



INSPECTOR MODEL 910B

OPERATIONS MANUAL

LITE-CHECK VEHICLE TESTER

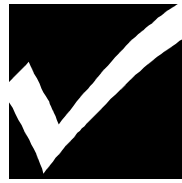
for

**AIR BRAKES, ELECTRICAL,
& ABS**

REV 8.25

LITE-CHECK

3102 E Trent Avenue
Spokane, WA 99202
800 343-8579
www.lite-check.com



CAUTION!!!!

- ✓ **BLOCK VEHICLE WHEELS FROM MOVEMENT BEFORE RELEASING BRAKES.**
- ✓ **THE ANTENNA MUST BE FULLY EXPOSED FOR A GOOD RADIO SIGNAL.**
- ✓ **DO NOT ARC WELD WHILE USING THE TESTER. TESTER IS GROUNDED TO THE CHASSIS. DAMAGE WILL OCCUR TO THE TESTER.**
- ✓ **DO NOT HOOK UP ELECTRICAL DEVICES ON THE SAME TRAILER THAT THE TESTER IS DIAGNOSING. TESTER NEEDS A CLEAN POWER SUPPLY.**
- ✓ **DO NOT LENGTHEN EXISTING POWER CORD ON THE TESTER. ATTACH THE TESTER POWER CORD DIRECTLY TO A 12-VOLT BATTERY OR A REGULATED POWER SUPPLY. LENGTHENING THE POWER CORD WILL CAUSE A POWER DROP.**
- ✓ **BE AWARE OF VOLTAGE SPIKES, TESTER WILL ONLY OPERATE ON REGULATED POWER. USE A 12-VOLT BATTERY OR LITE-CHECK 311R REGULATED POWER SUPPLY.**
- ✓ **USING A BATTERY CHARGER OR POWER CONVERTER, AS A POWER SOURCE, WILL DAMAGE THE TESTER. DO NOT CHARGE A BATTERY WHEN THE BATTERY IS CONNECTED TO THE TESTER.**
- ✓ **THE TESTER WILL NOT OPERATE EFFICIENTLY BELOW 10.5 VOLTS AND WILL INDICATE "LOW BATTERY" (LOW BAT).**
- ✓ **THE TESTER MAY SHUT DOWN BELOW 9.0 VOLTS.**
- ✓ **IF OPERATING GASOLINE MOTORS NEAR TESTER, PLEASE BE SURE THAT THEY HAVE STATIC SUPPRESSION ON THE ENGINE. STATIC CAN CAUSE RADIO INTERFERENCE.**
- ✓ **THE EMERGENCY AIR MUST BE APPLIED BEFORE THE SERVICE BRAKES WILL OPERATE. THIS PREVENTS BRAKE COMPOUNDING.**

TABLE OF CONTENTS

INTRO TO THE LITE-CHECK 910B <i>INSPECTOR</i> - DIAGNOSTIC TESTER	1 - 2
<u>SET-UP AND OPERATION</u>	
-HOW TO SET UP THE LITE-CHECK 910B	3
-READING DIGITAL DISPLAY	4
-KEY BOARD OPERATIONS	5
-REMOTE CONTROL	6
-TRAILER ELECTRICAL SUPPLY	7
-LOW BATTERY MESSAGES	7
<u>TRAILER OPERATION</u>	
-TRAILER OPERATION	8
-CIRCUIT CONDITION MESSAGES	8 - 9
-INSPECTING FOR ELECTRICAL FAULTS – TRAILERS.....	10
-ELECTRICAL FAULT CONDITIONS	11 - 12
-AUTOMATIC TRAILER ELECTRICAL TEST.....	12 - 13
-TRAILER AIR SYSTEMS OPERATION	14
<u>TRACTOR OPERATION</u>	
-TRACTOR OPERATION	15
-TRACTOR SERVICE BRAKES	16
<u>CABLE TEST</u>	
-7-WAY CABLE TEST	16 - 17
<u>ABS TEST</u>	
-TRAILER POWER SUPPLY REQUIREMENTS – TMC 141	17
-TRAILER END OF THE LINE TEST	18
-ABS FAULT IDENTIFICATION AND TROUBLESHOOTING.....	18
-TRAILERS WITH BLINK-CODE STYLE ABS ECU'S, AUTOMATED OPERATION	19
-“ONE BUTTON ABS”	20
-ECU ODOMETER READING NEW	20
-PLC BASED ABS TESTING BY MANUFACTURER	21 - 25
-BENDIX & WABCO FAULTS AND DESCRIPTIONS	26 - 29
-HALDEX FAULT CODES AND DESCRIPTIONS	30 - 31
<u>GLOSSARY</u>	
-DEFINITION OF TERMS	32
WARRANTY AND SERVICE INFORMATION	Inside Back Cover

LITE-CHECK 910B ACCESSORIES

- 311R 12VDC REGULATED POWER SUPPLY
- 330A PEDAL ACTUATOR
- 301M SERVICE TRUCK MOUNTING/CONNECTION KIT
- 300K SHOP CONNECTION KIT WITH CART

LITE-CHECK 910B INSPECTOR DIAGNOSTIC TESTER

|||| LITE-CHECK

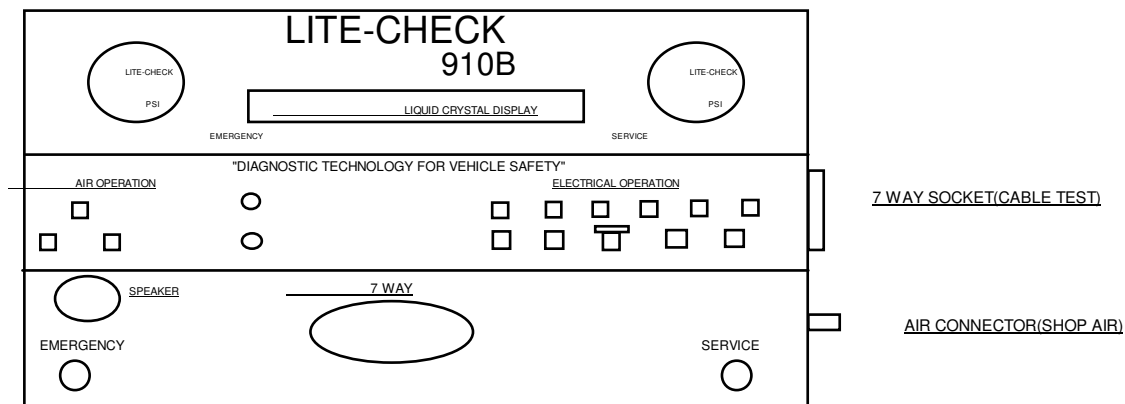


INSPECTOR 910B

The LITE-CHECK 910B *INSPECTOR* Diagnostic Test system will do vital diagnostics on the electrical systems and the air systems on both tractors/trailers. Additionally, the *INSPECTOR* software trailer ABS inspection, fault identification, and troubleshooting support at the fingertips of trailer inspectors and mechanics. With the LITE-CHECK 910B, your facility has an efficient tool for the safety assurance and maintenance of your heavy-duty fleet.

Key Features of the 910B INSPECTOR....

- * **Patented remote control operation of electrical and air systems**
- * **Dynamic monitoring of electrical faults**
- * **Computer driven monitoring of all 7-way circuits at the same time allows direct identification of shorts between circuits, open grounds, open supplies, and chassis short.**
- * **Computer display provides fault information at the tester, and unique audible alarms assist in troubleshooting and repair activities at various locations around the trailer and tractor**
- * **Regulated “Service Air” for consistent brake application and inspection**
- * **Performs one-step air systems leak test with built-in 60 second timer**
- * **Automatic Cable Test**
- * **“One-Button ABS” feature with direct access to faults present in ABS controllers**
- * **Built-in guidance for ABS fault resolution**



LITE-CHECK 910B DIAGNOSTIC TESTER

The following items are included with the LITE-CHECK 910B *INSPECTOR*:

- (1) Owners Manual
- (1) Antenna
- (1) Remote Control
- (1) Plastic Cover with Remote Pocket

MATERIALS REQUIRED:

1. 7-way cable with 7-way plugs on both ends
2. ¼" air hoses with glad-hands on one end (2 each).
3. Quick disconnect air connectors (2 ea. male & female for tester and air hoses)
4. Filtered air regulator to provide clean 110-120psi air pressure
5. 12-volt battery (charged) to power the 910B INSPECTOR **OR** a Regulated Power Supply
Note: Power to the tester must be regulated to protect the trailer's ABS electronics and ensure consistent tester performance
6. Mounting location or plate to secure the tester
Note: The Lite-Check 910B INSPECTOR is a "diagnostic" tester that monitors the current flow through the ground circuit to aid in identifying various fault conditions. Care should be taken to insure that the tester's case is not grounded to the trailer or tractor under test. Also, when testing and inspecting tractor/trailer combinations, the tester should not be supplied with power from the tractor under test.

