



OPERATING & MAINTENANCE MANUAL

VERSION 3.0



LNS Services
Part of NorLand Limited

3111 Norland Avenue
Burnaby, British Columbia
Canada V5B 3A9

Email: locknsafe@lns.ca
Phone: (604) 205-9600

<http://www.lns.ca/lock-n-safe>

TABLE of CONTENTS

1	PRODUCT OVERVIEW	2
1.1	SYSTEM OVERVIEW	2
1.2	TYPICAL INSTALLATION OVERVIEW	2
1.3	INSTALLATION PROCEDURE	4
2	SYSTEM OPERATION	5
2.1	GENERAL INFORMATION.....	5
2.2	LUMBER SORTER SHUTDOWN PROCEDURE.....	6
2.3	LUMBER SORTER RE-ACTIVATION PROCEDURE.....	6
3	MAINTENANCE	8
3.1	INSPECTION AND SERVICE LIFE	8
3.2	MAINTENANCE GUIDELINES	8
3.3	INSPECTION CHECKLIST	10
4	REPLACEMENT PARTS	11
5	WARRANTY	12

1 PRODUCT OVERVIEW

Lock 'N' Safe[™] makes it possible to lockout any lumber bin sorter with the push of a button and a padlock. Since 1989, *Lock 'N' Safe*[™] systems have been installed on over 70 different sorters around the world.

Specifications	Standard System	Heavy Duty System
Restraint Unit Rated Load	Max. Bin Weight 20,000 lbs (used a pair)	Max. Bin Weight 40,000 lbs (used a pair)
Suspension Cable	3/4" Cable	1" Cable
Unit Weight	50 lbs	85 lbs
Max Regulated Air Pressure	80 psi	
Min Air Pressure	60 psi	

1.1 SYSTEM OVERVIEW

The concept is simple. *Lock 'N' Safe*[™] is similar to a cable brake that stays open with compressed air. *Lock 'N' Safe*[™] brake units are welded to the bin floors. A cable that is independent of the sorter cables threads through the brake unit and is anchored on the top and bottom of the sorter.

When the operator shuts the air to the unit off, a set of concentric pins moves the shoe towards the cable. The clamp is designed so that increased load on the clamp increases the grip on the cable.

When load is placed on the brake units, the mechanism moves the brake shoes to grip the cables tighter thereby providing the friction force to hold the load. The greater the load, the more braking force!

The factor of safety on each brake unit is 5:1 based on actual load tests made on the prototypes. Each brake unit is shop tested after assembly to 150% of its rated load on our test bed. Cables are proof tested by our supplier on a random basis.

1.2 TYPICAL INSTALLATION OVERVIEW

In a typical installation, *Lock 'N' Safe*[™] brake units are welded to the floor of a lumber sorter bin, beyond the lumber line and clear line sides, using an adapter bracket

designed specifically for each make and model of sorter. All Welding is to be done by a CWB / AWS D1.1 certified welder. Copies of the welder's certificates are to be sent to LNS for quality control purposes.

To secure the *Lock 'N' Safe*™ system, steel core wire rope cables are mounted to the frame of the sorter using custom made top and bottom anchor brackets. The cables, made to the specific length requirements of each sorter, are equipped with a swaged-on-ferrule that fits through the top anchor bracket. The cables are entered through the brake units, pre-tensioned and anchored to the bottom brackets.

A separate air header is installed on the lumber line side to supply compressed air to all the brake units. The air header is normally field piped to an air supply, near the first bin, using a main lock-and-bleed valve. A regulator is included to insure that maximum air pressure does not exceed 80 PSI. Individual lock-and-bleed air valves and spiral supply hoses are plumbed from the header to the lumber line side actuator. A hose is installed through the bin floor to supply air to the clear line side actuator.

