



Vehicle Restraint Owner's Manual

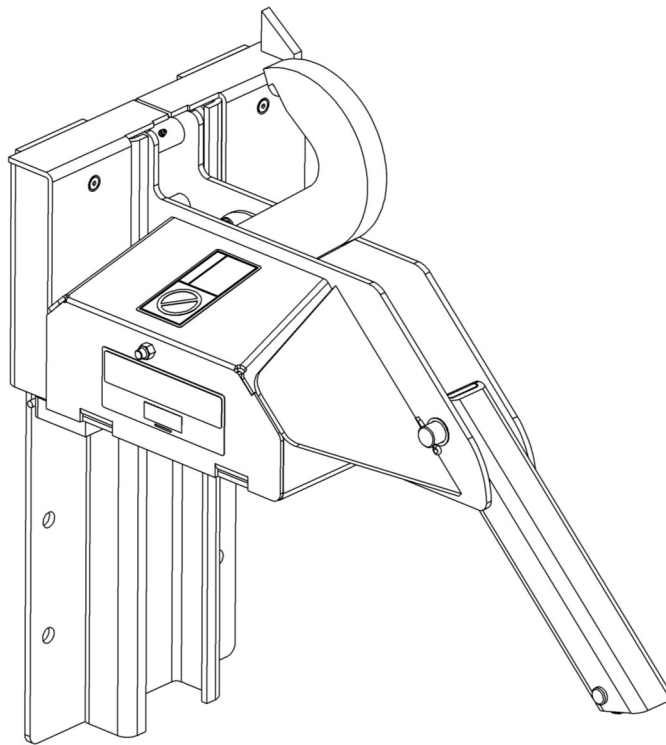



TABLE OF CONTENTS


SAFETY WARNINGS	3
COMPONENTS DESCRIPTION	4
OPERATING PROCEDURES	5
ROUTINE MAINTENANCE	9
TROUBLESHOOTING	11
CONTROL HARNESS	13
ELECTRICAL SCHEMATIC	14
OUTSIDE LIGHT BOX WIRING	15
PARTS	16
NOTES	21
WARRANTY.....	23

SAFETY WARNINGS

You will find the safety alerts DANGER, WARNING, CAUTION or IMPORTANT used throughout this manual. Their meaning is listed below:

 DANGER
This is the highest level statement. Failure to follow the listed instructions will most likely result in severe injury or death.

 CAUTION
The statements used with this level of warning deal with a safe operating procedure. If the procedure is ignored the possibility of personal injury may exist.

 WARNING
This is a statement of serious hazard. Failure to follow the listed instructions could place the individual at risk of serious injury or death.

IMPORTANT
IMPORTANT is used to draw attention to a procedure that needs to be followed to prevent machine damage.

DO NOT OPERATE THIS PRODUCT UNTIL YOU HAVE READ AND UNDERSTAND THE SAFETY PRACTICES, WARNINGS AND OPERATING INSTRUCTIONS CONTAINED WITHIN THIS MANUAL. IMPROPER USE OF THE LOCK & LOAD VEHICLE RESTRAINT COULD RESULT IN SERIOUS INJURY OR DEATH.

If the Lock & Load vehicle restraint does not operate properly using the procedures in this manual, BE CERTAIN TO CHOCK THE VEHICLE WHEELS BEFORE LOADING OR UNLOADING. Contact NOVA or your local representative for service.

COMPONENTS DESCRIPTION

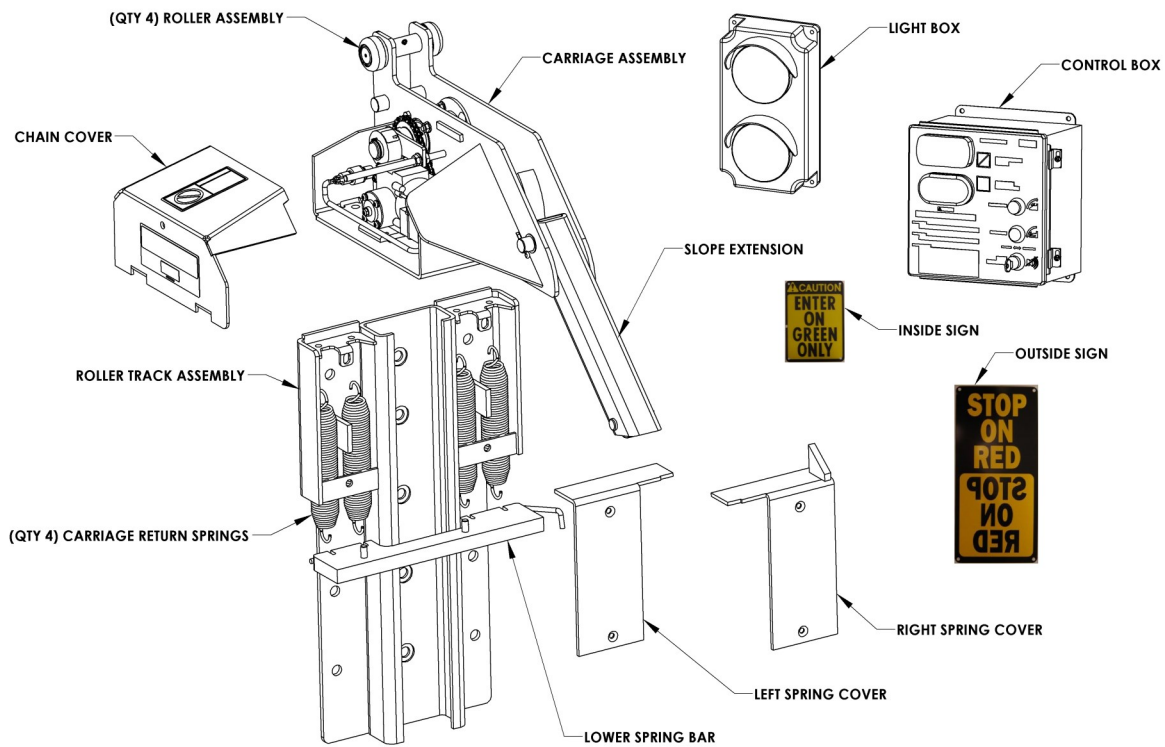


Figure A—Lock & Load Components Description

OPERATING PROCEDURE



WARNING

Before loading or unloading a vehicle at your loading dock while using a 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.

Always operate the 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 11 of this manual.

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.

FAILURE TO FOLLOW THESE PROCEDURES COULD RESULT IN SERIOUS INJURY OR DEATH.

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.

