KNIGHT GLOBAL

D-SERIES

Servo Hoist Maintenance and Operation Manual

THIS MANUAL CONTAINS IMPORTANT INFORMATION REGARDING INSTALLATION, SAFETY, MAINTENANCE, AND OPERATION OF THE KNIGHT GLOBAL SERVO HOIST AND SHOULD BE AVAILABLE TO ALL PERSONNEL RESPONSIBLE FOR USING THE HOIST.

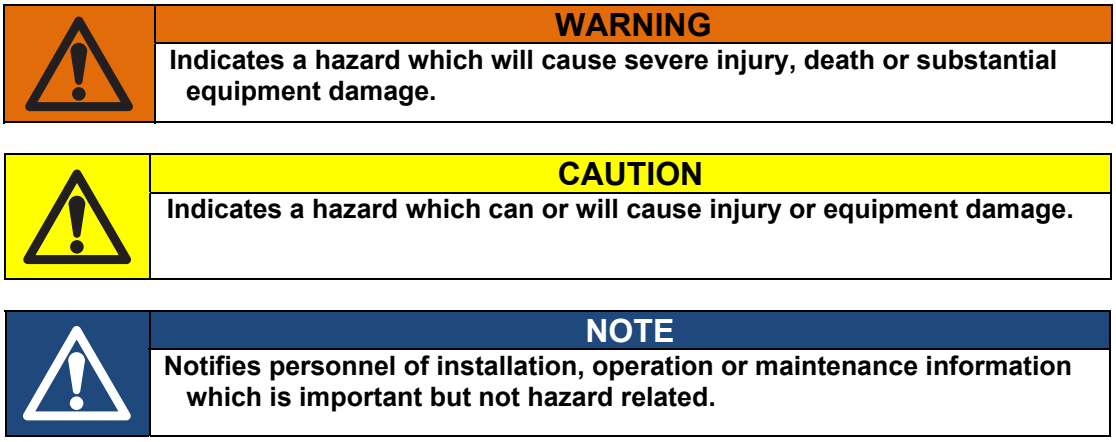
REV: 005_202112

This manual provides important information for all personnel involved in the installation, operation and maintenance of the Knight Global Servo Hoist. All personnel must read this document before operating the equipment.

Every effort has been made to provide complete and accurate product information in this manual. However, due to product improvements and changes, discrepancies and omissions may be present. Visit our website at www.knightglobal.com for the updated information on all our products.

It is the responsibility of the end user to exercise common sense and judgment when performing the tasks described in this manual. If any procedure seems inaccurate, incomplete or unsafe please put the equipment in a safe condition and contact Knight Global service department for assistance. Knight Service department's phone number is: (248) 375-7962.

Throughout this manual there are steps and procedures that if not performed correctly can result in personal injury or equipment damage. The following signal words are used to identify the level of potential hazard.



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1. SAFETY

Knight Global cannot be aware of or provide for all the procedures by which the Servo Hoist operations or repairs may be conducted and the hazards which may result from each method. If operation or maintenance not specifically recommended by Knight Global is conducted, it must be ensured that product or personnel safety is not endangered by these actions. If not sure of an operation or maintenance procedure or step, personnel should place the Servo Hoist in a safe condition and contact a supervisor and/or the Knight Global service department for technical support. Modifications to upgrade, re-rate or otherwise alter this equipment shall be authorized only by the original equipment manufacturer.

If a below-the-hook lifting device or sling is used with the Servo Hoist, refer to ANSI/ASME B30.9 “Safety Standard for Slings”, or ANSI/ASME B30.20 “Safety Standard for Below-the-Hook Lifting Devices”.

Electrical equipment described in this manual are designed and built-in compliance with ANSI/NFPA 70, “National Electrical Code”. It is the responsibility of the system designer, system manufacturer, crane or rail manufacturer, installer, and user to ensure that the installation and associated wiring of the Servo Hoist and components are in compliance with ANSI/NFPA 70, and all applicable Federal, State and Local Codes.

Hazardous voltages are present in the Servo Hoist and components. Only properly trained and competent personnel should perform inspections or repairs on the Servo Hoist or accessories. Prior to performing any maintenance (mechanical or electrical) on the Servo Hoist, de-energize (disconnect) the main switch supplying power to the Servo Hoist. Lock out the power supply following standard plant procedures.

Ensure that the installation, inspection, testing, maintenance and operation are in compliance with ANSI/ASME B30.16 “Safety Standard for Overhead Hoists”, OSHA Regulations, ANSI/NFPA 70, National Electric Code, and applicable ANSI/ASME standards. This is the responsibility of the owner/operator.

All personnel that will install, operate, inspect, test or maintain the hoist should read this manual and be familiar with all applicable portions of the referenced standards.

If clarification of any information in this manual or additional information is required, contact Knight Global. Do not install, operate, inspect, test or maintain the hoist unless all information is understood.

A. General Safety Precautions

- Do not operate the Servo Hoist before reading this technical manual.
- Allow only personnel trained in safety and operation of this Servo Hoist to operate the Servo Hoist.
- If the Servo Hoist is locked out or a “DO NOT OPERATE” sign is on the Servo Hoist or controls, do not operate the Servo Hoist until the lock or sign is removed by designated personnel.
- Do not use the Servo Hoist if the hook’s safety latch has been sprung or broken.
- If the Servo Hoist utilizes a hook, ensure the hook’s safety latch is engaged before operating the hoist.

- Before each shift or prior to use, inspect the Servo Hoist in accordance with the procedures defined in the Maintenance section of this manual.
- Never place your hand or fingers inside the throat area of a hook.
- Never operate a Servo Hoist with twisted, kinked or damaged chain.
- Only operate a Servo Hoist when the chain is centered over the hook. Do not “side pull” or “yard” the chain.
- Do not force the hook into place by hammering.
- Ensure the load is properly seated in the saddle of the hook.
- Never run the chain over a sharp edge.
- Pay attention to the load at all times when operating the Servo Hoist.
- Ensure no personnel are in the path of the load.
- Do not lift the load over personnel.
- Never use a Servo Hoist for lifting or lowering people.
- Do not allow anyone to stand on a suspended load.
- Do not swing a suspended load.
- Never leave a suspended load unattended.
- Never cut or weld a suspended load.
- Do not operate a Servo Hoist if the chain is jumping, jamming, overloading or binding.
- Do not operate a Servo Hoist if it is generating excessive noise.
- Avoid collisions or bumping of the Servo Hoist.
- Do not operate a Servo Hoist when damaged or malfunctioning.
- Do not remove load or handling device until tension is released from the chain.
- Discontinue operation of a Servo Hoist after multiple unresolved faults. A system fault would be signified by the Red light on the Run-Stop button continuously flashing or the Run-Stop button having to be repeatedly reset.

B. Safety Devices

Motor Holding Brake

A motor holding braking system engages and holds the vertical axis in place in the event of a power outage or when the Run-Stop button is pressed.

Overload Capacity Protection

Protects the equipment and prevents the operator from lifting or moving more weight than the system is rated for. If the load weight exceeds the programmed capacity, the hoist will not lift any further until the excess load is removed. Downward motion is permitted when overloaded to allow the user to safely set the weight back down on a stable surface.

Run-Stop Push Button

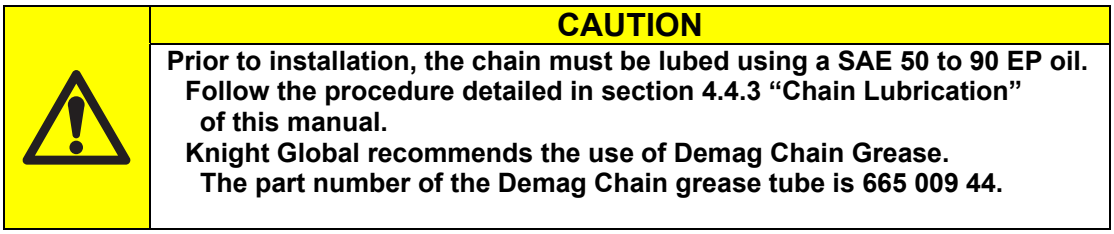
If an operator needs to stop motion immediately, the operator pushes the Run-Stop button. The system will not function until it is reset. To reset the system from the Run-Stop condition, the operator turns the button clockwise to release it from the depressed position. All virtual limits and programs remain intact.

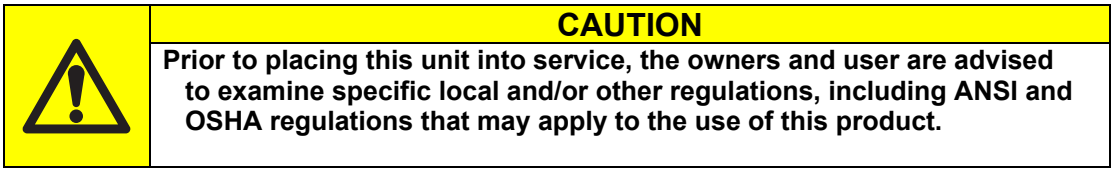
Safety Drop Stop (SDS) Chain

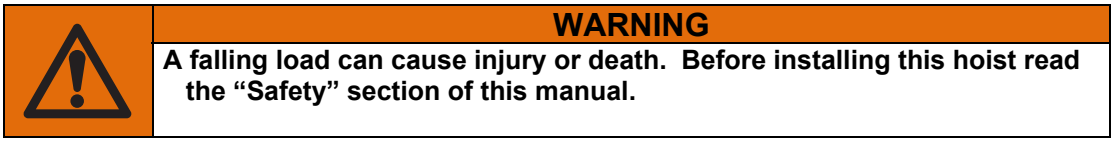
All Standard units have a Safety Drop Stop (SDS) chain included. The SDS Chain moves up and down the vertical axis with the load chain. It provides load stabilization in the event of a catastrophic load chain failure. This unique feature has a US Patent NO. 10,099,904 awarded as of 2018.

2. INSTALLATION

Prior to installation, visually inspect the Servo Hoist for signs of damage or missing parts.







Follow all procedures in this section for installation and set-up of the Servo Hoist.

Retain all product information supplied with the Servo Hoist for future reference.

Ensure that the supporting structure is able to support the weight of the system and load. The structure should be able to support 300 percent of the combined weight of the Servo Hoist and load. Do not use a supporting structure that tilts the Servo Hoist to one side or the other.

For safe and proper installation into a rail system, refer to the installation manual provided by the rail system manufacturer.

When installation is complete and prior to placing the Servo Hoist into operation, inspect the Servo Hoist following the instructions in section 4.4.2.1 “Recommendations for Periodic Inspections” in the “Maintenance” portion of this manual.

A. Introduction

Prior to installing and operating the Knight Servo Hoist, all operators using this device should be familiar with the main components of the lifting system. (Refer to Figure 2-1)

Servo Hoist: The Servo Hoist assembly is a powered lifting device. The upper drive assembly contains the servo motor with holding brake, gearbox, servo drive, power contactor, 24 VDC Power Supply, regen board, chain bucket, chain guide assembly, and AC Plug.

Coiled Cable Assembly: In most cases, a 19-pin coil cable carries signals from the control handle to the Servo Hoist. Some examples are: Analog load cell voltages, digital inputs and outputs including direction commands, Lift Mode, Float Mode, and Run-Stop signals. In some cases, a 19-pin straight cable carries some or all of these signals to the Servo Hoist.

Control Handle: The main interface between the operator and the lifting device. The handle can be an inline handle, a fixture handle, or a discrete up / down handle.

Figure 2-1

B. Initial Setup

Step 1: Unpacking

1a) Unpack the Servo Hoist. Lift the hoist carefully out of packaging.
1b) Keep the accompanying documents with the hoist or near the site of operation.

Step 2: System Assembly

Knight Servo Hoists are typically delivered pre-assembled; if not, read the following sections.

2a) Servo Hoist Trolley Installation
2b) Safety Cable Installation
2c) 19-pin Coil Cable Installation
2d) 4mm and 5mm Chain Installation

Step 2a) Servo Hoist Trolley Installation:

Prior to installation visually inspect the trolley for signs of damage or missing parts.

1) Slide the trolley or adapter plate into the trolley mounting plate on top of the Servo Hoist. (Refer to Figure 2-2)

CAUTION

Ensure that there is a (2) two-point connection when using the universal adapter plate to hang the hoist from a structure. (Refer to Figure 2-3)

2) Insert the (2) two ½-13x1¾" (grade 8 or better) socket head cap screws (SHCS) and (2) two washers.

NOTE

The trolley should be mounted offset of the load distribution.

3) Secure the (2) two SHCS with (2) two ½-13 reverse lock nuts. As each bolt is tightened, the reverse lock nut will get drawn into its slot and get trapped there.
4) Install the safety cable through the servo trolley or adapter and the trolley mounting plate. (Refer to Step 2b "Safety Cable Installation")
5) Roll hoist into rail system.

Figure 2-2

Figure 2-3

Step 2b) Safety Cable Installation:

1) Slide thimbles together. (Refer to Figure 2-4)
2) Slide (2) two Crosby cable clamps onto the cable.
3) Loop the end of cable around thimble and run the end through the Crosby clamps.
   The cable saddle (forged part) rests on the “live” (longer) end of the cable.
   The U-bolt rests on the “dead” (shorter) end of the cable. (Refer to Figure 2-5)
4) Tighten each nut on a single clamp, alternating sides. Repeat this procedure on the other clamp.
   Each nut should be tightened to a minimum of 15 ft-lbs.
5) Follow the steps below for trolley or adapter plate.
6) Insert cable through the center hole on the trolley bracket which is attached to the hoist and place (2) two Crosby clamps on the other end of the cable. (Refer to Figure 2-6)
7) Secure the (2) two Crosby clamps snug to the thimble, repeating step 3.
8) Install the cable so that the Servo Hoist has a drop of not more than 1 in. [2.54 cm].
9) Trim excess cable and tape ends of cable to prevent fraying. (Refer to Figure 2-6)

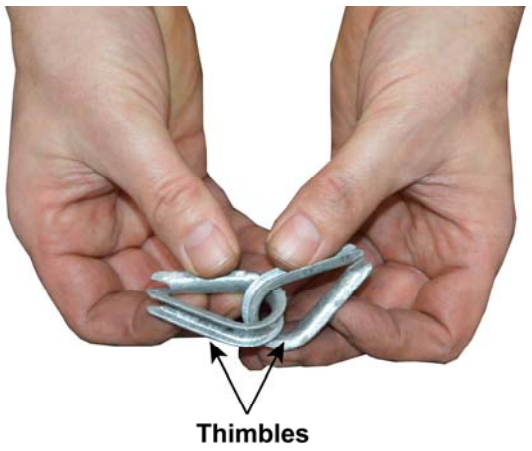


Figure 2-4

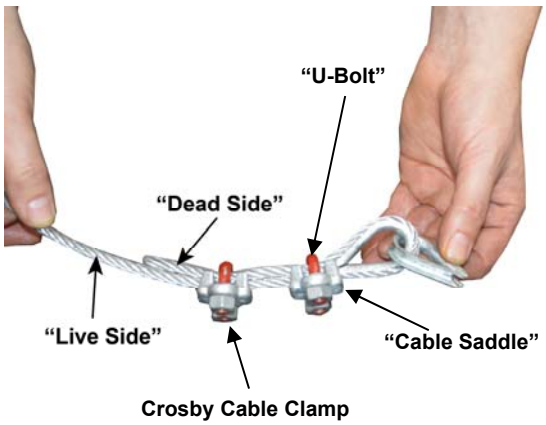


Figure 2-5

Figure 2-6

Figure 2-7

Step 2c) 19-pin Coil Cable Installation:

1) Ensure power is removed from hoist.
2) Slide the 19-pin coil cable upward over the chain and into the clamping assembly.
3) Secure the (4) four M6 nuts onto the bolts that pass through the clamping assembly from the bottom of the Servo Hoist. (Refer to Figure 2-8)
4) Connect the 19-pin connector to the bottom of the Servo Hoist. (Refer to Figure 2-9)
5) Seat both chains into the control handle's chain nest. Secure both of the chain's retaining bolts through the provided holes in the chain nest. (Refer to Step 2d "4mm and 5mm Chain Installation")
6) Loosen the (2) two M4 screws holding the 19-pin receptacle and slide it out of the control handle's housing. (Refer to Figure 2-10)
7) Connect the 19-pin connector to the receptacle, slide it back into the control handle's housing and secure the (2) two M4 screws. (Refer to Figure 2-11)
8) Secure the (2) two M6 bolts for each of the handle coil cable clamping rings located on top of the control handle. (Refer to Figure 2-11)

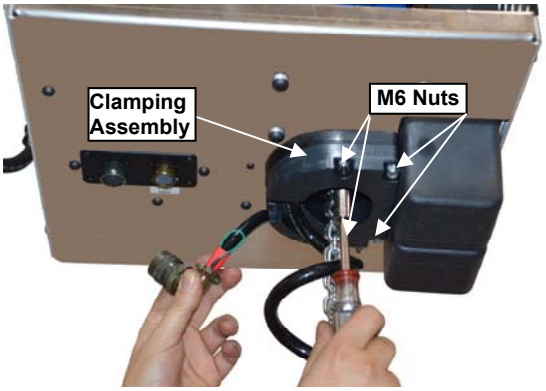


Figure 2-8

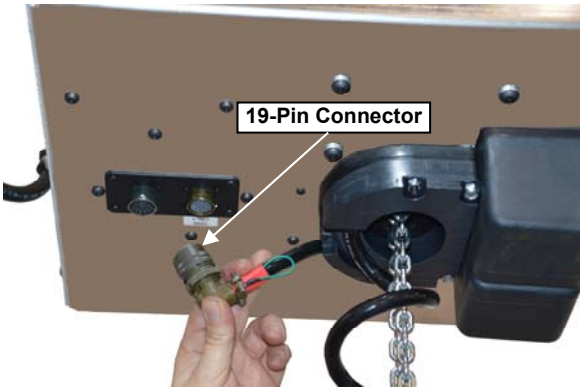


Figure 2-9

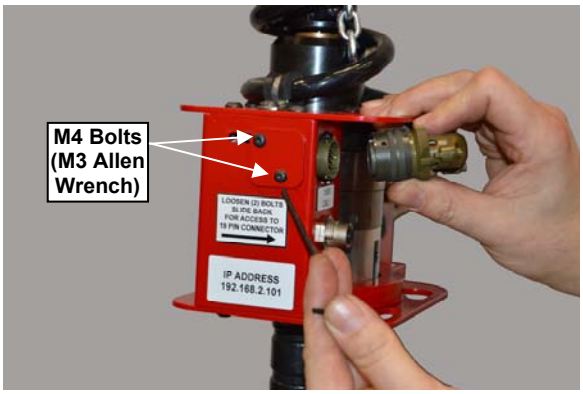


Figure 2-10

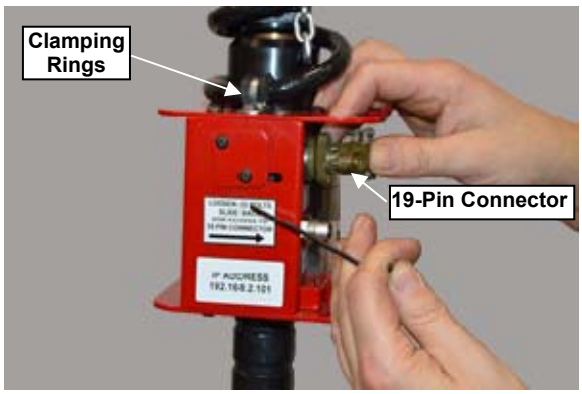


Figure 2-11

Step 2d) 4mm and 5mm Chain Installation:

CAUTION

DO NOT CUT CHAIN TO SHORTEN IT! The chain will be reeled into the hoist in Section 2, Step 5 "Control Handle Set-up".

1) Thread both chains through the coil cable.
2) Place the load chain into the top portion of the chain nest and insert the bolt provided thru chain nest in front of load chain's last link. An M4 Allen wrench is required if the servo's capacity is 250 or 500lbs. Otherwise, both the M4 and then M5 Allen wrenches will be required. (Refer to Figure 2-12)
3) Ensure that both chains are parallel with no twists from the gear box down to the chain nest.
4) Install the last link of the Safety Drop Stop (SDS) chain into the lower portion of the chain nest in front of the load chain. Ensure that the SDS chain is kept parallel to the load chain.
5) Install the bolt provided into the bottom bolt hole in the chain nest and through the last link in the SDS chain. (Refer to Figure 2-13)
6) Ensure that the large O-ring is fitted into the groove of the chain nest and the small O-ring is just above the chain nest but below the safety chain ID tag. (Refer to Figure 2-14)
7) Figure 2-15 shows the completed installation of both chains into the chain nest.

