- Allows for testing of just Emergency or Emergency and Service circuits
- Leak rates are displayed during the Air Leak Test. **NOTE:** This test has no time limit.
- A negative leak rate indicates an internal leak between the systems (pressure is rising on the service side)
- To prevent brake compounding, the Service air **cannot** be activated unless the Emergency air has been activated **first**.
- Ensure the air lines are connected properly, blue (black) is **Service**, red is **Emergency**

Electrical (Lighting)

- Displays real-time voltage supplied by the VERIFIER
- Each circuit can be energized independently to accurately determine that circuit's condition
- Voltage and current for each selected circuit will be shown on the tablet screen
- Circuit condition descriptions are as follows:

CONDITION	DESCRIPTION
GOOD	The circuit is good with no issues
CHASSIS SHORT	The circuit has a short to the trailer (chassis) return circuit
CIRCUIT SHORT	The circuit has a short to another circuit (e.g., Tail to Marker)
OPEN	The circuit is open - wire is disconnected or broken
OPEN GROUND	No circuits are grounded through the 7-way

NOTE: If a Chassis Short is detected, the VERIFIER Trailer Interface will retry the circuit approximately 1 time per second until either the issue is fixed, another circuit is activated or the shorted circuit is deactivated.

ABS

Press the "ABS" button on the tablet

- Reads Haldex, Bendix, Meritor and Wabash ECUs with PLC through the AUXILIARY PIN 7 (with some exceptions—contact Lite-Check for details)
- Includes support for Roll Stability and Advanced ABS
- Displays all PLC ABS information on the Tablet screen for easy access

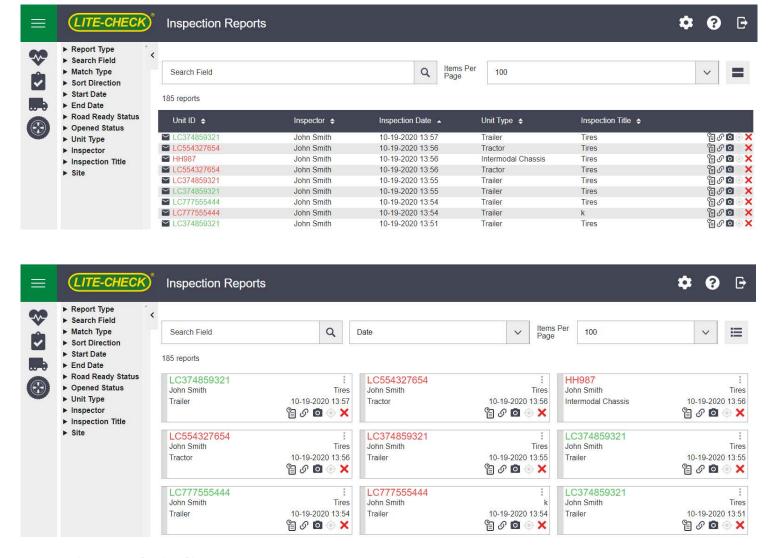
Steps of ABS operation

- 1. The VERIFIER will determine the condition of the Brake and Auxiliary circuits
- 2. The VERIFIER will determine if a **PLC signal** can be detected. If there is no signal, the operator will be notified to exit the test
- 3. The VERIFIER will determine the manufacturer and ECU model
- 4. Additionally, it will determine the following information:
 - Configuration
 - **Active Faults** The details for each fault can be listed There is a help feature available for each fault (not available for Wabash)
 - Odometer reading for that particular ECU
 - Trip odometer reading, which can be reset (if supported by ABS model)
 - Serial Number for that particular ECU
 - VIN if available
 - ECU Voltage if available
 - **Wheel Speed** Displays real-time wheel speed reading as well as the highest RPM. Readings will be reset when the test is exited.
 - **ABS Load Test** Turns on all the lighting circuits and displays the voltage and current at the VERIFIER as well as the ECU voltage, if it is available.

Lite-Check Cloud

The Lite-Check Cloud serves as a secure repository for all inspection reports submitted from the tablet. From the cloud you can view all inspection reports, see the inspection history of a trailer, view fleet status, perform analytics and more. To view the cloud anywhere in the world on any device with internet access, open a browser window and go to https://lcfleetsolutions.com

Note that our cloud server was designed for Chrome and some features will not work correctly in other browsers.



Viewing and Finding Reports

There are two ways to view the cloud; list or card view. Each report is labeled by the trailer ID. Click it to open the report. To view the next page, click the page numbers at the bottom of the report type column. Reports can be sorted by trailer ID, date, or inspector's name using the control above the report columns. Additional options can be seen by hovering the cursor over the menu (three vertical dots).

Deleting Reports

To delete a report click the delete option in the menu on the report card. This will redirect you to a page to confirm your intention to delete the report. Once a report is deleted it cannot be recovered.