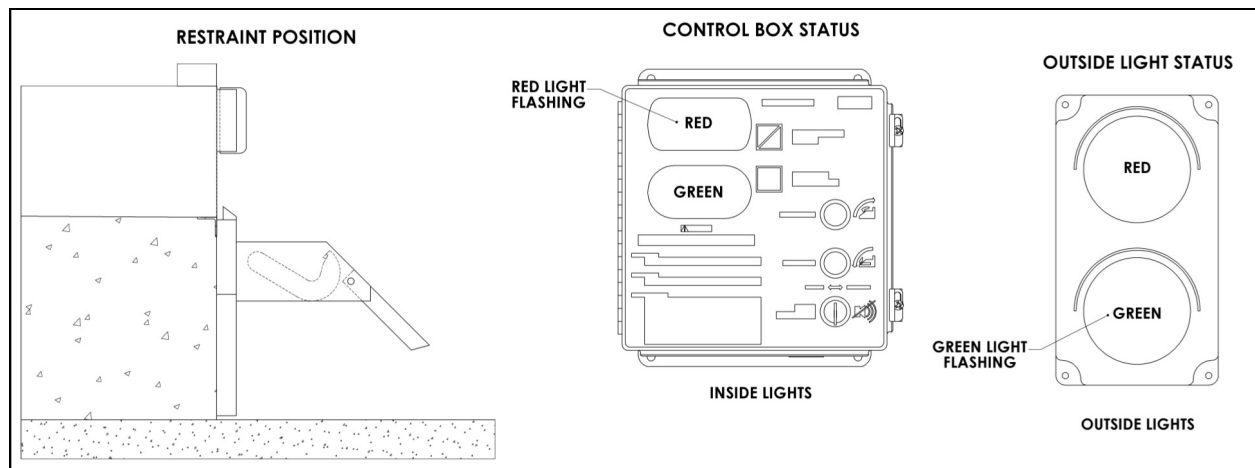


FIGURE B—STORED POSITION

OPERATING PROCEDURE *continued*

RESTRAIN Button Pressed - Restraint ENGAGING

Trailer has backed into loading dock and is parked firmly against dock bumpers. Hook rotates from stored position to engage RIG. Outside light is flashing red alerting truck driver not to move. Refer to Figure C.

If horn sounds, proceed to FAULT, otherwise proceed to Restraint ENGAGED.



CAUTION

If trailer can not be restrained due to a lift gate or other obstruction that could become damaged, proceed to OVERRIDE.

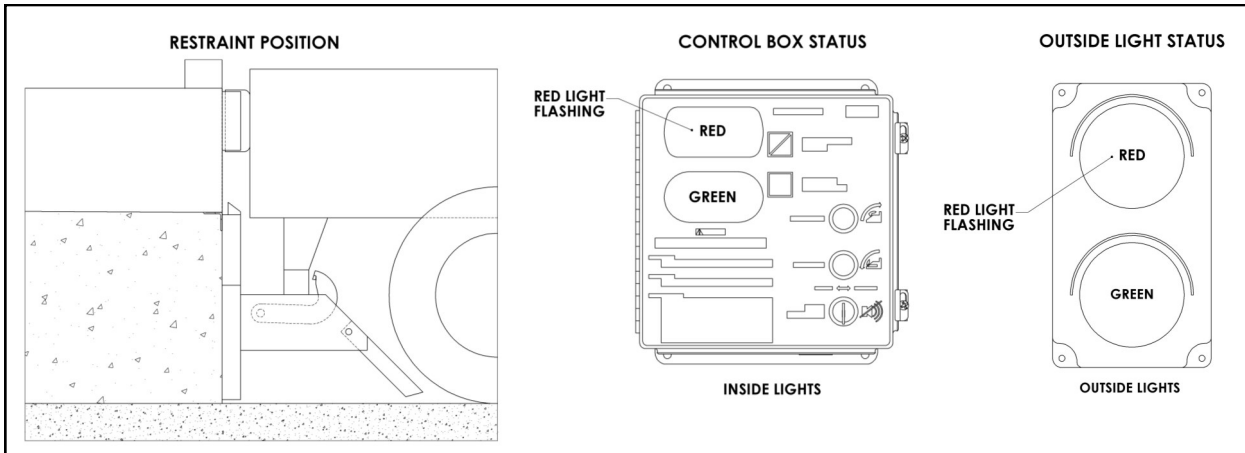


FIGURE C—RESTRAINT LOCKING

Restraint ENGAGED

Once the RIG is engaged by the hook, an ENGAGED 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 Lock & Load vehicle restraint hook securely engages the RIG of the trailer before operating the dock leveler.

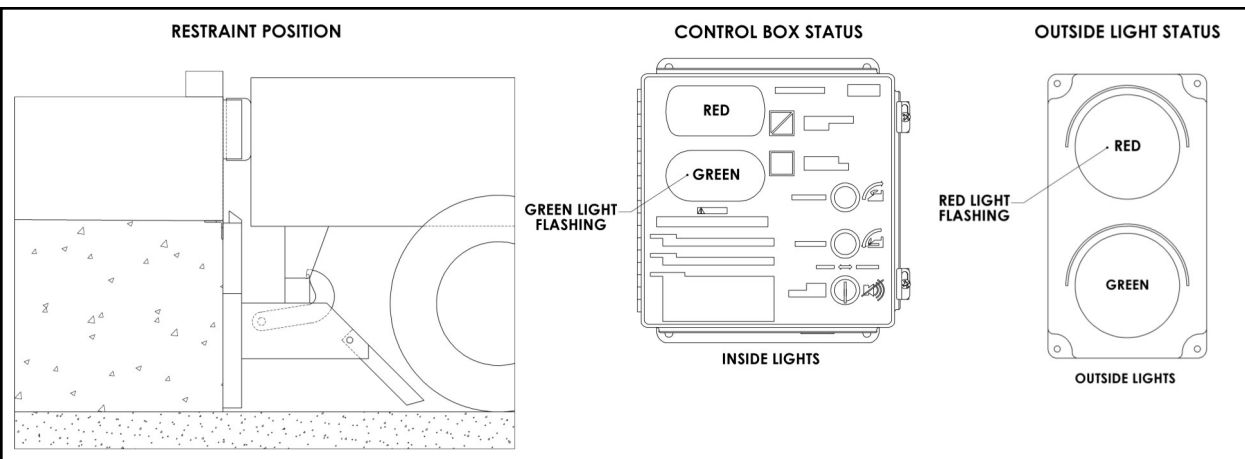


FIGURE D—RESTRAINT LOCKED

OPERATING PROCEDURE *continued*

RELEASE Button Pressed- Restraint DISENGAGING

Hook travels from the ENGAGED position to the STORED position. Outside light is flashing red alerting truck driver not to move. Refer to Figure E.

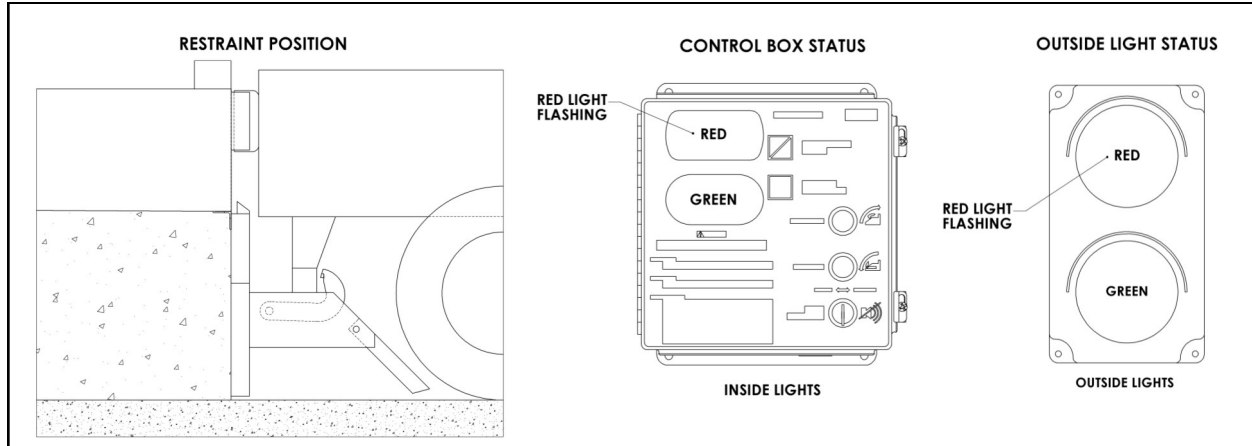


FIGURE E—RESTRAINT UNLOCKING

FAULT from ENGAGING State

Hook cannot engage the RIG. This could be due to a RIG that is located too far toward the rear axle, bent, obstructed or missing. Inside light is flashing red and horn is pulsing, alerting the fork-lift 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 OVERRIDE. If not, press RELEASE to clear the fault, have trailer back up and repeat Restraint ENGAGING.

