



Interlocked Vehicle Restraint Owner's Manual

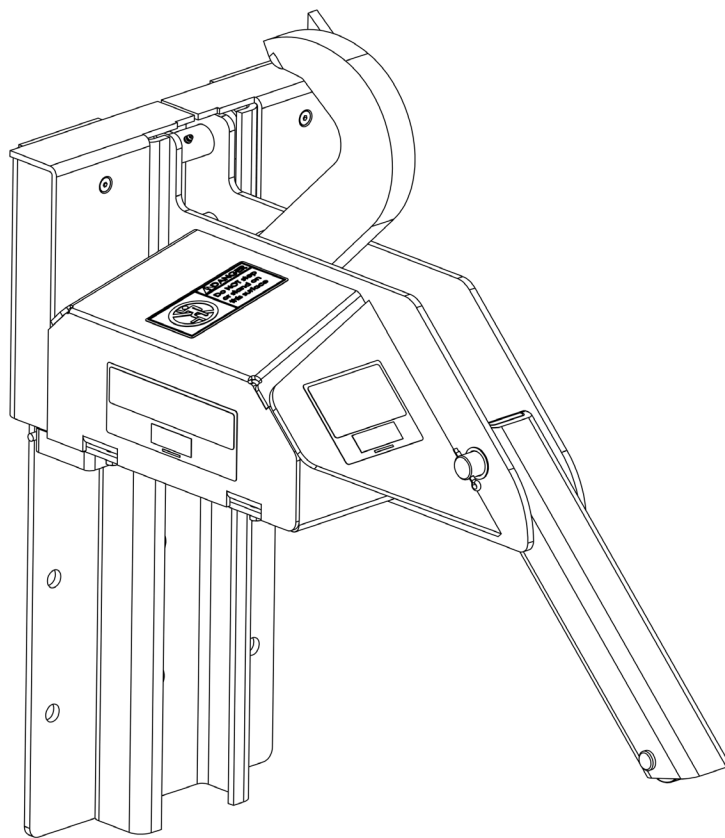



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PRECAUTIONS

Recognize Safety Information

Safety-Alert Symbol



The Safety-Alert Symbol is a graphic representation intended to convey a safety message without the use of words. When you see this symbol, be alert to the possibility of death or serious injury. Follow the instructions in the safety message panel.


DANGER

The use of the word DANGER signifies the presence of an extreme hazard or unsafe practice which will most likely result in death or serious injury.


WARNING

The use of the word WARNING signifies the presence of a serious hazard or unsafe practice which could result in death or serious injury.


CAUTION

The use of the word CAUTION signifies possible hazard or unsafe practice which could result in minor or moderate injury.

NOTICE

The use of the word NOTICE indicates information considered important, but not hazard-related, to prevent machine or property damage.

SAFETY INSTRUCTIONS

Indicates a type of safety sign, or separate panel on a safety sign, where safety-related instructions or procedures are described.

General Operational Safety Precautions



Read and understand the Owner's/User's Manual and become thoroughly familiar with the equipment and its controls before operating the transport vehicle restraint.

Never operate a transport vehicle restraint while a safety device or guard is removed or disconnected.

Never remove DANGER, WARNING, or CAUTION signs, Placards or Decals on the equipment unless replacing them.

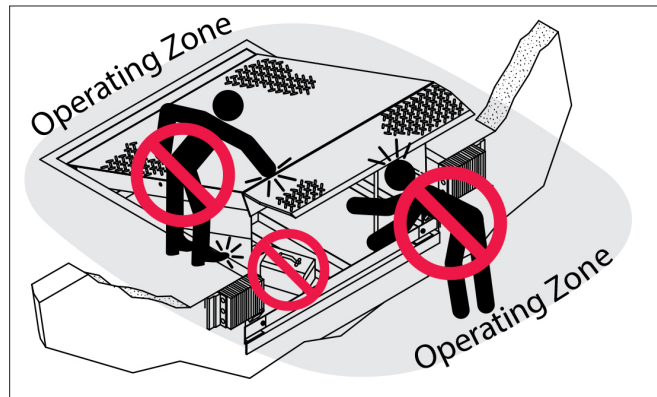



Figure 1

Do not start the equipment until all unauthorized personnel in the area have been warned and have moved outside the operating zone (see Figure 1).

Remove any tools or foreign objects from the operating zone before starting.

Keep the operating zone free of obstacles that could cause a person to trip or fall.

 **WARNING:** This product can expose you to chemicals including lead, which are known to the State of California to cause cancer or birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

PRECAUTIONS

Operational Precautions



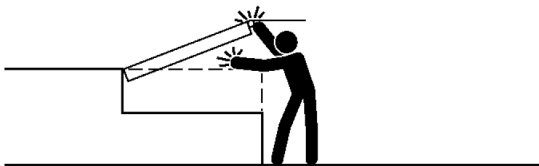
Learn the safe way to operate this equipment. Read and understand the manufacturer's instructions. If you have any questions, ask your supervisor.

DANGER

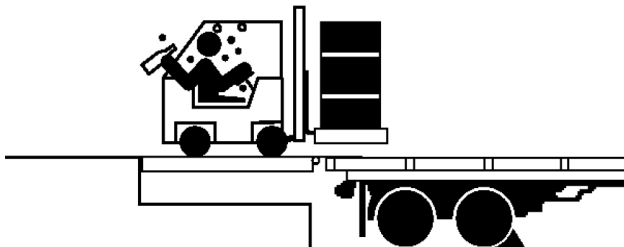


Stay clear of dock leveling device and restraint when transport vehicle is entering or leaving area.

Do not move or use the dock leveling device and restraint if anyone is under in front or near it.

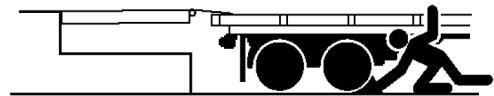


Keep hands and feet clear of pinch points. Avoid putting any part of your body near moving parts.



Do not operate any equipment while under the influence of alcohol or drugs.

WARNING



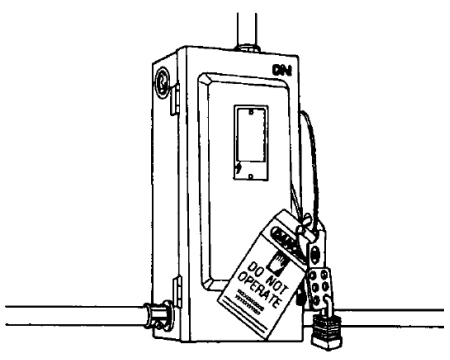
Chock/restrain all transport vehicles. Never remove the wheel chocks until loading or unloading is finished and transport vehicles driver has been given permission to drive away.

Do not use a broken or damaged restraint device. Make sure proper service and maintenance procedures have been performed before using.

PRECAUTIONS

Maintenance Precautions

DANGER



Electrical power must be OFF when servicing the equipment. For maximum protection, use an OSHA approved locking device to lock out all power sources. Only the person servicing the equipment should have the key to unlock the device.

VEHICLE RESTRAINT SAFETY DECAL'S
 Every 90 days (quarterly) inspect all safety labels, placards and tags to ensure they are present, easily seen and legible. Refer to the Parts section of this publication to identify the location of the safety items listed below. Call NOVA Technical Service for replacements.

Page #	Item #	Description
27	37	No Step Decal
30	2	Move on Green Sign
30	3	Caution Sign
30	4	Placard, Restraint Operation
31	5	Decal, Arc Flash
31	6	Decal, Hook Position

DANGER


Arc Flash and Shock Hazard
PPE [Personal Protection Equipment] Required

De-energize equipment before working on or inside.
 Do not open cover without appropriate PPE.
 Refer to NFPA 70E for PPE requirements.
 This panel may contain more than one power source.

MF2-202-000

Hazardous Voltage Will Result in Death or Serious Injury

WARNING



Always post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the unit before maintenance is complete.

ALWAYS disconnect electrical power source and ground wire before welding on restraint.

DO NOT ground welding equipment to any electrical components of the restraint. Always ground to the restraint frame.

DO NOT grind or weld if hydraulic fluid or other flammable liquid is present on the surface to be ground or welded.

DO NOT grind or weld if uncontained hydraulic fluid or other flammable liquid is present. Stray sparks can ignite spills or leaks near the work area. Always clean up the oil leaks and spills before proceeding with grinding or welding.

Always keep a fire extinguisher of the proper type nearby when grinding or welding.

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OWNER'S/USER'S RESPONSIBILITIES

1. The manufacturer shall provide to the initial purchaser and make the following information readily available to the owners/users and their agents, all necessary information regarding Safety Information, Operation, Installation and Safety Precautions, Recommended Initial and Periodic Inspections Procedures, Planned Maintenance Schedule, Product Specifications, Troubleshooting Guide, Service Parts Listing, Warranty Information, and Manufacturers Contact Information.
2. The owner/user should recognize the inherent dangers of the interface between the loading dock and the transport vehicle. The owner/user should, therefore, train and instruct all operators in the safe operation and use of the restraining device in accordance with manufacturer's recommendations and industry standards. Effective operator training should also focus on the owner's/user's company policies, operating conditions and the manufacturer's specific instructions provided with the restraining device. Maintaining, updating and retraining all operators on safe working habits and operation of the equipment, regardless of previous experience, should be done on a regular basis and should include an understanding and familiarity with all functions of the equipment. Owner's/user's shall actively maintain, update and retrain all operators on safe working habits and operations of the equipment.
3. When selecting a restraining device, it is important to consider not only present requirements but also future plans and any possible adverse conditions, environmental factors or usage. The owners/users shall provide application information to the manufacturer to receive recommendations on appropriate equipment specifications.
4. The owner/user must see all nameplates, placards, decals, instructions and posted warnings are in place and legible and shall not be obscured from the view of the operator or maintenance personnel for whom such warnings are intended for. Contact manufacturer for any replacements.
5. Modifications or alterations of restraining devices shall be made only with prior written approval from the original manufacturer. These changes shall be in conformance with all applicable provisions of the MH30.3 standard and shall also satisfy all safety recommendations of the original equipment manufacturer of the particular application.
6. An operator training program should consist of, but not necessarily be limited to, the following:
 - a. Select the operator carefully. Consider the physical qualifications, job attitude and aptitude.
 - b. Assure that the operator reads and fully understands the complete manufacturer's owners/users manual.
 - c. Emphasize the impact of proper operation upon the operator, other personnel, material being handled, and equipment. Cite all rules and why they are formulated.
 - d. Describe the basic fundamentals of the restraining device and components design as related to safety, e.g., mechanical limitation, stability, functionality, etc.
 - e. Introduce the equipment. Show the control locations and demonstrate functions. Explain how they work when used properly and maintained as well problems when they are used improperly.
 - f. Assure that the operator understands nameplate data, placards and all precautionary information appearing on the restraining device.
 - g. Supervise operator practice of equipment.
 - h. Develop and administer written and practical performance tests. Evaluate progress during and at completion of the course.
 - i. Administer periodic refresher courses. These may be condensed versions of the primary course and include on-the-job operator evaluation.
7. It is recommended that the transport vehicle is positioned as close as practical to the dock leveling device and in contact with both bumpers. When an industrial vehicle is driven on or off a transport vehicle during the loading and unloading operation, the transport vehicle parking brakes shall be applied and wheel chocks or restraining device that provides equal or better protection of wheel chocks shall be engaged. Also, whenever possible, air-ride suspension systems should have the air exhausted prior to performing said loading and unloading operations.

OWNER'S/USER'S RESPONSIBILITIES

8. When goods are transferred between the loading dock and a trailer resting on its support legs/landing gear instead of a tractor fifth wheel or converter dolly, it is recommended that an adequate stabilizing device or devices shall be utilized at the front of the trailer.
9. In order to be entitled to the benefits of the standard product warranty, the dock safety equipment must have been properly installed, maintained and operated in accordance with all manufacturer's recommendations and/or specified design parameters and not otherwise have been subject to abuse, misuse, misapplication, acts of nature, overloading, unauthorized repair or modification, application in a corrosive environment or lack of maintenance. Periodic lubrication, adjustment and inspection in accordance with all manufacturers' recommendations are the sole responsibility of the owner/user.
10. Manufacturer's recommended maintenance and inspection of all restraining devices shall be performed in conformance with the following practices: A planned Maintenance schedule program must be followed, only trained and authorized personnel shall be permitted to maintain, repair, adjust and inspect restraining devices, and only the use of original equipment manufacturer parts, manuals, maintenance instructions, labels, decals and placards or their equivalent. Written documentation of maintenance, replacement parts or damage should be kept. In the event of damage, notification to the manufacturer is required.
11. Restraining devices that are structurally damaged shall be removed from service, inspected by a manufacturer's authorized representative, and repaired or replaced as needed or recommended by the manufacturer before being placed back in service.