1.3 INSTALLATION PROCEDURE

- Empty lumber from bins, lower bins onto chains and lock out sorter
- Layout location for upper cable mounts (2 per bin – 1 on lumber line side & 1 on clear line side)
- Prep and weld upper cable mounts
- Layout location for lower cable mounts (2 per bin – 1 on lumber line side & 1 on clear line side)
- Prep and weld lower cable mounts
- Layout location for restraint mounts (2 per bin – 1 on lumber line side & 1 on clear line side)
- Prep and weld restraint mounts
- Prep and weld restraints to restraint mounts
- Install prefabricated air header at convenient height for operators
- Install air components between air header and restraint units (1 system per bin)
- Install air components between mill air supply and air header (1 system per sorter)
- Apply air to system
- Install cables (2 per bin – 1 on lumber line side & 1 on clear line side)
- Unlock sorter, raise bins a few feet, and bleed air from system (restraint locks to its cable)
- Lower bins until full weight of bin is transferred from hydraulics to restraints this tensions the cables) and lock out sorter
- Tighten cable clamps at lower cable mount (cable will now be taut between upper and lower mounts)
- Unlock sorter
- Apply air (sorter is now back to normal operation)

Note that work can be done in stages and the sorter can be put back into service at any stage of the installation

2 SYSTEM OPERATION

The following sections contain instructions for operating your *Lock 'N' Safe*[™] system.

2.1 GENERAL INFORMATION

The following general operating information applies to all *Lock 'N' Safe*[™] systems:

- *Lock 'N' Safe*[™] units contain no user-replaceable parts. Please contact LNS Services immediately if a unit becomes inoperable;
- *Lock 'N' Safe*[™] units are to be used as a static brake only. *Lock 'N' Safe* systems are not intended to be used as an operating device to lower loaded bins should the sorter's hydraulic system fail;
- *Lock 'N' Safe*[™] units are held in the open position by air supplied to their actuators. The operating air pressure should be 80 PSIG (no less than 60 PSIG). Air supply to the actuator is critical to each unit's operation. It is important that valves, connections and fittings be free of leaks. Broken or leaking air lines should be replaced immediately as a *Lock 'N' Safe*[™] unit will lock under low or no air pressure, which will prevent its bin from lowering;
- Once air to a *Lock 'N' Safe*[™] unit has been turned off, it will begin to clamp its bin restraint cable. The more load that is applied, the tighter the clamping action; and,
- Prior to re-activating the air supply to a *Lock 'N' Safe*[™] unit, an attempt must be made to lift its bin. The clamping action of a *Lock 'N' Safe*[™] unit will allow its bin to move up, but not down. This attempt to lift its bin must be done to transfer the load from the *Lock 'N' Safe*[™] unit's bin restraint cable back to the sorter's cable. This action also serves to take-up any slack in the sorter's cable.

2.2 LUMBER SORTER SHUTDOWN PROCEDURE

Please use the following procedure for shutting down your lumber sorter. To ensure the safety of yourself and others, the entire procedure must be reviewed prior to initiating a partial or complete shutdown of your lumber sorter.

1. Shut-off and lockout the following sorter drives:
 - Bin hydraulic drive;
 - Sorter drive; and,
 - Floor-chain drive(s).
2. Test the 'Start' controls to insure the correct drives are locked out;
3. Close and lockout air valves to the appropriate *Lock 'N' Safe*[™] unit(s) and bleed off air pressure (allow sufficient time for air to bleed off from the clear line side actuator) on bins to be worked in or under and adjacent bins as required by your facility's safety regulations. Check the indicator on each *Lock 'N' Safe*[™] unit to insure they are in the 'Locked' position prior to entering or working underneath a bin; and,
4. If you have any doubts about how to safely and properly operate your *Lock 'N' Safe*[™] system, please contact your facility's safety manager or LNS Services ***prior to working in or under any bin.***

2.3 LUMBER SORTER RE-ACTIVATION PROCEDURE

Please use the following procedure for re-activating your lumber sorter. To ensure the safety of yourself and others, the entire procedure must be reviewed prior to re-activating your lumber sorter.

1. Unlock and re-start the bin hydraulics drive;
2. Raise the previously locked-out bins to insure the load is taken fully by the hydraulic system cables. There should be no slack in the bin cables (unlocking bins with slack cables may result in cable damage);
3. Unlock and turn-on the air supply valves to the *Lock 'N' Safe*[™] unit(s) that was previously locked out. Ensure the *Lock 'N' Safe*[™] unit(s) is in the 'Unlocked' position;

4. Unlock and turn-on the air supply valves to the diverter air cylinders that were previously locked out; and
5. Unlock and re-start the sorter and floor-chain drives to resume normal operation.