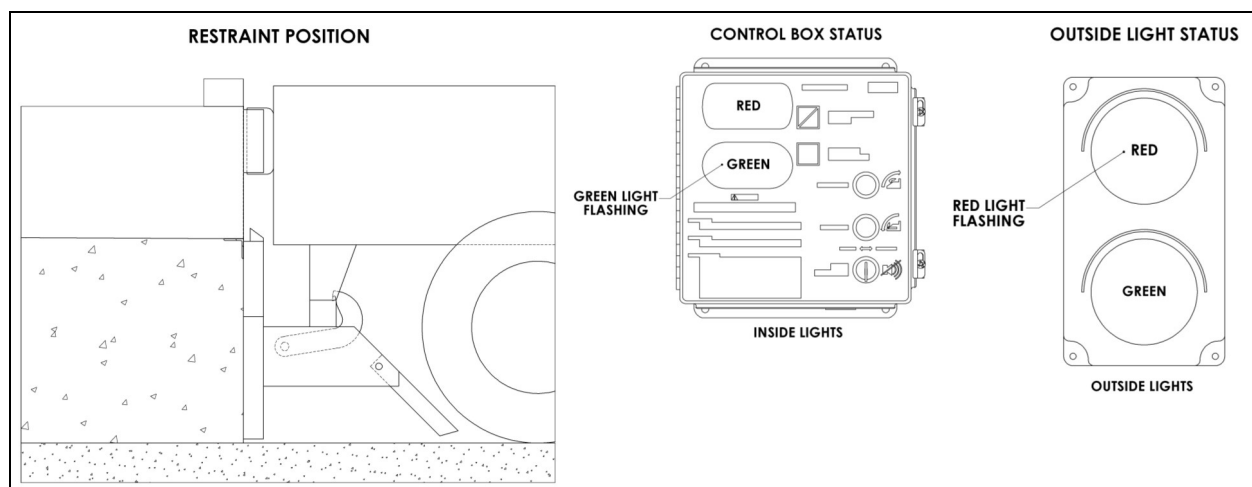


FIGURE F—FAULT STATE

OPERATING PROCEDURE *continued*

HORN OVER-RIDE State, KEY SWITCH TURNED TO OVER-RIDE after Securing Trailer by Alternate Means

An alternate means of securing the truck must be used (e.g. wheel chocks) if the hook can not capture the RIG. Inside lights are flashing red and green alerting the forklift operator the trailer is secured by other means. Outside light is flashing red alerting the truck driver not to move. See Figure G.

To return to STORED, turn the HORN OVER-RIDE key and press the RELEASE button.

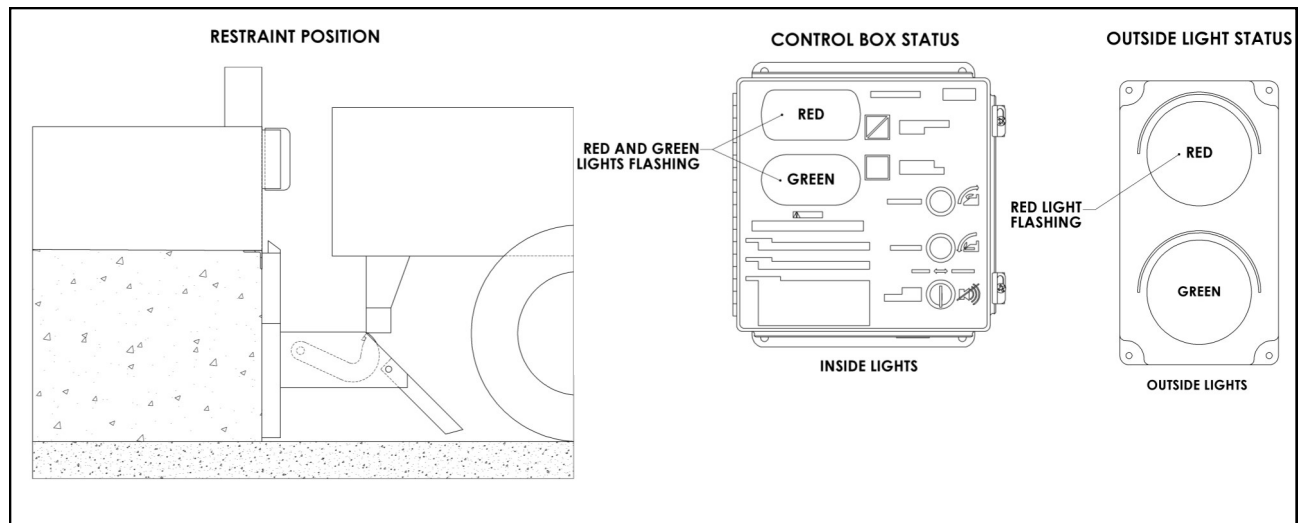


FIGURE G—HORN OVER-RIDE STATE

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



CAUTION

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

IMPORTANT

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 Lock & Load vehicle restraint location, it may be necessary to raise the leveler before performing maintenance. Raise the leveler, insert and secure the maintenance strut, and LOCKOUT/TAGOUT the power source.

DAILY

- Remove debris around 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 a synthetic oil-base moly grease with a temperature range of -40° to 170° F.
- Verify brake torque is greater than 500 in-lbs, and less than 700 in-lbs at the hook shaft, rotating the hook from ENGAGED to STORED.
- 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 100 ft-lbs.
- Perform operational test after all maintenance repairs and adjustments are complete.
- Inspect dock bumpers. 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 10.
- 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.

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 75 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.