OPERATING PROCEDURES

! WARNING

Before loading or unloading a vehicle at your loading dock while using a NOVA Lock & Load™ vehicle restraint, always visually inspect to be sure that the restraint is engaged with the Rear Impact Guard (RIG). If the restraint is still not engaged after backing the trailer firmly against the dock bumpers, secure the trailer by other means.

Be sure that the area around the RIG assembly is clear of obstructions.

Rear Impact Guards with cover plates should be secured by other means.

Always operate the NOVA Lock & Load™ vehicle restraint from the top of the dock.

Inspect all restraint lights daily to make certain they work properly.

Perform maintenance on restraints in accordance with Maintenance on page 13 of this manual.

NOVA Lock & Load™ vehicle restraints should be operated only by authorized personnel who have read and understand the Owner's Manual.

If you have questions, Call your local representative or NOVA at (800) 236-7325.

! WARNING

Verify the text "Lock & Load™" is present in the display of the PLC as illustrated in FIGURE A.

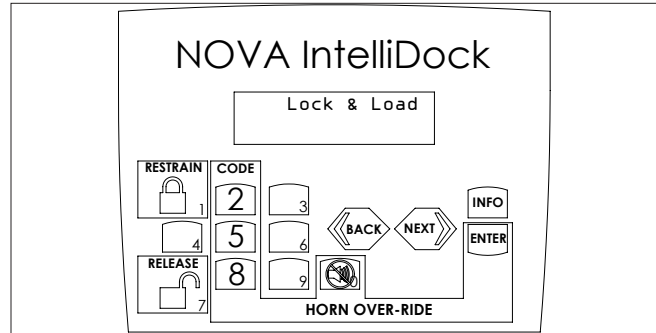


FIGURE A—VERIFY PLC DISPLAY

Stored Position / Restraint UNLOCKED

Hook is in the STORED position. Inside light is flashing red alerting forklift operator unsafe condition exists. Outside light is flashing green alerting truck driver it is safe to back in.

Refer to Figure B.

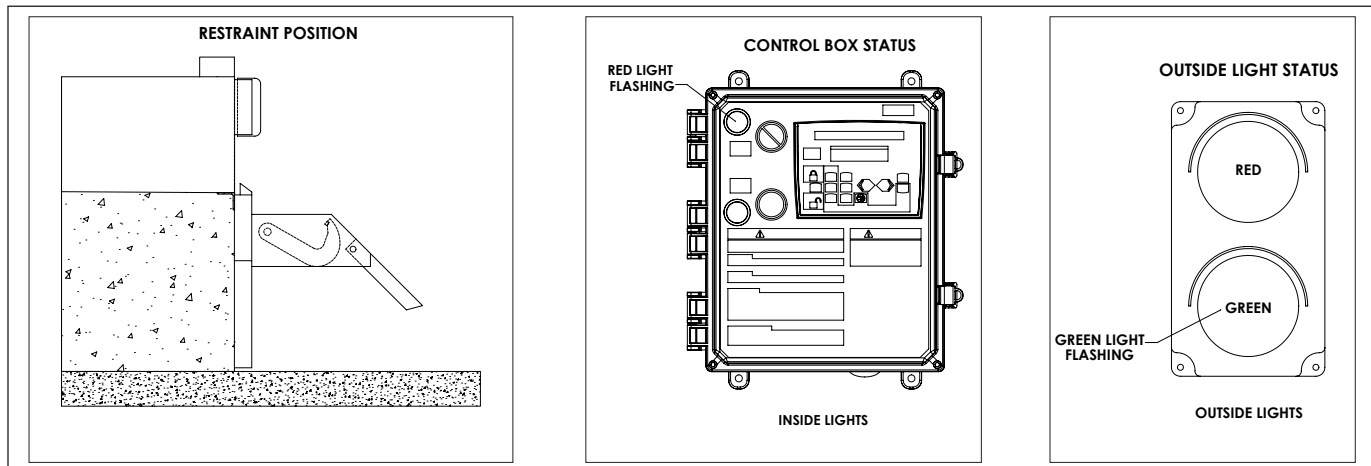


FIGURE B—STORED POSITION

OPERATING PROCEDURES

Interlocked Equipment Position to Lock Restraint

Interlocked equipment must be in position listed below:

PLC Display: Interlock Door A	Door must be closed
OR	
PLC Display: Interlock Door B	Door could be opened or closed
OR	
PLC Display: InterlockLeveler	Leveler must be stored

RESTRAIN Button Pressed - Restraint LOCKING

Trailer has backed into loading dock and is parked firmly against dock bumpers. The alarm will sound while the hook rotates from stored position to securely capture RIG. The inside light is flashing red. Outside light is flashing red alerting truck driver not to move. Refer to Figure C.

If horn sounds after hook has finished rotating, proceed to FAULT, otherwise proceed to Restraint LOCKED.

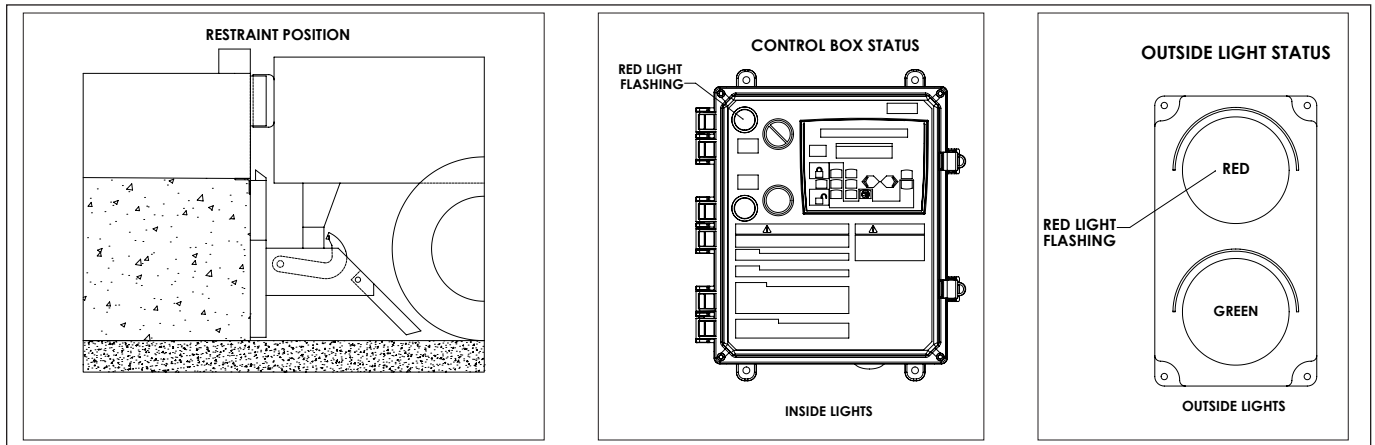


FIGURE C—RESTRAINT LOCKING

OPERATING PROCEDURES

Restraint LOCKED

Once the RIG is securely captured by the hook, a LOCKED condition exists. Inside light is flashing green alerting the forklift operator a safe condition exists. Outside light is flashing red alerting truck driver not to move. Refer to Figure D.

If during loading/unloading the inside light turns red and the horn sounds, press RESTRAIN button to secure the RIG.

! WARNING

Visually inspect to ensure that the NOVA Lock & Load™ vehicle restraint hook securely captures the RIG of the trailer before operating the dock leveler.

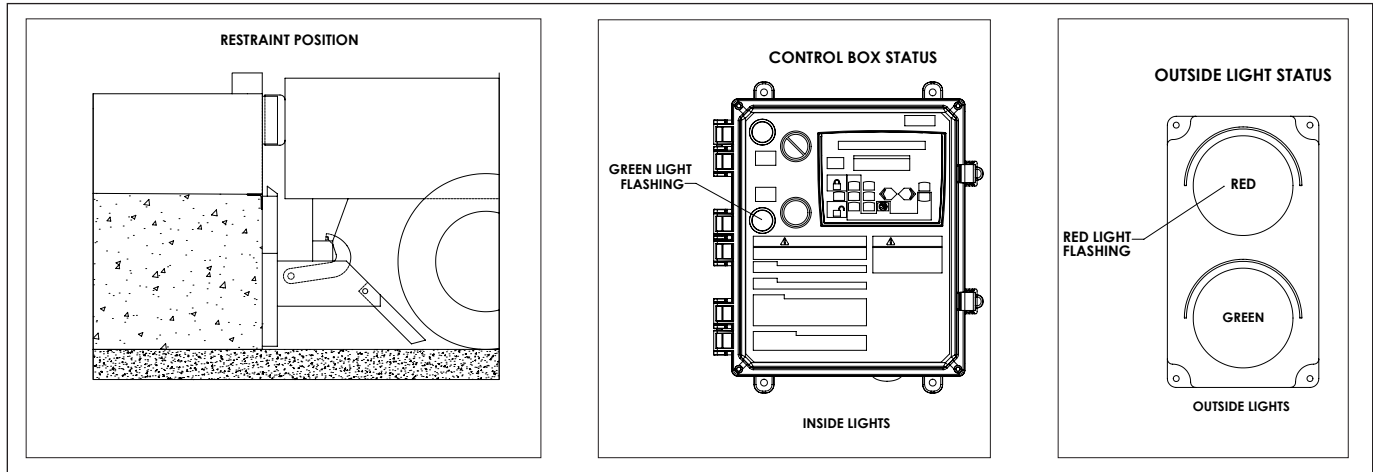


FIGURE D—RESTRAINT LOCKED

Interlocked Equipment is Now Active

Interlocked equipment position listed below:

- PLC Display: Interlock Door A
OR
- PLC Display: Interlock Door B
OR
- PLC Display: InterlockLeveler

- Overhead door can be opened
- Overhead door can be opened or remain opened
- Leveler can be placed into back of transport vehicle

OPERATING PROCEDURES

Interlocked Equipment Position to Unlock Restraint

Interlocked equipment must be in position listed below:

PLC Display: Interlock Door A	Door must be closed
OR	
PLC Display: Interlock Door B	Door must be closed
OR	
PLC Display: InterlockLeveler	Leveler must be stored

RELEASE Button Pressed - Restraint UNLOCKING

Hook travels from the LOCKED position to the STORED position. Inside light is flashing red. Outside light is flashing red alerting truck driver not to move. Refer to Figure E. When the process is complete, the hook is in the stored position as shown in Figure B on page 8.