SET-UP PROCEDURES:

1. Review the Owners Manual and Quick Reference Guide
2. Mount the tester securely
3. Connect the 910B Tester to a 12 volt power supply
Note: A 12 volt battery charger or simple inverter cannot be used, applied power must be clean (filtered and regulated)
4. Connect air supply, through a filtered regulator, to the tester on the side panel. (110psi is recommended)

Red Battery Clamp or Ring Terminal - Positive
Black Battery Clamp or Ring Terminal – Negative

If tester will not operate, check to see if 12 volt power line polarity is reversed

SOME REMINDERS:

DO NOT USE BATTERY CHARGERS - Battery Chargers are non-regulated

NOTE: THE TESTER WILL NOT OPERATE RELIABLY BELOW 10.5 VOLTS AND WILL INDICATE "LOW BATTERY" (LOW BAT) .

THE TESTER WILL COMPLETELY SHUT DOWN IF VOLTAGE DROPS BELOW 9.0 VOLTS.

THE SYSTEM STARTUP DEFAULT IS SET FOR TRAILER OPERATION

INPUT AIR PRESSURE SUPPLY MUST BE ABOVE 90 PSI FOR TESTER TO BE USED FOR AIR BRAKE INSPECTIONS (110psi INPUT AIR IS RECOMMENDED)

EXAMPLES OF MESSAGES ON THE DIGITAL DISPLAY

LITE CHECK INSPECTOR 910B REV 8.20
--

THIS IS THE FIRST SCREEN THAT APPEARS ON THE DISPLAY FOR SEVERAL SECONDS

NOTE: Mode and Rev may be different in other models.

VDC XX.XX AMP 00.00 TRAILER

WHEN THE TESTER IS READY, IT IS INITIALLY IN THE "TRAILER" MODE

NOTE: Tester automatically begins in the "TRAILER" mode.

Electrical circuits will show "**GOOD**" with the amperage load.

VDC is the voltage of the tester.

AMP is the circuit amperage the tester is reading.

VDC 13.XX AMP 01.XX 4-BRAKE GOOD

THE TESTER WILL DISPLAY THE PIN NUMBER AND CIRCUIT THAT IS ENGAGED

7 WAY PIN NUMBERS AND CIRCUITS:

4-BRAKE	2-MARKER	7-AUXILLARY	3-LEFT (TURN)
6-TAIL	5-RIGHT (TURN)	1-GROUND	

KEYBOARD OPERATIONS

DESCRIPTION: The panel keyboard overlay is located on the face of the tester. The remote control and the tester panel keyboard work parallel with each other.

<u>PANEL KEY</u>	<u>REMOTE KEY</u>	<u>FUNCTION</u>
AIR OPERATION		
"EMERG"	"EMERG"	Operates emergency air
"SERVICE"	"BRAKE"	Operates service air (if emergency is pressurized)
"AIR LEAK TEST"	"AIR LEAK TEST"	Blocks air source for vehicle air leak test

ELECTRICAL OPERATION

"BRAKE"	"BRAKE"	Operates brake electrical circuit & "Service Air"
"MARKER"	"MARKER"	Operates marker (clearance) circuit
"AUX."	"AUX."	Operates auxiliary circuit (ABS power)
"LEFT"	"LEFT"	Operates left turn circuit
"TAIL"	"TAIL"	Operates tail circuit
"RIGHT"	"RIGHT"	Operates right turn circuit

ACTIVATING MULTIPLE CIRCUITS AT THE SAME TIME

Note: Diagnostic troubleshooting support will be restricted

<u>PANEL KEY</u>	<u>REMOTE KEY</u>	<u>FUNCTION</u>
"STORED"	"B" or "STORED"	Sets the tester to the "multiple circuits" mode, press again to exit Switch the individual circuits on or off as desired

DETAILS: Diagnostic testers such as the 910B INSPECTOR, and other members of the Lite-Check family of automatic vehicle testers, activate a single circuit at a time and monitor the activity on all of the circuits to provide computer assisted fault identification. Multiple circuits can be activated at the same time by using the "STORED" on the tester or the remote control unit. In this mode, multiple circuits can be switched on and off, with the tester's computer display indicating the total current draw of all of the circuits. Press the "STORED" or "B" key to leave this mode.

<u>PANEL KEY</u>	<u>REMOTE KEY</u>	<u>FUNCTION</u>
MISC		
"ALL CIRCUIT TEST"	N/A	Automatic test of all 6 circuits
"ALARM MUTE"	N/A	Turns alarm off during electrical test
"TRACTOR"	"TRACTOR"	Select "Tractor" mode and activate cable test

"ONE-BUTTON ABS" AND OTHER ABS FUNCTIONS

"A" or "ABS"	"A" or "ABS"	ABS test
"B" or "STORED"	"B" or "STORED"	Measure total trailer amperage load or read stored faults
"C" or "CLEAR"	"C" or "CLEAR"	Clear ABS faults
"D" or "SELECT"	"D" or "SELECT"	Select ABS type or PLC Active Fault Repair Help Screen

*NOTE: AN "OR" IN THE KEY TITLE INDICATES AN UPGRADE HAS BEEN MADE TO THE PANEL & REMOTE SWITCH MEMBRANES. THIS DOES NOT AFFECT THE KEY FUNCTIONS.

REMOTE CONTROL

DESCRIPTION: The remote control allows the vehicle inspector to operate air & electrical functions around the vehicle and observe the response.

REMOTE CONTROL OPERATION:

1. Press and release designated key
2. Inspect. One light circuit will be activated at a time (See "Activating Multiple Circuits" on page 7 if desired)
3. Remote control can be keyed to operate one or multiple testers.
4. Remote control operation is parallel to panel keyboard
5. Range with good AA batteries is over 100 feet
6. Sending lamp will light up when button is pressed on remote control
Note: Replace (4) AA batteries if lamp does not illuminate

NOTES:

1. **IF REMOTE CONTROLS NEED TO BE KEYED TO DIFFERENT TESTERS, CALL LITE-CHECK FOR ASSISTANCE**
2. **ANTENNA ON TESTER MUST BE FULLY EXPOSED FOR BEST RECEPTION.**
3. **CHECK TESTER VOLTAGE (minimum 10.50 volts) AND REMOTE CONTROL BATTERIES IN CASE OF POOR OPERATION.**

ELECTRICAL SUPPLY - POLARITY

DESCRIPTION: The tester is designed for negative ground vehicles (black-negative, red-positive). In case of reversed battery leads on power cable, tester will not operate.

SET UP:

1. Attach battery cable clamps (or ring terminals) to 12vdc automotive battery or Regulated Power Supply.

Black battery cable - negative

Red battery cable - positive

2. Turn power switch on located on back panel of the tester for operation.

LOW BATTERY MESSAGES

The tester message "**LOW BATTERY**" indicates that the 12-volt battery powering the tester needs to be recharged. The tester will display the voltage (VDC) that is being received.

NOTE: THE TESTER WILL NOT WORK PROPERLY IF THE BATTERY IS NOT CHARGED TO THE FULLEST (12+ VOLTS).

NOTE: The tester will not operate and possibly lock up, if the power is below 10.5 volts.

VDC 10.40 LOW BATTERY

THIS SCREEN INDICATES THAT THE BATTERY NEEDS TO BE RECHARGED.

TRAILER OPERATION

Connect a 7-way cable and 2 each 1/4" airlines from the tester to the trailer. (Be careful to connect "service" to "service", and "emergency" to "emergency")

OPERATION:

1. Use either the tester panel keys or the remote control.
2. Tester's panel circuit indicator lights will illuminate with operation.
3. Digital display will show electrical status.
4. Air gauges will show air application pressure.

AIR BRAKE:

1. Release parking brakes (source air at 110-120psi) by pressing "**EMER**" key.
2. Set service brakes (regulated at 85-90psi) by pressing "**BRAKE**" key.
3. Perform air test by pressing "**AIR LEAK TEST**" key and observe the air gauges for change.
4. Release air by pressing "**EMER**" key.

NOTE: EMERGENCY AIR MUST BE APPLIED BEFORE SERVICE BRAKES WILL OPERATE. THIS PREVENTS BRAKES FROM COMPOUNDING.

Tester automatically starts in the electrical mode.