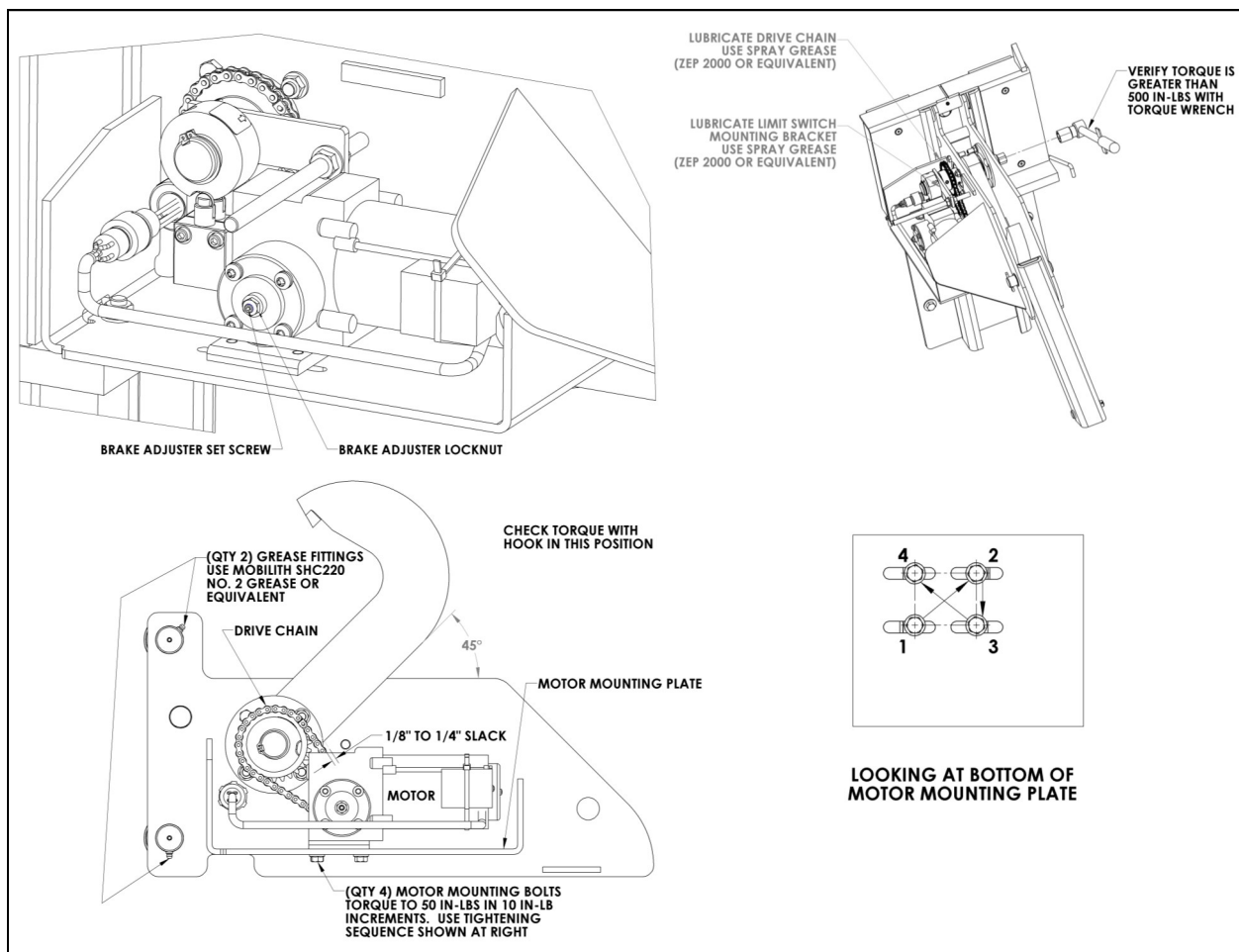


FIGURE H—MAINTENANCE AND LUBRICATION

TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	RESOLUTION
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 1A fuse. and circuit breaker on power module. Verify wiring per Electrical Schematic, Figure K page 14.
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 L2 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 Electrical Schematic, Figure K page 14.
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.
Lock & Load vehicle restraint is operational but all lights are out.	<ul style="list-style-type: none"> Bulbs burnt out, loose or missing. Incorrect wiring. 	<ul style="list-style-type: none"> Check all bulbs and replace as required. Verify wiring per Electrical Schematic, Figure K page 14.
Lock & Load vehicle restraint horn does not sound but hook and lights are operational.	<ul style="list-style-type: none"> Horn is defective. Incorrect wiring. 	<ul style="list-style-type: none"> Power horn using 12V DC power. If horn does not sound, replace as required. Verify wiring per Electrical Schematic, Figure K page 14.
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 SW1 and SW2 at the control box and outside junction box.
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 plate. Broken or weak springs. 	<ul style="list-style-type: none"> Check to see if roller track plate is clean and rollers are clean, full of debris and lubricated. Use only approved grease to lubricate rollers. Verify that the roller track plate is straight and not damaged. Remove spring cover and replace as required

TROUBLESHOOTING CONTINUED

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.