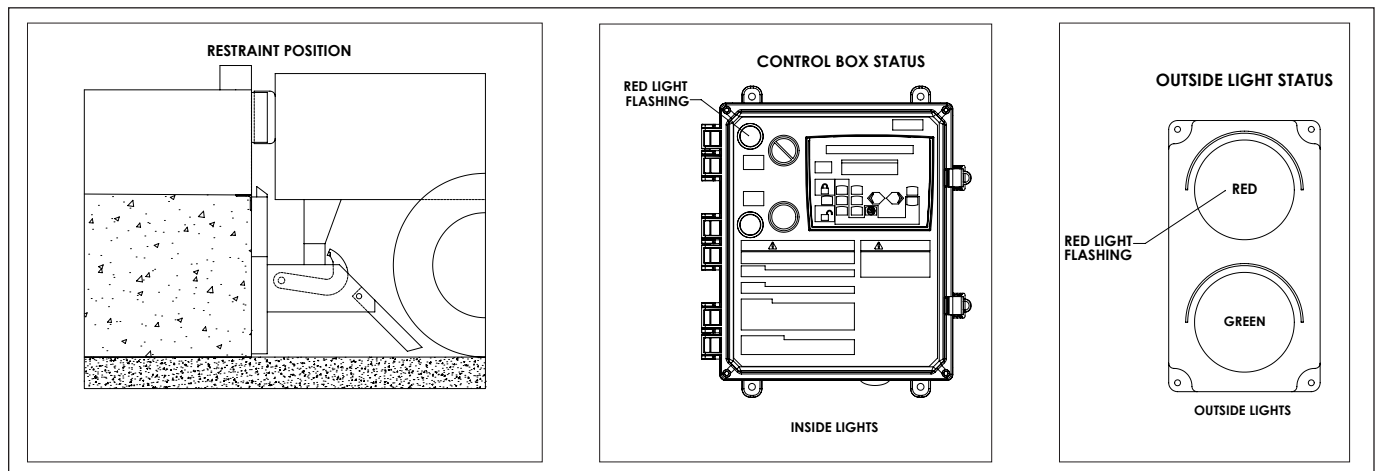


FIGURE E—RESTRAINT UNLOCKING

OPERATING PROCEDURES

FAULT from LOCKING State

Hook cannot lock the RIG. This could be due to a RIG that is located too far toward the rear axle, bent, obstructed, presence of a lift gate, or missing. Inside light is flashing red and horn is pulsing, alerting the forklift operator that the trailer is not locked. Outside light is flashing red alerting the truck driver not to move. See Figure F.

If the trailer is parked firmly against the dock bumpers proceed to horn over-ride state. If not, press RELEASE to clear the fault, have trailer back up and repeat Restraint LOCKING procedure.

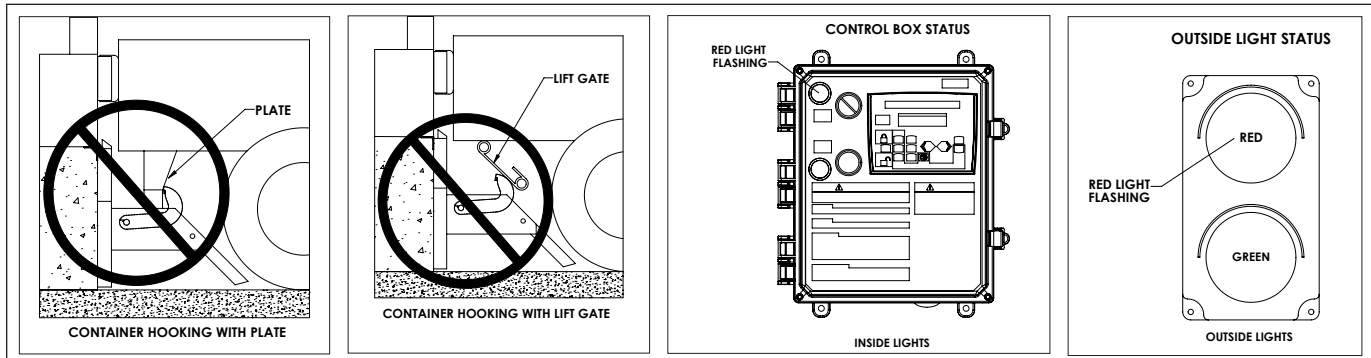


FIGURE F—FAULT STATE

HORN OVER-RIDE

If alarm sounds and red light is on after attempting to RESTRAIN the RIG, the trailer may not be serviceable. Ensure Dock Leveler is in the stored position. Secure trailer by alternate means. Depress the “HORN OVER-RIDE” button (0) on the key pad, enter default over-ride code 5528 then press the “ENTER” button. Inside red and green lights are flashing; outside light is flashing red only. Position Dock Leveler to service trailer and proceed with caution.

⚠ DANGER

Before activating “HORN OVER-RIDE”, ensure that dock leveler is in stored position and secure trailer by other means.

HORN OVER-RIDE RESET

Ensure Dock Leveler is in the stored position. Unsecure the trailer. Depress the “HORN OVER-RIDE” button (0) on the key pad, enter default over-ride code 5528 then press the “ENTER” button. Press the “RELEASE” button on the key pad.

5528 = default over-ride code. The default over-ride code can be changed.

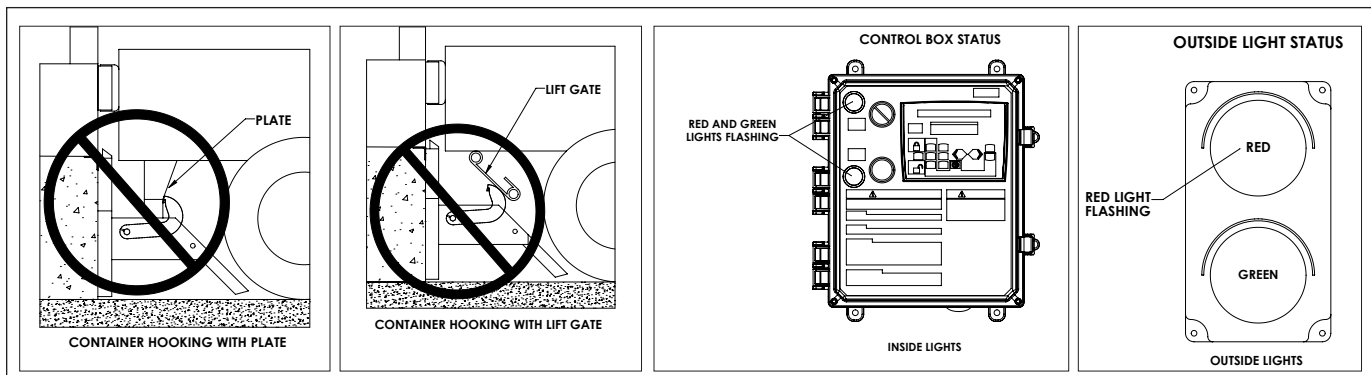


FIGURE G—HORN OVER-RIDE STATE

ROUTINE MAINTENANCE

! DANGER

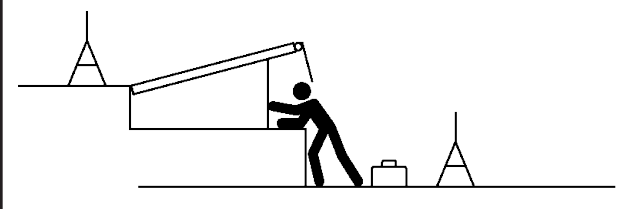
When working with electrical or electronic controls, make sure that the power source has been locked out and tagged according to OSHA regulations and approved local electrical codes.

Post safety warnings and barricade work area, at dock level and at ground level, to prevent unauthorized use of the dock.

! WARNING

Safe operation of the NOVA Lock & Load™ truck restraint requires all lights and the horn to be working properly. DO NOT use NOVA Lock & Load™ vehicle restraint if parts are broken or missing.

! WARNING



Always post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the unit before maintenance is complete.

! CAUTION

Use lifting device (e.g. crane, jack) when lifting carriage (approx. 110 lbs.). Lifting by hand may cause back injury.

NOTICE

Maintenance may be required more frequently at loading docks exposed to harsh environments (extreme climates, corrosive chemicals, frequency of usage, etc.). If these conditions exist, consult NOVA for accelerated maintenance requirements.

NOTE: If a leveler is installed at the NOVA Lock & Load™ vehicle restraint location, it may be necessary to raise the leveler before performing maintenance. Raise the leveler, insert and secure the maintenance prop, and LOCKOUT/TAGOUT the power source.

DAILY

- Remove debris around NOVA Lock & Load™ Vehicle restraint.
- Verify that restraint operates smoothly and inside, outside lights and horn are working.
- Replace damaged or missing light bulbs and lenses.
- Repair, remount, or replace outside and inside signs and labels as required.
- Inspect dock bumpers. Missing bumpers must be replaced.

180 DAYS

- Perform all Daily maintenance.
- Grease rollers at fittings located on the top and bottom axle with Mobilith SHC220 No. 2 grease or equivalent.
- Verify brake torque is greater than 500 in-lbs (42 ft-lbs), and less than 700 in-lbs (58 ft-lbs) at the hook shaft, rotating the hook from ENGAGED to STORED.
- Inspect hook for free play on the hook shaft. Tighten hook set screw to 96 in-lbs (8 ft-lbs) if free play is present.
- Inspect the outside electrical connections (junction box, conduit, power harness) and outside communication light. Loose or damaged components must be repaired or replaced.
- Check that all concrete anchor bolts are torqued to 60 ft-lbs.
- Perform operational test after all maintenance repairs and adjustments are complete.
- Inspect dock bumpers. A minimum of four inches (4") of protection is required. Worn, torn, loose or missing bumpers must be replaced.

360 DAYS

- Perform all Daily and 180 Day maintenance.
- Check and tighten, if necessary, motor drive chain. To tighten see Figure H, page 14.
- Lube chain using chain lube.
- Lubricate limit switch mounting bracket between drive sprocket and cam with a synthetic oil-base moly grease with a temperature range of -40° to 170° F.

NOTE:

In addition, it is recommended and good safety practice to use an additional means to support the dock platform and lip anytime when physically working in front of or under the dock leveler. This additional means may include, but not limited to a boom truck, fork truck, stabilizing bar or equivalent.

ROUTINE MAINTENANCE

DRIVE CHAIN ADJUSTMENT

Inspect the drive chain periodically for dirt and chain slack. Open the motor enclosure and clean the chain with solvent. After cleaning, spray with a high quality chain spray type lubricant.

The drive chain should not have more than 1/4" slack. Refer to Figure H. To tighten chain:

- Open motor enclosure and loosen the four (4) motor mounting bolts.
- Pry the motor assembly forward, in the slotted holes, until the chain is tight with proper alignment between sprockets.
- Hold in this position and tighten the four (4) motor mounting bolts to 108 in-lbs.

⚠ DANGER

When working with electrical or electronic controls, make sure that the power source has been locked out and tagged according to OSHA regulations and approved local electrical codes.

BRAKE TORQUE ADJUSTMENT

(Refer to Figure H)

- Loosen brake adjuster locknut while holding the adjuster screw to prevent inadvertent adjustment.
- Turn adjuster screw clockwise to increase brake torque as needed.
- Tighten adjuster locknut while holding the adjuster screw to prevent inadvertent adjustment.
- Verify brake torque is in the range of 500 to 700 in-lbs at the hook shaft; readjust as required.