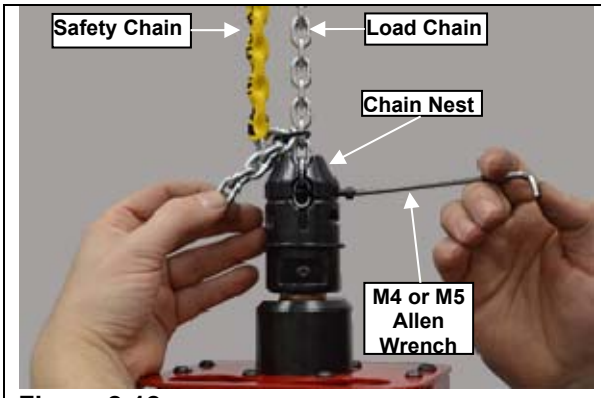


Figure 2-12

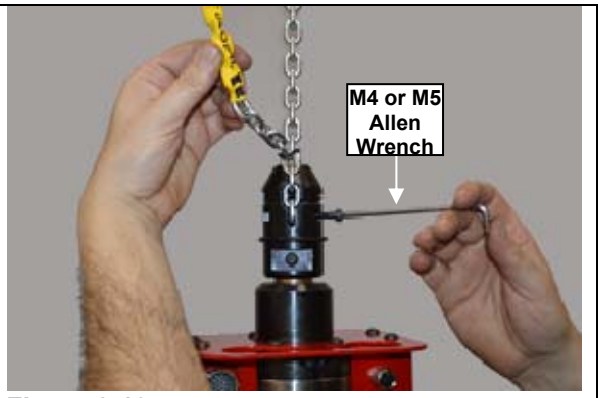


Figure 2-13

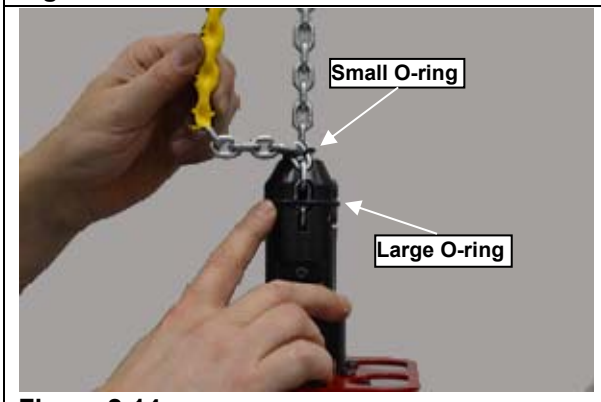


Figure 2-14

Figure 2-15

Step 3: Power Supply to Servo Hoist

Prior to installation visually inspect the Servo Hoist for signs of damage or missing parts.

Power Requirements: 240 VAC 20 FLA Single Phase 50/60 Hertz is Standard. Call a Knight Representative to obtain the correct power requirements for your system.

Refer to system specific documentation for any special power requirements.

1) The Servo Hoist power is connected by a twist lock plug (Refer to Figure 2-16: Standard) or fed by a hard-wired circuit, provided by end user (Refer to Figure 2-17: CE Compliant).
2) The red light on the Run-Stop button will illuminate when power is provided to the Servo Hoist system.

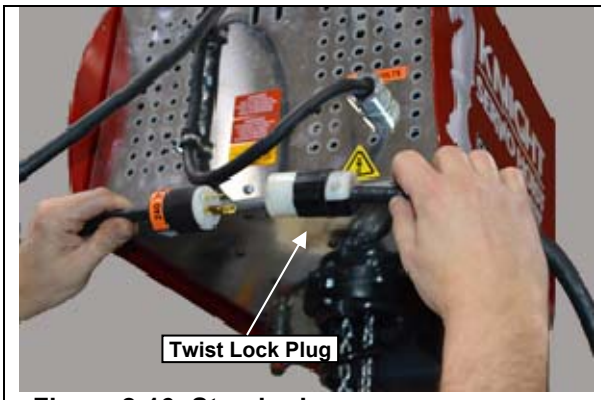


Figure 2-16: Standard

Figure 2-17: CE Compliant

Step 4: Releasing the Run-Stop button

The Run-Stop button is engaged for shipping purposes.

1) Turn Run-Stop button a quarter of a turn clockwise to release the Run-Stop and wait for red light to turn off. (Refer to Figure 2-18.)
2) Please, refer to the Run-Stop mode functionality in section 3.D. “Servo Hoist Functionality Modes” of this manual for more information.

Figure 2-18

Step 5: Control Handle Set-up

Inline Handle setup:

1) Hold the inline handle and trigger with one hand, and hold the chain away from the inline handle with other hand. (Refer to Figure 2-19)
2) Apply upward pressure on inline handle until the green light flashes.
3) Once green light starts flashing, release the inline handle and the GREEN light will illuminate.
4) Grasp the inline handle and apply upward pressure until the chain starts feeding into the hoist. Continue this until the inline handle is hanging vertically from the hoist at a comfortable height.

Figure 2-19

	NOTE
⚠	**A continuously flashing GREEN light indicates a safe start activation fault. The system is sensing commanded motion during the Power-Up sequence.** **Remedy** **Analog Handle: Release the handle and verify that the GREEN light illuminates solid. If the GREEN light still flashes after the handle is released, refer to section 7. "Troubleshooting".**

Step 6: Test Hoist Movement

Test the Servo Hoist movement by applying upward and downward pressure on the inline handle. The system should move up and down freely.

Step 7: Back-Up Software

Knight Servo Hoists are pre-programmed prior to delivery. It is a good practice to back-up this software before initial operation. Refer to the section 5. 'Software' portion of this manual for instructions to connect to the Servo Hoist and to back-up the software.

Step 8: Software Adjustments (If necessary)

After making a back-up of the software in step 7, it may be necessary to adjust certain parameters in the software to ensure that the servo performs correctly for a specific application. Refer to the following first-time adjustments in section 5. 'Software'.

- Verify that the Float load cell is zeroed correctly, see Section 5 E. Step 36
- Verify the hoist's maximum allowed weight. This is also known as the Up Stop weight of the hoist. See Section 5 E. Step 36
- Verify the hoist's minimum weight. This is also known as the Down Stop or pay out weight of the hoist. See Section 5 E. Step 36
- Verify the hoist's fixture weight, see Section 5 E. Step 39

3. OPERATION

A. Principle of Operation

The Servo Hoist system receives a command to move up or down along the “Z” axis from any input force applied to the handle.

B. Model Number

The Servo Hoist model number* designates the Servo Hoist type and its specifications. (Refer to Figure 3-1)

- The first set of letters indicate the type of Servo Hoist.
- The numbers following the Servo Hoist Type prefix letters reference the system’s rated capacity.
- “D” designates that this is a D-Series hoist.
- “S” designates our Safety Drop Stop feature.**
- The next (3) three numbers indicate the voltage
- The following number indicates the phase of the system.
- The last (3) three digits are a Knight control servo code.

The hoist’s model number* and serial number can be found on the Knight identification label located on the Servo Hoist.

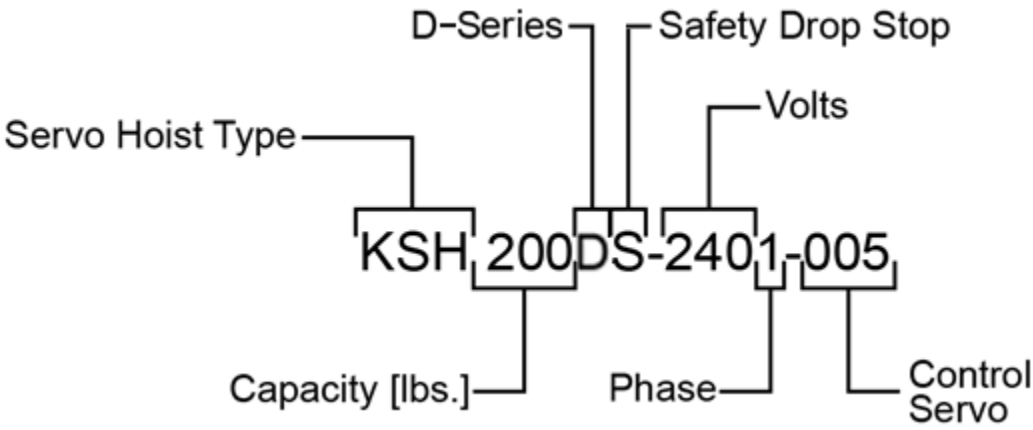


Figure 3-1 Servo Hoist Model Number Example

* For all models and specifications, refer to the website: https://knightglobal.com/product/d-series-servo-hoist/

** All Knight Servo Hoists include a Safety Drop Stop chain that travels with the load chain to support the fixture in the event of a catastrophic load chain failure.

C. Servo Hoist Control Configuration

Figure 3-2: D-Series Servo Hoist

D. Servo Hoist Functionality Modes

Run-Stop

Step 1. Press the RUN-STOP button, located on the Operator Control Interface (OCI) module.

- Motion is stopped and the motor's holding brake is set.
- The Run-Stop button will illuminate red.

Step 2. Reset the RUN-STOP button by twisting it a quarter of a turn clockwise.

Shut Down

Step 1. Press the RUN-STOP button, located on the Operator Control Interface (OCI).

Step 2. Follow the warning labels on the Servo Hoist and disconnect the power supplied to the unit.

Start Up

Step 1. Connect the power supply to the unit.

- The hoist will power up and the OCI's RED indicator will illuminate.

Step 2. Reset the RUN-STOP button by twisting it a quarter of a turn clockwise.

- The OCI's RED and GREEN indications will briefly flash when the system is ready to function.
- The unit will then default to No Mode: the OCI's GREEN, BLUE, and RED indicators will turn off.

No Mode

When the Servo Hoist powers up the unit will be in this energy saving mode. No mode can also be triggered if the hoist is inactive for set time period. By default, this time out feature is turned off. When in No Mode, the holding brake will engage and power will be removed from the motor. When the unit is in No Mode, the OCI's GREEN, BLUE, and RED indicators will be off.

Lift Mode

Press the GREEN (Lift) button to place the Servo Hoist into Lift Mode.

- The GREEN (Lift) indicator will illuminate.

	NOTE
	**A continuously flashing GREEN light indicates a safe start activation fault. The system is sensing commanded motion during the Power-Up sequence.** **<u>Remedy</u>** **Analog Handle: Release the handle and verify that the GREEN light illuminates solid. If the GREEN light still flashes after the handle is released, refer to section 7. "Troubleshooting".**

Step 1. Squeeze the Enabling Trigger.

Step 2. Apply force to the handle in the desired direction of travel (upward or downward). The travel speed of the fixture is proportional to the force applied to the handle.

	NOTE
	**If the hoist is in No Mode and a lift command is given to the system via the inline handle, the hoist will automatically go into Lift Mode.**

Float Mode

Step 1. Press the BLUE (Float) button to place the Servo Hoist into Float Mode.
When the BLUE button is pressed, a snapshot is taken of the load that is attached to the end of the hoist (i.e. the system records the weight suspended from the fixture).
The BLUE (Float) indicator will illuminate.

Step 2. Apply pressure to the top of the part to move it down or lift up on the part to move it up.
Do not use the lift controls to move the part as this will place the hoist back into Lift Mode.

WARNING

An operator should never be able to release a load while in Float mode. The operator must switch to Lift mode in order to release a load.

NOTE

If the Knight controls team programmed the hoist, it will never release or unclamp a part while it is in Float mode. The hoist will have to be switched to Lift mode for a part to be released or unclamped.

To change from Float Mode to Lift Mode, follow any of the steps below:

- Operate the lift controls. The hoist will automatically change to Lift Mode and then it will move up or down.
- Press the GREEN (Lift) push button and the unit will change into Lift Mode.
- Allow the Float Mode Timeout timer to expire. This timer is set at the factory to 0ms of non-use, a value of 0 turns the timeout feature OFF. To change this timer, refer to section 6G. 'tPRM Parameter Array' in the parameter descriptions section.

NOTE

The part must be picked up while the hoist is in Lift Mode and then the operator may place the Servo Hoist into Float Mode.

NOTE

Do not rest your hand on the part when pressing the Float push button. This can cause a bias or an incorrect zero value measurement to be processed and may cause unintended movement.

NOTE

Use of the Lift Mode controls will prevent the unit from remaining in or changing to Float Mode.

Fault Mode

The Red light will flash.

Step 1. Press the RUN-STOP button, located on the Operator Control Interface (OCI).
- Motion is stopped and the motor's holding brake is set.
- The RUN-STOP button will illuminate red.

Recovery:

Step 1. Correct the situation that caused the fault.
Refer to section 7.B. "System Activity screens including Faults, Warnings and Error Codes" for a list of common faults.

Step 2. Follow the Start Up procedure to restore power to the unit.

4. MAINTENANCE

A. CHAIN INSPECTION

4.1 Inspection Overview

The inspection procedures and recommendations in this manual are based on:

- ANSI/ASME B30.16 “Overhead Underhung and Stationary Hoists”
- ISO7592-1983 “Calibrated Round Steel Link Lifting Chains -- Guidelines to proper use and maintenance.”

The following definitions and recommendations are from both specifications and pertain to the recommended inspection procedures in this manual.

Qualified Person: A person who, by possession of a recognized degree in an applicable field, or certificate of professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter at hand.

Designated Person: A person selected or assigned by the employer or the employer’s representative as being competent to perform specific duties.

Abnormal Operating Conditions: Environmental conditions that are unfavorable, harmful, or detrimental to the operation of a hoist, such as excessively high or low ambient temperatures, exposure to weather, corrosive fumes, dust laden or moisture laden atmospheres, and hazardous locations.

4.2 Use of Chain Safely in Any Application

Balance: Know the Load - determine the weight, center of gravity, angle and lift.	
Overload: Never Overload the Chain - check the working load limit on the identification tag.	
Knots, Twists and Kinks - Ensure chain is not twisted, knotted or kinked before lifting load. Chains should not be shortened with knots, bolts or other make-shift devices.	
Sharp Edges - Protect chain with padding when lifting sharp edged loads.	
Abrupt Movement - Lift and lower loads smoothly. Do not jerk.	
Extreme Temperatures - Do not expose alloy chain to temperatures of 400°F or higher or -40°F or lower.	

Figure 4-1

4.3 Determining the Frequency of Chain Inspections

Knight recommends utilizing load criteria and duty cycle data when determining the frequency of inspections. Inspection frequency should be identified by a qualified person and is based on factors such as the severity of the environment the hoist is being used in, percentage of capacity lifts, cycle time and shock loading. Each Servo Hoist should be rated individually and inspections performed in accordance with that rating.

Proper maintenance depends on an evaluation of the severity of usage to which the hoist and the chains are subjected to in the specific application.

The overall determination of how often the hoist and chains should be inspected is a combination of its Service Rating Load Criteria (Section 4.3.1) and its Service Class or Duty Cycle (Section 4.3.2).

4.3.1 Service Rating Load Criteria

Light Service: Hoist and chains normally subjected to light loads and very rarely to maximum loads.

Moderate Service: Hoist and chains normally subjected to moderate loads but fairly frequently to maximum loads.

Heavy Service: Hoist and chains normally subjected to loads of heavy magnitude and frequently to maximum loads.

Very Heavy Service: Hoist and chains regularly subjected to maximum loads.

4.3.2 Service Class (Duty Cycle)

Service Class is determined by the total number of cycles the system has performed. (Table 4-1)

- Service Class 0: 0 to 20,000 loaded cycles.
- Service Class 1: 20,001 to 100,000 loaded cycles.
- Service Class 2: 100,001 to 500,000 loaded cycles.
- Service Class 3: 500,001 to 2,000,000 loaded cycles.
- Service Class 4: over 2,000,000 loaded cycles.

Cycles Per Day	Desired Life (Years)				
	1	5	10	20	30
5	0	0	0	1	1
10	0	0	1	1	2
25	0	1	1	2	2
50	0	1	2	2	3
100	1	2	2	3	3
200	1	2	3	3	4
300	2	3	3	4	4
750	2	3	4	4	4
1,000	2	3	4	4	4

Table 4-1: Service Class

Example: If the system is performing 100 cycles per day, it will progress though Service Classes during its use:

1 year	26,000 cycles	Service Class 1
5 years	130,000 cycles	Service Class 2
10 years	260,000 cycles	Service Class 2
20 years	520,000 cycles	Service Class 3
30 years	780,000 cycles	Service Class 3

4.4 Type of Inspections

The inspection procedure is divided into two general classifications based upon the intervals at which the inspections should be performed for the hoist and chains during regular use. The general classifications are herein designated as "frequent" and "periodic" with respective intervals between inspections as defined below.

In addition, visual observations shall be conducted during regular service for any damage or evidence of malfunction which might occur between regular inspections.

4.4.1 Frequent Inspection (Visual)

This is a visual examination of the hoist and its chains by the operator or other designated personnel, without requiring records to be made. This inspection should be carried out at the following intervals:

A.	Light Service	or	Service Class 0 / 1	– **Every Month**
B.	Moderate Service	or	Service Class 2	– **Every Two Weeks**
C.	Heavy Service	or	Service Class 3	– **Every Week**
D.	Very Heavy Service	or	Service Class 4	– **Every Day**

Additionally, the operator should check the system continually during operation to ensure that no malfunctions are occurring (such as abnormal noises or binding of the chain).

4.4.1.1 What to Look for During a Frequent Inspection

Operator should examine the chain throughout its working length to detect any evidence of wear, distortion or external damage. Equipment should be operated under a load as near as possible to the usual operating load, in both directions and observe the functioning of the chain. The chain should feed smoothly into and out of the servo.
Additionally, the operator should check the system continually during operation to ensure that no malfunctions are occurring.

- Check for visual signs or abnormal noises (grinding etc.) which would indicate a potential problem.
- Ensure controls function properly and return to neutral when released.
- Ensure the load chain feeds through the hoist correctly.
- Ensure that the chain doesn’t bind, is excessively noisy or “clicks” as it leaves the bottom of the servo.

If any of these abnormal conditions are evident, the Servo Hoist should be taken out of service and a detailed inspection and corrective actions should be taken by qualified maintenance personnel.

4.4.2 Periodic Inspection (Documented)

This is a thorough examination of the hoist and its chains conducted by a qualified person, making records of external conditions to provide a basis for the hoist's continuing evaluation. This Inspection should be carried out at the following intervals:

A. Light Service or Service Class 0/1 – **Yearly**
(equipment remains in place).

B. Moderate Service or Service Class 2 – **Every Six Months**
(equipment remains in place unless external conditions indicate that disassembly should be done to permit detailed inspection).

C. Heavy Service or Service Class 3 – **Every Three Months**
(equipment remains in place unless external conditions indicate the disassembly should be done to permit detailed inspection).

D. Very Heavy Service or Service Class 4 – **Every Six Weeks**
(equipment remains in place unless external conditions indicate that disassembly should be done to permit detailed inspection).

4.4.2.1 Recommendations for Periodic Inspections

Perform the inspection detailed under section 4.4.1.1 "What to Look for During a Frequent Inspection" of this manual.

Next, the chains should be cleaned for inspection, using any cleaning method that will not cause damage. Adequate lighting should be provided for the person inspecting the chain. The chain should be examined link by link for cracks, gouges, nicks, distortion, corrosion, deposits of foreign material, and for interlink wear. To inspect for wear at the interlink contact points, slacken the chain and rotate adjacent links to expose the inner ends of the link. If wear is observed or if elongation is suspected, measure the chain. Knight recommends using the Knight Load Chain Gauge (KSAA1003) for quick GO / NO GO checks of chain length.

A. Chain Link Thickness

If chain is worn to less than the minimum allowable thickness (T), remove the chain from service. (Refer to Figure 4-2)

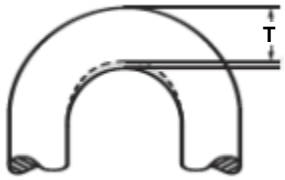


Figure 4-2

Minimum Allowable Chain Link Thickness at Any Point

Nominal Chain Size		Minimum Thickness "T"	
Inches	mm	Inches	mm
.157	4.0	.137	3.48
.196	5.0	.171	4.35

Table 4-2

B. Chain Gauge Replacement Measurement for 4mm Load Chains

1. Raise the hoist to the full up position and mark the chain.
2. Lower the hoist to the full down position.
3. Select 13 links starting with the link that was marked in step 2.
4. The 13-selected links should fit loosely onto gauge prongs as shown below. If links number 1 and 13 do not fit onto prongs or have to be forced into selection, replace the load chain. This indicates that the chain's length has increased by 2% or more and should be removed from service and replaced with new chain.
5. Perform this inspection in multiple sections of the chain working up to the sprocket.

