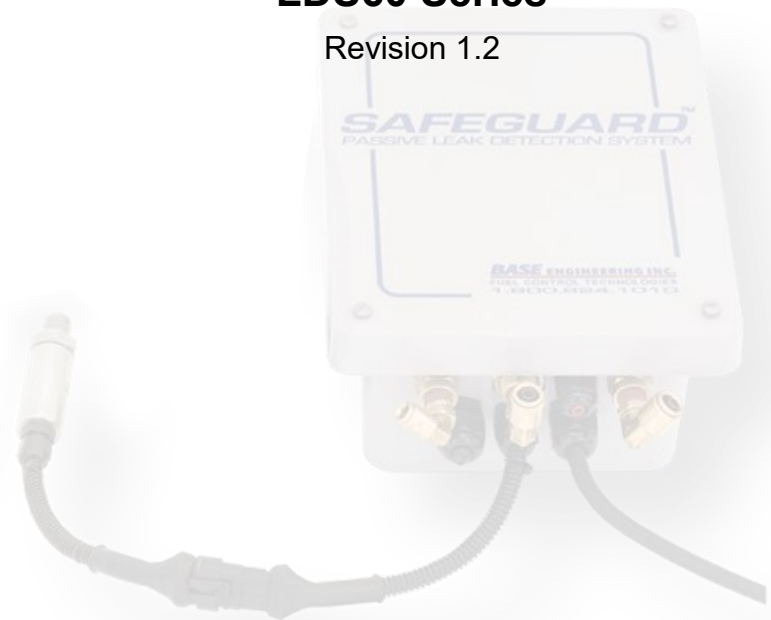


INSTALLATION AND OPERATION PROCEDURES

LDS60 Series

Revision 1.2



THIS MANUAL SHOULD BE KEPT IN THE TRUCK ALL THE TIME

Thank you for purchasing this product.

BASE Engineering Inc. strives to continuously improve its products and services. Customer feedback is an important part of this process. If you have suggestions for the improvement of this product, this document or the services we provide, we would like to hear from you. Please contact us at the numbers listed below:

Steve A. Belyea - President

1-800-924-1010

1-506-635-2280

1-506-635-2281 fax

sales@baseng.com

WARNING: The receiver/relay enclosure unit is NOT approved for use in hazardous locations. Installation must be carried out by a qualified electrician in a non-hazardous zone well removed from any explosive or dangerous gas supply, piping, hoses or valve fittings.

FCC Rules and Compliance.

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

- i. This device may not cause harmful interference, and
- ii. This device must accept any interference received, including interference that may cause undesired operation.

FCC Part 15.231

TECHNICAL SUPPORT

Product technical support is available by contacting BASE Engineering Inc. at 1.800.924.1010 or 506-635-2280 between 7:00am and 5:00pm Eastern Standard Time (USA). After hours technical support can be reached at this same phone number.

BASE ENGINEERING INC.
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DESIGN CERTIFYING ENGINEERS (DCE) STATEMENT—BASE ENGINEERING INC. LDS100 TRANSPORT PASSIVE SYSTEM

Updated June 19, 2017

BASE Engineering Inc. is registered under section 107.503 of Title 49, code of federal regulations (49 CFR) as a “Design Certifying Engineering” facility. Registration identification number CT-8500. In Canada, BASE Engineering complies with the requirements set forth in clause 8.1.5 of CSA Standard B620-09, under registration # 35-0202.

In accordance with United States Department of Transportation (USDOT) 49 CFR and Transport Canada CSA B620-09, **BASE Engineering’s** LDS Series Passive Transport Shut-Down Systems have been designed and tested by registered Design Certifying Engineers / Design Engineers.

Per the requirements of 49 CFR 173.315 (n) (2), and CSA B620-09 5.3.2.5 (b) and (c), these electronic “passive” leak detection systems are certified to automatically detect a complete delivery hose separation and stop product flow from an MC-330/331 Cargo Tank.

Operational Description

BASE Passive systems utilize microprocessor based sensing technology to detect a sudden loss of hose pressure within a specific time frame. The systems continually monitor delivery hose pressure and compares this to the previous few seconds’ delivery history to automatically establish acceptable limits. The systems automatically compensate for temperature and resulting pressure changes in addition to changes in discharge equipment and methods.