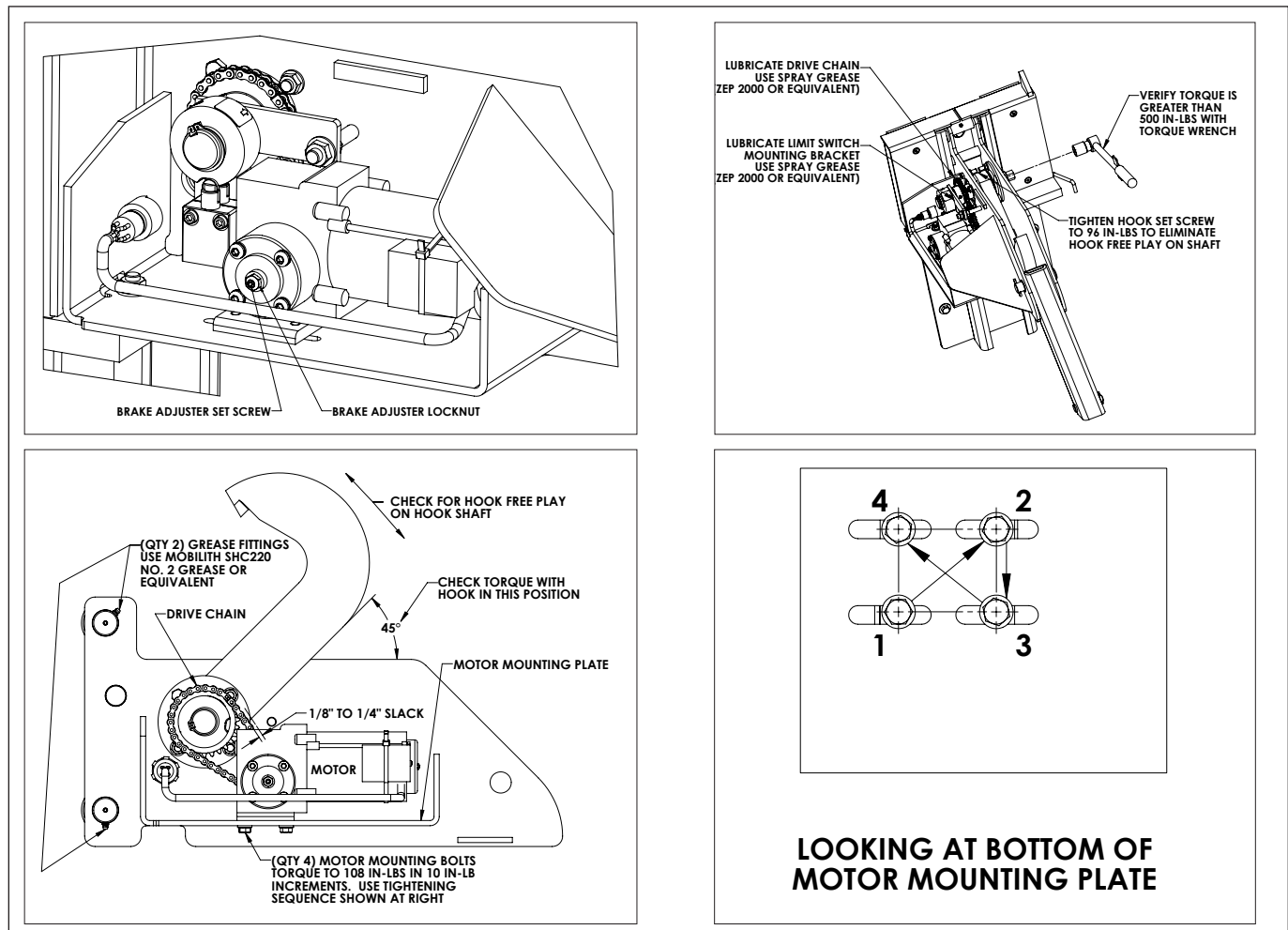


FIGURE H—MAINTENANCE AND LUBRICATION

TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	RESOLUTION
NOVA Lock & Load™ vehicle restraint lights do not flash and the hook does not raise.	<ul style="list-style-type: none"> • Power source malfunction. • Incorrect wiring. 	<ul style="list-style-type: none"> • Check power source, including facility circuit breaker and circuit breaker on power module. • Verify wiring per wiring diagrams starting on page 22.
NOVA Lock & Load™ vehicle restraint lights are flashing, but the hook does not raise or lower to full extent.	<ul style="list-style-type: none"> • Chain is loose or broken. • Low incoming voltage. • Drive motor defective. • Incorrect wiring. 	<ul style="list-style-type: none"> • Adjust or replace as required. • Verify incoming voltage at L1 and N is a minimum of 110V. Do not power off a control transformer from other equipment unless properly sized for load. • Check motor. Repair or replace as needed. • Verify wiring per wiring diagrams starting on page 22.
NOVA Lock & Load™ vehicle restraint is operational, but hook drops causing lights to change and/or horn to sound while trailer is being serviced.	<ul style="list-style-type: none"> • Verify brake torque. • Drive motor defective. 	<ul style="list-style-type: none"> • If brake torque is less than 500 in lb or chain is loose or broken, adjust or replace as required. • Check motor. Repair or replace as needed.
NOVA Lock & Load™ vehicle restraint is operational but all lights are out.	<ul style="list-style-type: none"> • LEDS burnt out, loose or missing. • Incorrect wiring. 	<ul style="list-style-type: none"> • Check LED Modules and replace as required. • Verify wiring per wiring diagrams starting on page 22.
NOVA Lock & Load™ vehicle restraint horn does not sound but hook and lights are operational.	<ul style="list-style-type: none"> • Horn could be silenced. • Horn silencer could be fully closed. • Horn is defective. • Incorrect wiring. 	<ul style="list-style-type: none"> • Press #5 and #8 on keypad at the same time to unsilence horn. Pressing #2 and #8 on the keypad at the same time will silence horn for only 15 minutes. • Baffle attached to horn can be rotated clockwise or counter clockwise to adjust volume of horn. • Power horn using 24V DC power. If horn does not sound, replace as required. • Blue wire labeled "HRN-(+)" must be connected to + tab on horn and white wire labeled "V" must be connected to — tab on horn for horn to sound. Verify incoming voltage is 24V DC.
NOVA Lock & Load™ vehicle restraint hook is in stored position with an inside green light.	<ul style="list-style-type: none"> • Incorrect wiring. 	<ul style="list-style-type: none"> • Verify wiring of LS1 and LS2 at the control box and outside junction box.
NOVA Lock & Load™ vehicle restraint carriage does not return to a full up position.	<ul style="list-style-type: none"> • Carriage binding in track. • Damaged roller track. • Broken or weak springs. 	<ul style="list-style-type: none"> • Check to see if roller track is clean and rollers are clean, free of debris and lubricated. Use only approved grease to lubricate rollers. • Verify that the roller track is straight and not damaged. • Remove spring cover and replace as required.

TROUBLESHOOTING

LIMIT SWITCH TEST PROCEDURE

- Set multimeter to “RX1” scale for “Continuity Test”.
- Attach multimeter leads to pins “B” and “C” of limit switch connector. You should have:
 - plunger released - no meter reading.
 - plunger depressed - a “Full Scale” meter reading.

NOTE: The green (ground) wire of the limit switch does not have to be tested. A continuity test lamp may be used instead of a multimeter.

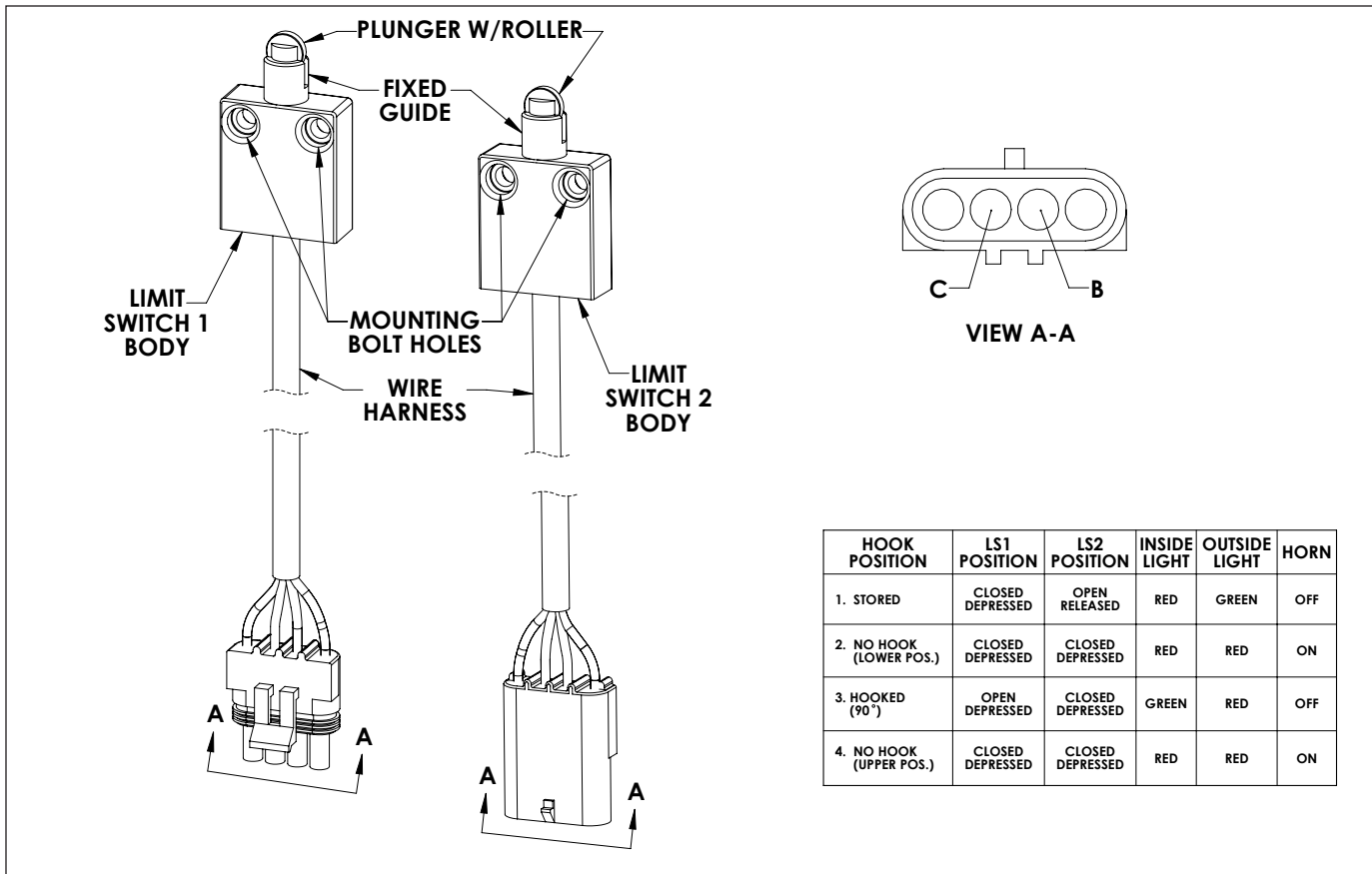


FIGURE I—LIMIT SWITCH AND HOOK POSITION CHART

TROUBLESHOOTING

1. ENTERING MAINTENANCE MODE ON THE CONTROL BOX

Key point: This step can be done on any display or operation except when in Horn Over-Ride.

- a. Depress the "HORN OVER-RIDE" button (#0 button).
- b. The red light, on the control box, will start flashing if the green light was flashing. This is normal to notify the end user that they are about to enter a new mode.
- c. Enter the Maintenance code, 28252, and then press "ENTER".
 - i. If the wrong code was entered, the "Wrong PW: Reenter Or wait" display will appear. On this display, repeat steps 1a through 1c to enter maintenance mode.
 - ii. Or if no further input is completed within 30 seconds, the "Wrong PW: Reenter Or wait" display will clear and the screen will return to the previous display.

2. NAVIGATING THROUGH MAINTENANCE MODE

- a. Use the "NEXT" and "BACK" buttons to navigate through Maintenance Mode.

Display #1 = Faults

Displays #2 - 8 = Counters

Displays #9 & 10 = Cycles

Displays #11 & 12 = Inputs & Outputs

Display #13 = Change Horn Over-Ride Password

#1 Display — Faults

This display shows the most current fault status. There may be more than one fault occurring at a given time but only the most recent one can be displayed. See displays #2-7 for more fault information. Also, check display #11 for proper inputs.

Key point: Counters on displays #2-8 can be reset by following the instructions below. Once on the display with the counter that needs to be reset, press and hold "ENTER" for five seconds. After five seconds, the counter display will begin to flash, release "ENTER". Next, press the "HORN OVER-RIDE" button (#0 button) to set counter back to zero. This is the only acceptable entry to reset the counters. Once the counter has been reset, press "ENTER" to successfully reset counter.

#2 Display — No LS1 No LS2

This display shows the number of times Limit Switch 1 (LS1) and Limit Switch 2 (LS2) are off at the same time. LS1 and LS2 are found inside the motor tray. See Figure N, on page 26, item 5 and 6.

This fault can occur if	Resolution
LS1 malfunctioned when the hook is locked or unlocked.	Ensure LS1 is tightened and working properly. Inputs can be verified on display #11 (page 20).
LS2 malfunctioned when the hook is locked or unlocked.	Ensure LS2 is tightened and working properly. Inputs can be verified on display #11 (page 20).

If a limit switch is positioned and tightened properly but cannot read the position of the hook correctly, replace the limit switch). (Part Numbers - LS1: MF2-038-000 or LS2: MF2-039-000)

#3 Display — Hook Not Active

This display shows the number of times, LS1 and LS2 are on at the same time. LS1 and LS2 are found inside the motor tray. See Figure N, on page 26, item 5 and 6.