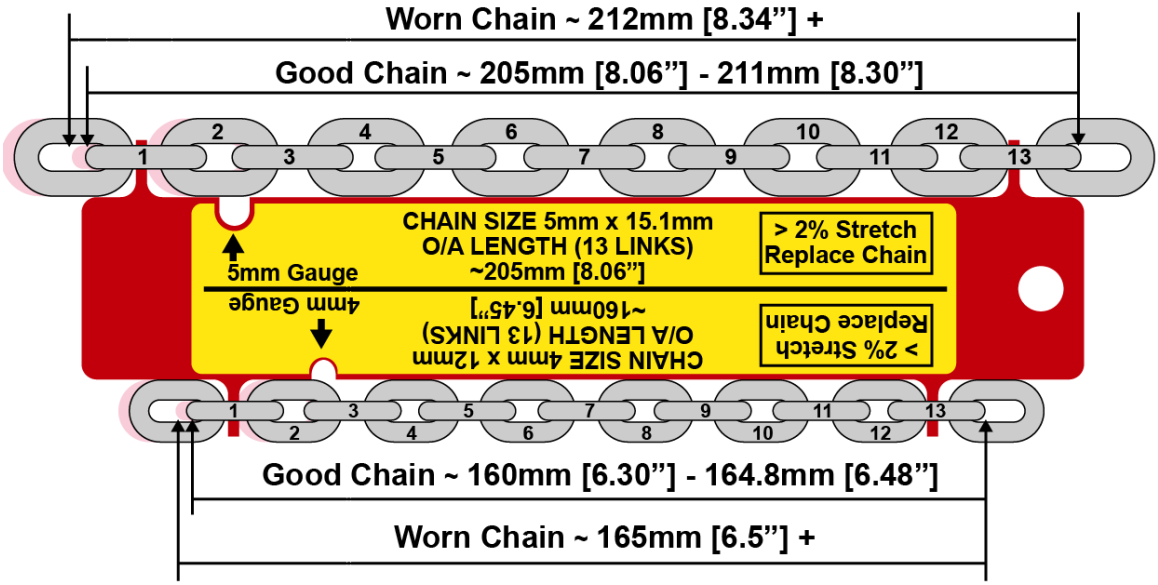


Figure 4-3

C. If Chain Gauge is Not Available

- Select an unworn, un-stretched length of the load chain.
- Suspend the chain vertically under tension. Use a caliper type gauge to measure the accumulated pitch of between 5 and 13 links.
- Measure the same number of links throughout the used chain and calculate the percentage increase in length.
- The chain should be replaced if the gauge length measured over any 5, 7, 9, 11, or 13 links as appropriate exceeds that of the unused chain by 2%.

D. Rejection Criteria

The chain should be rejected and replaced if any of the following conditions are observed: (Refer to Figure 4-4)

- Cracked or worn links
- Severe nicks or gouges
- Twisted or bent links
- Severe corrosion
- Deposits which cannot be removed
- Increase in gauge length which exceeds the manufacturer's recommendations. In the absence of manufacturer's recommendations, the chain should be replaced if the gauge length measured over any 5, 7, 9, 11, or 13 links as appropriate exceeds that of the unused chain by 2%.

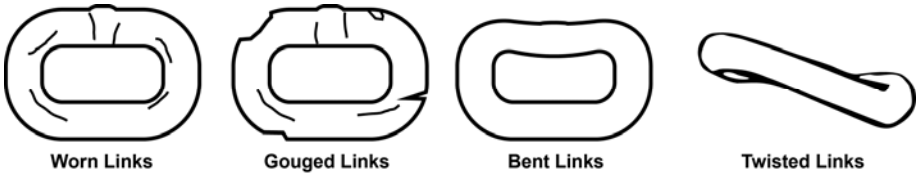


Figure 4-4

4.4.2.2 Recommended Record Keeping for Periodic Inspections

Adequate records as a part of periodic inspection are essential for the proper use of calibrated chains. The chain record should include a complete description and identification of the new chain, the date and results of each inspection, the date and results of each test and the date and description of any maintenance.

The record is a continuous history of the chain and shows that it has been regularly inspected and maintained in good operating condition.

When the chain is removed from service, a new record should be prepared for the replacement chain.

4.4.3 Chain Lubrication:

Keep chain well lubricated. Never operate a hoist when the load chain does not flow freely and smoothly into and out of the gear box assembly or when it makes noises indicative of binding or other malfunctions. Replace the chain if it is visibly damaged in any way.

Clean, lubricate, and inspect the load chain based on the frequent inspection criteria described in section 4.4.1. In a corrosive environment, lubricate more frequently than normal. Failure to maintain a clean and well lubricated load chain will result in rapid load chain wear that can lead to chain failure which can cause severe injury, death or substantial property damage.

If required, clean the chain with acid free solvent to remove rust or abrasive dust buildup before the chain is lubricated.

Lubricate each link of the chain with a light coat of SAE 50 to 90 EP oil or equivalent machine/gear oil. Ensure that oil is applied to the bearing surfaces of the load chain links. Wipe off excess oil from the load chain surfaces. Substitute a dry lubricant for use in dusty environments. Knight recommends Demag Chain Grease: P/N 665 009 44.
(Refer to Figure 4-5: Chain Lubrication)

Lubricate hook and safety latch pivot points with same lubricant used on the load chain.

Lubricate chain without load on chain. This will allow lube to penetrate between links.

WARNING

Failure to maintain a clean and lubricated load chain will void the manufacturer's warranty.

Figure 4-5: Chain Lubrication

4.4.4 Load Chain Replacement:

Care should be taken to re-install the chain without any twists down the entire chain's length between the gear box and its anchored end in the chain nest. Proper orientation of the entering link should be established since a twist cannot be corrected except by removing and re-installing the chain.

Refer to Section 4.6 "Load and Safety Drop Stop Chain Replacement (Normal Maintenance)" for further instructions on how to replace load chain.

B. PREVENTATIVE MAINTENANCE FOR KNIGHT SERVO HOIST

4.5 Servo Hoists Inspections

4.5.1 Recommendations for Frequent Inspections for Servo Hoists (Visual)

This is a visual examination by the operator or other designated personnel, without requiring records to be made. Inspection should be carried out at the following intervals recommended in section 4.4.1 'Frequent Inspection (Visual)'.

Additionally, the operator should check the system continually during operation to ensure that no malfunctions are occurring.

4.5.1.1 Servo Hoist:

- Visually inspect the Servo Hoist and ensure that it is in good general working order. Repair or replace any broken or missing parts.
- Cycle the Servo Hoist and listen for any abnormal noises (grinding, etc.). If any abnormal noises are evident, an inspection of the Servo Hoist must be performed.
- Inspect how the chain feeds through the Servo Hoist. If any binding is evident, clean and lubricate the chain (Refer to section 4.4.2 'Periodic Inspection (Documented)'. If the problem persists replace the chain.
- Cycle the Run-Stop button and ensure it functions correctly.

4.5.1.2 Load Shackle:

- Check the shackle for signs of wear.
- Ensure the load shackle is not cracked, nicked or gouged. Replace the shackle as necessary.
- Confirm all cotter pins and / or keepers are in place.

If any of these abnormal conditions are evident, the Servo Hoist should be taken out of service and a detailed inspection and corrective actions should be taken by qualified maintenance personnel.

4.5.2 Periodic Inspection (Documented)

Perform the items listed in the section 4.4.1.1. 'What to Look for During a Frequent Inspection' in addition to the items listed below. All findings from this inspection should be recorded.

4.5.2.1 Supporting Structure:

- Check for distortion, wear and continued ability to support the load. Refer to manufacturers' instructions for overhead rail systems.

4.5.2.2 Rail Trolley (if applicable):

- Ensure wheels and side rollers run smoothly and are not excessively worn. Replace the wheels and side rollers as necessary.
- Visually check the nylon at the bearing and along the face of the wheel for cracks.

4.5.2.3 Fasteners:

- Check all fasteners and ensure they are not loose, missing or damaged.

4.5.2.4 Load Hook (if applicable):

- Inspect for cracks, wear or damage.
- Inspect hook throat for spreading and proper safety latch engagement.
- Measure hook throat at wear points: greater than ten percent wear in any throat zone requires replacement. Refer to manufacturer's instructions for wear zone information.
- Inspect the hook eye or chain nest and sleeve for correct functionality. Also, each should rotate without binding and should not be damaged.

4.5.2.5 Valves, Timers, and Switches:

- Check during an operation cycle to ensure the sequence is operating at optimum efficiency. Repair or replace if needed.

4.5.2.6 Wiring:

- Check for broken, loose, missing, and worn wires. Check all electrical cables for signs of age, wear, or damage, and make sure all connections are tight and secure. Repair or replace if needed.

4.5.2.7 Electrical Enclosures, Disconnect Boxes, and Circuit Breakers:

- Check for obvious signs of damage and repair or replace if needed.
- Verify disconnect is operational. Check for loose, bent, or broken components. Repair or replace if needed.
- Inspect for loose or broken terminals. Check for the presence of contaminants like dirt, dust, grease, or rust. Repair or replace if needed.

If any of these abnormal conditions are evident, the Servo Hoist should be taken out of service and a detailed inspection and corrective actions should be taken by qualified maintenance personnel.

4.5.2.8 Labels and Tags:

- Ensure that all labels are intact and legible. Replace as necessary. (Refer to Figure 4-6)

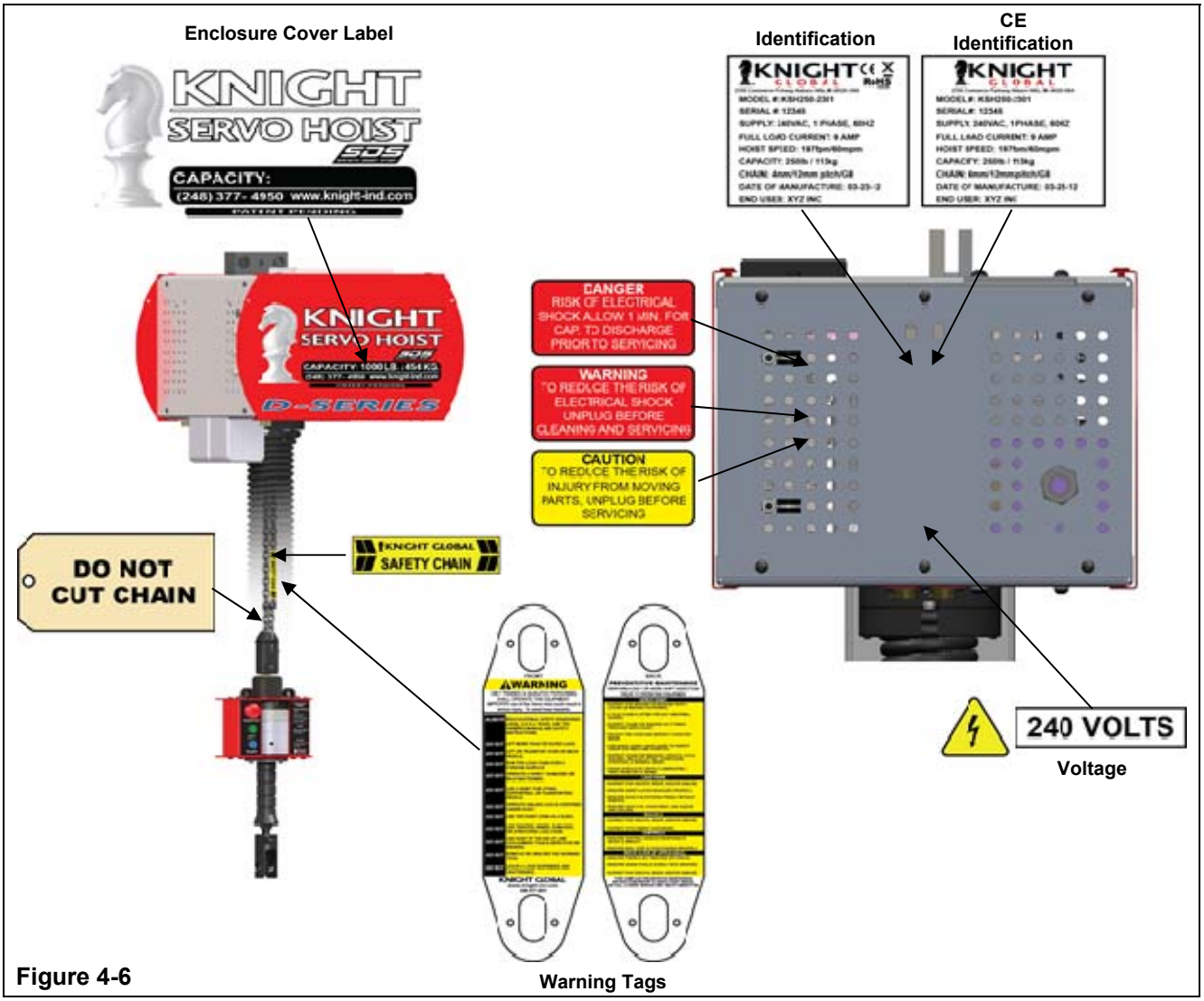


Figure 4-6

If any of the labels or warning tags listed above are missing, contact Knight Global at 248-377-4950 to order replacements.

4.6 Load and Safety Drop Stop Chain Replacement (Normal Maintenance)

The materials required for the chain replacement are shown in Figure 4-7:

SDS REPLACEMENT CHAIN KIT
#KDSA1010 (4mm Chain)
#KDSA1011 (5mm Chain)

(2) Steel Grade (80) Chains.
(2) Chain End Stop assemblies.
(2) Interface links to assist in installing the chain.
(1) Chain Installation Tool.
(1) Safety Chain Identification Sleeve
(1) Small O-Ring.
(1) Large O-Ring.

Figure 4-7

Step 1. Raise the inline handle to its full up position (Home).

Step 2. Measure the distance from the top of the inline handle to the bottom of the servo hoist. (Refer to Figure 4-8)

Step 3. Record this measurement because it will be used in section 4.6.1 Resetting the Encoder Offset.

Date of Replacement	Measurement
_____	_____ in.
_____	_____ in.
_____	_____ in.
_____	_____ in.
_____	_____ in.

Figure 4-8

Step 4. Move the inline handle down to a comfortable working height.

Step 5. Remove ALL of the load that is attached to the hoist under the inline handle. This includes the part and the system's fixture.

Step 6. Push the RUN-STOP button and its RED light will illuminate.

Step 7. Disconnect the input power supplied to the Servo Hoist.

WARNING

Wait for the capacitors to discharge. It will typically take about (6) six minutes for the capacitors to fully discharge.

Step 8. Remove both chains from the chain nest. The bottom bolt releases the Safety Drop Stop (SDS) chain and the top bolt releases the Load chain.

A M4 Allen wrench will be required (Refer to Figure 4-9)

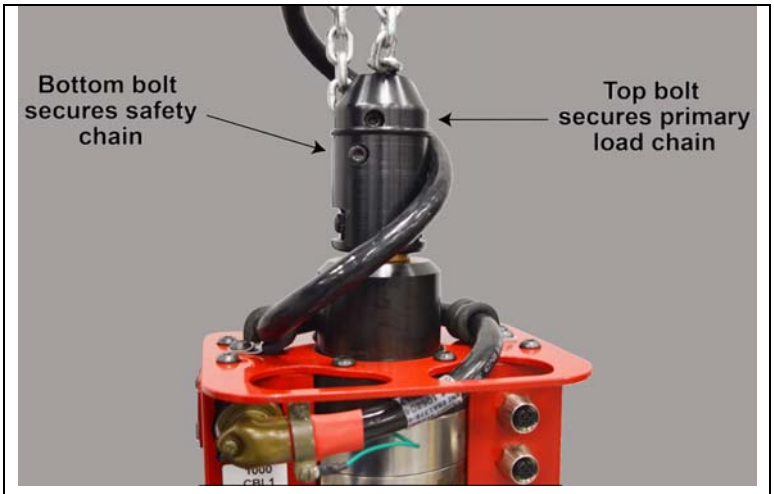


Figure 4-9

Step 9. Remove the bottom bolt and the SDS chain first and then remove the top bolt and load chain. Ensure that the inline handle is supported before the load chain is disengaged from the chain nest.

Step 10. Remove the side covers from Servo Hoist. (Refer to Figure 4-10)

a. Remove the (2) two M6 screws on the bottom of each of the covers.

b. Lift cover upwards off the pins.

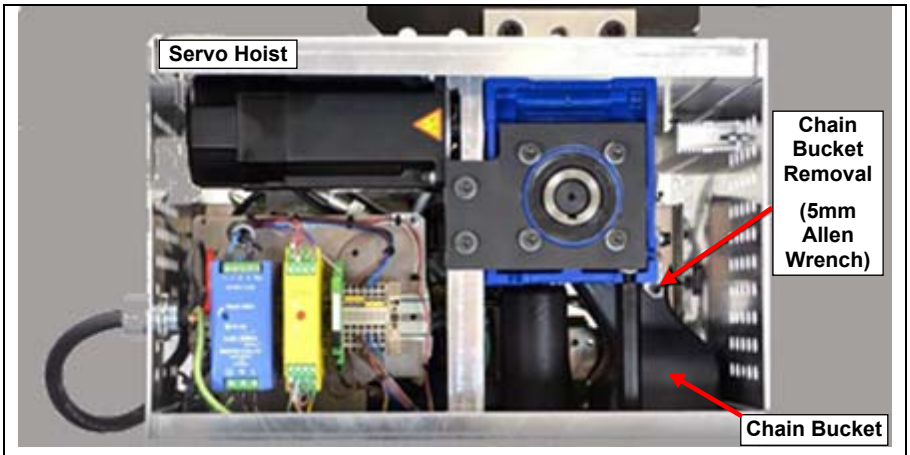


Figure 4-10

Step 11. While supporting the chain buckets, remove the (1) one M5 retainer bolt that secures both chain buckets inside of the Servo Hoist. (Refer to Figure 4-11)

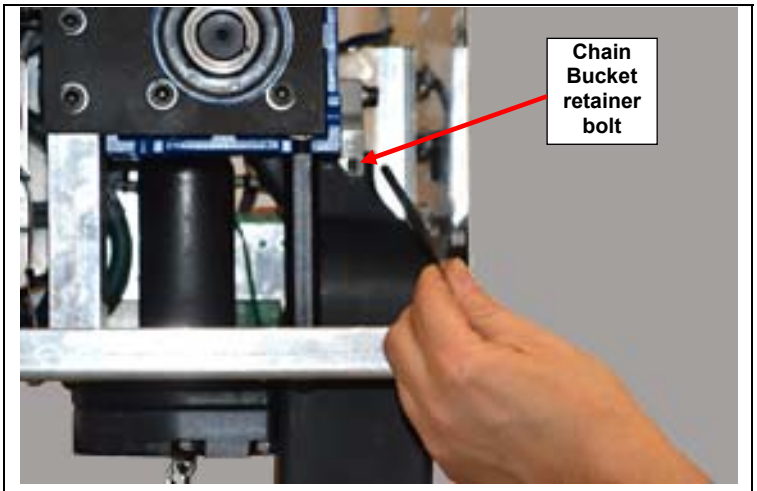


Figure 4-11

Step 12. Remove both chain buckets through the bottom of the Servo Hoist.

Step 13. Remove both chains from their individual chain buckets.

Step 14. Remove both of the end-stop assemblies from the each of the old load and Safety Drop Stop (SDS) chains.

Step 15. Connect both of the old chains together with the both of new chains by using both of the yellow chain interface links. (Refer to Figure 4-12)

Figure 4-12

Step 16. Power the system back up.

Step 17. To enable the chain pay-out sequence, using the Operator Control Interface (OCI), twist the Run-Stop button clockwise to enable the hoist.
Within 3 seconds, press the Run-Stop button, press and release the Green Lift button and then the Blue Float button, twist the Run-Stop button clockwise and release. This will start the pay-out mode after three to ten seconds.
If the direction is incorrect, press the Run-Stop button to stop the pay-out mode and repeat the above sequence to pay-out the chain in the opposite direction.

Step 18. Stop the pay-out mode by pressing the Run-Stop button when the yellow interface chain links have moved through the gear box and are at an acceptable height to reattach the inline handle.

Step 19. Remove input power from the Servo Hoist, allowing enough time for the system to discharge.

Step 20. Lubricate both the load and the Safety Drop Stop (SDS) chains per section 4.4.3 'Chain Lubrication'.

Step 21. Reinstall both chains into each of their correct chain buckets and add end-stops.

Step 22. Reinstall the chain buckets back into the servo hoist.

Step 23. Reinstall the servo hoist side covers.

Step 24. The SDS chain needs to be cut to the correct length so it has slack in it when the load chain is properly connected.

Step 25. Ensure that both chains are parallel with no twists from the gear box down to their respective ends.

Step 26. Count down seven links from the end of the load chain. Cut the seventh link so the SDS chain is six links longer than the load chain. (Refer to Figure 4-13)

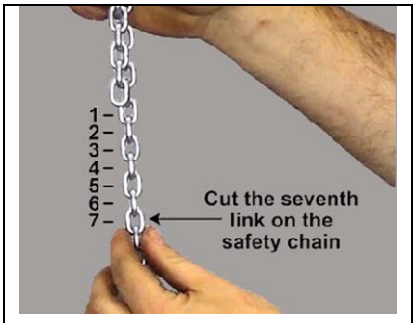


Figure 4-13

Step 27. Install the safety chain identification sleeve on the SDS chain and then heat shrink it to the SDS chain on the eighth link up from the bottom of the SDS chain. (Refer to Figure 4-14)

Figure 4-14

Step 28. Reinstall the new small O-ring around both the load and SDS chains.

Step 29. Reinstall both chains back through the center of the coil cable.