A 316 stainless steel pressure transducer “probe” machined with a male ¼ inch NPT thread is fitted to the trailer discharge piping per the manufacturer’s instructions. In the event of a delivery hose separation, the probe signals the control unit to “turn off” an electric/air solenoid. The loss of power to the solenoid causes the solenoid to exhaust all up-stream air. A normally closed air actuator (supplied by installer) is fitted to the tanks liquid internal valve(s) and used to hold the valve(s) in the open position. Any loss of air to this actuator causes the liquid internal valve(s) to close. Subsequently this system will automatically close the liquid internal valve(s) with any interruption of 12V DC electrical power or air supply.

An audible alarm is sounded when the system automatically triggers a shut-down or when the manual "TEST" button is pushed.

Components are weatherproof in design and self-contained within NEMA 4x enclosures. A manual "TEST" button is included which causes the system to receive a "false" failed hose signal. It is strongly recommended that this feature be used to test system operation on a daily basis.

Operational Parameters

- A division 2.1, 2.2, or 2.3 compressed gas is used which is non-corrosive to 316 stainless steel. Approved gases include Propane and Anhydrous Ammonia.
- Ambient air temperature is between -40 degrees Fahrenheit and +120 degrees Fahrenheit.
- Normal working pressure measured at the discharge hose connection is not less than 20 PSI and not greater than 300 PSI during the offloading process.
- A 2" diameter or larger product delivery hose not exceeding 40 feet length is used to offload the tank trailer.
- An air operated internal valve is used or an air actuator is added to an existing cable operated internal valve to "pull" the emergency release when the system triggers a shut-down.

To ensure proper operation this passive system must be installed and tested by a DOT registered inspector (RI) in accordance with the manufacturers' instructions and requirements of 49 CFR 173.315 (n) (2) iii and CSA B620-09 clause 7.2.9

Please contact the manufacturer for operational approval outside of the above stated certification parameters.

Signed,



Stephen A. Belyea
President
CT—8500



Christina Desjardins, P Eng.
Chief Engineer
35-0202

WARRANTY AND RETURN PROCEDURES

Limited Warranty Policy

This **BASE Engineering Inc.** radio remote control system is sold with a limited warranty to be free from defects in material and workmanship for a period of **4 years from the date of manufacture**. This warranty covers only repair or replacement parts/components. Labor to diagnose, remove, or replace failed components is not covered under this warranty.

Replacement parts will be shipped within 24 hours when possible. All defective components must be returned to the factory clearly marked with a RGA (Returned Goods Authorization) number for identification purposes. Returning an item without an authorized RGA number will result in substantial processing delays.

Warranty Claims

BASE Engineering Inc. will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within the warranty period. Before any warranty repairs are attempted or before returning any product to the factory **BASE Engineering** must be contacted. **BASE Engineering** staff will require the model number and the serial number of the system.

BASE Engineering is not liable for material, labor or contingent liabilities arising out of the improper use or function of any product. Warranty shall become void if the product is improperly installed, modified, damaged, abused, or used for applications other than intended use.

TROUBLESHOOTING

The system alarm is sounding “beep beep pause” repeatedly.

- This signifies a lost probe (pressure transducer) signal. Check the probe plug for corrosion, broken pin or wire separation. If this connection appears secure check the “Test” button to ensure it is not stuck in the “on” (depressed) position. If a probe replacement is required always replace both sections of wire.

NOTE: Removing the transducer probe will present a hole in the discharge line. ALWAYS ensure that repairs are conducted only by qualified, authorized personnel in accordance with all DOT regulations

The tank internal valve will not open.

- Check the power fuse located inside the LDS60 control module first. If the fuse is ok and power is present check the air supply on the inlet and outlet of the air solenoid.
- If there is air on the inlet but not the outlet check the main system ground. If the main system ground connection is secure the air solenoid controlling the internal valve may need to be replaced.

PRODUCT WARNINGS

PLEASE READ BEFORE OPERATING OR INSTALLING ANY BASE SYSTEM

Air solenoids used to control the tank internal valves should be connected to the same air supply for the DOT required MANUAL Emergency Stop switch(es). Following activation of the radio remote Emergency Stop feature, the operator **MUST** first close the manual internal valve switch prior to resetting the **BASE** system. Failure to do this may result in the internal valve(s) automatically and unintentionally reopening with system reset.