LIGHTING:

1. Panel electrical indicator light is normally lit up. Press the "**TRACTOR**" key to turn off electrical mode if only air operation is desired.
2. In normal operating mode, only **one** electrical circuit will operate at a time. Digital Display will show amperage, voltage, and circuit condition.

AVAILABLE CIRCUIT CONDITION MESSAGES

Note: Lite-Check automatic testers are "live" in that any changes in circuit conditions are immediately reflected by the tester

GOOD - (CIRCUIT PASSES)

Circuit indicator light is on.

Amperage will indicate the circuit load on the Digital Display

VDC 13.XX AMP 01.88 4-BRAKE GOOD

OPEN - (OPEN WIRE AND NO AMPERAGE LOAD)

Panel circuit indicator light is on and the "OPEN" fault alarm sounds

Digital display shows active circuit and displays fault: "OPEN"

VDC 13.XX AMP 00.00 4-BRAKE OPEN

SHORT - (CIRCUIT WIRES ARE IN CONTACT)

Panel circuit indicator lights illuminate for all shorted circuits “shorted” and the “SHORT” fault alarm sounds
 The computer/tester display indicates the circuit under test, current draw, and fault type
 Amperage shows the total circuit load on the digital display

VDC 13.XX	AMP 03.40
5-RIGHT	SHORTED

CHASSIS - (CIRCUIT WIRE IS IN CONTACT WITH CHASSIS or FRAME)

Panel circuit indicator light is on and the “CHASSIS” fault alarm sounds
 Current to the trailer is restricted, and the amperage shows 00.00 on the digital display
 Tester momentarily applied 12 volts to the trailer at 5 second intervals

VDC 13.XX	AMP 00.00
2-MARKER	CHASSIS

OPEN GROUND - (GROUND WIRE IS OPEN)

Panel circuit indicator lights are illuminated for all circuits and the “OPEN GROUND” fault alarm sounds
 The computer/tester display indicates the circuit under test, current draw, and fault type

VDC 13.XX	AMP 00.00
7-AUXIL.	OPEN GROUND

NOTE: If more than one fault is detected, the tester will first identify the worst fault. Once that fault is corrected the tester will go to the next fault and so on.

FAULTS REPAIRED

The tester will reset to normal operation when the faults are repaired

Circuit indicator light is on.

Amperage will indicate the circuit load on the Digital Display

VDC 13.XX	AMP 01.87
7-AUXIL.	GOOD

INSPECTING FOR ELECTRICAL FAULTS

TRAILERS

OVERVIEW:

Begin the inspection process with a properly setup 910B INSPECTOR with adequate air and appropriate 12 volt power.

Air and air connections are not required when performing electrical inspections.

Lite-Check automatic testers are programmed to concurrently monitor all of the wires on the 7-way cable connecting the tester to the trailer and provide immediate feedback on the conditions of each electrical circuit under test.

PROCESS:

Consistency is key to efficient and effective inspections. The 910B INSPECTOR can be used in a variety of ways, and provides the greatest contributions when the inspectors or mechanics employing the tool use it in a way that compliments their preferred process for inspections and troubleshooting.

As a general rule, the following steps represent a sound process for a trailer inspection when an assistive device such as a Lite-Check automatic tester is being used.

With the tester connected to the trailer and operating in the normal "TRAILER" mode:

1. Stand at a front corner of the trailer and using the remote control, activate the "MARKER" and "TAIL" circuits. Observe the operation of the high mounted lights and any front and side mounted lights in that area of the trailer
2. Move to the rear of the trailer and stand so that both the rear and one side are clearly visible. Activate the appropriate circuits for the visible fixtures
3. If the ABS side indicator lamp is visible, confirm that it illuminates when the "BRAKE" and "AUX" circuits are activated. It should illuminate then turn off after a few seconds for both circuits.
4. Move to the opposite rear corner of the trailer and into a position where the remaining rear lights and the remaining side can be observed. Check to insure that all rear and side lights have been inspected. Also, inspect the ABS side light for operation if this has not already been completed.
5. If air is available to the trailer, complete the slack adjuster and brake function inspection at this time. Press the "EMER." Button to apply emergency air to the trailer, and actuate the brakes by repeatedly pressing the "BRAKE" button as needed.
6. Proceed to the front of the trailer and inspect the remaining marker and other front lights not observed earlier in the inspection.

Electrical faults will be signaled by the tester as appropriate.

Electrical circuits that have burned-out or damaged lamps, yet still have properly operating lamps on the circuit will not indicate a fault. The testers computer display can be used to observe the current being drawn by each circuit to look for unusual variances from expected values.

ELECTRICAL FAULT CONDITIONS

OPEN GROUND FAULT

FAULT WITH GROUND WIRE

The return ground wire is damaged, disconnected, etc.

Panel circuit indicator lights are illuminated for all circuits and the "OPEN GROUND" fault alarm sounds
The computer/tester display indicates the circuit under test, current draw, and fault type

VDC 13.XX AMP 00.00 7-AUXIL. OPEN GROUND

OPEN CIRCUIT FAULT

FAULT WITH CIRCUIT SUPPLY WIRE.

Panel circuit indicator light is on and the "OPEN" fault alarm sounds
Digital display shows active circuit and displays fault: "OPEN"

VDC 13.XX AMP 00.00 4-BRAKE OPEN

This screen is identifying a disconnected or broken brake wire.

SHORTED CIRCUIT FAULT

FAULT WITH MULTIPLE CIRCUITS INVOLVED WHEN A SINGLE CIRCUIT IS UNDER TEST (Tester has identified electrical activity on more than one circuit)

Panel circuit indicator lights illuminate for all shorted circuits "shorted" and the "SHORT" fault alarm sounds
The computer/tester display indicates the circuit under test, current draw, and fault type
Amperage shows the total circuit load on the digital display

VDC 13.XX AMP 03.40 5-RIGHT SHORTED
--

This screen is identifying a short to the right turn signal. The circuit(s) that is shorted to the left turn signal will be illuminated, on the tester panel along with the right turn signal.

ELECTRICAL FAULT CONDITIONS (cont.)

CHASSIS GROUND FAULT

FAULT WITH CIRCUIT SUPPLY WIRE IN CONTACT WITH THE CHASSIS OR GROUND CIRCUIT

Panel circuit indicator light is on and the "CHASSIS" fault alarm sounds
Current to the trailer is restricted, and the amperage shows 00.00 on the digital display
Tester momentarily applied 12 volts to the trailer at 5 second intervals

VDC 13.XX AMP 00.00
2-MARKER CHASSIS

This screen is identifying that the marker circuit wire is shorted to the chassis. The testers' software protects the vehicle harness by pulsing the power every 5 to 6 seconds.

NOTE: If more than one fault is detected, the tester will first identify the worst fault. Once that fault is corrected the tester will go to the next fault and so on.

AUTOMATIC TRAILER ELECTRICAL TEST

DESCRIPTION: AUTOMATIC ELECTRICAL TEST OF THE TRAILER WIRING SYSTEM.

SET UP:

1. Connect tester to the trailer with the vehicle cable.
2. Press "**TEST**" key, on the tester panel, to initiate the automatic test of all electrical circuits.
3. Press "**TEST**" key, on the tester panel, to end the automatic test.

NOTE: WHEN A FAULT IS IDENTIFIED AN ALARM WILL SOUND ON THE CIRCUIT. THE TESTER WILL FAIL THE TEST. WHEN THE FAULT HAS BEEN CORRECTED, RERUN THE AUTOMATIC TEST THE TESTER WILL IDENTIFY MORE THAN ONE FAULT.

EXAMPLES OF SCREENS:

VDC 13.XX AMP 00.00
TEST RESULTS P P P P P

AUTOMATIC TEST "**PASSED**"
Each "P" represents one of the circuits
The circuits are listed in the order they appear on the front of the tester
"BRAKE", "MARKER", "AUX.", "LEFT", "TAIL", "RIGHT"

This screen is showing, on the right side of the second line, that the circuits have "**PASSED**" the automatic test.

VDC 13.XX AMP 00.00
TEST RESULTS 000000

ALL CIRCUITS ARE **"OPEN"**

This screen is showing, on the right side of the second line, that all circuits are **"OPEN"**

VDC 13.XX AMP 00.00
TEST RESULTS GGGGGG

ALL CIRCUITS HAVE AN **"OPEN GROUND"**

This screen is showing that there is an **"OPEN GROUND"**

VDC 13.XX AMP 00.00
TEST RESULTS OCPSPS

VARIOUS FAULTS ARE IDENTIFIED.

This screen is showing that BRAKE is **"OPEN"**, MARKER is shorted to **"CHASSIS"**, and LEFT and RIGHT TURN SIGNALS are **"SHORTED"**

VDC 13.XX AMP 00.00
TEST RESULTS PPPSPS

VARIOUS FAULTS ARE IDENTIFIED.