Step 30. Ensure that both chains are parallel to each other and have NO twists in them when they are installed into the chain nest. (Refer to Figure 4-15)

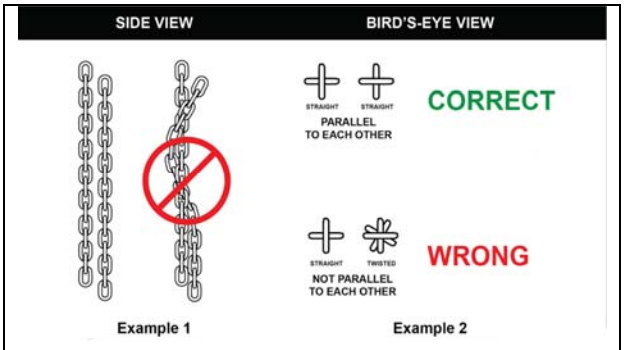


Figure 4-15

Step 31. First, the last link of the load chain is installed into the top slot of the chain nest. The chain must be kept parallel with no twists. The bolt is installed in front of the last link of the load chain and into the chain nest. (Refer to Figure 4-16)

Figure 4-16

Step 32. Next, the last link of the SDS chain is installed into the bottom slot of the chain nest. The chain must be kept parallel with no twists. The bolt is installed through the last link of the SDS and into the chain nest. (Refer to Figure 4-17)

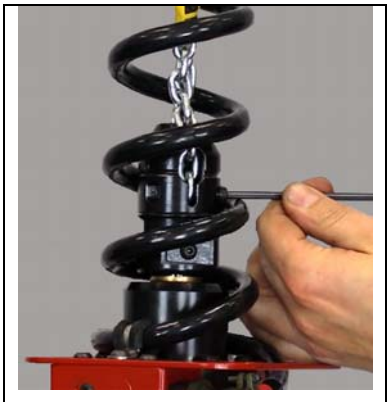


Figure 4-17

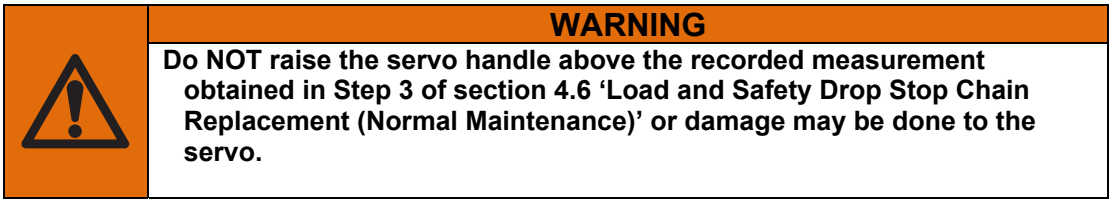
Step 33. Reinstall the large O-ring into the groove located on the chain nest.

Step 34. Move the small O-ring down so it is just above the top of the chain nest.

Step 35. The servo hoist may now be repowered and tested.

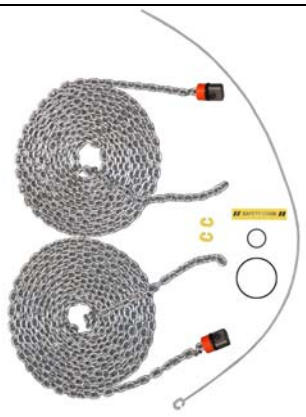
4.6.1 Resetting the Encoder Offset

Please refer to the Position Calibration screen found in section 5.E. Step 31.



4.7 Broken Chain Replacement

If the Load chain is broken, and has come out of the chain guide, Use the steps in this section along with those in section 4.6 to reinstall a new chain. The materials required for the chain replacement are shown in Figure 4-18:



SDS REPLACEMENT CHAIN KIT
#KDSA1010 (4mm Chain)
#KDSA1011 (5mm Chain)

(2) Steel Grade (80) Chains.
(2) Chain End Stop assemblies.
(2) Interface links to assist in installing the chain.
(1) Chain Installation Tool.
(1) Safety Chain Identification Sleeve
(1) Small O-Ring.
(1) Large O-Ring.

Figure 4-18

Step 1. Connect the old SDS chain to the new SDS chain using one of the yellow interface links. (Refer to Figure 4-19)

Figure 4-19

Step 2. To enable the chain pay-out sequence, using the Operator Control Interface (OCI), twist the Run-Stop button clockwise to enable the hoist.
Within 3 seconds, press the Run-Stop button, press and release the Green Lift button and then the Blue Float button, twist the Run-Stop button clockwise and release. This will start the pay-out mode after three to ten seconds.
If the direction is incorrect, press the Run-Stop button to stop the pay-out mode and repeat the above sequence to pay-out the chain in the opposite direction.

Step 3. When the yellow chain interface link reaches the gear box, stop the pay-out mode by pressing the Run-Stop button.

Step 4. Using the chain installation tool, locate the load chain pocket opening on the bottom of the gear box. (Refer to Figure 4-20)

Figure 4-20

Step 5. Using the chain installation tool, feed it completely through the gear box.

Step 6. Connect the new load chain to the chain installation tool.

Step 7. Pull the chain installation tool until the load chain just enters the gear box chain pocket opening.

Step 8. Ensure that the new load chain is aligned correctly so that it will enter the gear box properly.

Step 9. Ensure that there is tension on the chain replacement tool so that it is pulled into the gear box when the payout mode is started.

Step 10. Restart the pay-out mode by following the procedure listed in Step 2 above.

Step 11. This will feed the new load chain and SDS chain through the gear box.

Step 12. When the new load chain is long enough to attach to the chain nest, press the Run-Stop button to stop the pay-out mode. Follow the rest of the chain replacement steps starting with step 17 in section 4.6.

5. SOFTWARE

There are several subjects related to the Servo Hoist's software that will be reviewed here:

5.A.) Getting Started
5.B.) Connecting to a Servo Hoist
5.C.) Backing up the Knight Servo Hoist Software
5.D.) Loading New Hardware with Software
5.E.) Review the Hoist's Knight Servo Studio Software
5.F.) Accessing the Servo Hoist's Fault Log

In the next few sections of the manual a shorthand is used to point to a particular screen in the Knight Servo Studio (KSS) program:
Example: KSS Workspace tree location: Status \ Alarms/Warnings \ Row 3
The KSS Workspace can be found along the left side of the KSS window.
The next reference is a heading name located under the Work Order number of the system.
Expand this heading's drop down by clicking on the "+" sign next to its name.
The name of the particular screen is next. Double-Click to open the screen.
Sometimes a Row number is listed to highlight where an object is located on the screen.

First Time Adjustments:

If the Servo Hoist is being set up for the first-time, here is a list of functions to initially verify. These functions can be accessed from various screens located under the Setup section:
KSS Workspace tree location (User Level= Basic): Knight WO# \ Hoist Configuration \ …

1) The float load cell is reading correctly: This can be verified in the following section:
5.E. 'Review the Hoist Knight Servo Studio Software' under Step 36
KSS Workspace tree location (User Level= Basic): Knight WO# \ Hoist Configuration \ Float Load Cell

2) The hoist's minimum weight: This can be verified in the following section:
5.E. 'Review the Hoist Knight Servo Studio Software' under Step 36
KSS Workspace tree location (User Level= Basic): Knight WO# \ Hoist Configuration \ Float Load Cell

3) The hoist's maximum weight: This can be verified in the following section:
5.E. 'Review the Hoist Knight Servo Studio Software' under Step 36
KSS Workspace tree location (User Level= Basic): Knight WO# \ Hoist Configuration \ Float Load Cell
The hoist's maximum allowed weight cannot be set higher than the rated capacity of the hoist. It can be set lower than the rated capacity as desired.

4) The hoist's fixture weight is correct: This can be verified in the following section:
5.E. 'Review the Hoist Knight Servo Studio Software' under Step 39
KSS Workspace tree location (User Level= Basic): Knight WO# \ Hoist Configuration \ Fixture Weight

A. Getting Started

Listed below are the hardware and software items needed to connect to a Knight Servo Hoist:
(Refer to Figure 5-1)

- Laptop running Microsoft Windows 7 or above. (Customer Supplied)
- Ethernet Cable with (1) RJ45 connector and (1) M12 4-pin connector.
- The Knight Servo Studio software package.

Note: The Knight Servo Studio software and an Ethernet Cable can be ordered from Knight: P/N KCA1052.

Figure 5-1

B. Connecting to a Servo Hoist

The Knight Servo Studio software is used to configure and troubleshoot the Knight Servo Hoist. The following steps are required to initiate a connection between a computer running the Knight Servo Studio software and a Knight Servo Hoist:

Knight Servo Studio Software Package Setup:

Step 1. Setup the Ethernet communication settings for your laptop.

a. Using a Microsoft Windows based PC open the **Network and Sharing Center**.
b. Right click on **Local Area Connections**. Select **Properties**. (Refer to Figure 5-2)

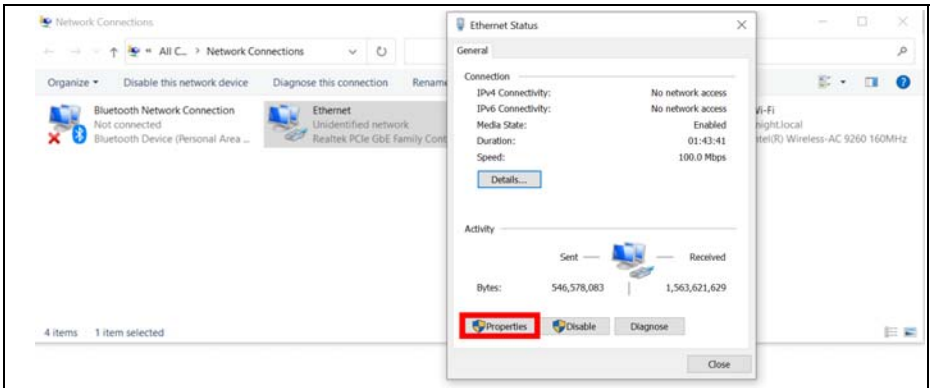


Figure 5-2

c. Select **Internet Protocol Version 4 (TCP/IPv4)**. Select **Properties**.
d. Select **Use the following IP address:**
In most cases the laptop's IP Address should be: 196.168.2.250
Type the correct IP address and Subnet mask into the spaces provided and press the 'OK' button. (Refer to Figure 5-3)

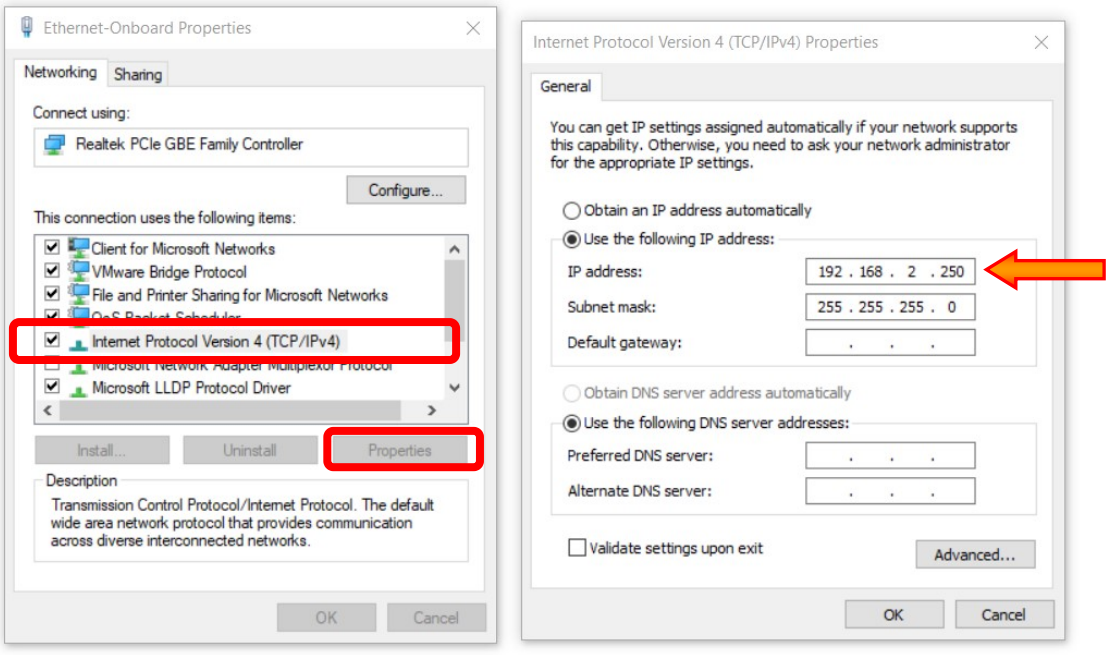


Figure 5-3

Step 2. Insert the USB card that was supplied with D-Series Hoist into the laptop. Double-click on the “Knight Servo Configuration Software Installer.msi” icon to launch the Knight Servo Studio installation software. (Refer to Figure 5-4)

Figure 5-4

Step 3. Double click on the blue Knight Servo Studio software icon located on the desktop and allow the Knight Servo Studio software to load.

Step 4. When the software loads, choose the ‘Open Project from Device’ option. The standard IP Address is automatically loaded into the Network Configuration box. The IP Address for the hoist will be located on a label next to the M12 ENET receptacle located on the Control Handle. (Refer to Figure 5-5)

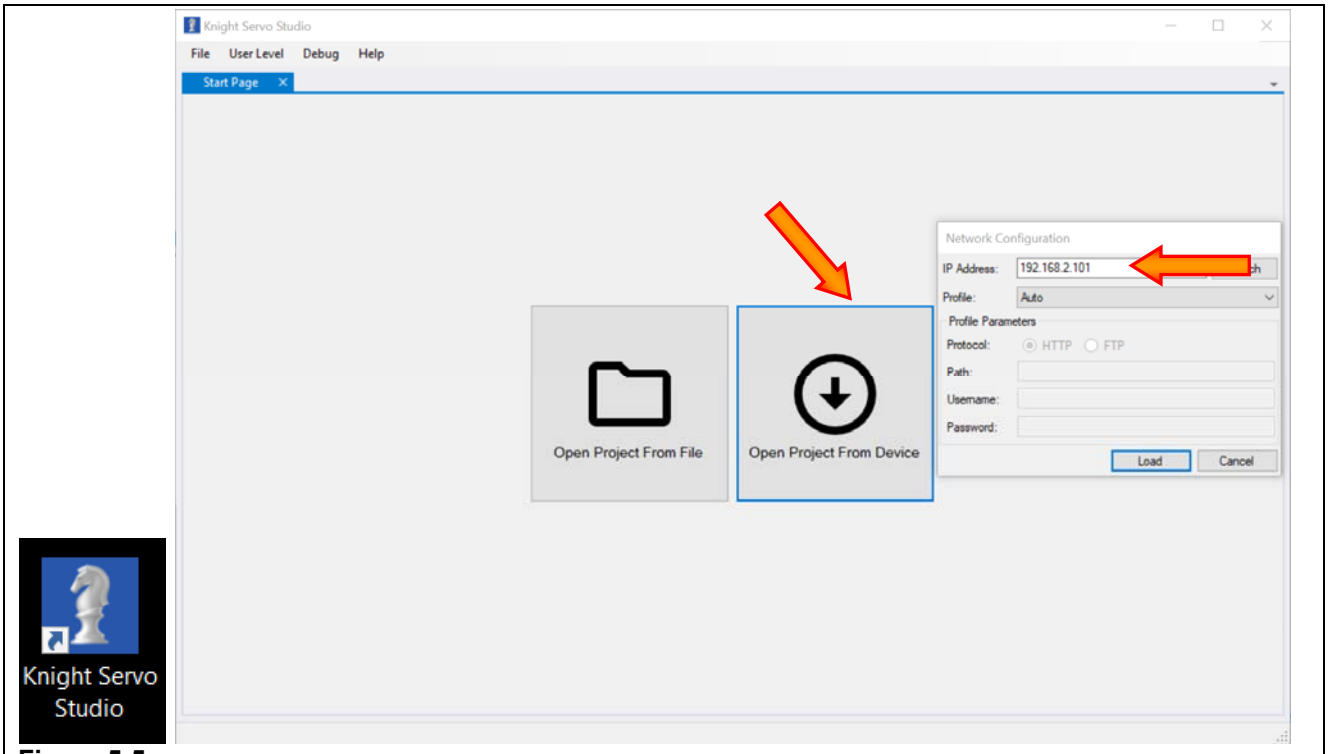


Figure 5-5

Step 5. Move the mouse to the right side of the screen and select the ‘Connect’ button. If the communications are operating correctly the red ‘Disconnected’ box will turn to a green ‘Connected’ box. (Refer to Figure 5-6)

If the Knight Servo Studio software does not connect to the hoist, recheck all of the connections and ensure that the hoist has its 240VAC power connected.

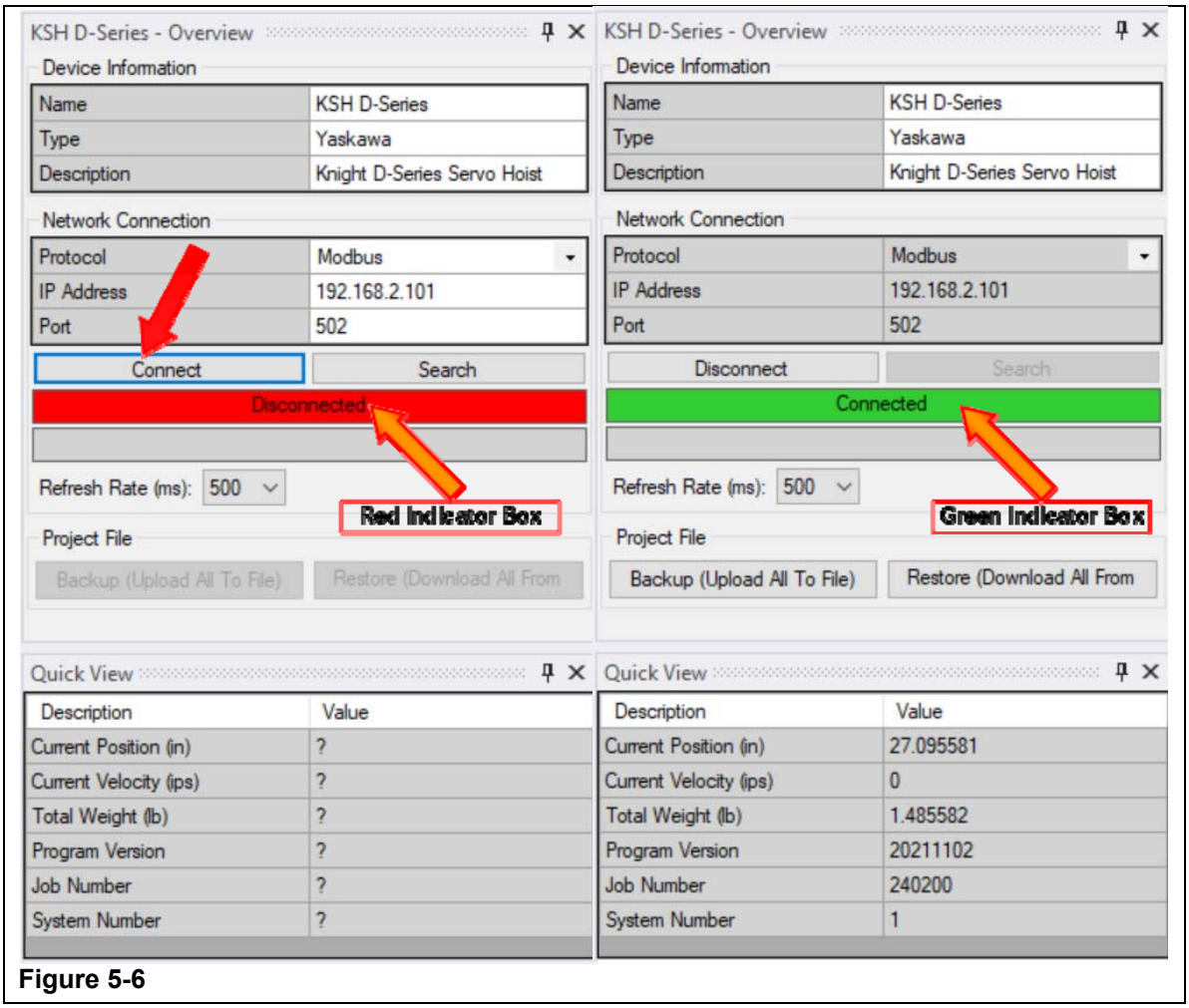


Figure 5-6

C. Backing up the Knight Servo Hoist Software

The section will explain how to save a backup copy of the 'Knight Servo Studio' (a .KSP file).

Save a copy of the Knight Servo Studio's .KSP file and Create a Yaskawa Backup Archive .ZIP:

Step 1. Mouse up to the top menu bar located on the left-hand side of the screen and select 'File'. Highlight the 'Save To File' option and select it. (Refer to Figure 5-7)

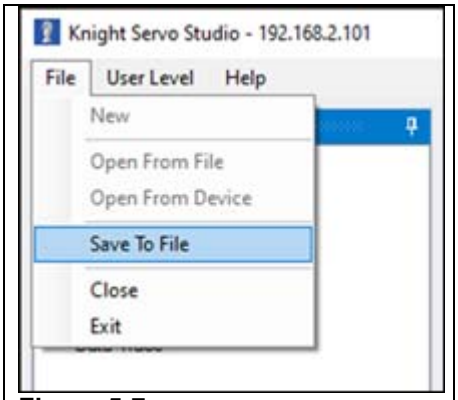


Figure 5-7

Step 2. Select a folder where to save the backup copy of the file. Ensure the Knight Work Order and System number is included in the filename. (Refer to Figure 5-8)

Knight suggests that a 'Controls' folder be created as well as subdirectories for each servo. The hoist's Work Order number should be used as the name for these new subdirectories. i.e. \Controls\123456.