Systems wired ‘hot’ to power when the vehicle is in motion have ALL remote functions still operable. A driver (or passenger) may accidentally activate the remote control, unintentionally causing the Emergency Stop feature to activate and the truck’s engine to stop instantly. Systems must be properly interlocked to prevent unintended use.

Never attempt to perform PTO repairs from under chassis while engine is running or while wearing radio remote control device.

All open valves must be closed prior to system reset to prevent the valve from automatically and unintentionally reopening with Emergency Stop reset.

DO NOT CONNECT CHASSIS GROUND TO EITHER OF THE HOSE REEL MOTOR ELECTRICAL LEADS WHEN USING A REMOTE CONTROL POLARITY REVERSE CIRCUIT. BOTH LEADS MUST BE CONNECTED DIRECTLY TO THE CONTROLLER AS SHOWN IN THE SUPPLIED SYSTEM DRAWINGS.

PRODUCT WARNINGS CONT'D

NEVER GO UNDER A TRUCK WITH THE ENGINE RUNNING AND NEVER USE THE REMOTE CONTROL DEVICE TO ACTIVATE THE PTO WHEN WORKING ON OR SERVICING THE PTO FROM UNDER THE TRUCK. THE REMOTE CONTROL DEVICE IS INTENDED TO BE USED ONLY WHEN THE OPERATOR IS NOT AT RISK OF BEING INJURED BY THE MACHINE.

Do not mix different brands of batteries or used and new batteries.

Unauthorized modifications to any **BASE** system or any unintended uses of **BASE** systems may void the manufacturer's warranty for the product. This may include, but is not limited to, drilling holes in **BASE** product enclosures, adding auxiliary or bypass switches, changes to installation procedures, modifications to antennae configurations, or changes to the electronic or mechanical workings of the system.

SYSTEM MAINTENANCE

Like many other components on mobile equipment, the LDS60 has regular maintenance that should be performed. Unless being used in extreme conditions an annual maintenance check will do. Here are the most common items that should be checked and maintained:

1. **Dry air-lines:** if there is moisture in the trailer air lines it can cause internal rusting of the air solenoids used to supply air to the internal valve. Simple maintenance of the trailer air drying system will eliminate any problems.
2. **Probe connector:** any connector exposed to the elements should be coated inside and out with dielectric grease to displace moisture. If moisture enters the plug, it may cause pins to corrode.
3. **Power and Ground:** always check the +12 and ground connections to ensure that they are secure and free of corrosion.

activates the probe signal as would happen if a hose separation should occur

11. While holding the test button in, press the reset button. The system will rearm and then should simulate a failed probe signal. The audible alarm should sound a “beep beep” – pause – “beep beep” pause repeatedly until test button is released. This test verifies the system is receiving a good probe signal and this audible warning would be present during a delivery if the probe signal was lost.

After releasing the test button press the reset button again for a complete system reset.

NOTE: Once the system has tripped it will be necessary to disengage the PTO and close the trailer / hose valve in order to reopen the internal valve.

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SYSTEM COMPONENTS

Please check that your package includes the following:

- Equipment mounted control unit with integrated control panel and alarm
- Pressure transducer

Additional hardware to be supplied by installer:

- Mounting hardware (nuts and bolts)
- Equipment specific electrical plug connectors
- Plastic tubing for pneumatic connections
- Special mounting brackets

It is strongly recommended that any radio control system be powered only when the equipment is parked and ready to work. A park-brake interlock switch for all air-brake truck applications is available from BASE Engineering at the time of order.

SYSTEM TESTING

Now the system is now installed and ready to operate. A mandatory test to ensure that the system is installed correctly is required. Pushing the "Test" button will simulate a hose failure and activate the system. The tank internal valve should close and the audible alarm should sound. Pushing the reset button will deactivate the alarm and rearm the system.

Operational testing can now be completed during the first off loading of product. The following is a typical routine that when used, tends to eliminate accidental tripping of the system during set up.

1. Set the trailer park brakes and apply wheel chocks

NOTE: This routine is not intended to overrule existing corporate offloading procedures but simply as a guide to trouble free use. Please follow your company's product delivery procedures and contact BASE Engineering if there is a conflict with the procedures below.