This screen is showing that all the circuits **"PASSED"** except the RIGHT and LEFT turn signals are **"SHORTED"** together.

TRAILER AIR SYSTEMS OPERATION

SET UP:

1. Push the "**EMER**" key on the tester or remote control.
2. Push the "**SERVICE**" key on the tester or the "**BRAKE**" key on the remote control.
3. Push the "**AIR LEAK**" key and the tester will do a leak down test.
4. To cancel this operation push "**EMER**" key.

VDC 13.XX	AMP 02.00
EMG	SERV

DISPLAY INDICATES THAT EMERGENCY AND SERVICE AIR APPLIED.
THE AMPS SHOWING ARE DUE TO THE BRAKE LIGHTS.

VDC 13.XX	AMP 02.00
EMG TEST	SERV T-58

AIR LEAK TEST IN PROCESS WITH A COUNT DOWN OF 60 SECONDS.

The 60 second count down allows the mechanic to time air loss per minute. The mechanic can watch the EMERGENCY and SERVICE air pressure gauges to observe loss. The gauges have 2psi increments allowing easy identification of air leaks.

If the PSI gauges settle out equally, that would indicate a faulty valve or chamber (**internal leak**).

If the PSI gauges show loss of air in one system, that would indicate a hole in the hose or in the connections (**atmospheric leak**).

DOT regulations allow a maximum air loss for Emergency at 2 PSI, and for the Service a maximum air loss of 3 PSI during a 1-minute period.

NOTE: AN "**ANTI-COMPOUND**" FEATURE IS BUILT INTO THE SOFTWARE.
THE EMERGENCY AIR MUST BE APPLIED BEFORE THE SERVICE WILL SET.

THIS SOFTWARE FEATURE WILL PROTECT THE TRAILER AIR SYSTEM. THIS PREVENTS THE SERVICE BRAKES FROM BEING SET BEFORE THE EMERGENCY BRAKES ARE RELEASED.

TRACTOR OPERATION

ELECTRICAL TESTING:

1. Connect tractor 7-way directly into the testers' 7-way connector in the front panel.

TRACTOR OUTPUT (TRACTOR IS POWERING TESTER):

1. Push TRACTOR key. (Display will show "-TRACTOR/CABLE")

VDC 13.XX TRK 00.00 - TRAC/CABL

The numbers to the right of "TRK" indicate the tractor's output voltage

2. Operate the tractor controls in the cab to check 7-way output.
(Recommend setting the tester so that the front panel can be viewed from the inside of the cab.)
3. The LCD Display will show:
 - A. Truck Voltage (e.g. TRK XX .XX)
 - B. Active Circuit
4. End tractor mode by pushing **TRACTOR** key.

VDC 13.XX TRK 15.10 7-AUXIL. -HIGH

TRUCK VOLTAGE OUTPUT IS EXCESSIVE
"-PASS" is between 10 and 15 volts
"-HIGH" is indicated for 15 volts and higher
"-LOW" is indicated for 10 volts and lower

VDC 13.XX TRK 14.10 4-BRAKE -PASS

TRUCK VOLTAGE OUTPUT TO THE BRAKE CIRCUIT
IS 14.1 volts

TRACTOR INPUT (TESTER IS POWERING TRACTOR):

1. Put tester in "**TRAILER**" mode.
2. Operate electrical circuits through the tester.
3. Tractor circuit conditions will appear on tester similar to the trailer operation (good, open, short, ground and open ground).

VDC 13.XX AMP 01.88 4-BRAKE GOOD

NOTE: TRACTOR CIRCUIT RELAYS WILL PREVENT THE LITE-CHECK FROM OPERATING VARIOUS ELECTRICAL CIRCUITS. FAULT ALARM MAY SOUND.

TRACTOR SERVICE BRAKES

You will need a **LITE-CHECK 330A Pedal Actuator** (www.lite-check.com/accessories_330A.htm) to apply the tractor service brakes.

1. Remove air hoses and 7-way cable from tester.
2. Plug pedal actuator 1/4" air hose to service air connector.
3. Install the pedal actuator (the flanged metal end goes against the brake pedal and by pushing the spring loaded latch you can extend the tube to hook onto the bottom side of the steering wheel.)
4. Push TRACTOR key.
5. Switch emergency air **ON** (anti-compound feature for trailer operation).
6. Operate brake switch (on either the remote control or the tester) to apply service brakes.

NOTE: The emergency air may be connected to the tractor dry tank to charge and test that system.

7-WAY CABLE TEST

DESCRIPTION: Tester will test the 7pin vehicle cable automatically.

SET UP:

1. Put tester in TRACTOR mode (push TRACTOR key on the tester panel.)
2. Tester will show voltage coming from the tester and the TRK (truck) voltage with "TRACTOR/CABLE" on the second line.
3. Plug in the cable in two places: the front 7way socket and the right side 7way socket.
4. Tester will automatically read the pins and show either "**PASS**" or "**FAIL**".
5. With a "**FAIL**" message:
 - A. A blank in the second line of the pin sequence means: **OPEN**.
 - B. A reversed pin means: **MIS-WIRE**.
 - C. The same pin number on the second line means: **SHORT**.
(refer to the second and third example)

VDC 13.XX TRK 00.00
- TRAC/CABL

INSERT both ends of the cable to be tested in to the two tester 7-way connections...

4273651 -CAB
4273651 -HIT PASS

THIS CABLE PASSED
ALL CIRCUITS ARE "**GOOD**"

The numbers indicate the pin numbers on the 7-way cable, and map to the order of the electrical buttons on the front of the 910B *INSPECTOR*. The tester's display lights will illuminate for each circuit that passes the test.

4273651	-CAB
4 73651	-HIT FAIL

CIRCUIT 2 IS "**OPEN**"
THIS CABLE FAILED

4273651	-CAB
4 33561	-HIT FAIL

THIS CABLE (SERIOUSLY) FAILED
CIRCUIT 2 IS "**OPEN**", CIRCUIT 7 IS "**SHORTED**" to CIRCUIT 3,
AND CIRCUITS 6 & 5 ARE "**MIS-WIRED**"

"**HIT**" means that the software is testing the pins

7 WAY PIN NUMBERS AND CIRCUITS:

4-BRAKE	2-MARKER	7-AUXILLARY	3-LEFT (TURN)
6-TAIL	5-RIGHT (TURN)	1-GROUND	

TRAILER ABS POWER SUPPLY REQUIREMENTS

DESCRIPTION: Determine total trailer running electrical load

See TMC Recommended Practice 141 - "The purpose of the Recommended Practice is to recommend a minimum voltage of 9.5 volts D.C. which new trailers must supply to their antilock braking system (ABS) electronic control unit (ECU) through both the stop lamp circuit and through the continuous power circuit. The specified value of 9.5 volts for minimum voltage includes a safety margin of 1.0 volt."

SET UP:

1. Connect tester to trailer with 7-way vehicle cable
2. Press "**STORED**" or "**B**" key (will allow multiple circuits as set tester to add circuit loads)
3. Record tester Voltage and Amperage (00.00 at this step)
4. Press the following keys in order
 - "MARKER"
 - "LEFT"
 - "TAIL"
 - "RIGHT"
 - "BRAKE"
 - "AUX"
5. Record Tester Voltage and Amperage
6. Press **STORED**" or "**B**" to cancel test

TRAILER ABS END OF THE LINE TEST

DESCRIPTION: Verify ABS wiring and plumbing installation

The purpose of the test is to confirm the correct operation of the ABS and the wiring and plumbing is correct.

1. Raise trailer wheels
2. Pressurize emergency air to release spring brakes
3. Press "STORED" or "B" key and power "AUX" circuit.
(“STORED” or "B" key allows “AUX” and “BRAKE” circuit to be applied)
4. Turn one wheel and apply "BRAKE".
5. Spinning wheel should have brake applied to verify correct installation.

ABS FAULT IDENTIFICATION AND TROUBLESHOOTING (For 910B Software Rev 8.20)

DESCRIPTION: Operate and test trailer ABS/PLC for Active and/or Stored Faults

Manufacturers and Types of ABS Supported by LITE-CHECK 910B Tester:

MFG	Using Lite-Check's exclusive "One-Button ABS"								PLC HELP
	BLINK CODE (old style)				PLC (Power Line Communications) (new style)				
	ACTIVE FAULT		STORED FAULT		ACTIVE FAULTS		STORED FAULTS		
	Read	Clear	Read	Clear	Read	Clear	Read	Clear	
Meritor Wabco	✓	✓	✓	✓	✓	✓	✓	✓	✓
Haldex					✓	✓	✓	✓	✓
Bendix EC30-T					✓	✓		✓	✓
Bendix TABS-6					✓	✓	✓	✓	✓
Wabash	✓	✓	✓	✓	✓	✓			

All information and directions were obtained from each of the above ABS OEMs. The LITE-CHECK process conforms to each OEMs procedure.