TROUBLESHOOTING

This fault can occur if	Resolution
The hook has been pushed off of LS2 after the hook had successfully stopped at LS2.	The hook can be either be restrained or released again depending on the situation. If neither resolves this fault, enter Horn Over-Ride mode by following the instructions printed on the control box.
LS1 malfunctioned when the hook is locked or unlocked.	Ensure LS1 is tightened and working properly. Inputs can be verified on display #11 (page 20).
LS2 malfunctioned when the hook is locked or unlocked.	Ensure LS2 is tightened and working properly. Inputs can be verified on display #11 (page 20).

If the limit switch is positioned and tightened properly but cannot read the position of the hook correctly, replace the limit switch. (Part Numbers - LS1: MF2-038-000 or LS2: MF2-039-000)

#4 Display – LS1 On LS2 Off

This display shows the number of times, LS1 has been on and LS2 has been off when the hook is locked. LS1 and LS2 are found inside the motor tray. See Figure N, on page 26, item 5 and 6.

This fault can occur if	Resolution
The RIG is able to fully release the hook without the "RELEASE" button on the control box being depressed.	Press the "RELEASE" button on the control and the fault will clear.
LS1 and LS2 are reversed.	Verify LS1 and LS2 are positioned as shown in Figure I (page 16).
LS1 and LS2 malfunctioned when the hook is locked.	Ensure LS1 is tightened and working properly. Inputs can be verified on display #11 (page 20).
LS2 malfunctioned when the hook is locked.	Ensure LS2 is tightened and working properly. Inputs can be verified on display #11 (page 20).

If a limit switch is positioned and tightened properly but cannot read the position of the hook correctly, replace the limit switch. (Part Numbers - LS1: MF2-038-000 or LS2: MF2-039-000)

#5 Display – LS1 Off LS2 On

This display shows the number of times, LS1 has been off and LS2 has been on when the hook is unlocked. LS1 and LS2 are found inside the motor tray. See Figure N, on page 26, item 5 and 6.

This fault can occur if	Resolution
LS1 and LS2 are reversed.	Verify LS1 and LS2 are positioned as shown in Figure I (page 16).
LS1 malfunctioned when the hook is unlocked.	Ensure LS1 is tightened and working properly. Inputs can be verified on display #11 (page 20).
LS2 malfunctioned when the hook is unlocked.	Ensure LS2 is tightened and working properly. Inputs can be verified on display #11 (page 20).
The hook is unable to unlock because the RIG is driving the hook upward.	Back up trailer slightly to disconnect RIG from hook.

If a limit switch is positioned and tightened properly but cannot read the position of the hook correctly, replace the limit switch (Part Numbers - LS1: MF2-038-000 or LS2: MF2-039-000)

TROUBLESHOOTING

#6 Display — No RIG Present

This display shows the number of times, the hook has rotated pass LS2 while restraining. During this fault, both LS1 and LS2 are on.

This fault can occur if	Resolution
The trailer is not properly aligned with dock door causing the RIG bar to be in the incorrect position.	Realign trailer and try locking hook again.
There is no RIG present to stop the hook from rotating.	Release hook back to unlocked position and enter Horn Over-Ride mode by following the instructions printed on the control box.

#7 Display — Door not closed/Ramp not stored (This fault will not occur with CB-21-B).

This display shows the number of times the door or ramp comes off of Limit Switch 4 (LS4) when the restraint is not locked and the control box is not in Horn Over-Ride.

This fault can occur if	Resolution
LS4 malfunctioned.	Ensure LS4 is tightened and working properly. Inputs can be verified on display #11 (page 20).
Door or leveler moved off of LS4 from external means.	Enter maintenance mode to activate interlocked equipment back onto LS4.

#8 Display — Horn Over-Ride Count

This display is to show the number of times the Horn Over-Ride function has been activated. The Horn Over-Ride function should only be used when the barrier cannot properly secure the RIG.

Key Point: The maintenance code can also be used to disable Horn Over-Ride in case the standard code for Horn Over-Ride has been over-written.

#9 Display — Total Cycles

This display shows the number of complete cycles the product has gone through. One cycle is defined as the hook moving from the unlocked position to the locked position and back to the unlocked position.

#10 Display — Cycles 2 Service

This display shows how many cycles the NOVA Lock & Load™ can go through before service is needed for the items on the list below:

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	CB-1004	12 AMP RELAY	1
2	CB-1005	20 AMP RELAY	2

For replacement parts, contact NOVA Technology.

TROUBLESHOOTING

#11 Display — 12345678 Inputs

This display shows all inputs going to the control box. The number zero (0) means the input is off. The number one (1) means the input is on. All inputs are listed below:

- | | |
|--------|--------|
| 1. LS1 | 5. N/A |
| 2. LS2 | 6. N/A |
| 3. N/A | 7. N/A |
| 4. LS4 | 8. N/A |

#12 Display — 12345678 Outputs

This display shows all outputs coming from the control box. The number zero (0) means the output is off. The number one (1) means the output is on. All outputs are listed below:

- | | |
|------------------------------|---------------------------------|
| 1. Control Box — Red Light | 5. Motor 1 — Restrain |
| 2. Control Box — Green Light | 6. Motor 2 — Unlock |
| 3. Outside — Red Light | 7. Alarm Horn |
| 4. Outside — Green Light | 8. Interlocked Equipment Active |

#13 Display — Enter New Override Password:

This display is for changing the password to enter and exit Horn Over-Ride. Once on this screen, press “ENTER” to change current password. Then enter new password. The new password can range from 1 to 9999. Once the new password has been typed, press “ENTER” to successfully change the password. Any leading zeros will be eliminated. Provide the new over-ride password to authorized dock attendant(s).

3. EXITING MAINTENANCE MODE ON THE CONTROL BOX

Key point: This procedure can be done on any maintenance screen.

- Depress the “HORN OVER-RIDE” button (#0 button).
- The red light, on the control box, will start flashing if the green light was flashing. This is normal to notify the end user that they are about to enter a new mode.
- Enter the Maintenance code, 28252, and then press “ENTER”.

Key point: The current Horn Over-Ride code will also work for exiting Maintenance Mode.

- If the wrong code was entered, the “Wrong PW: Reenter Or wait” display will appear. On this display, repeat steps 3a through 3c to exit maintenance mode.
- Or if no further input is completed within 30 seconds, the “Wrong PW: Reenter Or wait” display will clear and the screen will return to last display prior to entering maintenance mode.