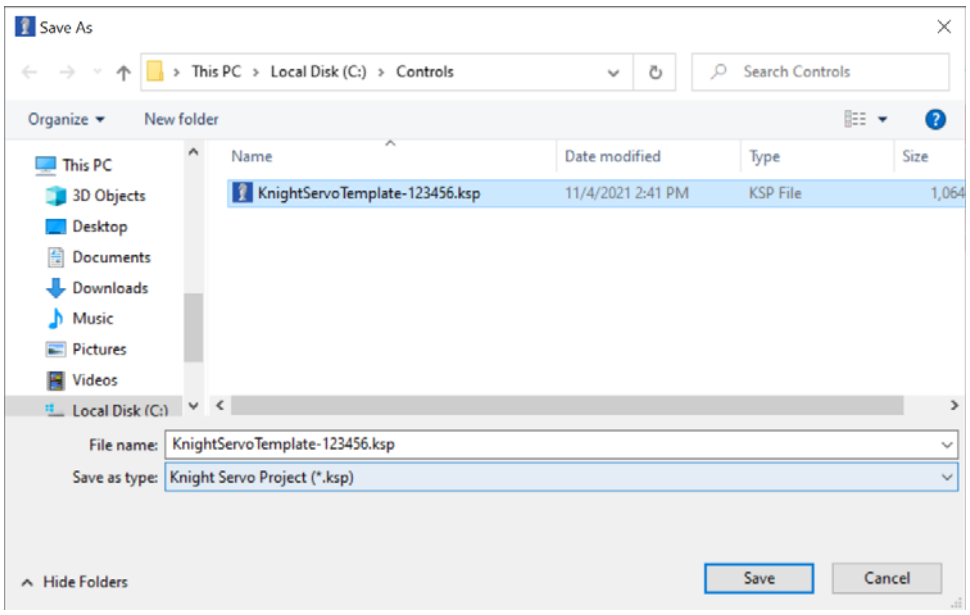


Figure 5-8

Step 3. Send a copy of the newly saved file to Knight's Servo Team at servos@knightglobal.com. This completes the Knight Servo Studio portion of the backup procedure, please continue to the Yaskawa Servo backup procedure in the next step.

Step 4. Create a new archive (backup) file for this newly setup system. This will copy information from the Yaskawa PLC to your laptop:

Step 5. Communicate with the Yaskawa PLC controller: (Refer to Figure 5-9)

a. While connected to the hoist open a web browser. (Google Chrome is preferred)
b. Browse to the address for the Yaskawa PLC: 192.168.2.101
c. The 'User' pulldown allows the "Log In" screen to be selected:

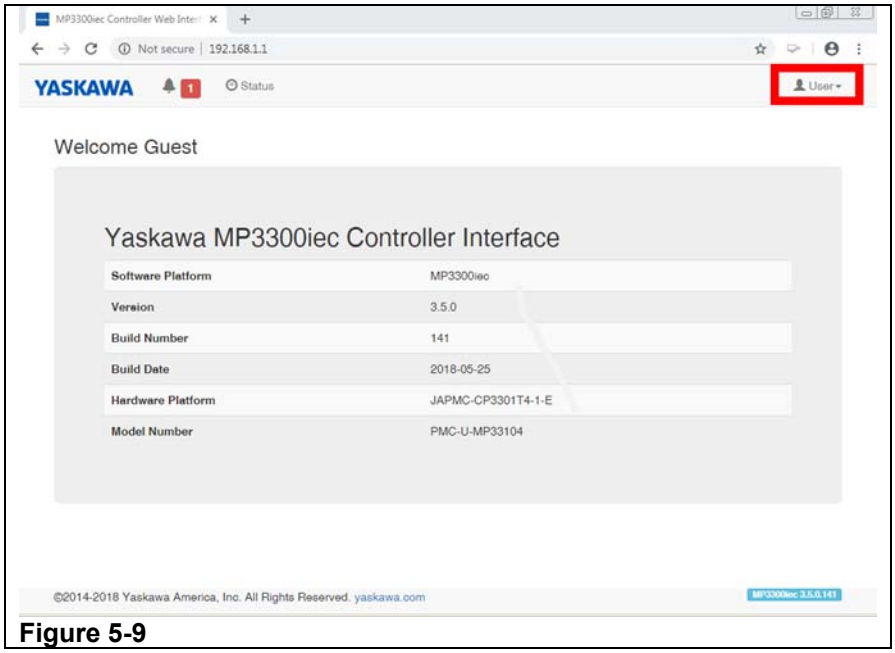


Figure 5-9

Step 6. Log into the Yaskawa controller. (Refer to Figure 5-10)

To 'Log In' to the Yaskawa drive the following values need to be entered in at the "Log In" Dialog Box: (Note: These are the default Yaskawa values)

User Name : Admin
Password : MP3300

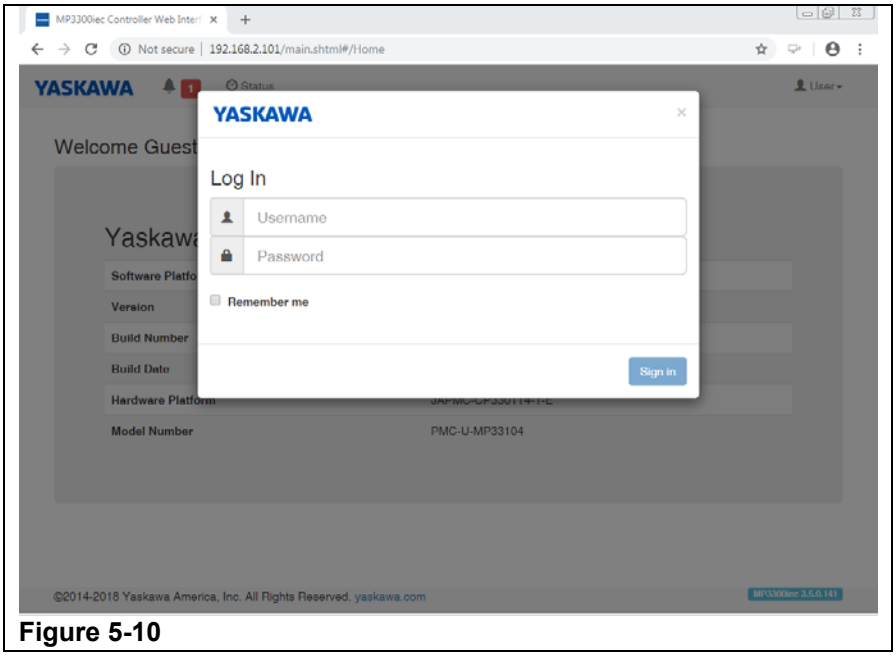


Figure 5-10

Step 7. Below is the Welcome Screen with the Yaskawa default settings when logged-in as Admin. (Refer to Figure 5-11)

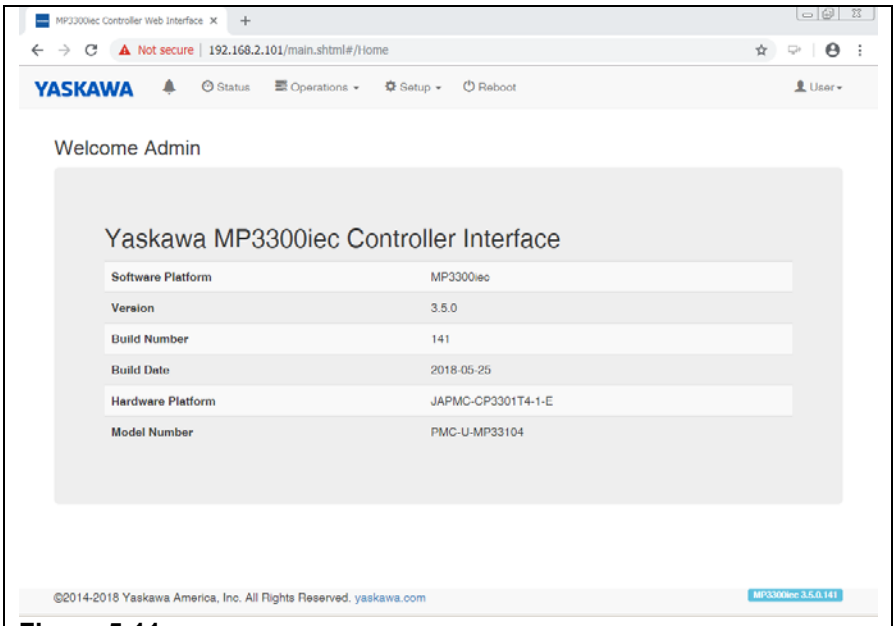


Figure 5-11

Step 8. To create a new archive file, return to the web browser. (Refer to Figure 5-12)

a. Go to the 'Setup' pulldown menu and select "Archive".
b. On the 'Archive' page select "Receive".

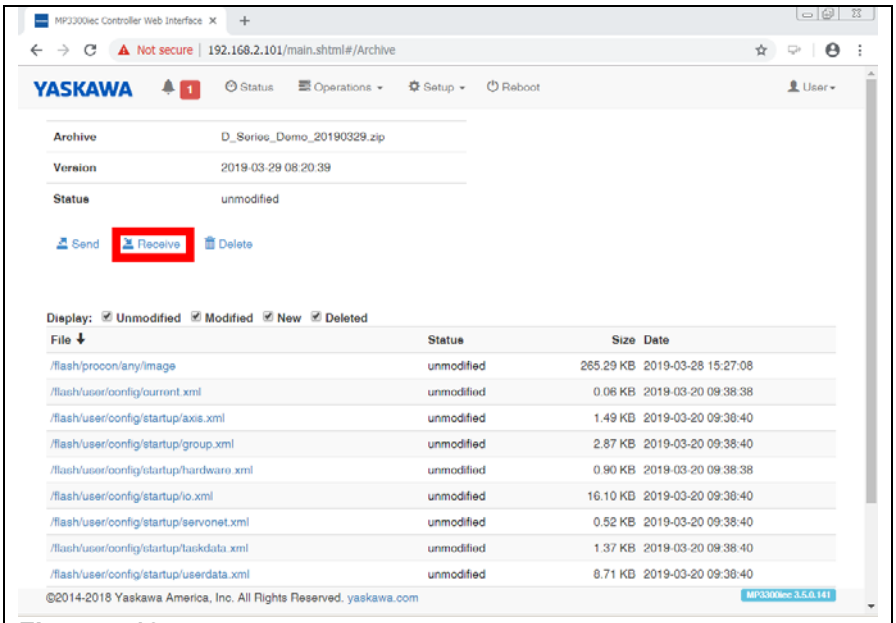


Figure 5-12

Step 9. Enter the name of the archive file and click the “Receive” button.
ONLY click the button ONCE (Refer to Figure 5-13)

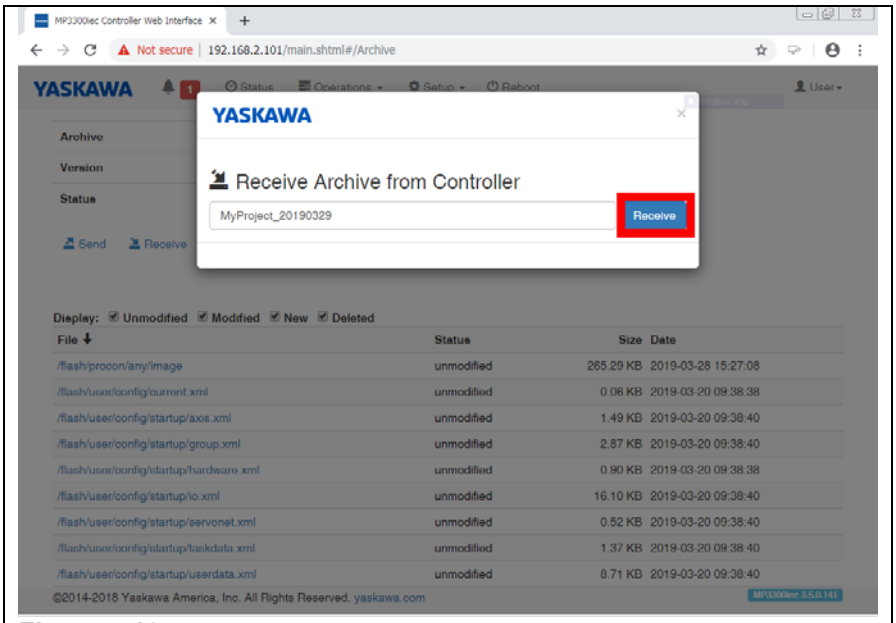


Figure 5-13

Step 10. Click the “Save” button to back up the .ZIP file to your ‘MyDocs’ folder or the “Save As” button to direct the .ZIP file to another folder. (Refer to Figure 5-14)

If the ‘Save’ prompt does not appear, Windows normally saves the archive file to your PC’s Downloads folder.

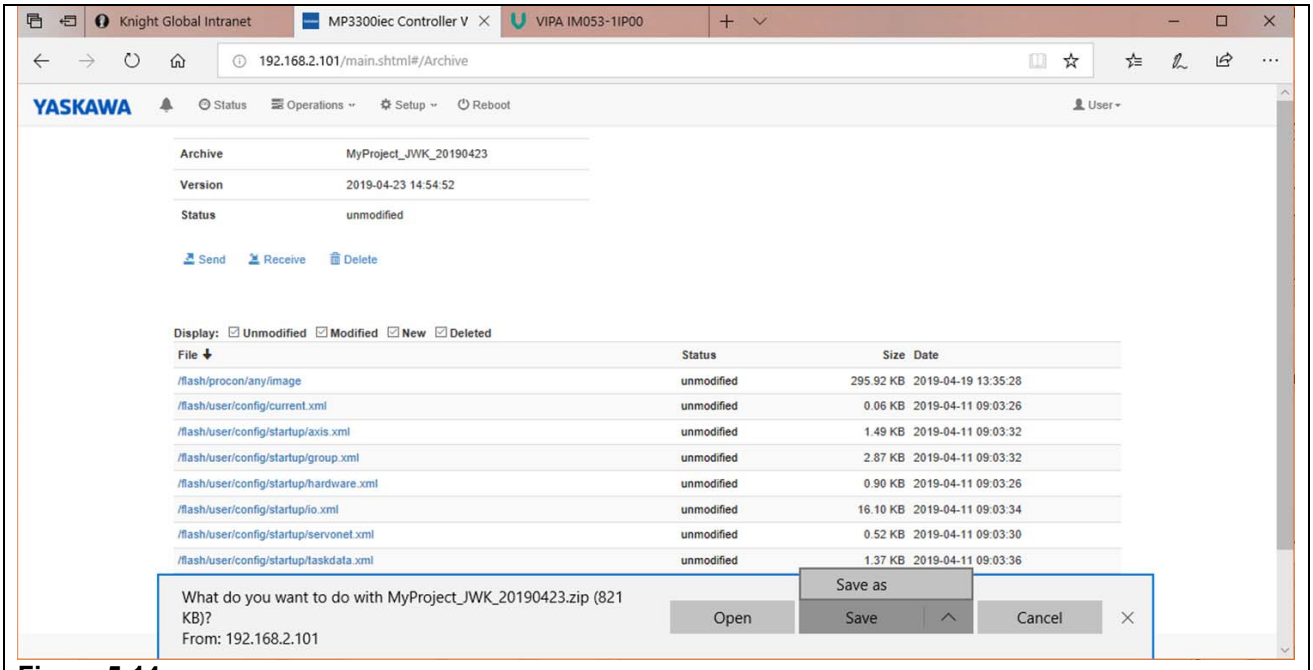


Figure 5-14

Step 11. A tan colored status banner will be displayed indicating the current status "Downloading archive…". Allow this to complete. (Refer to Figure 5-15)

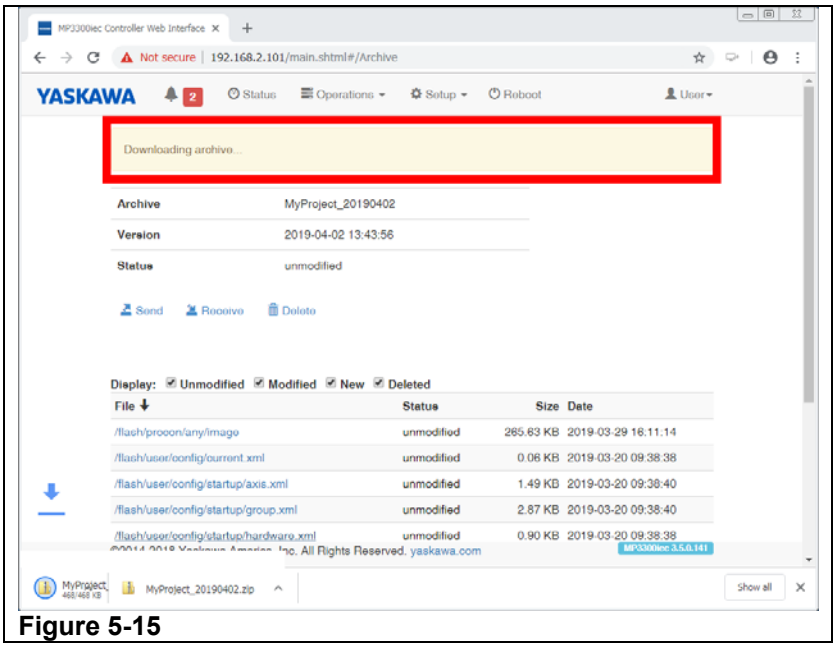


Figure 5-15

Step 12. Send a copy of the newly saved Archive (zip) file to Knight's Servo Team at servos@knightglobal.com.

Step 13. You have completed the Yaskawa Servo Backup procedure.

D. Loading New Hardware with Existing Software

Yaskawa PLCs, Drives, Motors, and VIPA I/O can be replaced in the field and the process for each will be explained in this section.

If the need to replace the Yaskawa PLC should arise, a new PLC will need to be purchased from Knight directly. This PLC will be shipped as a preassembled unit and will need to be preloaded with the appropriate software at Knight. Any update Archives will be specific to an individual PLC and are tracked based upon the hoist that it was originally shipped with.

WARNING

Installing an incorrect Archive will cause a Hardware Mismatch and cause the hoist to cease normal operation.

Step 1. Lower the hoist's support fixture and part so that no load is suspended from the hoist.

WARNING

There can be NO load suspended from the hoist prior to replacing a hardware component.

Step 2. Press the Run-Stop button.

Step 3. Remove the input power from the system.

Step 4. If possible, it is recommended to bring the hoist to ground level to replace the components listed in this section. All components listed will need to be replaced with an exact match to ensure functional requirements in order to run correctly.

- Motors can be replaced per Knight procedures: This will cause a loss of position and can be corrected by following the 'Reset Absolute Encoder' procedure (see 5.E Step 42).
- Drives can be replaced per Knight procedures: This will cause a loss of position and can be corrected by restoring the Drive Parameters stored in the PLC via the web browser. Once drive parameters have been restored, the 'Reset Absolute Encoder' procedure will be required as well to re-establish the appropriate drive motor relationship.
- VIPA I/O will require the correct Node address to be programmed if the Mechatrolink adapter portion is replaced.
- Related cabling of the Motor, Mechatrolink, Ethernet, etc.… should not require any direct programming procedures unless they caused a corruption of data in another device.