NOTE: If the 910B tester does not support a particular ECU, such as an Eaton unit, the tester display will read "NOT SUPPORTED AT THIS TIME" or "UNABLE TO DETERMINE ECU TYPE".

SET-UP:

1. Connect tester to trailer with 7-way cable and (2) ¼" airlines with gladhands
2. Press "AUX" key to test power circuit to ECU.
 - a. Normal amperage with ABS warning light on is +/- 0.42 amp
 - b. Normal amperage with ABS warning light off is +/- 0.12 amp
(ABS is working without fault)
3. Press "ABS" or "A" key to begin the "One-Button ABS" test, or if the ABS ECU is earlier than 2002, and manufactured by Meritor Wabco or Wabash, the tester can collect ABS status information using an automated "Blink Code" process.

BLINK CODE - AUTOMATED OPERATION

1. Press “**ABS**” or “**A**” key to begin the automated “Blink Code” process.

Display screen will show:

SUPPORTED BLINKCODES
<<WABCO>> WABASH

<<WABCO>> WABASH
ABS=START D=SELECT

Note: On the remote, “SELECT” key is labeled “D”.

2. Use the “D” or “SELECT” key to select either WABCO or WABASH as the ECU installed in the trailer
3. Press the “ABS” key to begin Blink Code ABS fault acquisition

Display screen will show:

BEGINNING ABS TEST
PLEASE WAIT

Additional status screens will follow

4. Screen will show ACTIVE fault if applicable
5. Press “ABS” or “A” key to remove power to ECU and make repairs
6. Press “ABS” or “A” key (repeat steps 1, 2, and 3 above) to verify repair and to view any additional active faults
7. Press “CLEAR” or “C” key to clear fault codes and reconfigure the system
8. Rotate wheels to activate the ECU
9. Press “AUX” key to observe warning light turn on and off.

Note: The 910B reads blink codes by observing the timing of current changes over the AUX cable. In situations where the original ABS fault light mounted to the side of the trailer has been replaced, the fault codes may not be able to be read by the tester. Additionally, the presence of devices drawing current from the AUX circuit may also interfere with the reading of Blink codes.

“ONE-BUTTON ABS”

ABS CONTROLLER COMMUNICATION USING PLC4TRUCKS AND COMMUNICATING VIA THE 7-WAY CABLE

1. Press “**ABS**” or “**A**” key to begin the automated “Blink Code” process.

Display screen will show:

BEGINNING ABS TEST
PLEASE WAIT

PLC TYPE ECU
SIGNAL DETECTED

DETERMINING ECU
MANUFACTURER

AT THIS POINT, PROCEDURES VARY SLIGHTLY FOR EACH MANUFACTURER. PLEASE CONSULT PROCEDURES FOR EACH MANUFACTURER ON THE FOLLOWING PAGES.

ECU ODOMETER READING (Available on REV 8.20 Software & higher ONLY)

1. Once the 910B *INSPECTOR* has identified the ABS ECU, simply press the “ALL CIRCUIT TEST” button on the panel membrane.
2. The screen on the tester will display the mileage reading being broadcast by the ABS ECU on the trailer under test.
3. It can take from 3 to 30 seconds for the ECU to update the mileage and send the signal to the tester. If it is still in update mode, the screen will display the following:

ABS ECU IS IN UPDATE
CYCLE PLEASE RETRY

The screen will return to the initial ABS ECU identified screen. You must press “ALL CIRCUIT TEST” button again to get odometer reading.

4. This feature is supported for the following ABS ECU's:
Wabco, Haldex, Bendix EC-30 & Bendix TABS-6

NOTES:

- 2003 and early 2004 Wabco ECU's do not report mileage and therefore cannot be read by the tester.
- If the update screen displays a static “Updating” message for more than a minute, there is likely a problem with the ECU.

910B INSPECTOR – PLC BASED ABS TESTING PROCEDURES BY MANUFACTURER

BENDIX EC30-T

NO ACTIVE FAULT

BENDIX EC-30T ECU
DETECTED

BENDIX EC-30 CAB OFF
NO FAULTS, ABS GOOD

CAB OFF
NO FAULTS, ABS GOOD

1. Press "CLEAR" or "C" key to clear Stored Faults
2. Press "ABS" or "A" key to exit ABS Test

Note: Stored faults can be cleared, but not read from a BENDIX EC-30 ECU

BENDIX EC30-T

ACTIVE FAULT

BENDIX EC-30T CAB ON
DETECTED

ACTIVE FAULT PRESENT
PRESS SELECT FOR HLP

1. Press "SELECT" or "D" key to activate the **Help Screen** which will identify the ECU specific fault information such as SID & FMI, and automatically scroll through the ECU manufacturer's recommended troubleshooting and repair suggestions.
2. When scroll is complete and "<end>" appears, you can press "SELECT" or "D" again to repeat the **Help Screen** text again.
3. Press ABS key (and AUX key if still on) to remove power to ECU
4. Repair Fault
5. Press "ABS" or "A" key to verify no more active faults. If another Active Fault is displayed, repeat above procedures until you get the NO ACTIVE FAULT screen.
6. Press "CLEAR" or "C" key to clear Stored Faults
7. Press "ABS" or "A" key to exit ABS Test

Note: Stored faults cannot be read on BENDIX EC30 and WABASH ECU's.

910B PLC TESTING PROCEDURE BY MANUFACTURER

(continued)

BENDIX TABS-6

NO ACTIVE FAULT

BENDIX TABS-6 ECU
DETECTED

CAB OFF
NO CURRENT FAULTS

NO FAULTS, ABS GOOD

1. Press "STORED" or "B" key to retrieve and read Stored Faults
2. Press "CLEAR" or "C" key to clear Stored Faults
3. Press "ABS" or "A" key to exit ABS test

BENDIX TABS-6

ACTIVE FAULT

BENDIX TABS-6 ECU
DETECTED

CAB ON

ACTIVE FAULT PRESENT
PRESS SELECT FOR HLP

ACTIVE FAULT CAB ON
(Description of Fault)

1. Press "SELECT" or "D" key to activate the **Help Screen** which will identify the ECU specific fault information such as SID & FMI, and automatically scroll through the ECU manufacturer's recommended troubleshooting and repair suggestions
2. When scroll is complete and "<end>" appears, you can press "SELECT" or "D" again to repeat the **Help Screen**.
3. Press ABS key (and AUX key if still on) to remove power to ECU
4. Repair Fault
5. Press "ABS" or "A" key to verify no more active faults. If another Active Fault is displayed, repeat above procedures until you get the NO ACTIVE FAULT screen.
6. Press "STORED" or "B" key to retrieve and read Stored Faults
7. Press "CLEAR" or "C" key to clear Stored Faults
8. Press "ABS" or "A" key to exit ABS Test

910B PLC TESTING PROCEDURE BY MANUFACTURER

(continued)

HALDEX

NO ACTIVE FAULT

HALDEX ECU DETECTED

HALDEX ECU CAB OFF NO FAULTS, ABS GOOD

CAB OFF NO CURRENT FAULTS

NO FAULTS, ABS GOOD

1. Press "STORED" or "B" key to retrieve and read **Stored Faults**
2. Press "CLEAR" or "C" key to clear Stored Faults
3. Press "ABS" or "A" key to exit ABS test

HALDEX

ACTIVE FAULT

HALDEX ECU DETECTED

HALDEX ECU CAB ON (Description of Fault)

ACTIVE FAULT PRESENT PRESS SELECT FOR HLP
--

ACTIVE FAULT CAB ON (Description of Fault)

1. Press "SELECT" or "D" key to activate the **Help Screen** which will identify the ECU specific fault information such as SID & FMI, and automatically scroll through the ECU manufacturer's recommended troubleshooting and repair suggestions
2. When scroll is complete and "<end>" appears, you can press "SELECT" or "D" again to repeat the **Help Screen**.
3. Press ABS key (and AUX key if still on) to remove power to ECU
4. Repair Fault
5. Press "ABS" or "A" key to verify no more active faults. If another Active Fault is displayed, repeat above procedures until you get the NO ACTIVE FAULT screen.
6. Press "STORED" or "B" key to retrieve and read Stored Faults
7. Press "CLEAR" or "C" key to clear Stored Faults
8. Press "ABS" or "A" key to exit ABS Test