If all the bins have been locked-out by using the main air header lock-and-bleed valve, please use the above procedure to re-activate your *Lock 'N' Safe*[™] system.

NOTE: Each *Lock 'N' Safe* system is equipped with a pressure switch that will prevent start-up of the sorter drive unless the main air valve is turned-on.

3 MAINTENANCE

Lock 'N' Safe[™] units contain no user-replaceable parts however; other components of the system including cables and airlines require regular inspection and maintenance. If a *Lock 'N' Safe* unit becomes inoperable, please contact LNS Services immediately.

3.1 INSPECTION AND SERVICE LIFE

1. Lock N Safe systems must be visually inspected and load tested by a certified LNS technician every 5 years in order to maintain certification per WSBC regulation Part 4.3(2) and 4.8(2)(c).
2. Lock N Safe brake units have a rated Service Life of 10 years, at which point they must be replaced unless they can be re-certified by our technician for an additional 5 years – based on our visual inspection and a successful load test.
3. Following Item 2, the Service Life of a Lock N Safe brake units is limited to a maximum of 15 years because our inspection and testing procedure cannot evaluate internal wear, cracking, fretting or corrosion - and the cost to adequately evaluate the brake's internal components is greater than the cost to replace the brake assembly.
4. We recommend that any Lock N Safe brake unit which is beyond its Service Life be replaced within 1 year to maintain the reliability of the system.

3.2 MAINTENANCE GUIDELINES

The following are general guidelines for maintaining your *Lock 'N' Safe* system. Please contact LNS Services if you have any questions.

- *Lock 'N' Safe*[™] units are designed to be used as a static brake only. They are not intended to be used as an operating device to lower a loaded bin should the sorter's hydraulic system fail;
- Air supply pressure to *Lock 'N' Safe*[™] units must be limited by a pressure regulating valve to a maximum of 80 PSIG. Pressures above this maximum may cause unseating of the diaphragm inside the *Lock 'N' Safe* unit's air actuator. Air leaks caused by excessive pressure can be repaired easily by:
 - Turning off and locking-out the air supply to the affected unit;
 - Undoing the clamping ring bolts holding the top and bottom sections of the air actuator together;
 - Lifting the top half of the air actuator slightly and re-seating the diaphragm evenly around the rim of the bottom half;

- Re-installing the top half of the air actuator and retaining ring. Then tighten the clamping bolts evenly as the ring is tapped lightly around its circumference with a rubber mallet. Then alternatively tighten the nuts with your wrench so that the distance between the clamp ears are equal on both sides. Using a torque wrench, apply a torque of between 22-33 ft-lbs. Do not over-tighten as deformation of the cap will cause further leakage;
 - As a final inspection, verify that the clamp ears are equally spaced on both sides. If they are not, then it is likely that one side has too much gap in the clamping surface to prevent a leak. Unbalanced clamp ears increase the likelihood of a leak.
 - Turning on the air supply and re-checking for leaks.
- The air supply to each *Lock 'N' Safe*™ unit is critical to its successful and trouble-free operation. It is important that all valves, connections and hoses be maintained as leak-free as possible. Broken or damaged flexible air lines should be replaced immediately as its corresponding *Lock 'N' Safe*™ unit will lock under low or no air pressure and prevent its bin from lowering;
 - The supply of clean and dry compressed-air is crucial to the continuous trouble-free operation of your *Lock 'N' Safe*™ system. Accumulations of dirt and/or moisture in the air actuator should be bled off at intervals depending on the quality of the air supply;
 - *Lock 'N' Safe*™ units are designed to function on dry and non-lubricated cables. In order to prevent an accumulation of grease, dirt, sawdust or oil it will be necessary to wipe-down and inspect the restraint cables at regular intervals;
 - The internal components of each *Lock 'N' Safe*™ unit have been lubricated for life during assembly. No further lubrication of the units or the air actuators, at any time, is required;
 - Periodic inspection of your *Lock 'N' Safe*™ system is recommended to maintain trouble-free operation. Inspection intervals should be no more than 6 months;
 - The condition of all restraint cables should be inspected regularly. Cables that have become loose from the bottom anchors or permanently deformed or damaged by lumber should be tightened or replaced immediately. Premature wear of the corresponding *Lock 'N' Safe*™ unit's internal parts may occur if cables are not aligned properly; and,
 - Cables may be re-tensioned by:

- Lowering the affected bin near the top of the floor chains;
- Locking out or engaging the *Lock 'N' Safe*[™] unit(s);
- Engaging the “Bin Lower” control momentarily so the weight is taken by the *Lock 'N' Safe*[™] unit;
- Unfastening the bottom anchor cable clamp, repositioning to the underside of the bracket and re-fastening in this position;
- Engaging the “Bin Raise” control momentarily to take the slack out of the main cables; and,
- Unlocking the *Lock 'N' Safe*[™] unit(s).

3.3 INSPECTION CHECKLIST

The following minimum inspections are required every 6 months. Please review your sorter manufacturer’s inspection requirements and consult with your facility’s safety representative prior to inspecting your *Lock 'N' Safe*[™] system.

- Check that air regulator pressure is 80 PSI;
- Check for air leaks in lines and air actuators;
- Ensure the rod-clevis pin is properly secured;
- Check all cables for kinks, wear or fraying;
- Ensure all cables are tight and not loose;
- Check the functionality of each *Lock 'N' Safe*[™] unit by lowering the load onto its cables; and,
- Ensure that any required welding repairs are completed by a CWB or equivalent certified welder.

4 REPLACEMENT PARTS

Pricing subject to change. Please contact LNS Services to confirm price and order any replacement parts.

STANDARD SYSTEM – 20,000 lbs BIN WEIGHT

Part #:	Description:	Price (CAD):
1018	STD Lock 'N' Safe Brake Unit c/w Air Actuator	1,080.00
7036	Coiled Air Line – 12 ft.	35.00
7031	Coiled Air Line – 15 ft.	40.00
7033	Coiled Air Line – 20 ft.	50.00
7032	Coiled Air Line – 25 ft.	55.00
7034	Coiled Air Line – 30 ft.	60.00
7035	Coiled Air Line – 50 ft.	70.00
8010	Air Switch	170.00
7010	Lock 'N' Bleed Valve – 3/8"	50.00
D900A-01	STD Air Actuator Replacement Kit	245.00
3000-XXXX	STD 3/4" Cable – Under 20 ft.	85.00
3000-XXXX	STD 3/4" Cable – Over 20 ft.	108.00
3000-XXXX	STD 3/4" Cable – Over 30 ft	132.00

Cable Description – 3000-XX(ft.)XX(in.)

(Example: Cable Length of 20'-7" = Part # 3000-2007)

HEAVY DUTY SYSTEM – 40,000 lbs BIN WEIGHT

Part #:	Description:	Price (CAD):
LNS-20K-011	HD Lock 'N' Safe Brake Unit c/w Air Actuator	1,580.00
7036	Coiled Air Line – 12 ft.	35.00
7031	Coiled Air Line – 15 ft.	40.00
7033	Coiled Air Line – 20 ft.	50.00
7032	Coiled Air Line – 25 ft.	55.00
7034	Coiled Air Line – 30 ft.	60.00
7035	Coiled Air Line – 50 ft.	70.00
8010	Air Switch	170.00
7010	Lock 'N' Bleed Valve – 3/8"	50.00
D900A-02	HD Air Actuator Replacement Kit	265.00
4000-XXXX	HD 1" Cable – Under 20 ft.	130.00
4000-XXXX	HD 1" Cable – Over 20 ft.	195.00
4000-XXXX	HD 1" Cable – Over 30 ft	260.00

Cable Description – 4000-XX(ft.)XX(in.)

(Example: Cable Length of 20'-7" = Part # 4000-2007)

5 WARRANTY

Lock 'N' Safe[™] products supplied by LNS Services are warranted against defects in material and workmanship for a period of two (2) years from the date of shipment. Replacement shall be made free of charge. upon proof satisfactory to LNS Services of the defect claimed. This Warranty is to the original purchase only and shall not apply to any defects resulting from misuse, negligence or physical damage.

This Warranty is also contingent on the Buyer maintaining the Product according to LNS Services specifications. LNS Services shall not be liable for any loss, cost or injury, damage to person or property, loss of use of the Product, nor for loss of production or any consequential damage of any kind or nature whatsoever.