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WIRING DIAGRAMS

OUTSIDE JUNCTION BOX

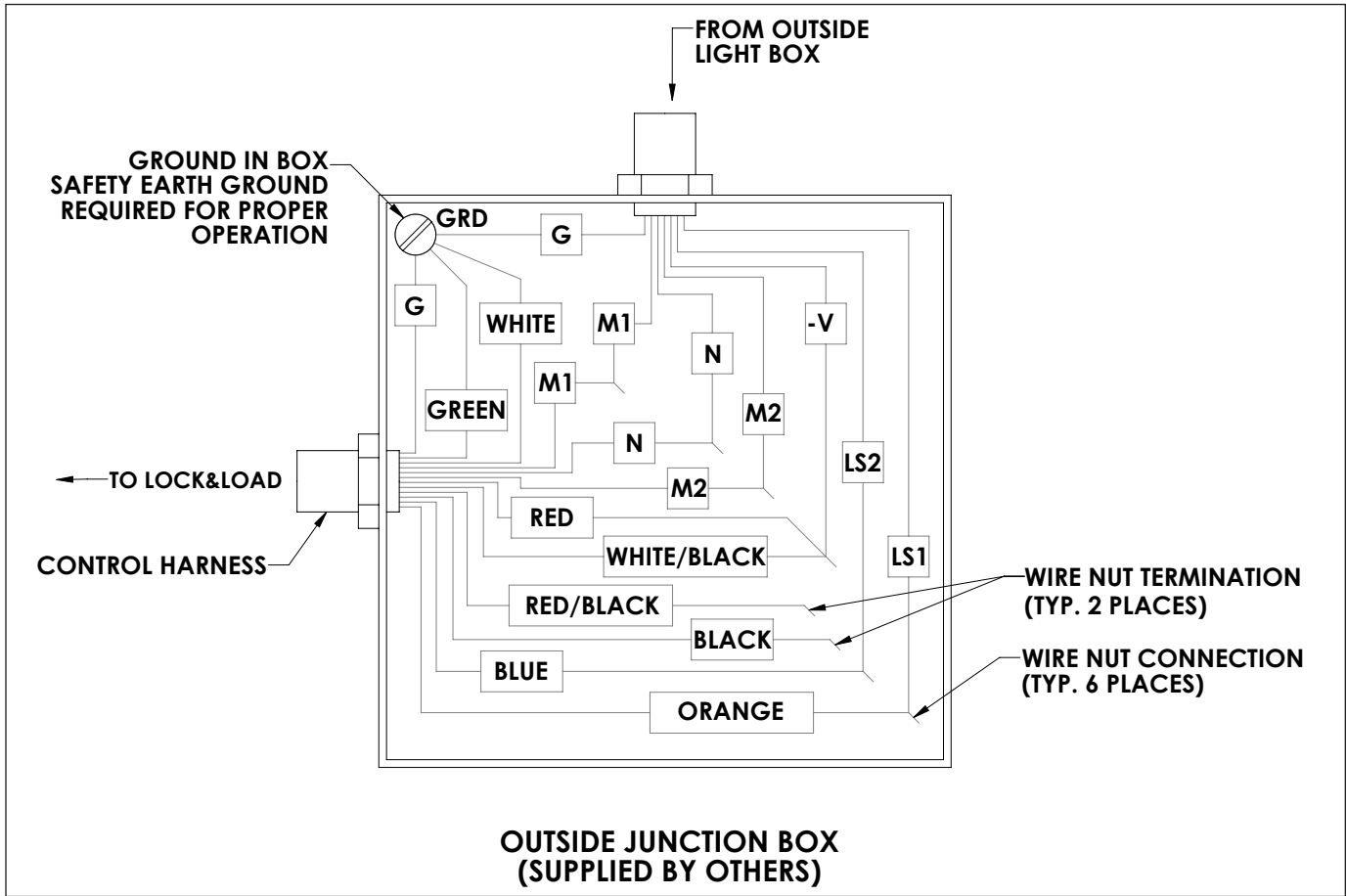


FIGURE J—OUTSIDE JUNCTION BOX

WIRING DIAGRAMS

OUTSIDE LIGHT WIRING

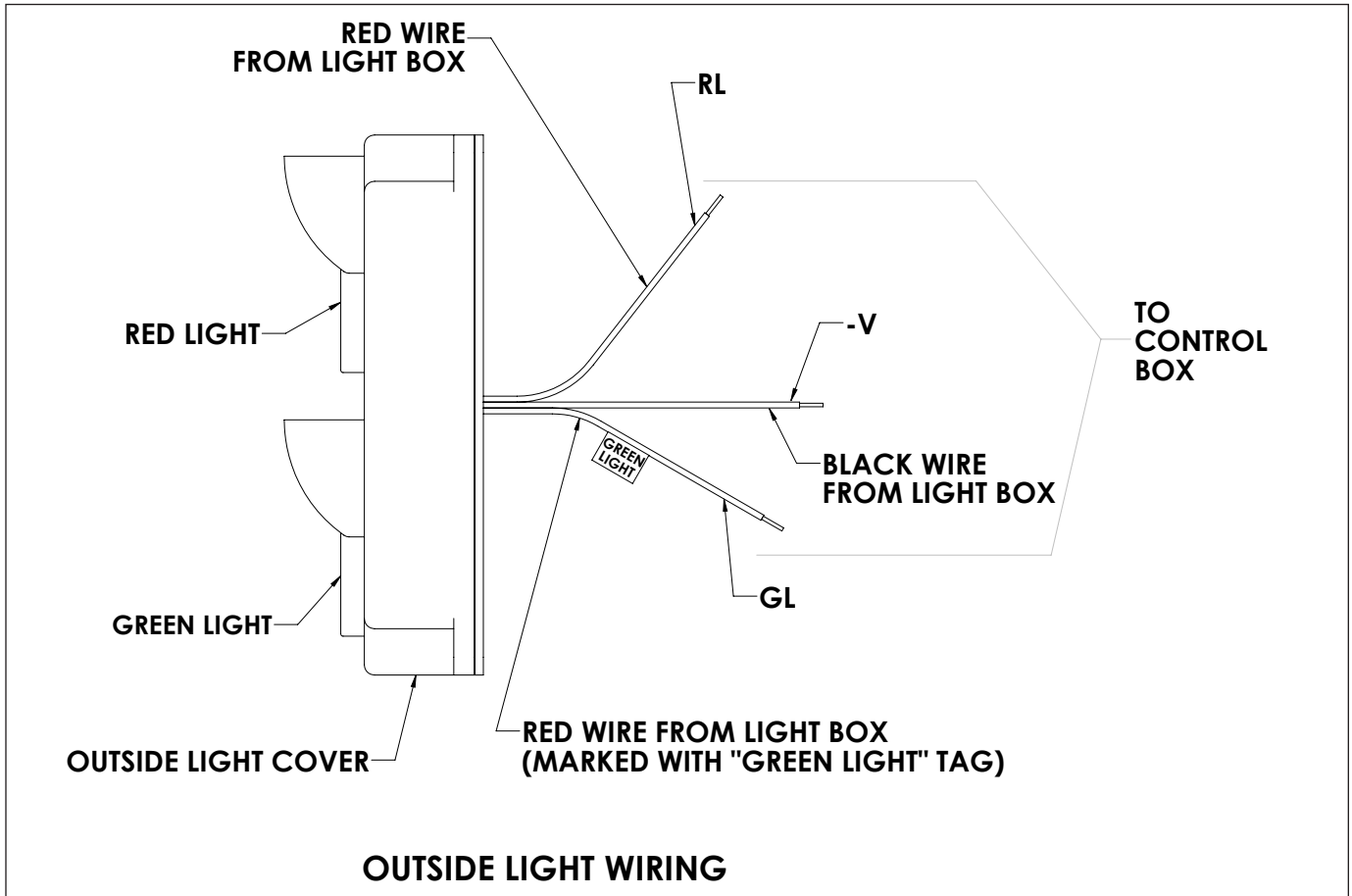


FIGURE K—OUTSIDE LIGHT WIRING

WIRING DIAGRAMS

CONTROL BOX WIRING - INTERLOCKED DOOR

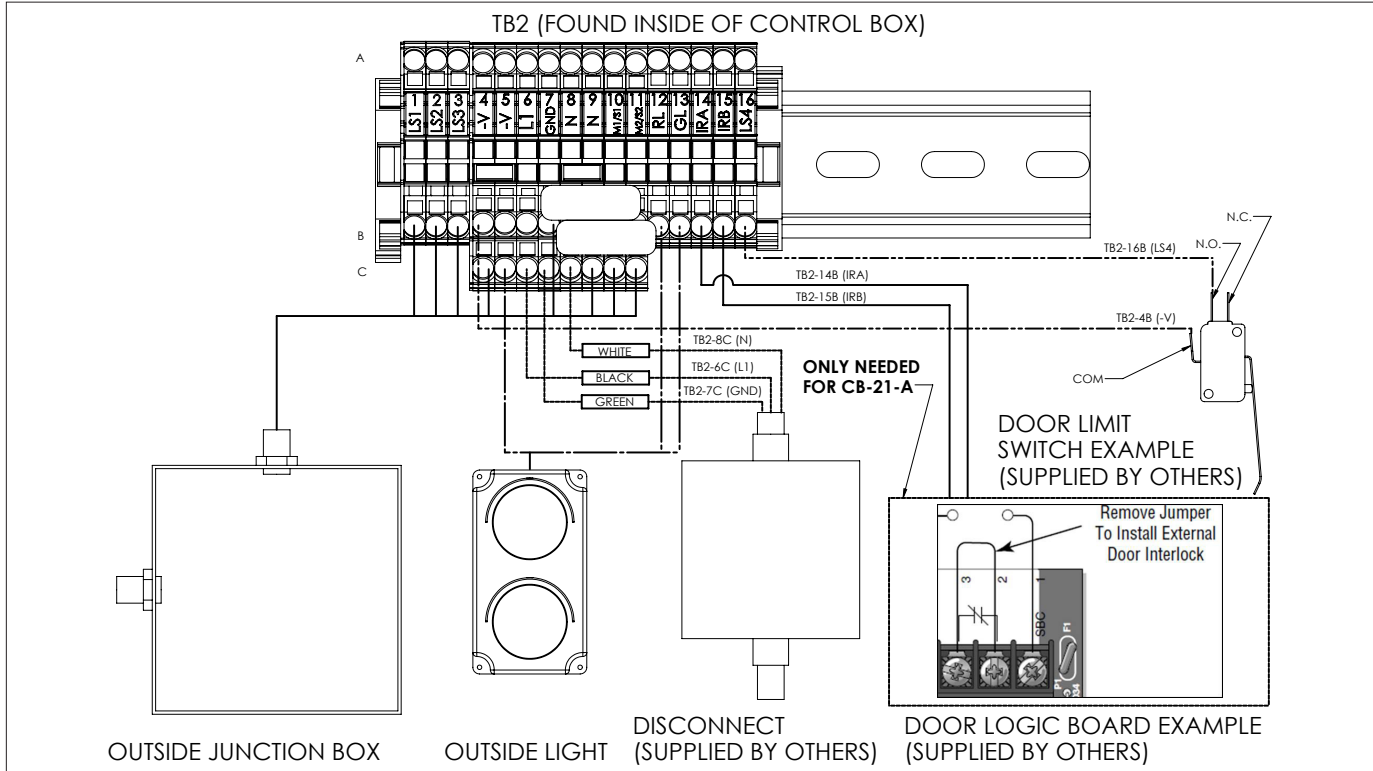


FIGURE L—CONTROL BOX TB2 INTERLOCKED DOOR WIRING SCHEMATIC (CB-21-A & CB-21-B)

- Disclosure:
 - Door logic board example may vary. Reference door operator owner's manual before installation.
 - For example above, remove jumper from 2 and 3, and run wires from IRA to 2 and IRB to 3 on DOOR LOGIC BOARD EXAMPLE.
 - Door limit switch example may vary. Limit switch should be installed in door operator electrical box. Do not splice or cut existing limit switch wires. Reference door operator owner's manual before installing.

WIRING DIAGRAMS

CONTROL BOX WIRING - INTERLOCKED LEVELER

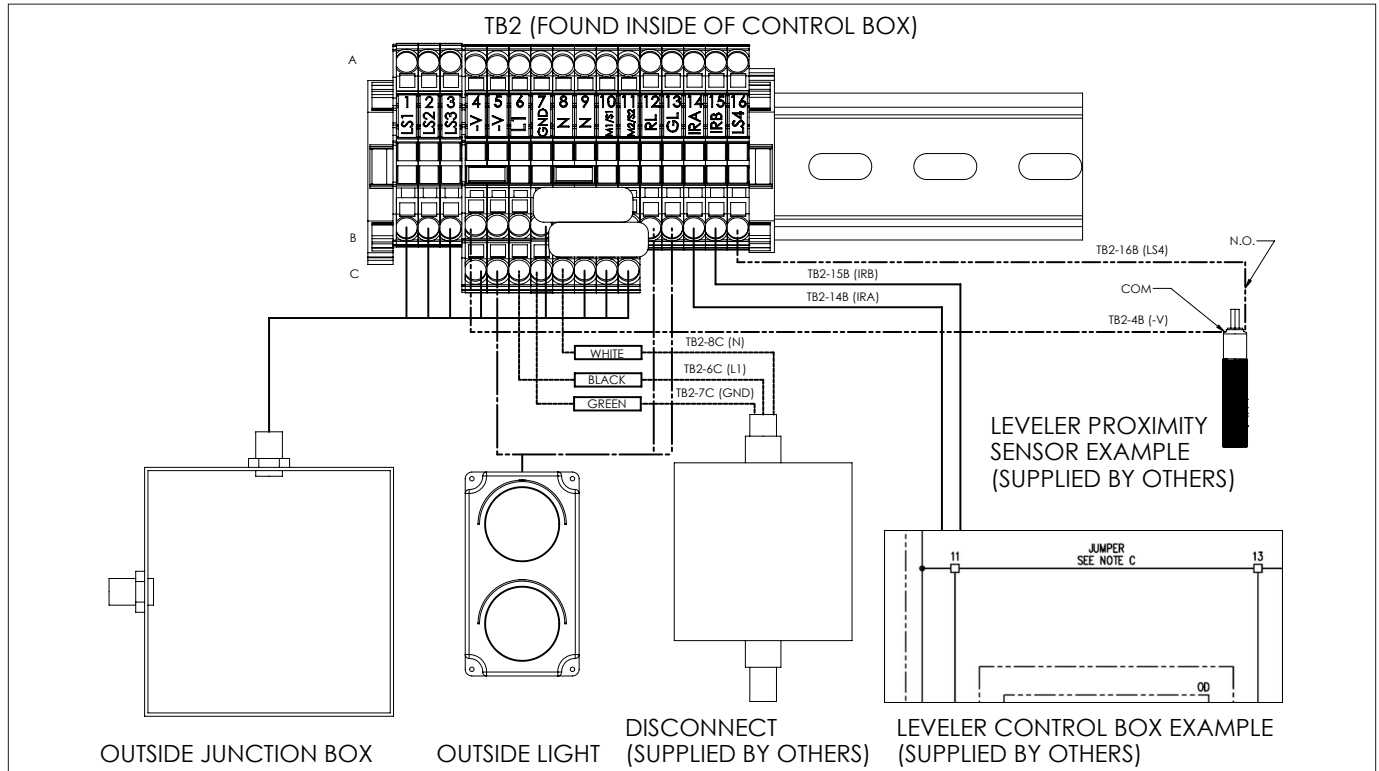


FIGURE M—CONTROL BOX TB2 INTERLOCKED DOOR WIRING SCHEMATIC (CB-21-C)

- Disclosure:
 - Leveler example may vary. Reference leveler owner's manual before installation.
 - For example above, remove jumper from 11 and 13, and run wires from IRA to 11 and IRB to 13 on LEVELER CONTROL BOX EXAMPLE.
 - Leveler proximity sensor example may vary. Proximity sensor should be installed with the sensor facing the lip of the leveler. Do not splice or cut existing limit switch wires. Reference leveler owner's manual before installing.