910B PLC TESTING PROCEDURE BY MANUFACTURER

(continued)

MERITOR WABCO

NO ACTIVE FAULT

WABCO ECU DETECTED

WABCO ECU CAB OFF NO FAULTS, ABS GOOD
--

CAB OFF NO CURRENT FAULTS

NO FAULTS, ABS GOOD

1. Press "STORED" or "B" key to retrieve and read **Stored Faults**
2. Press "CLEAR" or "C" key to clear Stored Faults
3. Press "ABS" or "A" key to exit ABS test

MERITOR WABCO

ACTIVE FAULT

WABCO ECU DETECTED

WABCO ECU CAB ON (Description of Fault)
--

ACTIVE FAULT PRESENT PRESS SELECT FOR HLP
--

ACTIVE FAULT CAB ON (Description of Fault)

1. Press "SELECT" or "D" key to activate the **Help Screen** which will identify the ECU specific fault information such as SID & FMI, and automatically scroll through the ECU manufacturer's recommended troubleshooting and repair suggestions
2. When scroll is complete and "<end>" appears, you can press "SELECT" or "D" again to repeat the **Help Screen**.
3. Press ABS key (and AUX key if still on) to remove power to ECU
4. Repair Fault
5. Press "ABS" or "A" key to verify no more active faults. If another Active Fault is displayed, repeat above procedures until you get the NO ACTIVE FAULT screen.
6. Press "STORED" or "B" key to retrieve and read Stored Faults
7. Press "CLEAR" or "C" key to clear Stored Faults
8. Press "ABS" or "A" key to exit ABS Test

Note: For any fault reading "SENSOR RATE UPD", you must rotate the wheels to clear the fault

910B PLC TESTING PROCEDURE BY MANUFACTURER

(continued)

WABASH NATIONAL

NO ACTIVE FAULT

WABASH ECU DETECTED

WABASH ECU CAB OFF NO FAULTS, ABS GOOD

CAB OFF NO CURRENT FAULTS

NO FAULTS, ABS GOOD

1. Press "CLEAR" or "C" key to clear Stored Faults
2. Press "ABS" or "A" key to exit ABS test

WABASH NATIONAL

ACTIVE FAULT

WABASH ECU DETECTED

WABASH ECU CAB ON (Description of Fault)

ACTIVE FAULT PRESENT PRESS SELECT FOR HLP
--

ACTIVE FAULT CAB ON (Description of Fault)

1. Press ABS key (and AUX key if still on) to remove power to ECU
2. Repair Fault
3. Press "ABS" or "A" key to verify no more active faults. If another Active Fault is displayed, repeat above procedures until you get the NO ACTIVE FAULT screen.
4. Press "CLEAR" or "C" key to clear Stored Faults
5. Press "ABS" or "A" key to exit ABS Test

Note: Stored faults cannot be read on BENDIX EC30 and WABASH ECU's.

*Note: Built-in **Help Screen** services are not available for WABASH ECU's.*

MANUFACTURER SPECIFIC FAULT CODES

BENDIX & WABCO FAULT CODES AND DESCRIPTIONS

Sensors

FMI	Initial Active Fault Screen	Bendix SID 1-4	Wabco SID 3-6
Desc.		(Location) Sensor Start	(color/#) Air gap too large
1	(location) SENSOR TOO LOW	Sensor output low during low-speed vehicle operation. Adjust speed sensor to contact tone ring. Verify condition of tone ring mounting and teeth. Rotate wheel and verify minimum 0.8 volts AC sensor output @ 1 RPS. Verify condition and retention force of sensor clip. Verify proper sensor lead routing and clamping.	The ABS ECU has detected that the sensor is not producing a large enough signal. Push the sensor in until it touches the tooth wheel
Desc.		(Location) Sensor Intermittent	(color/#) Wheel Speed Difference
2	(location) SENSOR ERRATIC	Intermittent sensor output. Adjust speed sensor to contact tone ring. Verify condition of tone ring mounting and teeth. Rotate wheel and verify minimum 0.8 volts AC sensor output @ 1 RPS. Verify condition and retention force of sensor clip. Verify proper sensor lead routing and clamping.	The ABS ECU has detected a wheel speed difference. Check for loose sensor connectors on the ECU and on the extension cables. Check for damaged teeth on the tooth wheel. Push sensor all the way in until it touches the tooth wheel. Check wheel bearing adjustment
Desc.		(Location) Sensor Shorted to VBAT	(color/#) Shorted to 12 Volts
3	(location) SENSOR SHORT HI	Check for corroded or damaged sensor and ECU wiring and connectors. Verify +12V is not measured at either sensor lead.	The ABS ECU has detected that the sensor wiring has 12 volts on it. Check the sensor wiring and connectors for damage. The resistance of the sensor should be between 500 and 2000 ohms. Replace sensor if the resistance reading is out of range
Desc.		(Location) Sensor Shorted to Gnd	(color/#) Shorted to Ground
4	(location) SENSOR SHORT LO	Check for corroded or damaged sensor and ECU wiring and connectors. Verify no continuity from sensor leads to ground.	The ABS ECU has detected that the sensor wire is shorted to ground. Check the sensor wiring and connectors for damage. The resistance of the sensor should be between 500 and 2000 ohms. Replace sensor if resistance reading is out of range
Desc.		(Location) Sensor Open	(color/#) Open Circuit
5	(location) SENSOR OPEN CKT	Check for corroded or damaged sensor and ECU wiring and connectors. Verify 1500 to 2500 ohms across sensor leads.	The ABS ECU has detected that the sensor wires or the sensor itself has an open in it. Check the sensor wiring and connectors for damage....
Desc.		() Sensor Shorted Across Sensor	(color/#) Open or short circuit
6	(location) SENSOR GRND CKT	Check for corroded or damaged sensor and ECU wiring and connectors. Verify 1500 to 2500 ohms across sensor leads.	The ABS ECU has detected that the sensor wire is open or shorted. Check the sensor wiring and connectors for damage.
Desc.		(Location) Sensor Lock Time Out	(color/#) Tone Wheel Defect
7	(location) SENSOR BAD RESP	Sensor output low during vehicle operation above 10 mph. Verify condition of tone ring mounting. Adjust speed sensors to contact tone ring. Rotate wheel and verify minimum 0.8 volts AC sensor output @ 1 RPS. Verify condition and retention force of sensor clips. Verify proper sensor lead routing and clamping	The ABS ECU has detected an erratic sensor signal that may be caused by a defective tone wheel. Examine the tone wheel for damaged/missing teeth, or wheel-end bearing adjustment causing runout

BENDIX & WABCO FAULT CODES AND DESCRIPTIONS (cont.)

Sensors (Cont.)			
FMI	Initial Active Fault Screen	Bendix SID 1-4	Wabco SID 3-6
Desc.		(Loc.) Sensor Frequency Doubling	(color/#) Wheel Slip Failure
8	(location) SENSOR FREQ ODD	Verify condition and retention force of sensor clips. Check for corroded or damaged sensor and ECU wiring and connectors. Verify no continuity from sensor leads to ground. Verify sensor leads are twisted pair.	The ABS ECU has detected that the sensor is producing an erratic signal. Check for loose sensor connectors on the ECU and on the extension cables. Check for damaged teeth on the tooth wheel. Push sensor all the way in until it touches the tooth wheel.
Desc.		() Sensor High Frequency Noise	(color/#) No Speed Detected
9	(location) SENSOR RATE UPD	Verify condition and retention force of sensor clips. Check for corroded or damaged sensor and ECU wiring and connectors. Verify no continuity from sensor leads to ground. Verify sensor leads are twisted pair.	The ABS ECU has detected that the sensor is producing no signal. Check for loose sensor connectors on the ECU and on the extension cables. Check for damaged teeth on the tooth wheel. Push sensor all the way in until it touches the tooth wheel.
Desc.		(Location) Sensor Wobble Run	(color/#) Erratic Speed Signal
10	(location) SENSOR RATE CHG	Sensor output intermittent or excessive wobble in exciter ring. Verify condition of tone ring mounting and teeth. Verify proper adjustment of wheel bearings. Adjust speed sensor to contact tone ring. Rotate wheel and verify minimum 0.8 volts AC sensor output @ 1 RPS. Verify condition and retention force of sensor clip. Verify proper sensor lead routing and clamping.	The ABS ECU has detected that the sensor is producing an erratic signal. Check for loose sensor connectors on the ECU and on the extension cables. Check for damaged teeth on the tooth wheel. Push sensor all the way in until it touches the tooth wheel or wheel-end bearing adjustment causing run out.
Desc.			(color/#) Chattering
11	(location) SENSOR NO IDENT		The ABS ECU has detected that the sensor is producing an erratic signal. Check for loose sensor connectors on the ECU and on the extension cables. Check for damaged teeth on the tooth wheel. Push sensor all the way in until it touches the tooth wheel.
Desc.		Sensor Abnormal Speed	(color/#) Bad Device or Component
12	(location) SENSOR SMARTDEV	Adjust speed sensor to contact tone ring. Verify proper number of tone ring teeth per sensed wheel. Rotate wheel and verify minimum 0.8 volts AC sensor output @ 1 RPS. Verify condition and retention force of sensor clip. Verify proper sensor lead routing and clamping	The ABS ECU has detected an internal error. Check the sensor cable for pinching or cuts and check connectors. If ok, call WABCO for technical support and return authorization claim number.
Desc.		(Location) Sensor Gross Mismatch	
13	(location) SENSOR CALIB NG	Tire size mismatch. Verify correct tire size as desired. Verify proper tire inflation. Verify proper number of tone ring teeth per sensed wheel. Verify proper wheel rolling radius setting in ECU.	