Step 5. Procedure for configuration and recovery with new hardware.

a. If VIPA I/O was replaced follow the steps below, otherwise skip to Step 5 b.

i. Power down the system

ii. Slide open (up) the ADR window on the top (front face) of the module, and flip the #4 dip switch (5th switch from top) from RIGHT to LEFT (1 to 0). Setting this dip switch assigns the modules node address so the controller can properly communicate with it. (Refer to Figure 5-16)

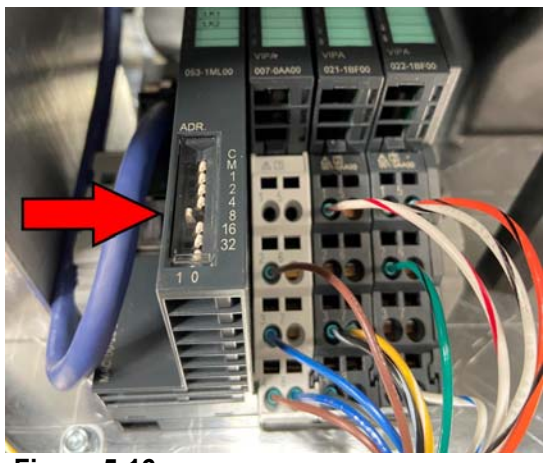


Figure 5-16

iii. Slide the window closed (down) until it snaps into place.

iv. Power up the system.

b. If you replaced the PLC, Drive, or need to update the Archive on the PLC, please log into the Yaskawa Admin Panel as shown in section 5.C steps 5, 6 and 7. Continue to follow the appropriate steps listed in that section.

c. If you are updating the PLC Archive with a new one supplied by Knight, the correct Archive files should already be loaded. If you are installing an Archive as a patch supplied by Knight, or reinstalling one previously saved from the same PLC/Hoist combination, follow the steps listed below, otherwise skip to step 5.D.d. “Drive Parameter verification and installation.”

i. Go to the ‘Setup’ pulldown menu of the Yaskawa website page and select “Archive”. (Refer to Figure 5-17)

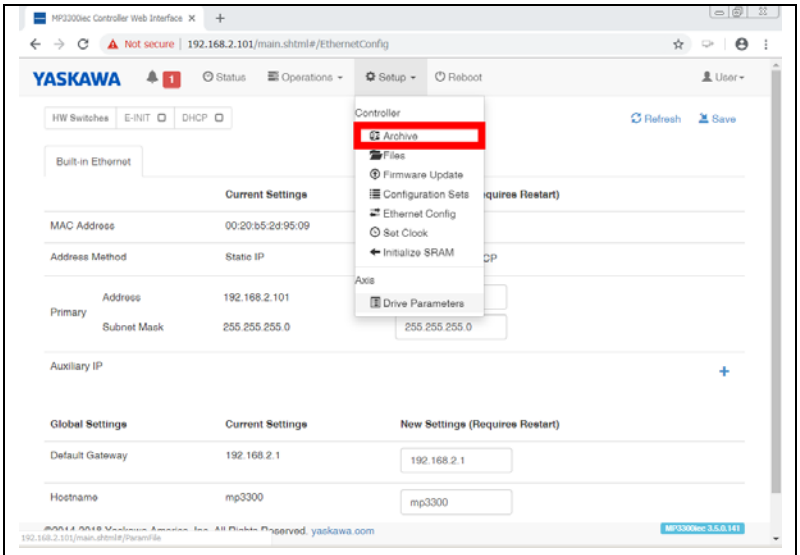


Figure 5-17

ii. The ‘Send’ option has the ability to do a “Clean install (deletes existing files)” or “Add/replace only”.

iii. The preferred method is typically to select the “Clean Install” radio button and then press the “+Add archive” Link.

iv. Select the location of where the .ZIP file is located on your laptop by using the ‘Open’ dialog box.

v. Select the “Send” option, located on the right-hand side of the ‘Send Archive to Controller’ dialog box. (Refer to Figure 5-18)

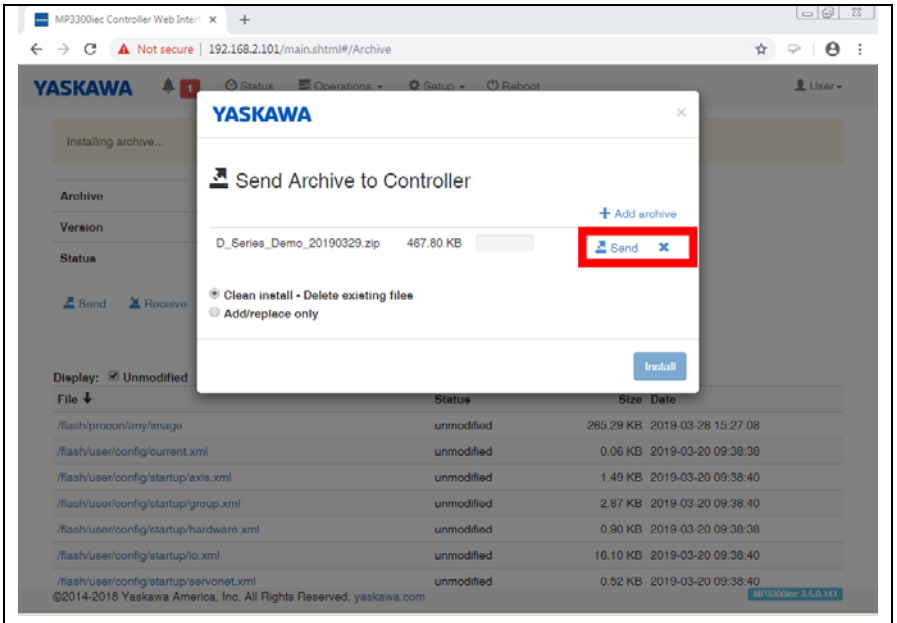


Figure 5-18

vi. When the send progression bar to the left of the Send option is complete, then press the “Install” pushbutton in the lower right-hand corner of this Dialog box. Allow the Archive to fully install. (Refer to Figure 5-19)

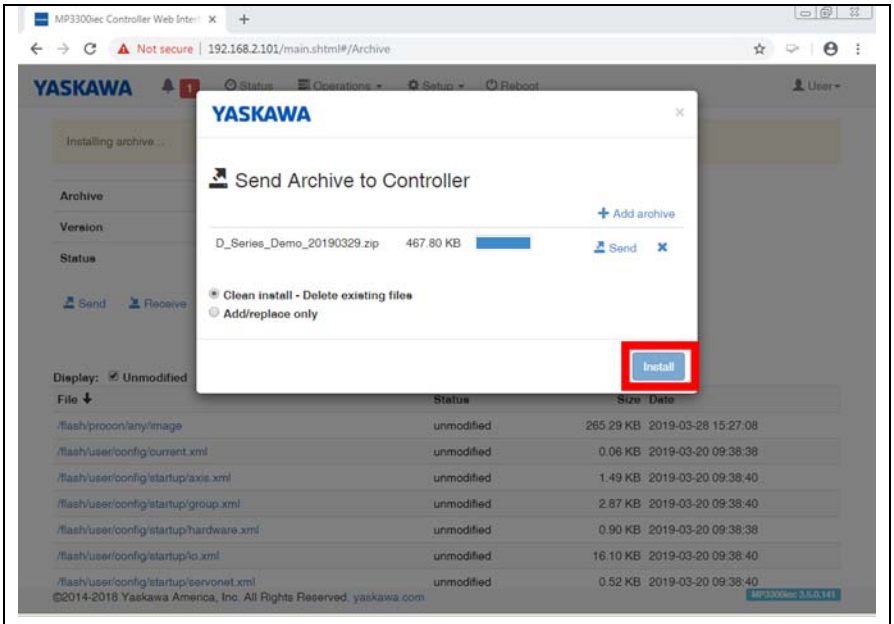


Figure 5-19

vii. On the upper menu bar, press the 'Reboot' button. (Refer to Figure 5-20)

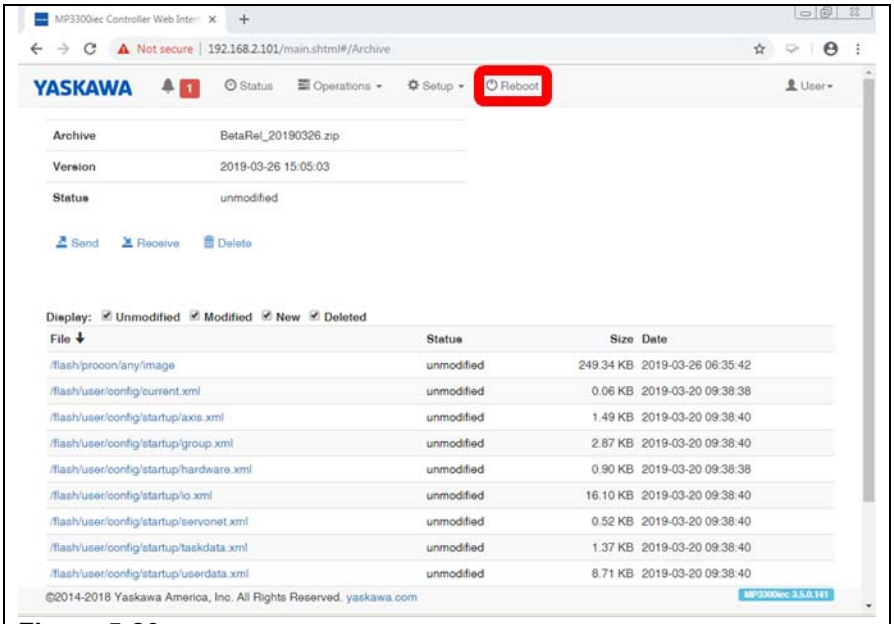


Figure 5-20

viii. On the 'Reboot' pop-up screen, press the "Reboot" button. This will make all of the recent changes persistent in the Yaskawa controller. (Refer to Figure 5-21)

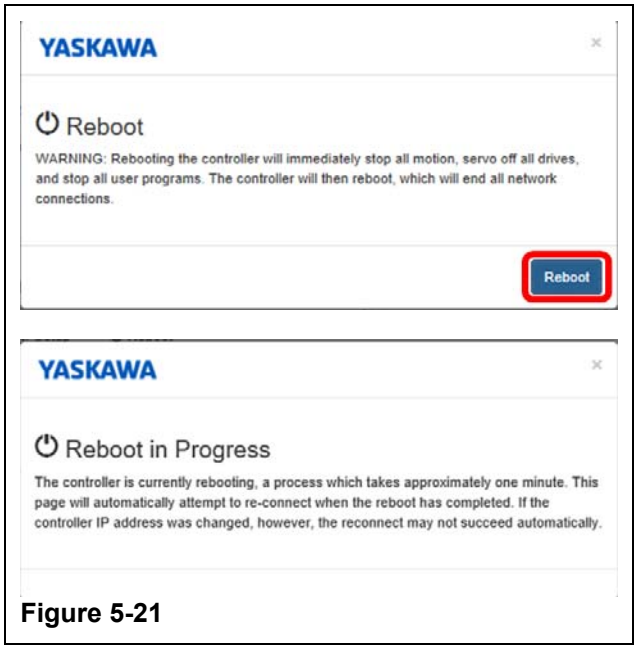


Figure 5-21

ix. After the reboot is finished, you will have to log back into the Yaskawa drive.

d. Drive Parameter verification and installation is required if you have updated the PLC or replaced the Drive.

i. From the 'Setup' pulldown menu of the Yaskawa website page, select the "Drive Parameters" option. (Refer to Figure 5-22)

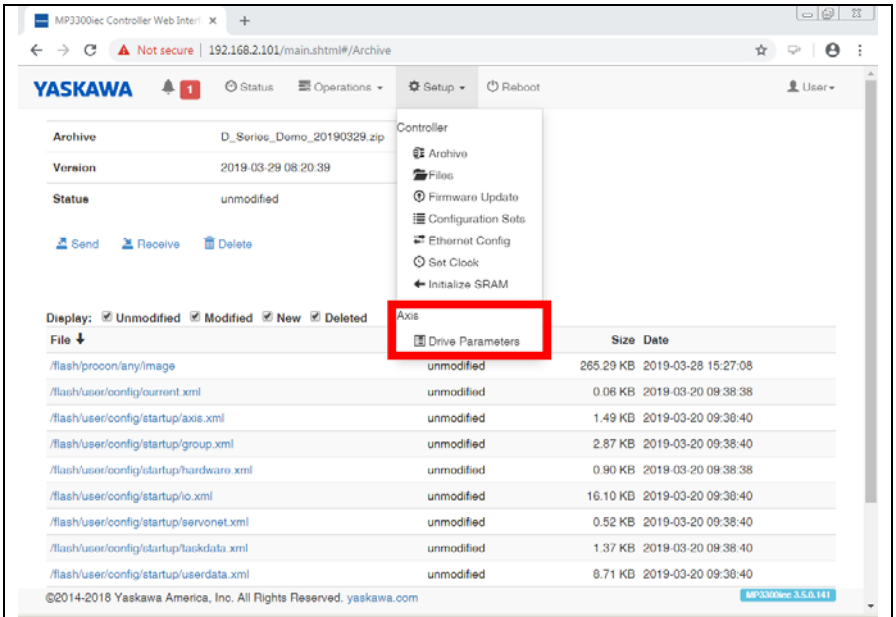


Figure 5-22

ii. The User Drive Parameters will initially show a "Not Verified" result. Click on the "Verify" to check the loaded 'User Parameters' parameters. The result will show as "Verified" or "MISMATCH(Pn###)". Any mismatch result means the User Parameters must be written from the PLC to the Drive.

NOTE: Pn825 will occasionally show up as a mismatch drive parameter, this should be disregarded.

iii. Make sure to use the "Write" command under 'User Parameters' column and ***NOT*** the one under the 'Factory Default Parameters' column. (Refer to Figure 5-23)

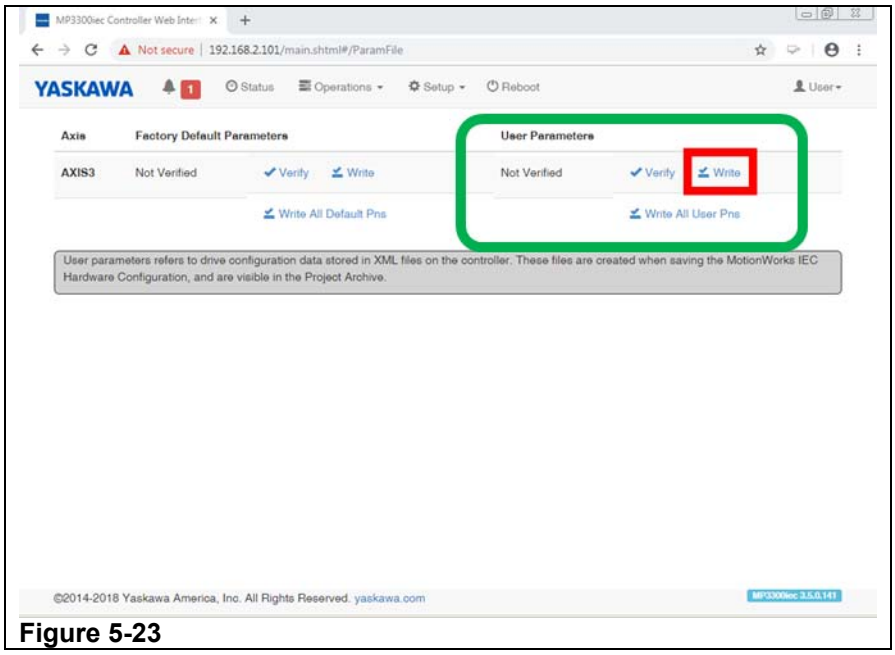


Figure 5-23

iv. In the ‘Write parameters’ dialog box press the “Write” Button. (Refer to Figure 5-24)

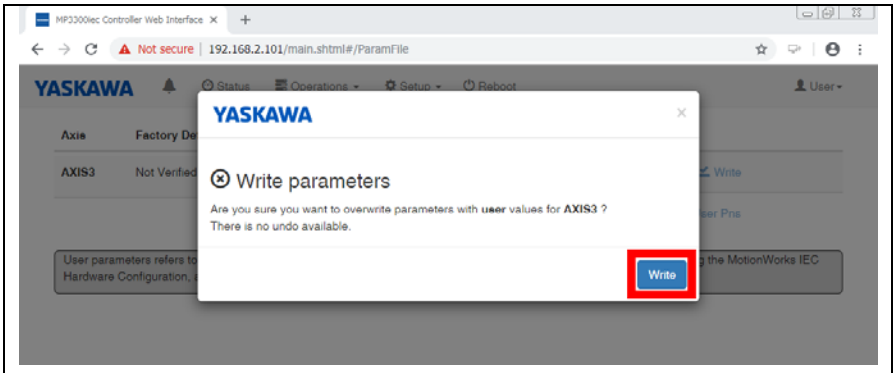


Figure 5-24

v. Confirm that the ‘User Parameters’ write function is “Verified”. (Refer to Figure 5-25)

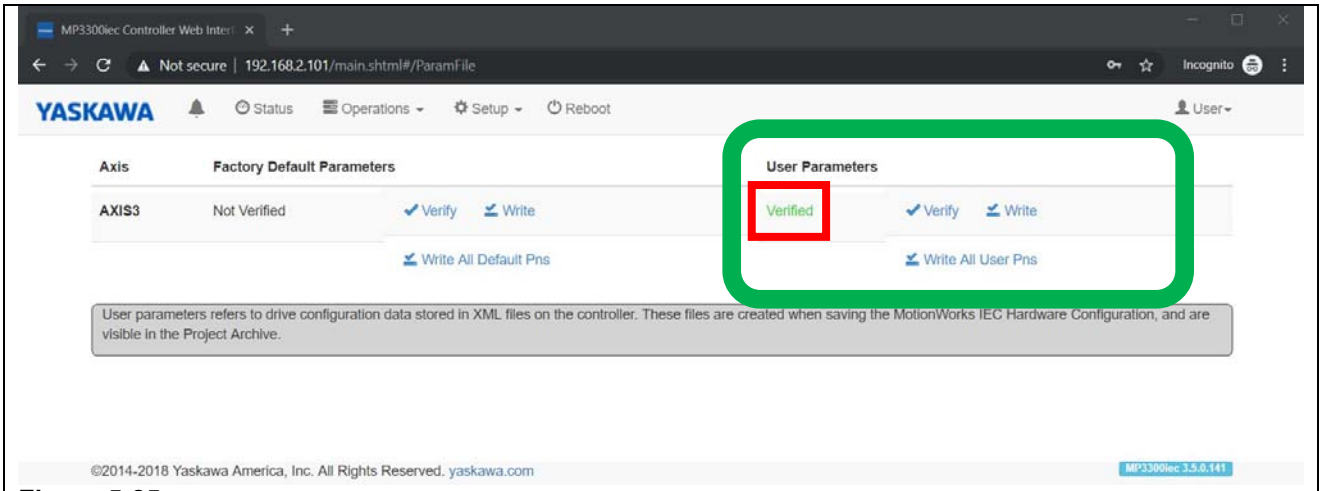


Figure 5-25

vi. Unplug the power to the servo, wait 30 seconds and plug back in power.

vii. Your PLC, Drive, I/O, and motor should all be functional and ready to be setup for your application.

E. Review the Hoist's Knight Servo Studio Software

The Knight Servo Studio Servo software is used to setup and troubleshoot the Knight Servo Hoist. Refer to section 5.B "Connecting to a Servo Hoist".

Step 1. When you are connected to the hoist, the Start screen will be shown: (Refer to Figure 5-26)

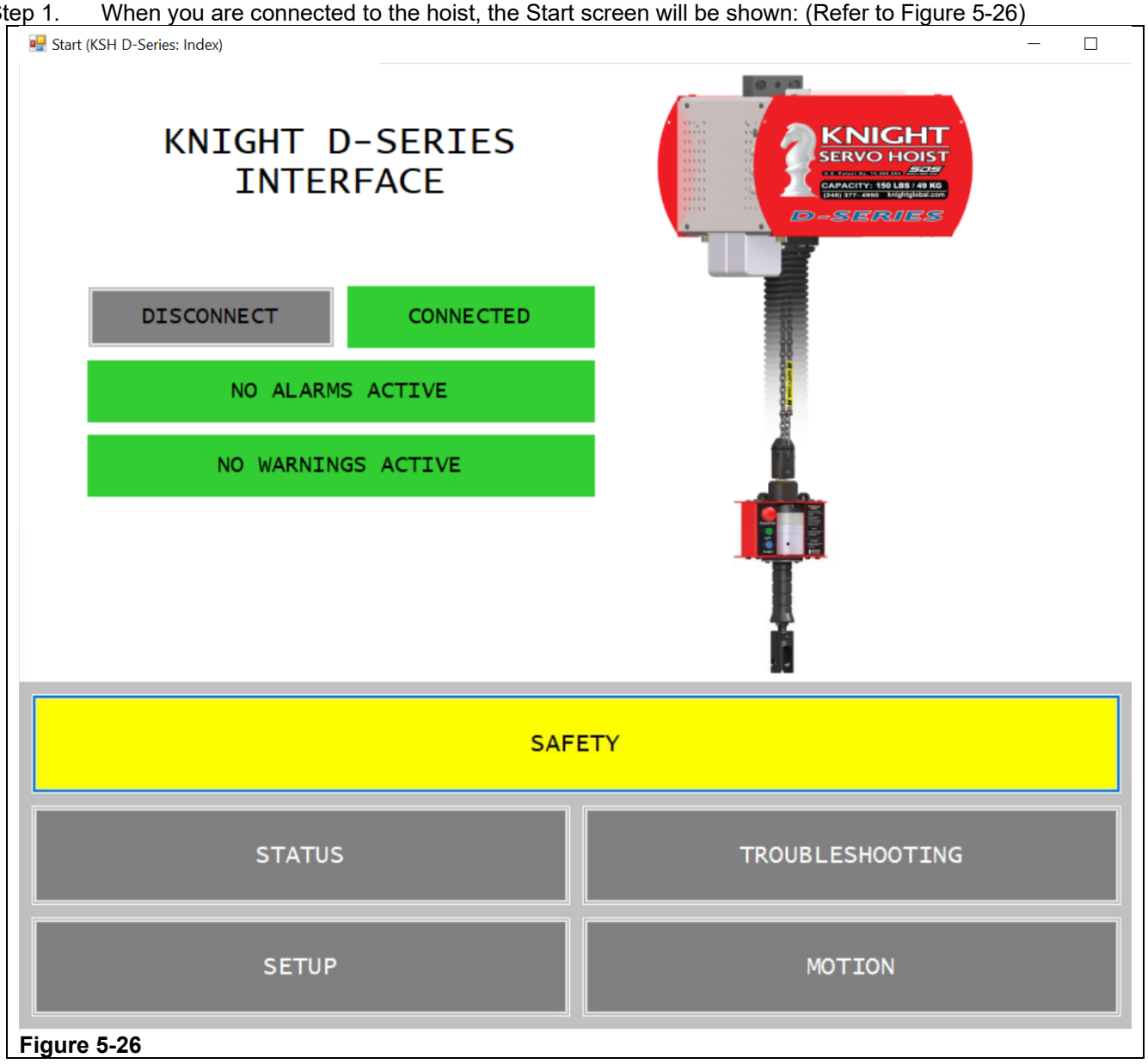


Figure 5-26

Start screen: (Refer to Figure 5-26)

Upper) The interface allows the user to Connect/Disconnect to and from the hoist. The connection, Alarm, and Warning states are also shown.