PARTS

CARRIAGE ASSEMBLY DRAWING

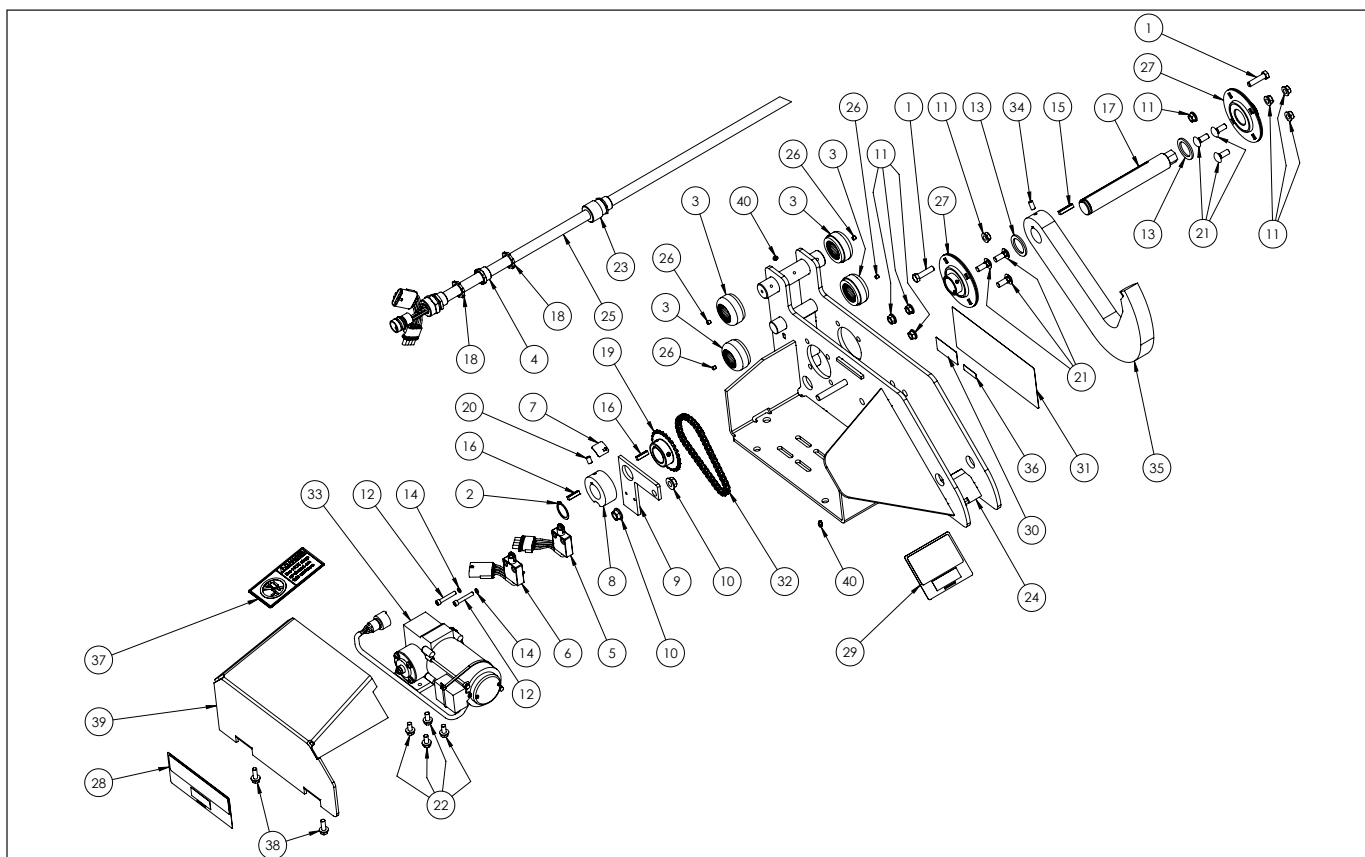


FIGURE N—CARRIAGE ASSEMBLY

CARRIAGE ASSEMBLY PARTS LIST

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	MF2-015-000	3/8-16 X 1 1/2" HEX HEAD CAP SCREW	2
2	MF2-061-000	1 1/4" EXTERNAL RETAINING RING	1
3	MF2-047-000	ROLLER ASSEMBLY	4
4	MF2-034-000	3/4" CONDUIT NIPPLE	1
5	MF2-038-000	LIMIT SWITCH, LS1	1
6	MF2-039-000	LIMIT SWITCH, LS2	1
7	MF2-094-000	CAM DECAL	1
8	MF2-028-000	CAM	1
9	MF2-024-000	LIMIT SWITCH MOUNTING PLATE	1
10	MF2-026-000	7/16-14 SERRATED FLANGE LOCK NUT	2
11	MF2-016-000	3/18-16 SERRATED FLANGE LOCK NUT	8
12	MF2-041-000	1/4-20 X 1 1/2" SOCKET HEAD CAP SCREW	2

PARTS**CARRIAGE ASSEMBLY PARTS LIST** *(continued)*

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
13	MF2-018-000	1 3/4" OD, 1 1/4" ID, 1/8" THICK, MACHINERY BUSHING	2
14	MF2-040-000	1/4" HI-COLLAR LOCK WASHER	2
15	MF2-021-000	1/4" X 1/4" X 1 1/4" HOOK KEY	1
16	MF2-023-000	1/4" X 1/4" X 1" KEY, SPROCKET & CAM	2
17	MF2-020-000	HOOK SHAFT	1
18	MF2-037-000	3/4" CONDUIT LOCK NUT	2
19	MF2-022-000	HOOK DRIVE SPROCKET W/SET SCREWS	1
20	MF2-019-000	5/16-18 X 1/2" SOCKET SET SCREW	1
21	MF2-014-000	3/8-16 X 1" CARRIAGE BOLT	6
22	MF2-117-000	5/16-18 X 5/8" FLANGE HEAD SCREW	4
23	MF2-033-000	CORD GRIP	1
24	MF2-004-000	CARRIAGE WELDMENT	1
25	MF2-005-000	WIRE HARNESS	1
26	MF2-017-002	1/4-28 X 1/4" SOCKET SET SCREW	4
27	MF2-017-000	LOCK & LOAD BEARING ASSEMBLY	2
28	MF2-064-000	"LOCK & LOAD" HORIZONTAL DECAL	1
29	MF2-065-000	"LOCK & LOAD" SQUARE DECAL	1
30	MF2-068-000	SERIAL NUMBER DECAL	1
31	MF2-080-000	"LOCK & LOAD" LARGE HORIZONTAL DECAL	1
32	MF2-107-000	CHAIN	1
33	MF2-110-000	MF2 MOTOR ASSEMBLY	1
34	MF2-167-000	5/16-18 X 5/8" THREAD LOCK, SOCKET SET SCREW	1
35	MF2-168-000	HOOK, UPWARD BIASED	1
36	MF2-186-000	PATENT PENDING DECAL	1
37	MF2-199-000	NO STEP DECAL	1
38	MF4-126-000	5/16-18 X 7/8" FLANGE HEAD SCREW	2
39	MF4-165-000	MOTOR/CHAIN COVER	1
40	MF2-013-000	GREASE FITTING	2

PARTS

ROLLER TRACK ASSEMBLY DRAWING AND PARTS LIST

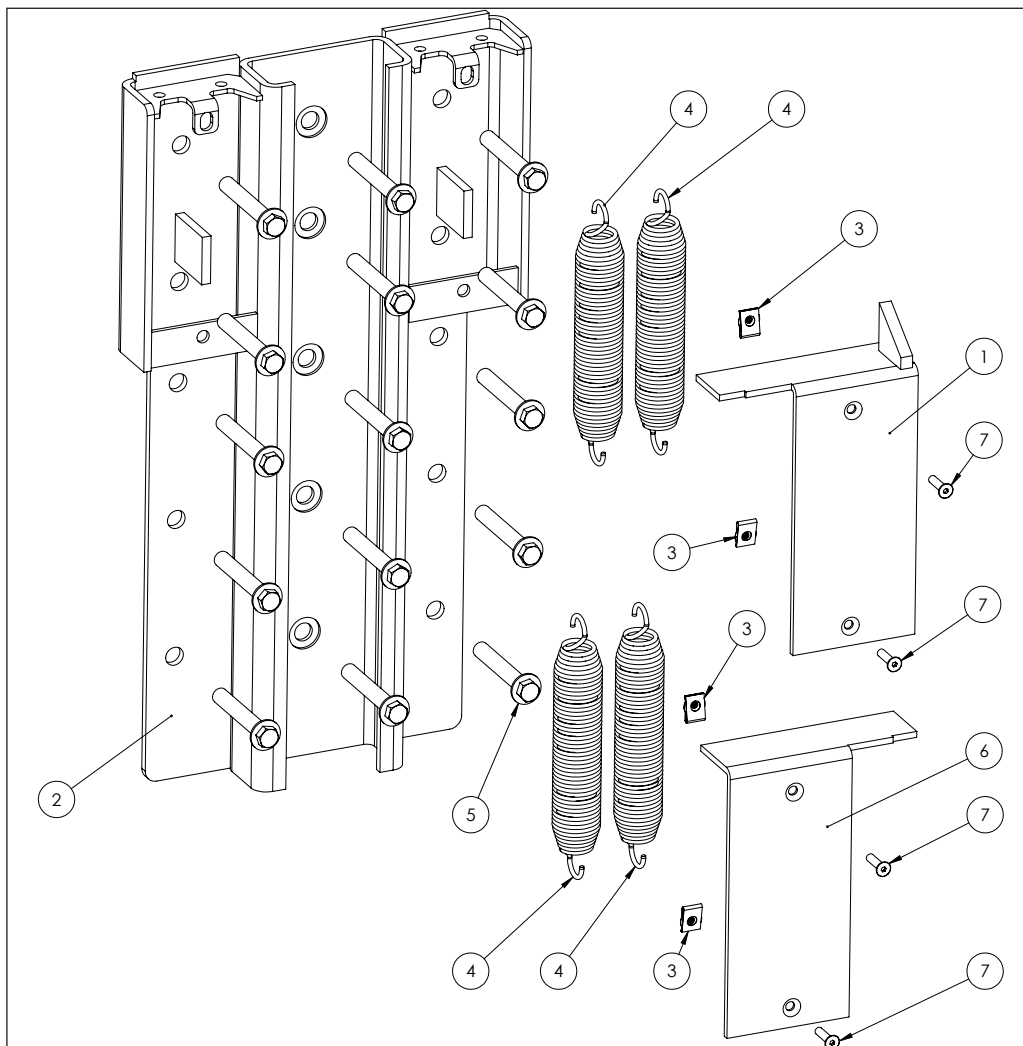


FIGURE O—ROLLER TRACK ASSEMBLY

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	MF2-052-000	SPRING COVER RIGHT HAND WITH GUSSET	1
2	MF2-048-000	ROLLER TRACK	1
3	MF2-214-000	5/16-18 CLIP ON BARREL NUT	4
4	MF2-050-000	EXTENSION SPRING	4
5	MF2-054-000	5/8" X 4" CONCRETE ANCHOR	15
6	MF2-051-000	SPRING COVER LEFT HAND	1
7	MF2-060-000	5/16"-18 X 1 1/4" FLAT HEAD SOCKET SCREW	4

PARTS

SLOPE EXTENSION DRAWING AND PARTS LIST

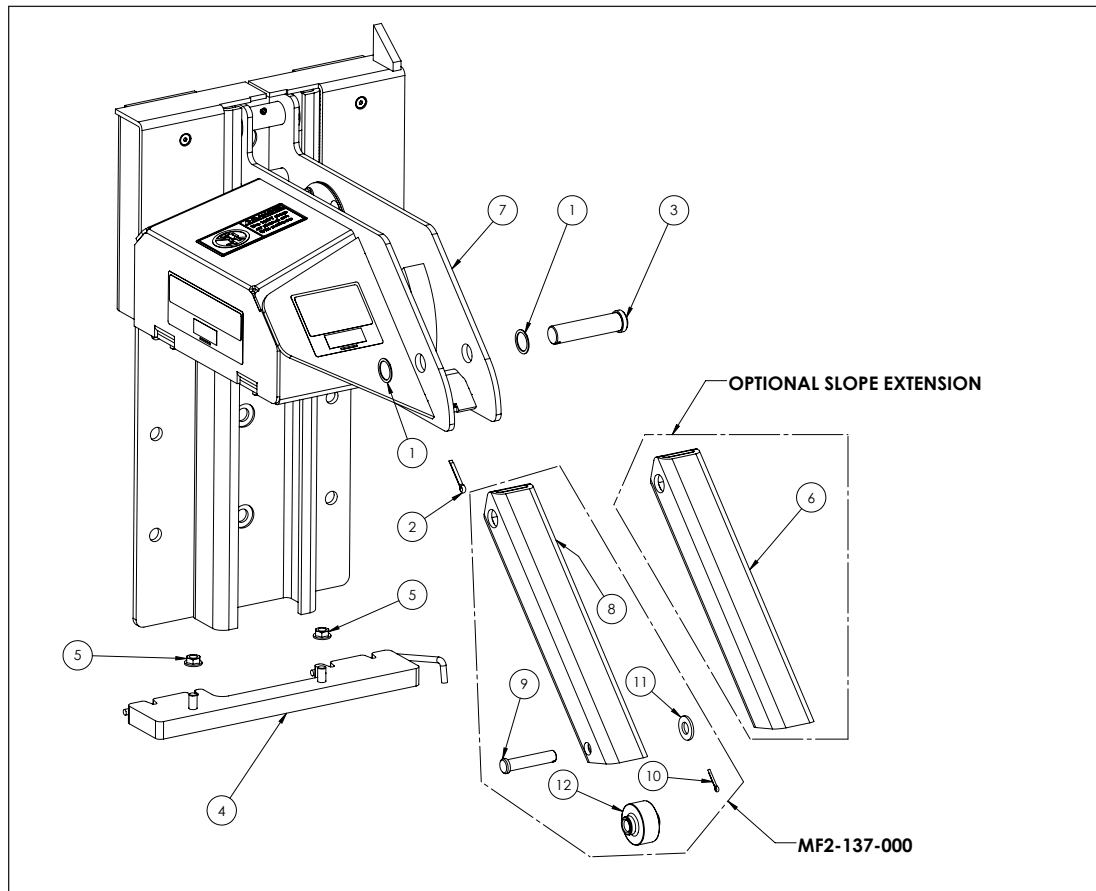


FIGURE P—SLOPE EXTENSION ASSEMBLY

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	MF2-045-000	1" X 18 GAUGE FLAT WASHER	2
2	MF2-046-000	COTTER PIN	1
3	MF2-044-000	SLOPE EXTENSION PIVOT PIN	1
4	MF2-043-000	SPRING MOUNTING PLATE ASSEMBLY	1
5	MF2-026-000	7/16-14 SERRATED FLANGE LOCKNUT	2
6	MF2-002-000	SLOPE EXTENSION	1
7	MF2-007-000	LOCK & LOAD CARRIAGE ASSEMBLY	1
8	MF2-132-000	ROLLER SLOPE EXTENSION	1
9	MF2-143-000	5/8" X 3" LONG CLEVIS PIN	1
10	MF2-142-000	COTTER PIN	1
11	MF2-130-000	5/8" SAE FLAT WASHER	1
12	MF2-136-000	ROLLER ASSEMBLY	1