IMPORTANT: IF YOU HAVE ANY QUESTIONS REGARDING THE ECU, PLEASE DIRECT THOSE QUESTIONS TO THE MANUFACTURERS TECHNICAL HELP DEPARTMENT.

BENDIX & WABCO FAULT CODES AND DESCRIPTIONS (cont.)**Modulators**

FMI	Initial Active Fault Screen	Bendix SID 7-10	Wabco SID 7-10
Desc.		Mod _ Shorted to VBAT	(Ext)Mod Valve (color) - short to 12v
3	MODULATOR () SHORT HI	Check for corroded or damaged modulator wiring and connections. Verify for M-21, M-22 or M-30 that resistance between pins: Hold to Common is 3.5 to 5.0 ohms, Exhaust to Common is 3.5 to 5.0 ohms, Exhaust to hold is 7.0 to 10 ohms. For M-32 and M-32QR, verify that resistance between pins: Hold to common is 4.9 to 5.5 ohms, Exhaust to Common is 4.9 to 5.5 ohms, Exhaust to Hold is 9.8 to 11 ohms. Verify no continuity from modular leads to ground.	The ABS ECU has detected a short to 12 volts on the (color) (external) modulator valve. Check the (external) valve cable and connectors. If cable is ok, call WABCO for technical support and return authorization claim number
Desc.			(Ext)Mod Valve(color) -short to grnd
4	MODULATOR () SHORT LO		The ABS ECU has detected a short to ground on the (color) (external) modulator valve. Check the (external) valve cable and connectors. If cable is ok, call WABCO for technical support and return authorization claim number
Desc.		Mod _ Open/Shorted to GND	(Ext) Mod Valve (color) - Open Ckt
5	MODULATOR () OPEN CKT	Check for corroded or damaged modulator wiring and connections. Verify for M-21, M-22 or M-30 that resistance between pins: Hold to Common is 3.5 to 5.0 ohms, Exhaust to Common is 3.5 to 5.0 ohms, Exhaust to hold is 7.0 to 10 ohms. For M-32 and M-32QR, verify that resistance between pins: Hold to common is 4.9 to 5.5 ohms, Exhaust to Common is 4.9 to 5.5 ohms, Exhaust to Hold is 9.8 to 11 ohms. Verify no continuity from modular leads to ground.	The ABS ECU has detected an open circuit on the (color) (external) modulator valve. Check the (external) valve cable and connectors. If cable is ok, call WABCO for technical support and return authorization claim number
Desc.		Mod _ Shorted to Ground	(Ext)Mod Valve (color)-short to grnd
6	MODULATOR () GRND CKT	Check for corroded or damaged modulator wiring and connections. Verify for M-21, M-22 or M-30 that resistance between pins: Hold to Common is 3.5 to 5.0 ohms, Exhaust to Common is 3.5 to 5.0 ohms, Exhaust to hold is 7.0 to 10 ohms. For M-32 and M-32QR, verify that resistance between pins: Hold to common is 4.9 to 5.5 ohms, Exhaust to Common is 4.9 to 5.5 ohms, Exhaust to Hold is 9.8 to 11 ohms. Verify no continuity from modular leads to ground.	The ABS ECU has detected a short to ground on the (color) (external) modulator valve. Check the (external) valve cable and connectors. If cable is ok, call WABCO for technical support and return authorization claim number
Desc.		Mod _ Lock Time Out	
7	MODULATOR () BAD RESP	No wheel response to ABS command. Verify proper modulator activation with brake pressure applied, at power-up (Chuff Test) and/or using diagnostic tool. Wiring to modulator may be reversed. Possible slow brake release. Check for dragging brakes, dry bearings, faulty return springs, parking brake system faults, restricted brake air lines, over adjusted slacks, out of round drums or damaged/loose tone rings.	

BENDIX & WABCO FAULT CODES AND DESCRIPTIONS (cont.)

Modulators (cont.)			
FMI	Initial Active Fault Screen	Bendix SID 7-10	Wabco SID 7-10
Desc.			
8	MODULATOR () FREQ ODD	Check for corroded or damaged modulator wiring and connections. Verify for M-21, M-22 or M-30 that resistance between pins: Hold to Common is 3.5 to 5.0 ohms, Exhaust to Common is 3.5 to 5.0 ohms, Exhaust to hold is 7.0 to 10 ohms. For M-32 and M-32QR, verify that resistance between pins: Hold to common is 4.9 to 5.5 ohms, Exhaust to Common is 4.9 to 5.5 ohms, Exhaust to Hold is 9.8 to 11 ohms. Verify no continuity from modular leads to ground.	
Desc.			(Ext) Mod Valve (color) - Failure
12	MODULATOR () SMARTDEV		The ABS ECU has detected a failure in the (color) valve circuit. Check the (external) valve cable and connectors. If cable is ok, call WABCO for technical support and return authorization claim number.
Desc.		Mod _ Shorted to Solenoid	(Ext) Mod Valve (color) - Not Found
14	MODULATOR () SPECIAL	Check for corroded or damaged modulator wiring and connections. Verify for M-21, M-22 or M-30 that resistance between pins: Hold to Common is 3.5 to 5.0 ohms, Exhaust to Common is 3.5 to 5.0 ohms, Exhaust to hold is 7.0 to 10 ohms. For M-32 and M-32QR, verify that resistance between pins: Hold to common is 4.9 to 5.5 ohms, Exhaust to Common is 4.9 to 5.5 ohms, Exhaust to Hold is 9.8 to 11 ohms. Verify no continuity from modular leads to ground.	The ABS ECU has not detected the external (color) valve circuit. Check the (external) valve cable and connectors. If cable is ok, call WABCO for technical support and return authorization claim number.

IMPORTANT: IF YOU HAVE ANY QUESTIONS REGARDING THE ECU, PLEASE DIRECT THOSE QUESTIONS TO THE MANUFACTURERS TECHNICAL HELP DEPARTMENT.