2. Drop the piping guard or gate
3. Connect the liquid and vapor product hoses to the bulk storage facility
4. Slowly open the internal valve charging the pump and trailer piping only
5. Slowly open the in-line valve at the trailer hose connection charging the delivery hose
6. Slowly open the valve into the storage tank
7. Slowly open the vapor return line from the storage tank charging the vapor hose (if used)
8. Slowly open the vapor return tank internal valve into the trailer
9. Carefully engage the tractor power take off
10. While the system is powered press and hold the test button. The air solenoid providing air to the internal valve will exhaust the air and attached backup alarm will sound. Pressing the test button

SYSTEM OPERATION

When the internal valve air switch is moved to the open position or in some cases when the pipe guard is dropped the system will automatically arm itself. When the LDS60 air switch is pressurized it supplies power to the control module. The system is now monitoring the pressure in the delivery piping and making decisions based on pressure/rate of change it may see during the delivery.

In the event that the system see a noticeable pressure change it will immediately remove power from the air solenoid causing the system to exhaust the air being used to keep the internal valve open.

To reset the system simply remove the air supply to the system by either closing the internal valve switch or closing the pipe guard (if equipped).

NOTE: Once the system has tripped it will be necessary to disengage the PTO and close the trailer / hose valve in order to reopen the internal valve.

LDS60 SERIES OVERVIEW

The **BASE Engineering Leak Detection System (LDS)** is an electronic control system designed to close a designated valve of an MC330-331 tank trailer if the delivery hose becomes ruptured or disconnected during the off loading process. Using microprocessor based electronics and a pressure transducer, the system monitors the pressure in the delivery piping and makes decisions based on pressure/rate of change during the delivery. To complete the monitoring process, the microprocessor controls an air solenoid that keeps the valve open by supplying air. If a shutdown is needed, the air solenoid is de-energized causing it to exhaust the air supply.

*LDS60-BUA and LDS60-DG are the most common LDS60 models. If your model is another configuration, this manual remains applicable.



SYSTEM INSTALLATION

When installing an LDS60 there are 4 key things that require attention:

1. Mounting the fiberglass enclosure:
 - The main enclosure is normally mounted on the curb side or right side of the trailer near the discharge piping. This enclosure incorporates the “TEST” and “RESET” controls which are used in day to day operation. These buttons should be visible and within easy reach of the operator.
2. Installing the pressure transducer:
 - The pressure transducer (probe) should be located in the discharge piping in a position that allows some degree of protection from the hose connect/disconnect process. If the trailer is equipped with a cross-over pipe to allow off-loading from both sides the probe should be located in the middle of this pipe. This operation requires the pipe to be removed by a DOT / TRANSPORT CANADA authorized facility for the installation of a 1/4 inch female NPT threaded fitting (see photo below). This fitting is welded into the pipe and requires a leak test prior to re-installation on the trailer. Once the pipe/ fitting is in place secure the probe by using an approved thread sealant.



3. Connecting to the trailer air-lines:
 - The system is designed to be activated with the opening of the internal valve. Please refer to the attached air-line drawings for reference. Please note that the main system power is dependent on this air supply. An air switch is installed via a T inside the fiberglass enclosure. This ensures that the system is only powered up while making a delivery (please see attached air-line schematic).
4. Making power and ground connections:
 - A 10ft cable has been provided to allow 12 volt power and Ground connections. Connect the white wire labeled 12 volts to a fused 12 volt source that's available during the unloading process. The system is low powered requiring only a 2Amp power supply. Connect the black ground wire to a good clean chassis ground.

DIXIE-GATE CONNECTIONS (- DG Option)

The system is designed to be activated by the application of the trailer park brakes in conjunction with the lowering or raising of a protective gate (Dixie-Gate). A low pressure switch is located inside the enclosure with a separate air line “quick connect” fitting provided on the outside of the enclosure (see provided drawing).

Connect a plastic DOT approved air line to the low air “quick connect” fitting on the enclosure. This is the system arming signal and must be from a source of air that is exhausted with the removal of the pipe/ valve protection or application of the trailer brakes.

When no air is present, the switch will turn the system on. Additionally, a pressure switch has been incorporated into the air supply line to the air solenoid/air actuator. When air is present, this switch will maintain power to the unit. If the trailer air bleeds off over an extended period of time, this switch will prevent the unit from energizing.