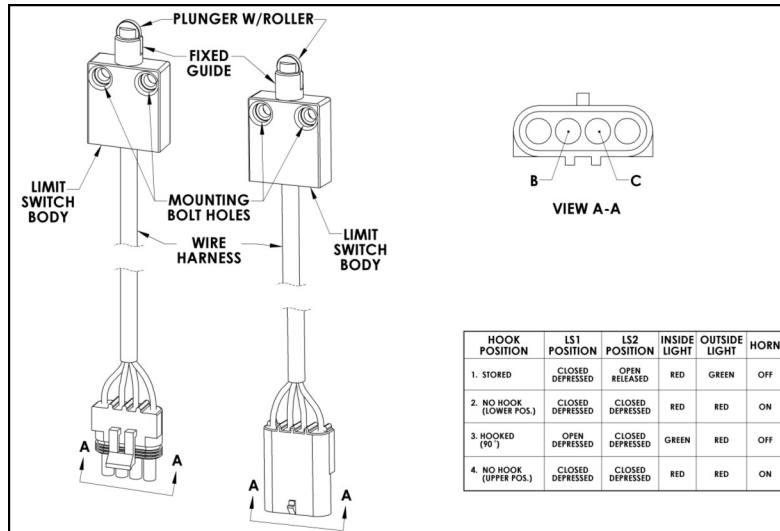


FIGURE I—LIMIT SWITCH AND HOOK POSITION CHART

CONTROL HARNESS

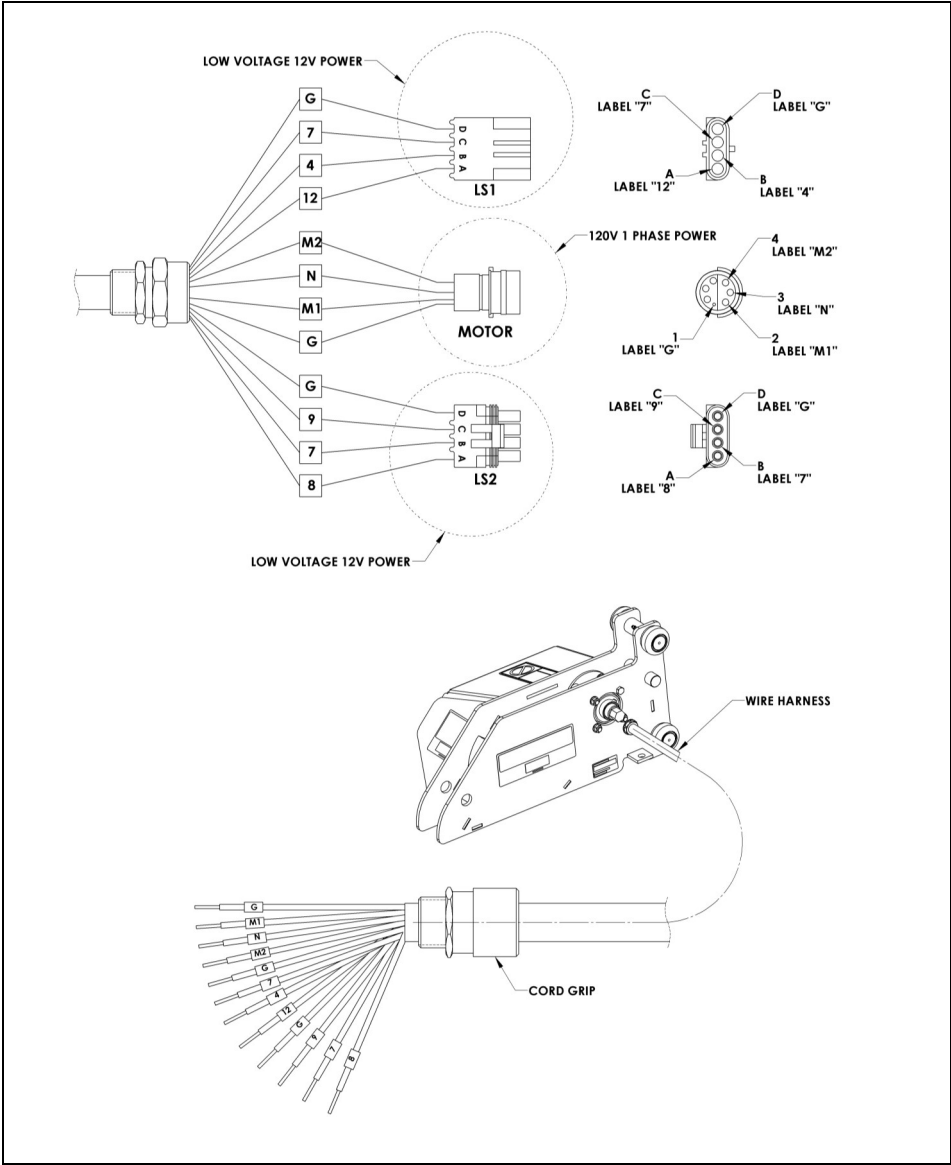


FIGURE J—CONTROL HARNESS

ELECTRICAL SCHEMATIC

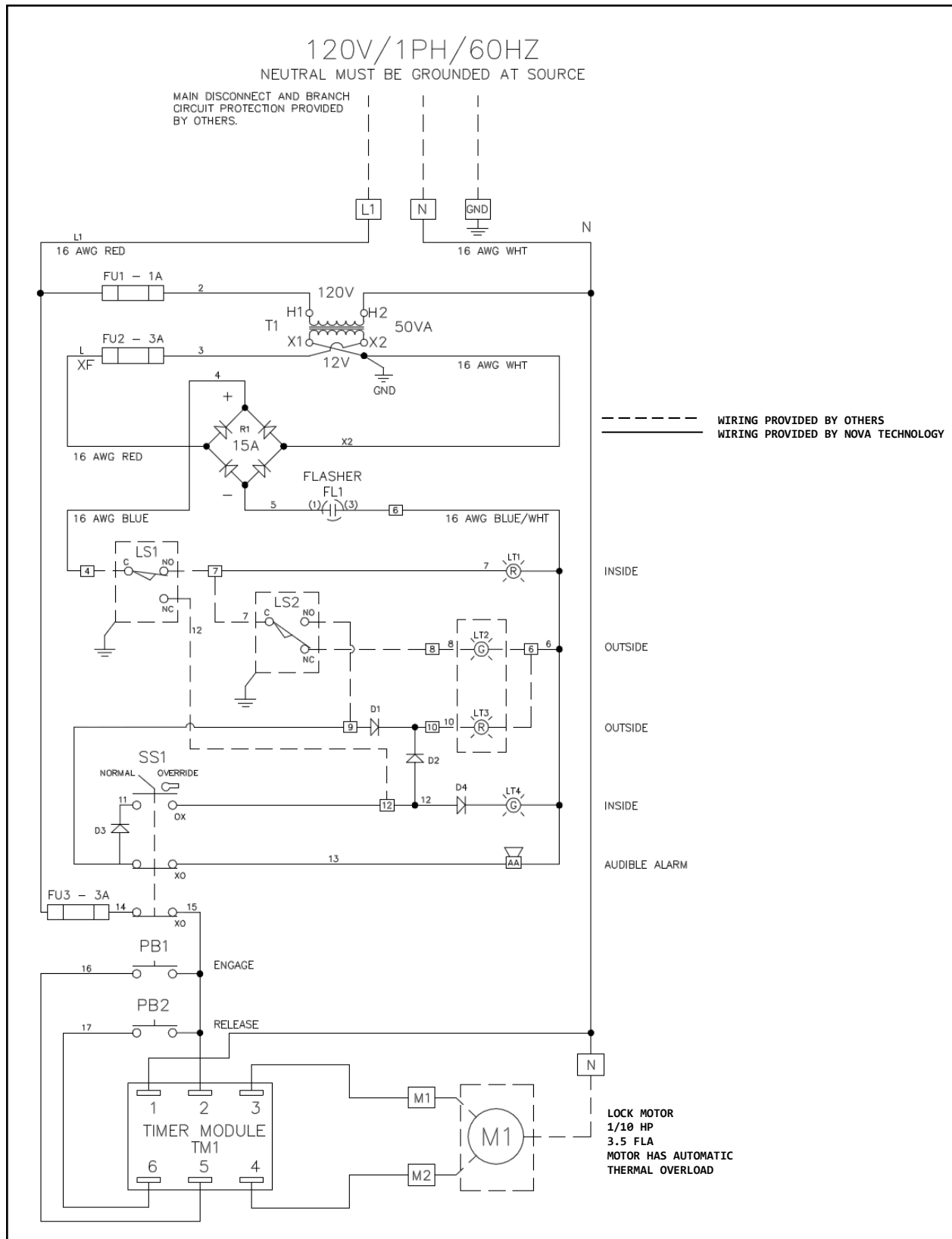


FIGURE K—ELECTRICAL SCHEMATIC

OUTSIDE LIGHT BOX WIRING

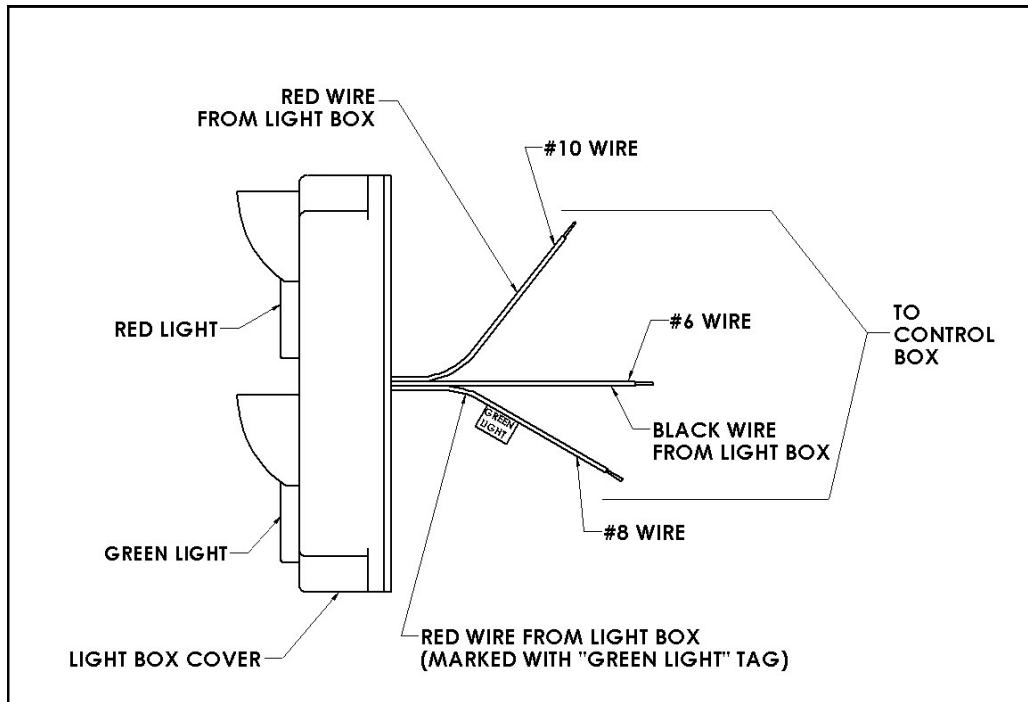


FIGURE L—OUTSIDE LIGHT BOX WIRING

PARTS

CARRIAGE ASSEMBLY DRAWING

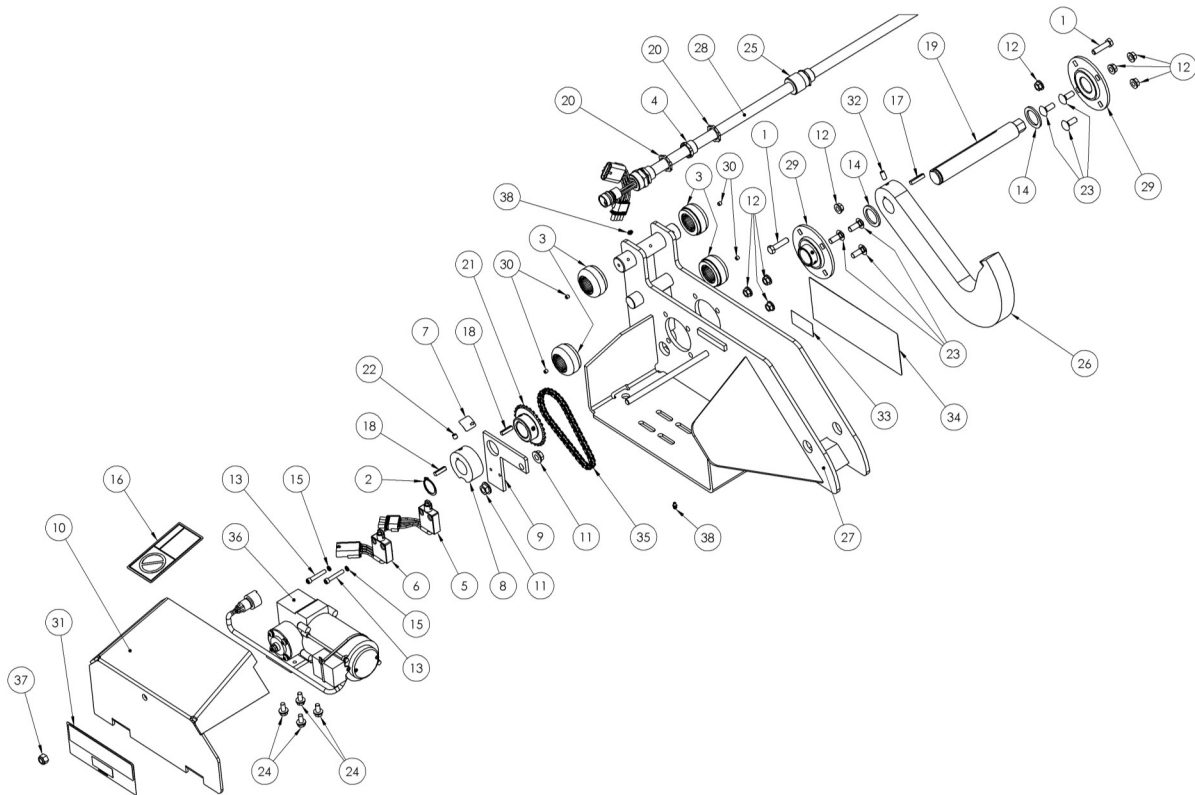


FIGURE M —CARRIAGE ASSEMBLY

CARRIAGE ASSEMBLY PARTS LIST

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	MF2-015-000	3/8"-16 X 1 1/2" HH CAP SCREW	2
2	MF2-061-000	SNAP 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	MF2-042-000	CHAIN COVER	1

PARTS *continued*

CARRIAGE ASSEMBLY PARTS LIST *continued*

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
11	MF2-026-000	7/16"-14 SERRATED FLANGE LOCK NUT	2
12	MF2-016-000	3/8"-16 SERRATED FLANGE WHIZ NUT	8
13	MF2-041-000	1/4"-20 X 1 1/2" SOCKET HEAD CAP SCREW	2