HALDEX FAULT CODES AND DESCRIPTIONS

01	Red channel wheel speed sensor. S1A has an open or short circuit. Check connections then replace cable or sensor as required. Resistance reading of sensor is between 980 and 2350 ohms. If sensor checks good, may be a defective ECU. Replace ECU as required.
02	Red channel wheel speed sensor. S1B has an open or short circuit. Check connections then replace cable or sensor as required. Resistance reading of sensor is between 980 and 2350 ohms. If sensor checks good, may be a defective ECU. Replace ECU as required.
03	Blue channel wheel speed sensor. S2A has an open or short circuit. Check connections then replace cable or sensor as required. Resistance reading of sensor is between 980 and 2350 ohms. If sensor checks good, may be a defective ECU. Replace ECU as required.
04	Yellow channel wheel speed sensor. S2B has an open or short circuit. Check connections then replace cable or sensor as required. Resistance reading of sensor is between 980 and 2350 ohms. If sensor checks good, may be a defective ECU. Replace ECU as required.
05	Blue channel wheel speed sensor. S3A has an open or short circuit. Check connections then replace cable or sensor as required. Resistance reading of sensor is between 980 and 2350 ohms. If sensor checks good, may be a defective ECU. Replace ECU as required.
06	Yellow channel wheel speed sensor. S3B has an open or short circuit. Check connections then replace cable or sensor as required. Resistance reading of sensor is between 980 and 2350 ohms. If sensor checks good, may be a defective ECU. Replace ECU as required.
07	No Fault Found. ABS Operational. If ABS warning lamp is on, drive vehicle above 6mph, then reapply power to ECU to get correct lamp flash.
11	Wheel speed sensor S1A (Red Channel) air gap too large. Push sensor head toward the exciter ring.
12	Wheel speed sensor S1B (Red Channel) air gap too large. Push sensor head toward the exciter ring.
13	Wheel speed sensor S2A (Blue Channel) air gap too large. Push sensor head toward the exciter ring.
14	Wheel speed sensor S1B (Yellow Channel) air gap too large. Push sensor head toward the exciter ring.
15	Wheel speed sensor S3A (Blue Channel) air gap too large. Push sensor head toward the exciter ring.
16	Wheel speed sensor S3B (Yellow Channel) air gap too large. Push sensor head toward the exciter ring.
20	Incorrect exciter (tone) ring used. Number of teeth on ring should be uniform on wheel ends.
21	Wheel speed sensor S1A (Red Channel) has an erratic voltage output. Check all connections. Sensor/exciter ring misalignment or defective sensor cable or sensor head.
22	Wheel speed sensor S1B (Red Channel) has an erratic voltage output. Check all connections. Sensor/exciter ring misalignment or defective sensor cable or sensor head.
23	Wheel speed sensor S2A (Blue Channel) has an erratic voltage output. Check all connections. Sensor/exciter ring misalignment or defective sensor cable or sensor head.
24	Wheel speed sensor S2B (Yellow Channel) has an erratic voltage output. Check all connections. Sensor/exciter ring misalignment or defective sensor cable or sensor head.
25	Wheel speed sensor S3A (Blue Channel) has an erratic voltage output. Check all connections. Sensor/exciter ring misalignment or defective sensor cable or sensor head.
26	Wheel speed sensor S3B (Yellow Channel) has an erratic voltage output. Check all connections. Sensor/exciter ring misalignment or defective sensor cable or sensor head.
41	Slow wheel recovery on red valve channel. Check for mech. faults such as dry bearings, broken springs, restricted piping, defective valve.
42	Slow wheel recovery on blue valve channel. Check for mech. faults such as dry bearings, broken springs, restricted piping, defective valve.
43	Slow wheel recovery on yellow valve channel. Check for mechanical faults such as dry bearings, broken springs, restricted piping, defective valve
61	Hold solenoid open circuit on red valve channel. Check cable and all connections. Solenoid may be defected, replace as required

HALDEX FAULT CODES AND DESCRIPTIONS (continued)	
62	Hold solenoid open circuit on blue valve channel. Check cable and all connections. Solenoid may be defected, replace as required
63	Hold solenoid open circuit on yellow valve channel. Check cable and all connections. Solenoid may be defected, replace as required
67	Dump solenoid open circuit on red valve channel. Check cable and all connections. Solenoid may be defected, replace as required
68	Dump solenoid open circuit on blue valve channel. Check cable and all connections. Solenoid may be defected, replace as required
69	Dump solenoid open circuit on yellow valve channel. Check cable and all connections. Solenoid may be defected, replace as required
71	Hold solenoid short circuit to ground on red valve channel. Check cable and all connections. Solenoid may be defective, replace as required.
72	Hold solenoid short circuit to ground on blue valve channel. Check cable and all connections. Solenoid may be defective, replace as required.
73	Hold solenoid short circuit to ground on yellow valve channel. Check cable and all connections. Solenoid may be defective, replace as required.
77	Dump solenoid short circuit to ground on red valve channel. Check cable and all connections. Solenoid may be defective, replace as required.
78	Dump solenoid short circuit to ground on blue valve channel. Check cable and all connections. Solenoid may be defective, replace as required.
79	Dump solenoid short circuit to ground on yellow valve channel. Check cable and all connections. Solenoid may be defective, replace as required.
81	Hold solenoid short circuit to B+ on red valve channel. Check cable and all connections. Solenoid may be defective, replace as required.
82	Hold solenoid short circuit to B+ on blue valve channel. Check cable and all connections. Solenoid may be defective, replace as required.
83	Hold solenoid short circuit to B+ on yellow valve channel. Check cable and all connections. Solenoid may be defective, replace as required.
87	Dump solenoid short circuit to B+ on red valve channel. Check cable and all connections. Solenoid may be defective, replace as required.
88	Dump solenoid short circuit to B+ on blue valve channel. Check cable and all connections. Solenoid may be defective, replace as required.
89	Dump solenoid short circuit to B+ on yellow valve channel. Check cable and all connections. Solenoid may be defective, replace as required.
90	Low supply voltage. Power supply (battery) voltage less than required for ECU. Reapply power to ECU to check if this fault is still occurring. Do not use a battery charger for a power supply to the ABS ECU.
91	No internal ABS ECU solenoid voltage. Faulty power supply or fuse blown. May be defective ECU. Replace as required.
92	Power input over voltage error. Power supply (battery) is greater than 16 volts DC. Check voltage regulator on engine.
93	Short circuit on ECU internal relay. Defective ABS ECU, valve cable or solenoid. Replace as required.
C0	ABS ECU is not configured for this sensor-valve combination. Check sensor and valve connections and reapply power.

IMPORTANT: IF YOU HAVE ANY QUESTIONS REGARDING THE ECU, PLEASE DIRECT THOSE QUESTIONS TO THE MANUFACTURERS TECHNICAL HELP DEPARTMENT.

GLOSSARY & DEFINITION OF TERMS

ALARM - Distinct sound for each type of fault. Alarm will automatically cease or change whenever fault is corrected.

TRACTOR-Power unit, prime mover with self contained power and air.

TRAILER-Depends on outside source of power and air to operate light and brake systems.

VEHICLE-Tractor, trailer or dolly.

VEHICLE CABLE- 7pin wiring cable between vehicles.

FAULT MESSAGES- Appears on the tester display along with active circuits and alarm.

ELECTRICAL CIRCUIT DEFINITIONS

GOOD CIRCUIT- Complete circuit with amperage load (some components may not work.)

OPEN CIRCUIT- Incomplete circuit without an amperage load. Fault message will appear with circuit indicators flashing and alarm sounding.

SHORT CIRCUIT- Circuit wires are in contact showing combined amperage load. Fault message will appear with all circuit indicator lights flashing and alarm sounding.

OPEN GROUND- Ground wire is not connected showing an incomplete circuit. Fault message will appear with all circuit indicator lights flashing and alarm sounding.

CHASSIS- Shorted circuit wire in contact with chassis. Fault message will appear with circuit indicator lights flashing and alarm sounding. Vehicle lights will not illuminate.

ABS GLOSSARY AND TERMS

ABS – Anti-lock Brake System now required on all new trailers and tractors

BLINK CODE – ABS indicator lamp located on trailer can indicate current and stored faults with a blink sequence.

1. Upon start-up, ABS lamp will light up and turn off if ABS has no stored faults.
2. Upon start-up, ABS lamp will light up and stay on with ABS stored faults.
3. Fault is identified by counting blinks of the ABS indicator lamp.

CONFIGURATION – number of sensors and modulator valves

2S/1M – 2 sensors and 1 modulator valve

4S/2M – 4 sensors and 2 modulator valve

ECU - Electronic Control Unit

1. Regulates braking according to input from wheel sensors
2. Stores faults in memory

PLC – “**Power Line Carrier**” (also known as **PLC4TRUCKS**) is a method to communicate ABS operation and other information to the tractor over the Auxiliary circuit. Tractors and Trailers manufactured after March 1, 2001 were required to have PLC capability.

MODULATOR VALVE – controls brake application with signal from ECU

SENSOR – Wheel sensor measuring wheel revolutions

FAULTS –

1. Current – fault which exists
2. Stored – fault, which occurred, but does not presently exist.
3. Intermittent – comes & goes, usually with certain driving conditions

LITE-CHECK WARRANTY AND SERVICE

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. Customer is responsible for shipping costs. Warranty does not cover abuse, neglect or damage caused by air, electrical, or other outside sources as specified in owners manual. Some parts may be subject to OEM warranties. Any modifications made to equipment without prior written approval voids this warranty. Any software upgrades released within one year from 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 for tracking.

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 the following instructions for shipping the LITE-CHECK testers and products to minimize damage.

- 1) **Remove** all air connections from tester
- 2) Include **remote control & antenna** with tester
- 3) Select sturdy box that exceeds tester size by at least 2 inches in all three dimensions
- 4) Pack tester in **upright position** with shipping label on top of box
- 5) Place dunnage on bottom and all surfaces to **prevent movement** inside box
- 6) Enclose return shipping instructions
- 7) **Include brief explanation of equipment problems and history**

SHIP TO THE FOLLOWING ADDRESS:

LITE-CHECK LLC
3102 E Trent Ave, Suite 215
Spokane, WA 99202