Lower) There are (5) five buttons that will display different overview screens for the Servo Hoist.

- Safety – Requirements to use the hoist correctly.
- Status – Screens that show the condition of the hoist.
- Troubleshooting – Screens that help diagnose common problems the hoist may experience.
- Setup – Screens that allow all of the hoist's parameters to be initially set up.
- Motion – Screens that allow for additional movement options to control the hoist in specific situations.

Step 2. Press the “SAFETY” button on the Start screen.

Step 3. Review the information on this screen. Anyone who will be operating or doing maintenance on the hoist is required to review this information. (Refer to Figure 5-27)

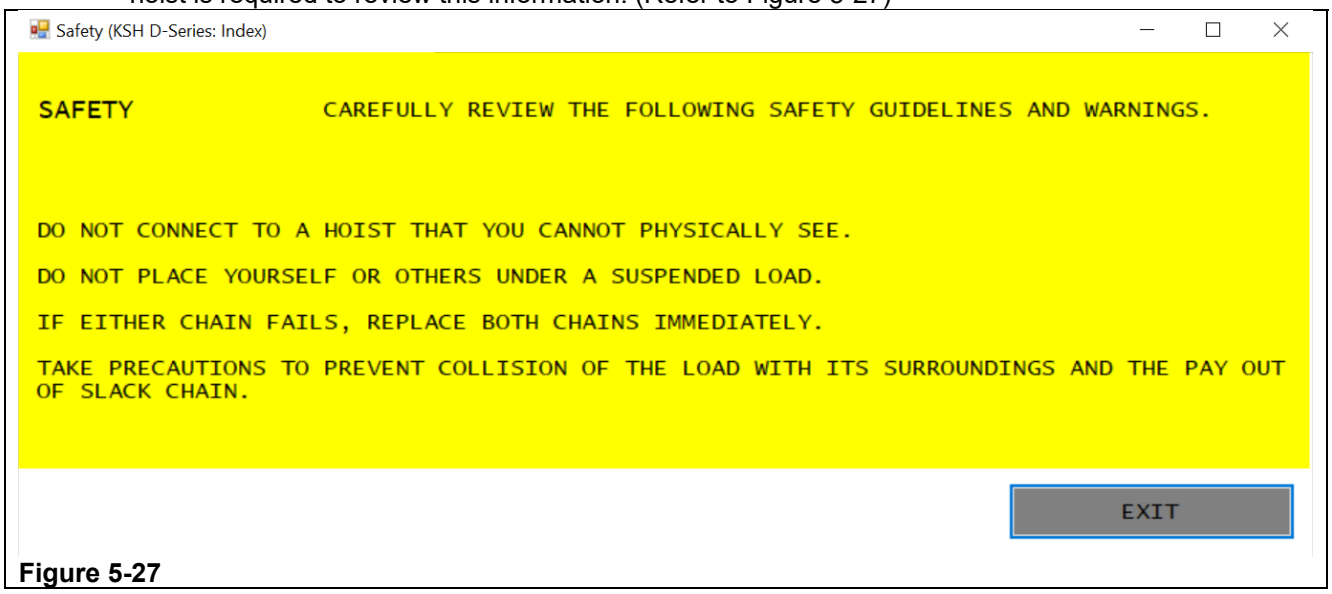


Figure 5-27

Step 4. Press the “STATUS” button on the Start screen.

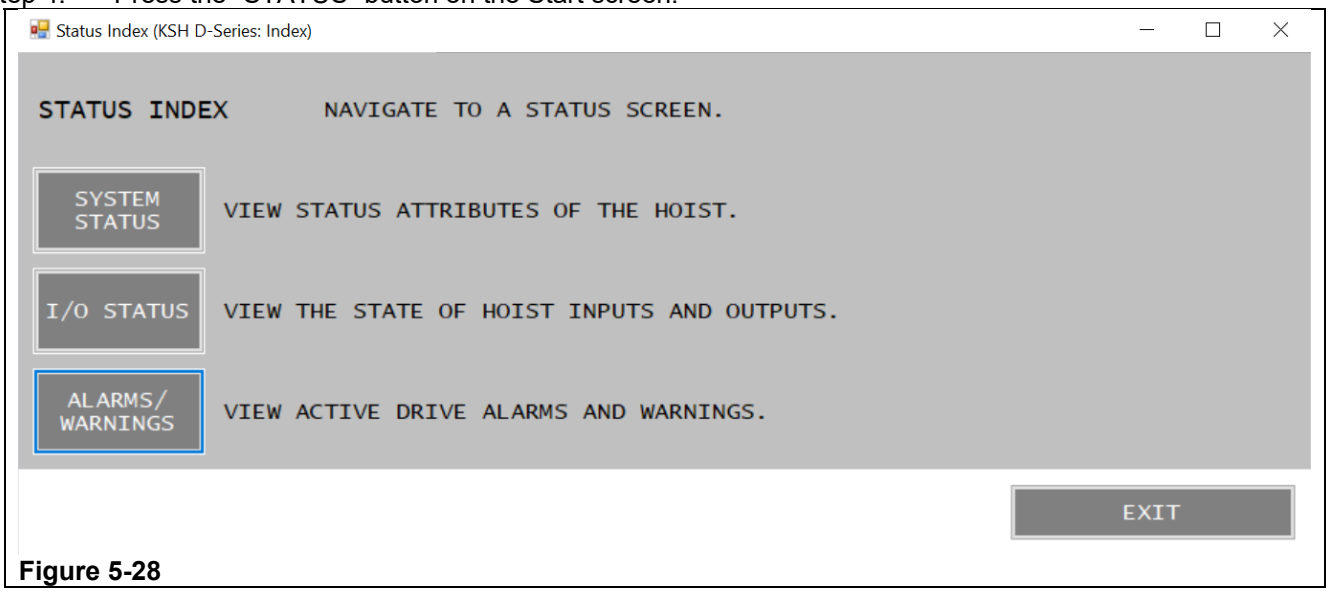


Figure 5-28

Status Index screen: (Refer to Figure 5-28)

Row #1) The ‘SYSTEM STATUS’ button will display a screen showing the status of the hoist and its modes.

Row #2) The ‘I/O STATUS’ button will display a screen showing the inputs and outputs of the hoist.

Row #3) The ‘ALARMS / WARNINGS’ button will display a screen showing any active Drive Alarms or Warnings occurring in the hoist.

Button) Press the ‘EXIT’ button to return to the hoist’s Start screen.

Step 5. Press the “SYSTEM STATUS” button on the STATUS INDEX screen.

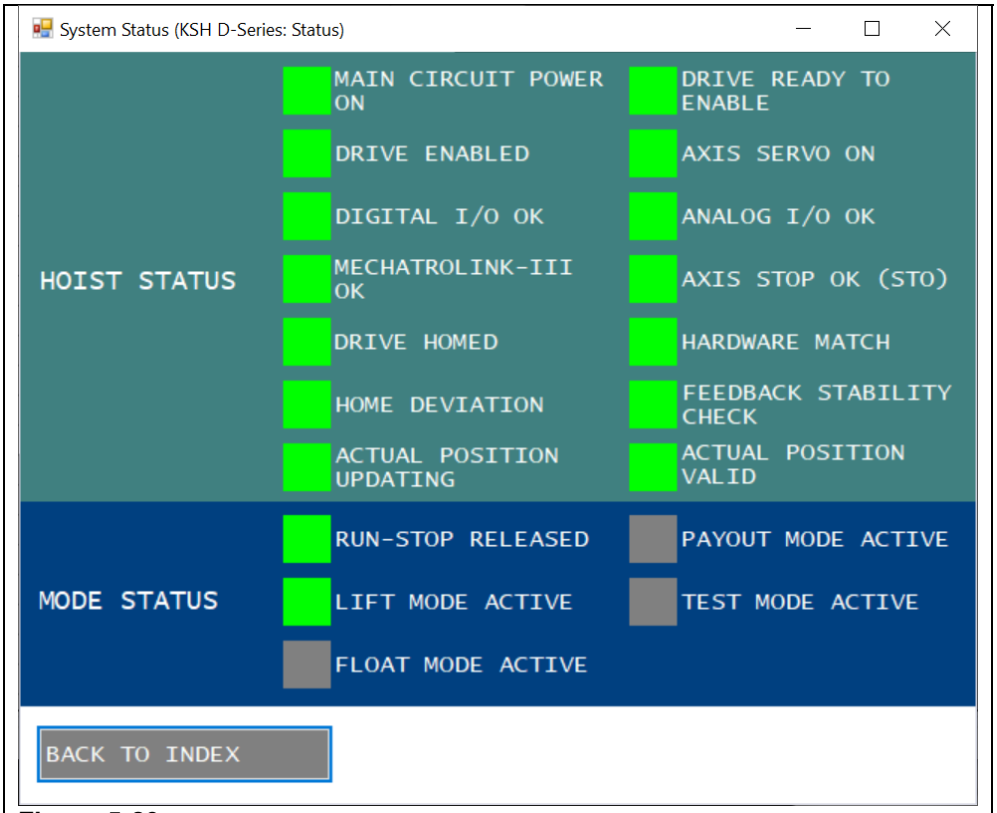


Figure 5-29

System Status screen: (Refer to Figure 5-29)

Upper) The upper section of this screen shows the status of the hoist.
If the indicator box is Green, the object is ON, if the box is Gray the object is OFF and if the box is Red then the object is disabled or faulted.

Lower) The lower section of this screen shows the status of the software modes of the hoist.
If the indicator box is Green, the object is active, if the box is Gray the object is inactive.

Button) Press the ‘BACK TO INDEX’ button to return to the STATUS INDEX screen.

Step 6. Press the “I/O STATUS” button on the STATUS INDEX screen.

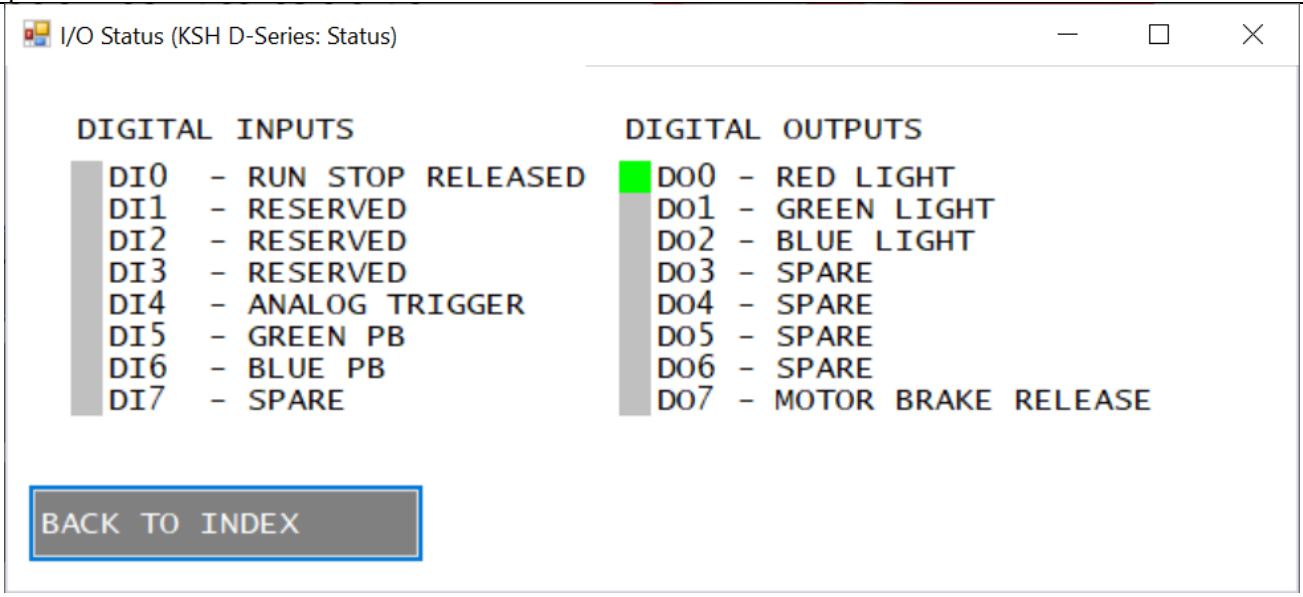


Figure 5-30

I/O Status screen: (Refer to Figure 5-30)

Upper) The indicator boxes to the left of the digital input or output descriptions will change color if they activate. If the box is Green, the I/O point is ON, if the box is Gray the I/O point is OFF.

Button) Press the ‘BACK TO INDEX’ button to return to the STATUS INDEX screen.

Step 7. Press the “ALARMS / WARNINGS” button on the STATUS INDEX screen.

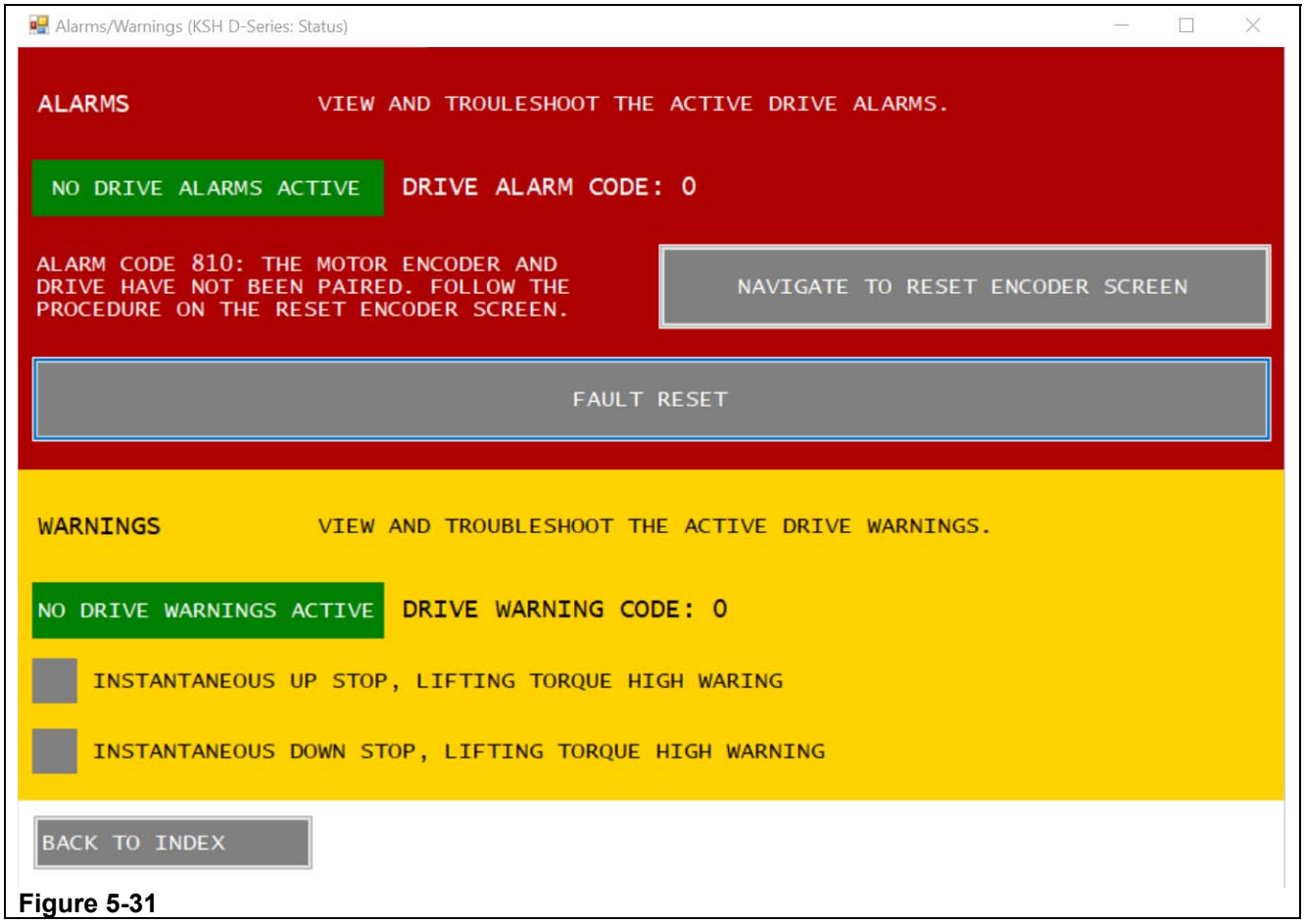


Figure 5-31

Alarms / Warnings screen: (Refer to Figure 5-31)

Upper) The upper section of this screen shows any Drive Alarms that are active. The current Alarm can be reset by pressing the “FAULT RESET” button.

Lower) The lower section of this screen shows any Drive Warnings that are active. The Up Stop and Down Stop warnings will illuminate yellow when active.

Button) Press the ‘BACK TO INDEX’ button to return to the STATUS INDEX screen.

Step 8. Press the “TROUBLESHOOTING” button on the Start screen.

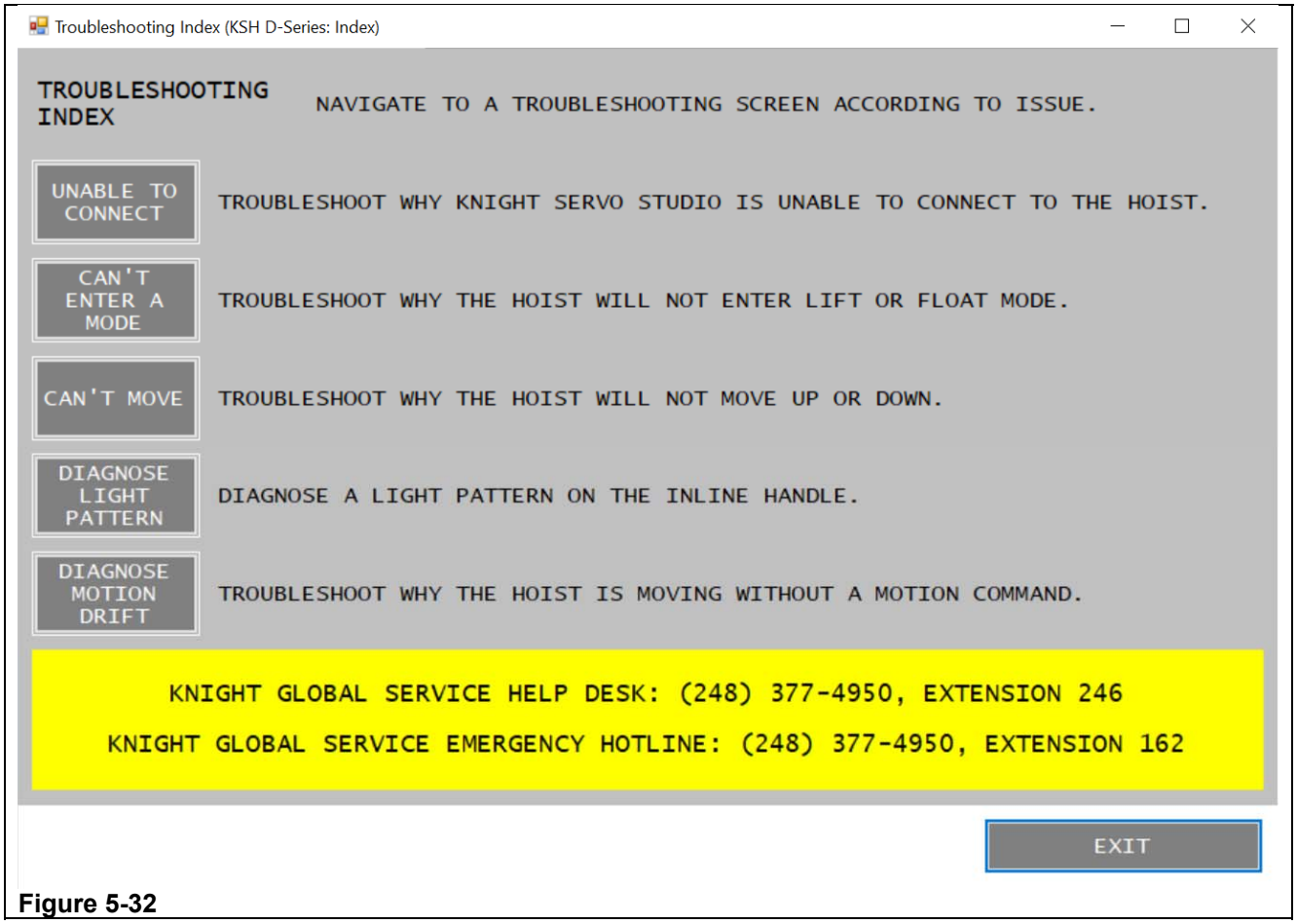


Figure 5-32

Troubleshooting Index screen: (Refer to Figure 5-32)

Row #1) The ‘UNABLE TO CONNECT’ button will display a screen showing the troubleshooting steps to help resolve any connection issues.