14	MF2-018-000	1 3/4" OD, 1 1/4" ID, 1/8" THK, MACHINERY BUSHING	2
15	MF2-040-000	1/4" LOCK WASHER	2
16	MF2-095-000	NO STEP DECAL	1
17	MF2-021-000	1/4" X 1/4" X 1 1/4" HOOK KEY	1
18	MF2-023-000	1/4" X 1/4" X 1" KEY, SPROCKET & CAM	2
19	MF2-020-000	HOOK SHAFT	1
20	MF2-037-000	3/4" CONDUIT LOCK NUT	2
21	MF2-022-000	HOOK DRIVE SPROCKET W/SET SCREW	1
22	MF2-019-000	5/16"-18 X 1/2" SK SET SCREW	1
23	MF2-014-000	3/8"-16 X 1" CARRIAGE BOLT	6
24	MF2-117-000	5/16"-18 X 5/8" FLANGE HEAD SCREW	4
25	MF2-033-000	CORD GRIP	1
26	MF2-003-000	STRAIGHT HOOK	1
27	MF2-004-000	CARRIAGE WELDMENT	1
28	MF2-005-000	WIRE HARNESS	1
29	MF2-017-000	LOCK & LOAD BEARING ASSEMBLY	2
30	MF2-017-002	SET SCREW	4
31	MF2-064-000	"LOCK & LOAD" HORIZONTAL DECAL	1
32	MF2-066-000	5/16"-18 X 5/8" SET SCREW	1
33	MF2-068-000	SERIAL NUMBER DECAL	1
34	MF2-080-000	"LOCK & LOAD" LARGE HORIZONTAL DECAL	1
35	MF2-107-000	CHAIN	1
36	MF2-110-000	MF2 MOTOR ASSEMBLY	1
37	MF2-027-000	7/16-14 NYLOCK NUT	1
38	MF2-013-000	GREASE FITTING	2