Downloading Images

Images taken during an inspection can be downloaded by clicking the "Image Gallery" option in the report menu. This will redirect to a page where you can view all of the images. To view an image in full resolution click its thumbnail. Select which images to download by clicking the check-box below its thumbnail, then click the button "Download selected images". This will generate a zip file containing the images. If you intend to download all the images taken, click the button "Download all images".

Saving Reports

To generate a PDF version of a report, open it and click "Print" in the web browser menu. When the print dialog appears change the destination to "Save as PDF" then click save. You can also send the report to a printer. PDF versions are ideal for saving on the local computer or sending via email.

Troubleshooting - Trailer Interface and Tablet

If the tablet loses its link to the VERIFIER Trailer Interface (becomes unresponsive):

- 1. Press the Bluetooth icon in the upper–left corner of the screen and select the Verifier from the list.
- 2. Restart the app
 - A. Press the "**APP HISTORY**" icon (to one side of the Home button; looks like two boxes, one in front of the other)
 - B. Swipe the title bar of the DOT app off the screen
 - C. Return to Home screen
 - D. Press the "LITE-CHECK DOT" icon on the Home screen to restart
 - E. If these steps do not resolve the problem, move on to step #3
- 3. Cycle power on both the VERIFIER Trailer Interface and Tablet For the VERIFIER TI:
 - (a) Flip the "POWER" switch off (Note that Emergency and Service air, if active, will be released!)
 - (b) Wait for the GREEN LED(Fault) to turn OFF
 - (c) Flip the "**POWER**" switch again to turn the VERIFIER Trailer Interface back on (Green LED light should be solid)

For the Tablet:

- (a) Press and hold the "POWER" button
- (b) Select "Power OFF"
- (c) Select "Power OFF" again
- (d) Wait for the "BLANK" screen
- (e) To turn the tablet back on, press and hold the "**POWER**" button until graphics appear on the screen
- (f) Wait for the tablet to finish booting
- (g) Swipe the LOCK icon
- (h) Open the LITE-CHECK DOT app

To Disconnect and Re-Connect the TABLET with the Trailer-Interface

Disconnecting: There are two different ways to disconnect to the TI. If you want to disconnect from one, and connect to another, tap on the Bluetooth icon in the top left corner and simply select the other device you want to connect to. The previous TI will disconnect automatically. If you just want to disconnect from the TI and not connect to another one, simply tap the "Disconnect" button on the top of the dialog that opens.

Re-Connecting: With the VERIFIER running start the LITE-CHECK DOT app. After a few seconds the tablet should automatically connect. If for any reason it does not, press the Bluetooth icon in the upper left corner and select the Verifier from the list.

The DOT app crashed

Every effort has been made to test the application thoroughly and find bugs prior to release. However, bugs can still occur, including unforeseen interactions with new versions of the Android OS or differences in hardware between various manufacturers' devices. If you encounter a crash or bug, we want to know! The Android system will automatically close the app in most cases. Restart the Lite-Check DOT app and select "View Log" from the menu. A dialog will appear with diagnostic information about the most recent problem the app encountered. Please tap the "Send Error Report" button and select an e-mail application. Please enter as much information as possible about what you were doing prior to the crash and any other details that may help us find the problem and then send the e-mail (the Lite-Check Verifier tech-support e-mail address is automatically set as the destination). If Wi-Fi with internet access is not available in your shop, please call Lite-Check tech support.

Warranty, Contact and Service Information
LITE-CHECK products have a one-year limited warranty on parts and labor against manufacturing defects. All warranty service to be performed at LITE-CHECK, Spokane, Washington. The Customer is responsible for shipping costs. The warranty does not cover abuse, neglect, or damage caused by air electrical, or other outside sources as specified in the owner's manual. Some parts may be subject to OEM warranties. Any modifications made to the equipment without prior written approval, voids this
warranty. Any software upgrades released within one year from the date of shipment will be provided at no additional cost. Extended, enhanced and/or expedited warranties are available.
Testers and power supplies have a serial number attached to the device for tracking purposes.
Questions concerning operation and service may be addressed to LITE-CHECK by calling
1-800-343-8579 during normal business hours (Pacific Time Zone).

Shipping LITE-CHECK Products

Please follow these instructions for shipping LITE-CHECK testers and products to minimize damage.

- 1. Call lite-check to get an RMA (Return Merchandise Authorization)
- 2. Remove all air connections from the tester
- 3. Include the tablet and tire tool (if applicable)
- 4. Select a sturdy box that exceeds the tester's size by at least 2 inches in all three dimensions.
- 5. Pack tester in an upright position with the shipping label on top of the box
- 6. Place packing material on bottom and all surfaces to prevent movement inside box
- 7. Enclose return shipping instructions
- 8. Include a brief explanation of equipment problems and history

Ship to the following address:

LITE-CHECK FLEET SOLUTIONS INC. 301 NORTH HAVANA SPOKANE, WA. 99202