PARTS

MISCELLANEOUS PARTS

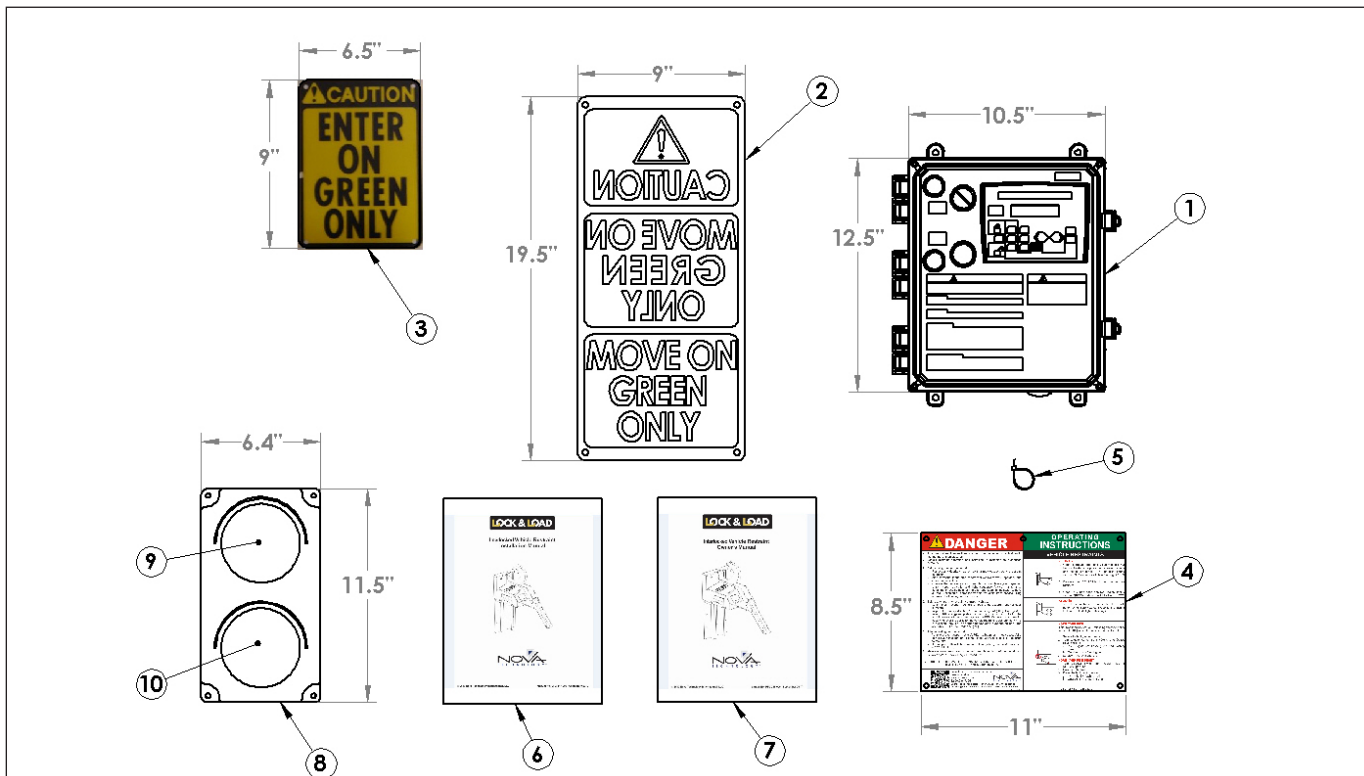


FIGURE Q—MISCELLANEOUS PARTS

MISCELLANEOUS REPLACEMENT PARTS LIST

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	CB-21-A OR CB-21-B OR CB-21-C	CONTROL BOX INTERLOCKED DOOR VERSION A OR CONTROL BOX INTERLOCKED DOOR VERSION B OR CONTROL BOX INTERLOCKED LEVELER	1
2	MF2-056-001	SIGN, CAUTION - MOVE ON GREEN	1
3	MF2-057-000	CAUTION SIGN	1
4	MF2-215-000	PLACARD - RESTRAINT OPERATION	1
5	MF2-216-000	ZIP TIE FOR CONTROL BOX PLACARD	1
6	MF2-217-000	INSTALLATION MANUAL	1
7	MF2-218-000	OWNERS MANUAL	1
8	MF4-183-000	OUTSIDE LIGHT	1
9	MF4-183-001	OUTSIDE RED LED LIGHT MODULE	1
10	MF4-183-002	OUTSIDE GREEN LED LIGHT MODULE	1

For replacement parts, contact NOVA Technology.

PARTS

CONTROL BOX PARTS

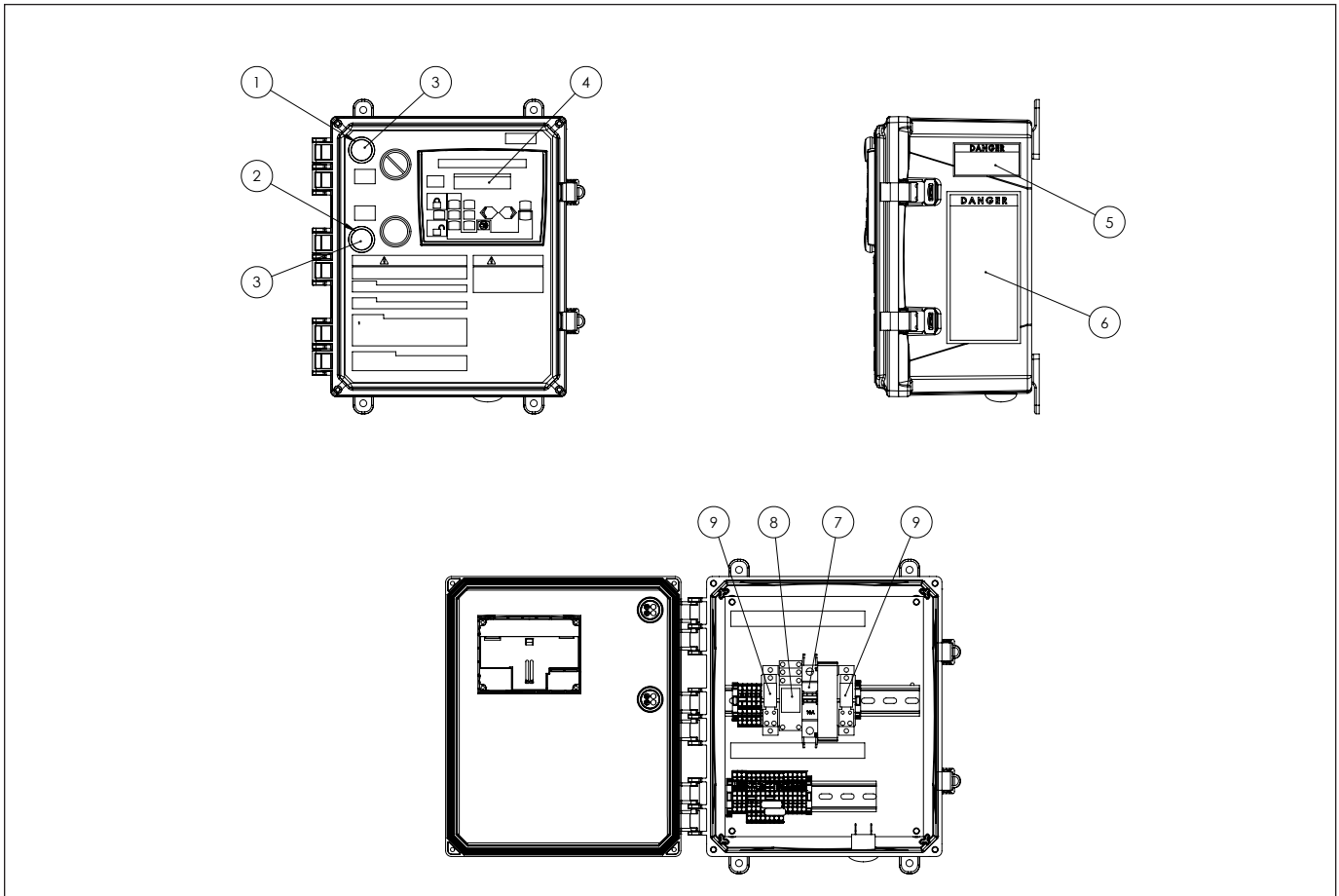


FIGURE R—CONTROL BOX PARTS

CONTROL BOX REPLACEMENT PART LIST

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	CB-1000	LIGHT, 24 VDC LED RED PILOT	1
2	CB-1001	LIGHT, 24 VDC LED GREEN PILOT	1
3	CB-1002	COVER, WHITE LED	2
4	CB-PLC-01	PLC - STANDARD	1
5	MF2-202-000	DECAL, ARC FLASH	1
6	MF2-200-000	DECAL, HOOK POSITION	1
7	CB-1003	BREAKER, CIRCUIT	1
8	CB-1004	RELAY, 12 AMP	1
9	CB-1005	RELAY, 20 AMP	2

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WARRANTY

NOVA TECHNOLOGY INTERNATIONAL, LLC warrants that its products will be free from defects in design, materials and workmanship for a period of one (1) year from the date of shipment. All claims for breach of this warranty must be made within 30 days after the defect is or can with reasonable care, be detected. In no event shall any claim be made more than 30 days after this warranty has expired. In order to be entitled to the benefits of this warranty, the product must have been properly installed, maintained and operated in accordance with all manufacturer's recommendations and/or specified design parameters and not otherwise have been subject to abuse, misuse, misapplication, acts of nature, overloading, unauthorized repair or modification, application in a corrosive environment or lack of maintenance. Periodic lubrication, adjustment and inspection in accordance with all manufacturers' recommendations are the sole responsibility of the Owner/User.

In the event of a defect, as determined by NOVA TECHNOLOGY INTERNATIONAL, LLC, covered by this warranty, NOVA TECHNOLOGY INTERNATIONAL, LLC shall remedy such defect by repairing or replacing any defective equipment or parts, bearing the cost for the parts, labor and transportation. This shall be exclusive remedy for all claims whether based on contract, negligence or strict liability.

PRODUCT SPECIFIC WARRANTY LOCK & LOAD VEHICLE RESTRAINT

In addition to the "Standard Product Warranty" provided with all Nova Products, NOVA TECHNOLOGY INTERNATIONAL, LLC guarantees materials, components and workmanship to be free of defects for the following extended periods:

- Extended 2-Year General Warranty—for a period of two (2) years from date of shipment, this warranty specifically applies to; the roller track assembly, carriage assembly, and control box only.
- Extended 5-Year Structural Warranty—for a period of five (5) years from date of shipment, product will carry a prorated structural warranty. This warranty specifically applies to; the roller track, carriage weldment, chain cover, straight hook, and lower spring bar only.

NOT COVERED UNDER WARRANTY

- Routine maintenance, lubrication, adjustments, including initial field set-up.
- Repairs required as a result of failure to follow routine maintenance procedures specified in the owner's manual, abuse, accident, willful damage, neglect, improper installation, submersion, or shipping damage.

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