PARTS *continued*

ROLLER TRACK ASSEMBLY DRAWING and PARTS LIST

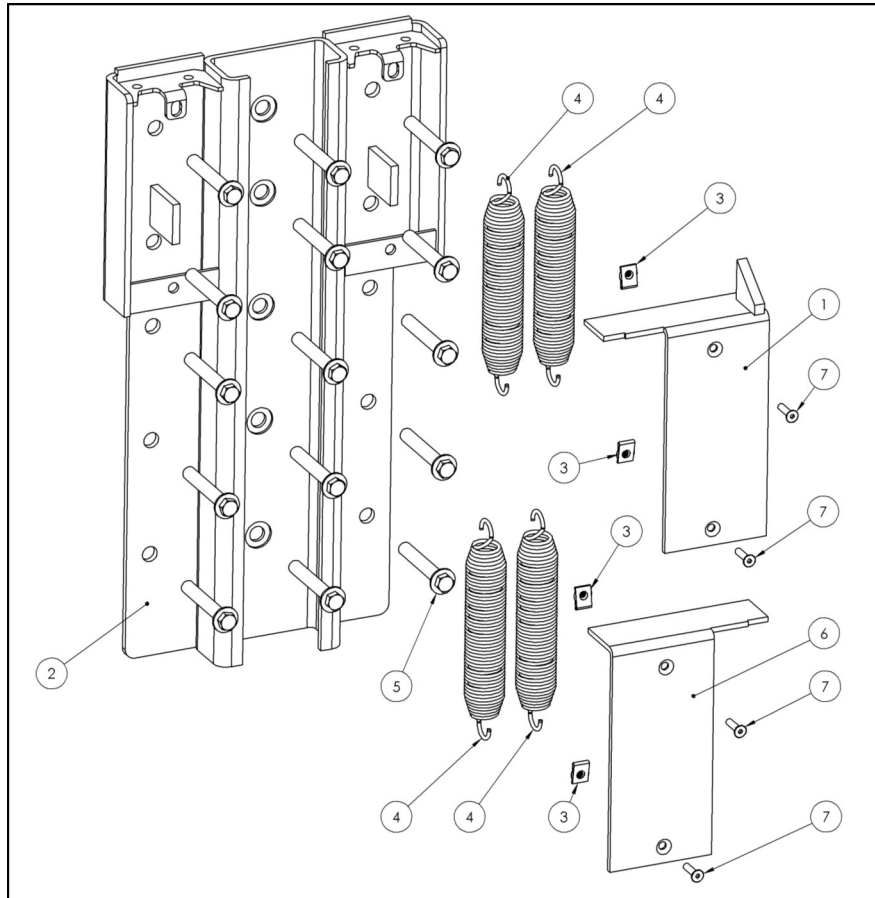


FIGURE N—ROLLER TRACK ASSEMBLY

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	MF2-052-000	SPRING COVER RIGHT HAND	1
2	MF2-048-000	ROLLER TRACK	1
3	MF2-049-000	5/16"-18 CAGE NUT	4
4	MF2-050-000	EXTENSION SPRING	4
5	MF2-054-000	5/8" X 4" CONCRETE ANCHOR	15
6	MF2-051-000	LEFT SPRING COVER	1
7	MF2-060-000	5/16"-18 X 1 1/4" FLAT HEAD SOCKET SCREW	4

PARTS *continued*

SLOPE EXTENSION DRAWING AND PARTS LIST

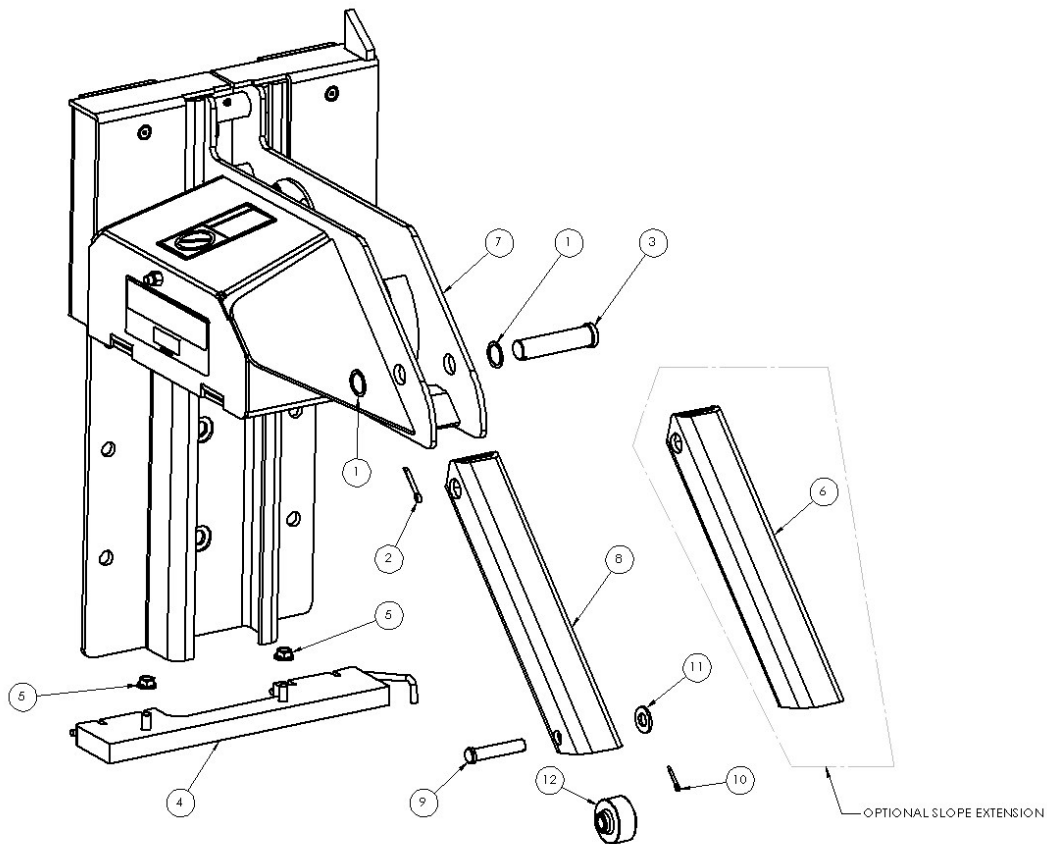


FIGURE O—SLOPE EXTENSION ASSEMBLY

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 LOCK NUT	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" 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 *continued*

ELECTRICAL PARTS

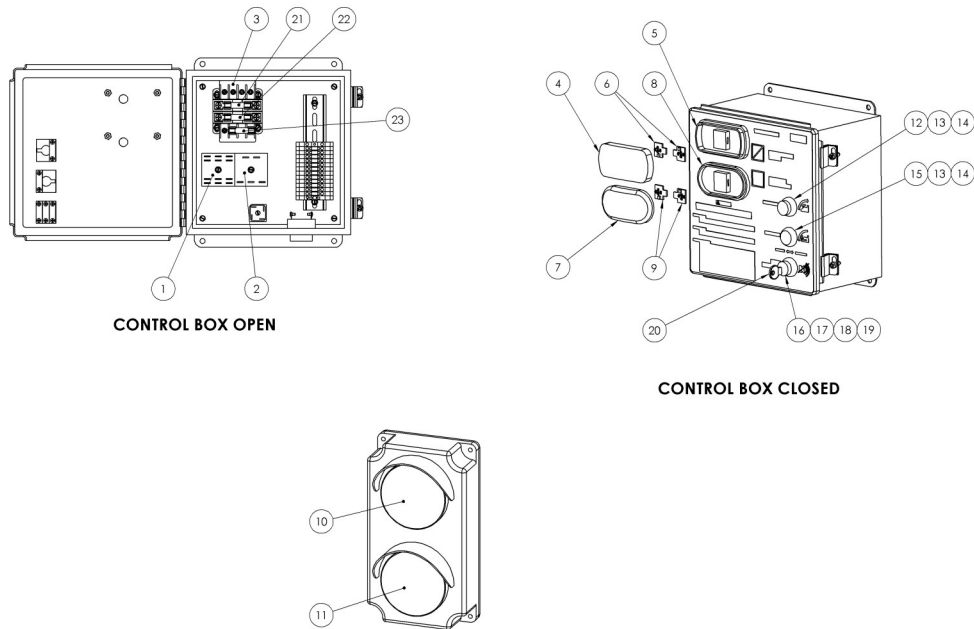


FIGURE P —ELECTRICAL PARTS

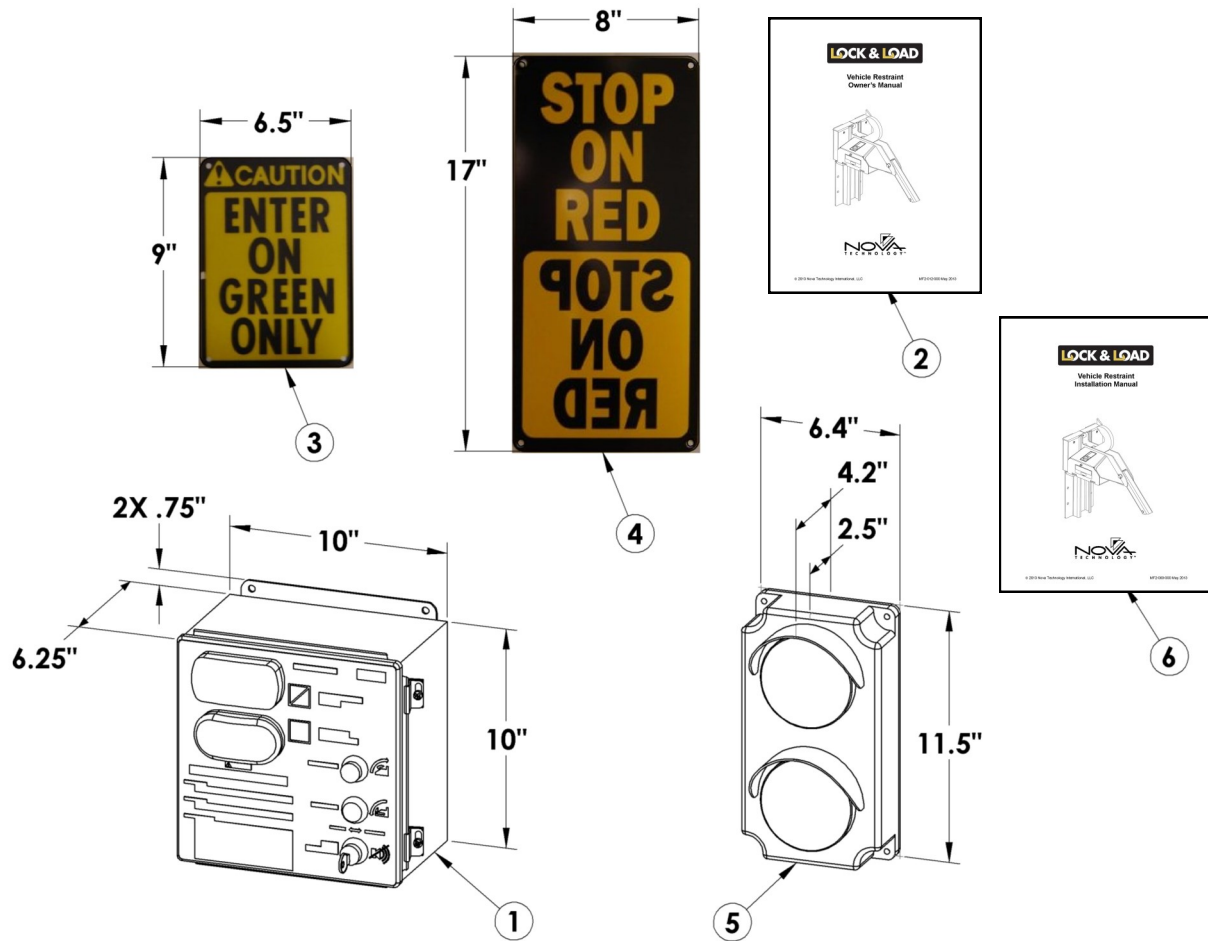
PARTS *continued*

ELECTRICAL REPLACEMENT PARTS LIST

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	MF2-082-000	TIMER	1
2	MF2-083-000	FLASHER	1
3	MF2-084-000	TRANSFORMER	1
4	MF2-085-001	RED RECTANGULAR LENS	1
5	MF2-085-002	RECTANGLE BASE	1
6	MF2-085-003	RED LED WEDGE	2
7	MF2-086-001	GREEN OVAL LENS	1
8	MF2-086-002	OVAL BASE	1
9	MF2-086-003	GREEN LED WEDGE	2
10	MF2-087-000	OUTSIDE RED LED LIGHT MODULE	1
11	MF2-088-000	OUTSIDE GREEN LED LIGHT MODULE	1
12	MF2-089-001	GREEN PUSH BUTTON	1
13	MF2-089-002	NO CONTACT	2
14	MF2-089-003	CONTACT BASE	2
15	MF2-090-001	YELLOW PUSH BUTTON	1
16	MF2-091-001	KEY SWITCH	1
17	MF2-091-002	NC CONTACT	1
18	MF2-091-003	NO CONTACT	1
19	MF2-091-004	CONTACT BASE	1
20	MF2-092-000	KEY	1
21	MF2-156-000	FUSE	1
22	MF2-157-000	FUSE	1
23	MF2-158-000	FUSE	1

PARTS *continued*

MISCELLANEOUS PARTS



MISCELLANEOUS REPLACEMENT PARTS LIST

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	MF2-011-000	CONTROL BOX	1
2	MF2-012-000	OWNERS MANUAL	1
3	MF2-057-000	CAUTION SIGN	1
4	MF2-056-000	STOP ON RED SIGN	1
5	MF2-055-000	OUTSIDE TRUCK LIGHT ASSEMBLY	1
6	MF2-093-000	INSTALLATION MANUAL	1

WARRANTY

NOVA STANDARD PRODUCT WARRANTY

Nova Technology International, LLC (“Nova”) 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, covered by this warranty, Nova 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 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 the 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.

WARRANTY LIMITATIONS

The above warranties are in lieu of any other warranties, whether expressed or implied, including but not limited to and implied warranty of merchantability for a particular purpose. Nova and its subsidiaries shall not in any event be liable to anyone, including third parties, for incidental, consequential or special damages of any kind including but not limited to, breach of warranty, loss of use, loss of profit, interruption of business or loss of goodwill.



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