Row #2) The ‘CAN’T ENTER A MODE’ button will display screens showing the steps to troubleshoot why the hoist cannot enter Lift or Float Mode.

Row #3) The ‘CAN’T MOVE’ button will display screens showing the steps to troubleshoot why the hoist cannot move up or down.

Row #4) The ‘DIAGNOSE LIGHT PATTERN’ button will display a screen showing the indicator light patterns for the red, green, and blue lights.

Row #5) The ‘DIAGNOSE MOTION DRIFT button will display a screen showing why the hoist may be moving without being commanded.

Button) Press the ‘EXIT’ button to return to the hoist’s Start screen.

Step 9. Press the “UNABLE TO CONNECT” button on the TROUBLESHOOTING INDEX screen.

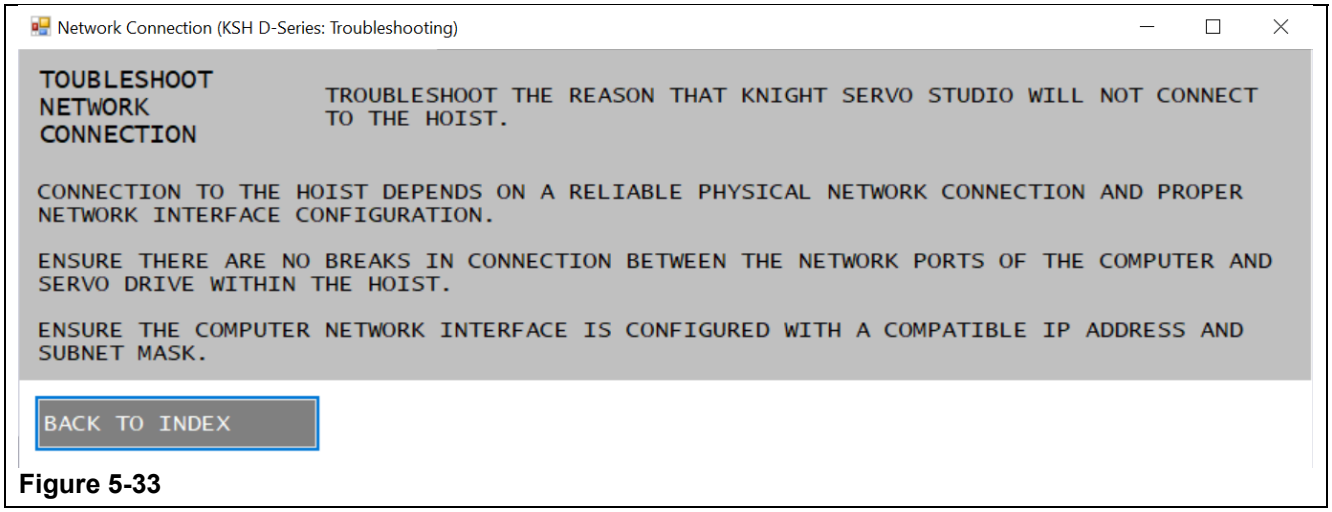


Figure 5-33

Network Connection screen: (Refer to Figure 5-33)

Row #1) Follow the steps listed on this screen to troubleshoot connection issues.

Button) Press the ‘BACK TO INDEX’ button to return to the TROUBLESHOOTING INDEX screen.

Step 10. Press the “CAN’T ENTER A MODE” button on the TROUBLESHOOTING INDEX screen.

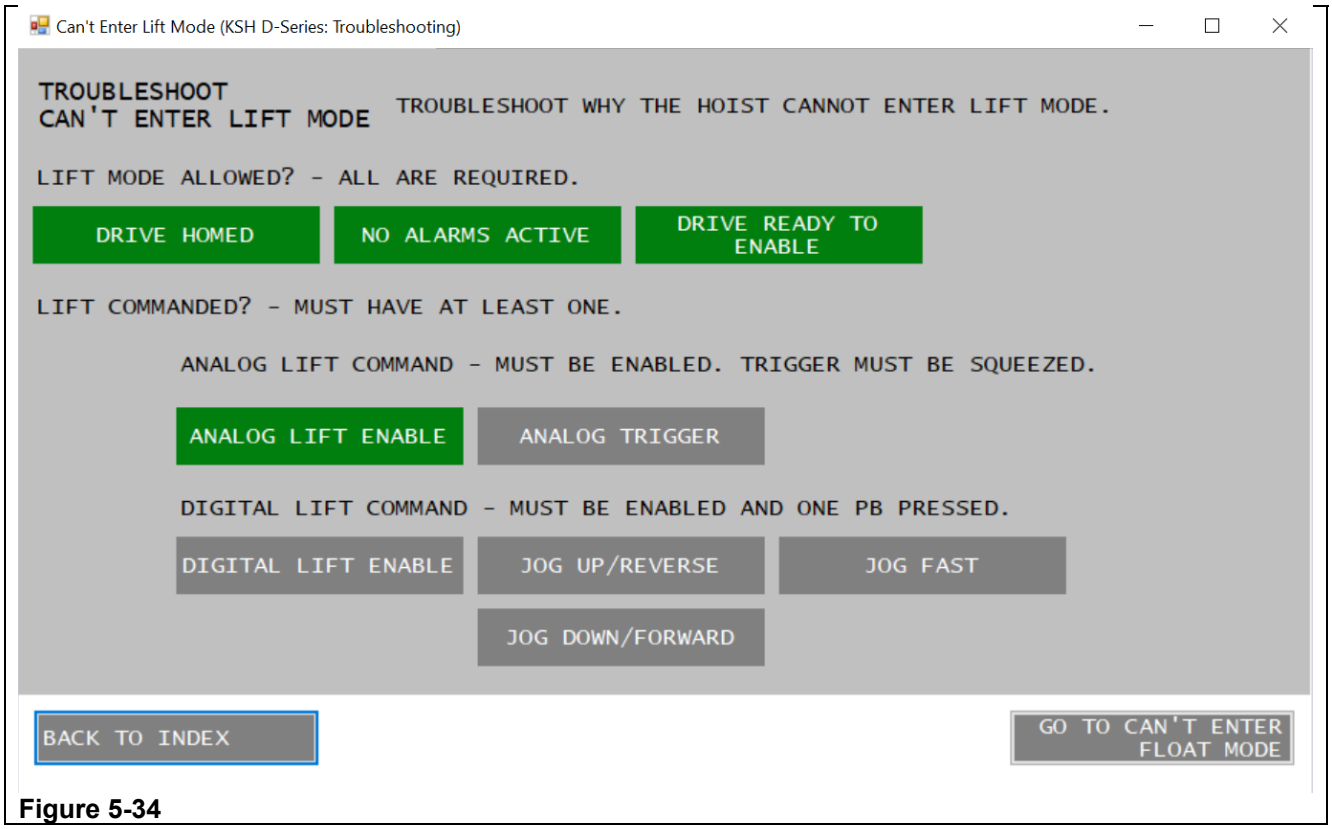


Figure 5-34

Can’t Enter Lift Mode screen: (Refer to Figure 5-34)

Row #1) Follow the steps listed on this screen to troubleshoot if the software is allowing the hoist to enter Lift Mode.

Row #2) Follow the steps to see if the hoist is registering the operator’s inputs.

Buttons) Press the ‘BACK TO INDEX’ button to return to the TROUBLESHOOTING INDEX screen.
Press the ‘GO TO CAN’T ENTER FLOAT MODE’ button to go to that screen.

Step 11. Press the “GO TO CAN’T ENTER FLOAT MODE” button on the CAN’T ENTER LIFT MODE screen.

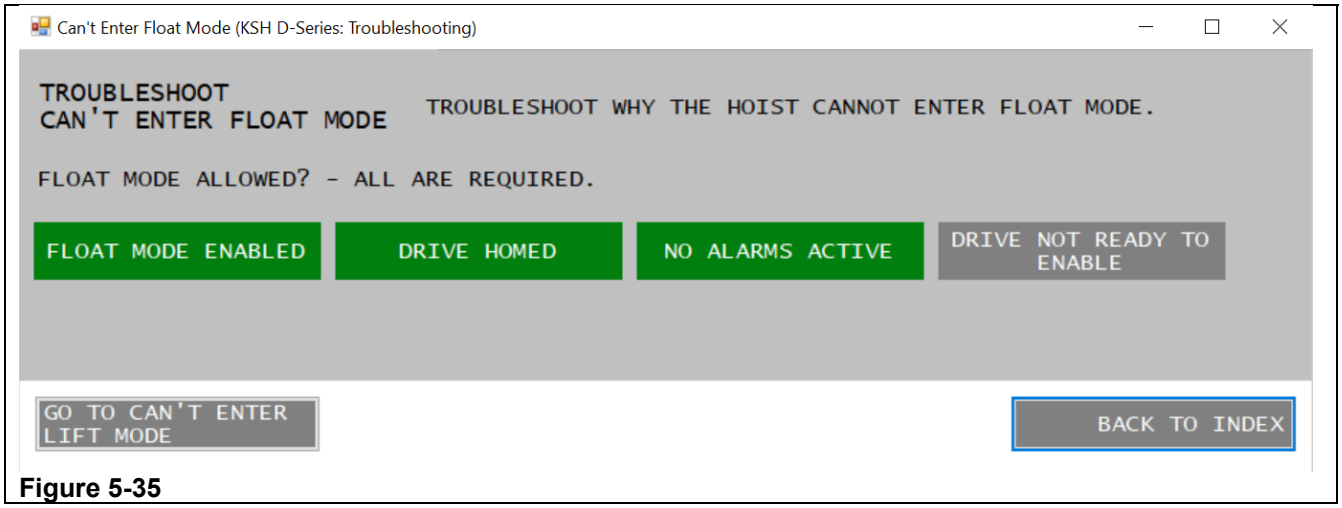


Figure 5-35

Can’t Enter Float Mode screen: (Refer to Figure 5-35)

Row #1) Follow the steps listed on this screen to troubleshoot if the software is allowing the hoist to enter Float Mode.

Buttons) Press the ‘GO TO CAN’T ENTER LIFT MODE’ button to return to that screen.
Press the ‘BACK TO INDEX’ button to return to the TROUBLESHOOTING INDEX screen.

Step 12. Press the “CAN’T MOVE” button on the TROUBLESHOOTING INDEX screen.

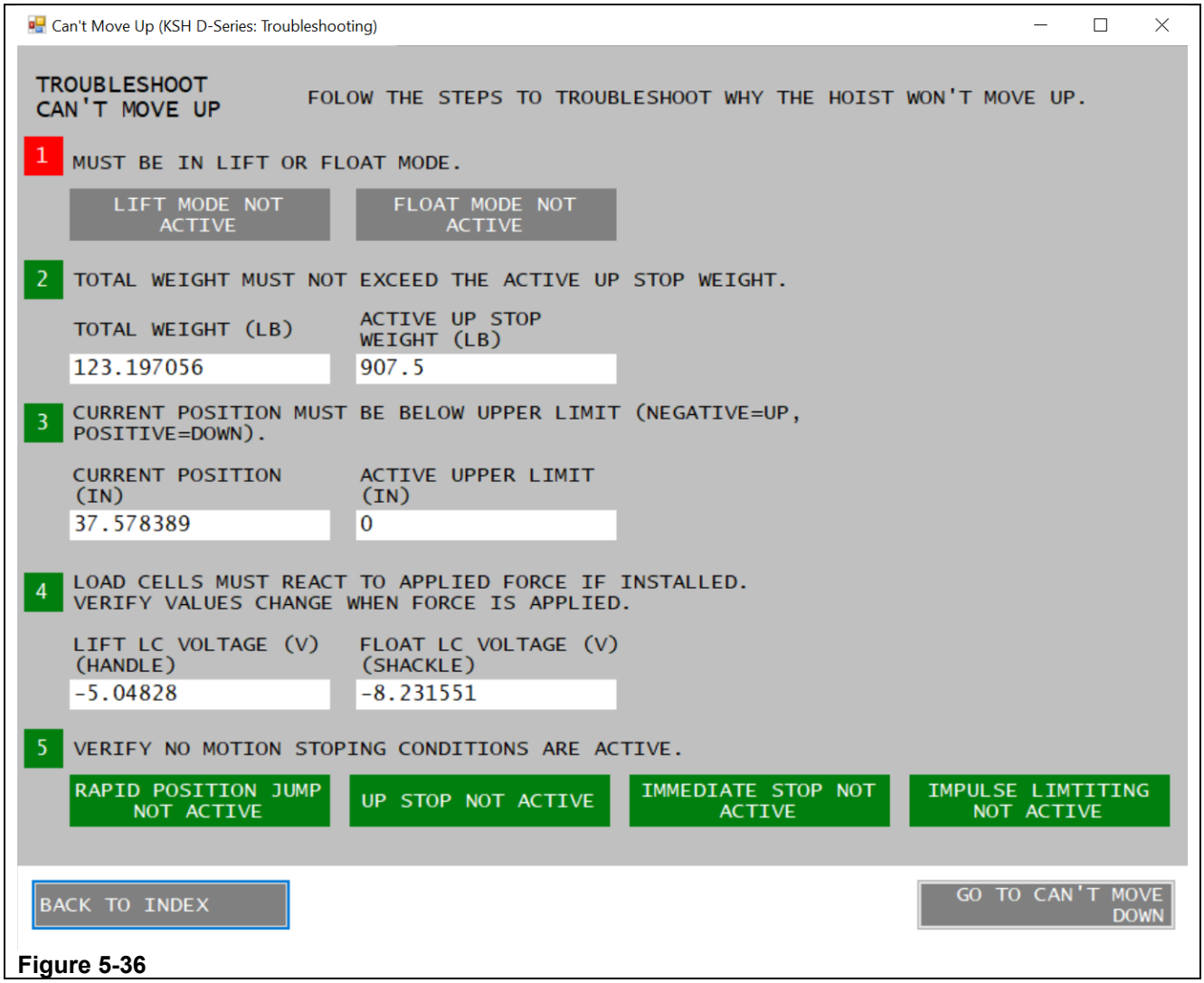


Figure 5-36

Can’t Move Up screen: (Refer to Figure 5-36)

Row #1) The ‘LIFT MODE NOT ACTIVE’ indicator will change to ‘LIFT MODE ACTIVE’ when Lift Mode is active.
The ‘FLOAT MODE NOT ACTIVE’ indicator will change to ‘FLOAT MODE ACTIVE’ when Float Mode is active.

Row #2) The ‘TOTAL WEIGHT (LB)’ display shows the total weight on the shackle of the inline handle.
The ‘ACTIVE UP STOP WEIGHT (LB)’ display shows the weight at which an up stop will activate.

Row #3) The ‘CURRENT POSITION (IN)’ display shows the hoist’s current position.
The ‘ACTIVE UPPER LIMIT (IN)’ display shows the set upper limit that the hoist can move to.

Row #4) The ‘LIFT LC VOLTAGE (V)’ Display shows the live voltage reading of the lift load cell tied to the handle.
The ‘FLOAT LC VOLTAGE (V)’ display shows the live voltage reading of the float load cell tied to the shackle.

Row #5) Various Up Stop conditions are displayed. Red = ON, Green = OFF.

Buttons) Press the ‘BACK TO INDEX’ button to return to the TROUBLESHOOTING INDEX screen.
Press the ‘GO TO CAN’T MOVE DOWN’ button to go to that screen.

Step 13. Press the “CAN’T MOVE DOWN” button on the CAN’T MOVE UP screen.

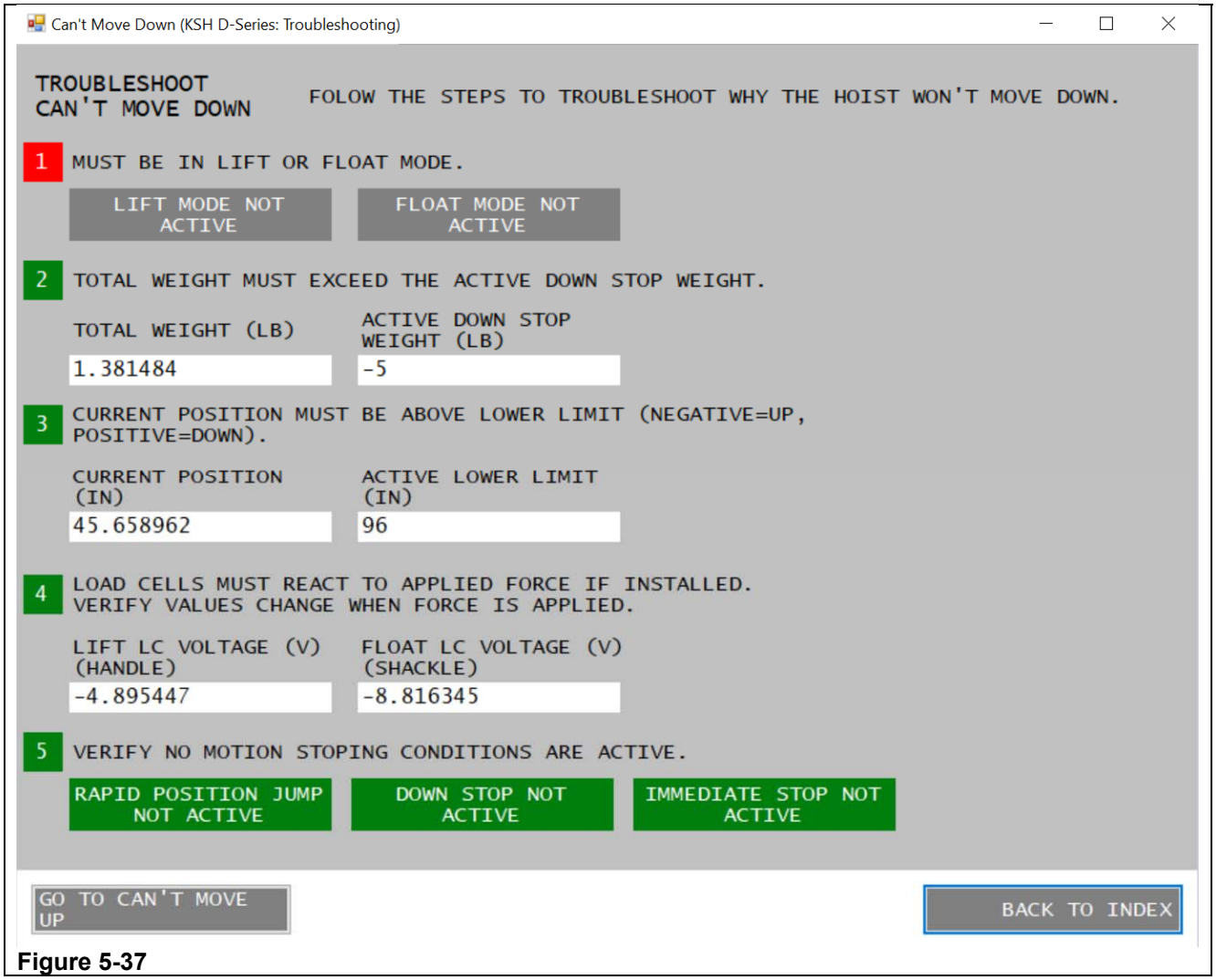


Figure 5-37

Can’t Move Down screen: (Refer to Figure 5-37)

Row #1) The ‘LIFT MODE NOT ACTIVE’ indicator will change to ‘LIFT MODE ACTIVE’ when Lift Mode is active.
The ‘FLOAT MODE NOT ACTIVE’ indicator will change to ‘FLOAT MODE ACTIVE’ when Float Mode is active.

Row #2) The ‘PART WEIGHT (LB)’ display shows the total weight on the shackle minus the fixture weight.
The ‘ACTIVE DOWN STOP WEIGHT (LB)’ display shows the weight at which a down stop will activate.

Row #3) The ‘CURRENT POSITION (IN)’ display shows the hoist’s current position.
The ‘ACTIVE LOWER LIMIT (IN)’ display shows the set lower limit that the hoist can move to.

Row #4) The ‘LIFT LC VOLTAGE (V)’ Display shows the live voltage reading of the lift load cell tied to the handle.
The ‘FLOAT LC VOLTAGE (V)’ display shows the live voltage reading of the float load cell tied to the shackle.

Row #5) Various Down Stop conditions are displayed. Red = ON, Green = OFF.

Buttons) Press the ‘GO TO CAN’T MOVE UP’ button to return to that screen.
Press the ‘BACK TO INDEX’ button to return to the TROUBLESHOOTING INDEX screen.

Step 14. Press the “DIAGNOSE LIGHT PATTERNS” button on the TROUBLESHOOTING INDEX screen.

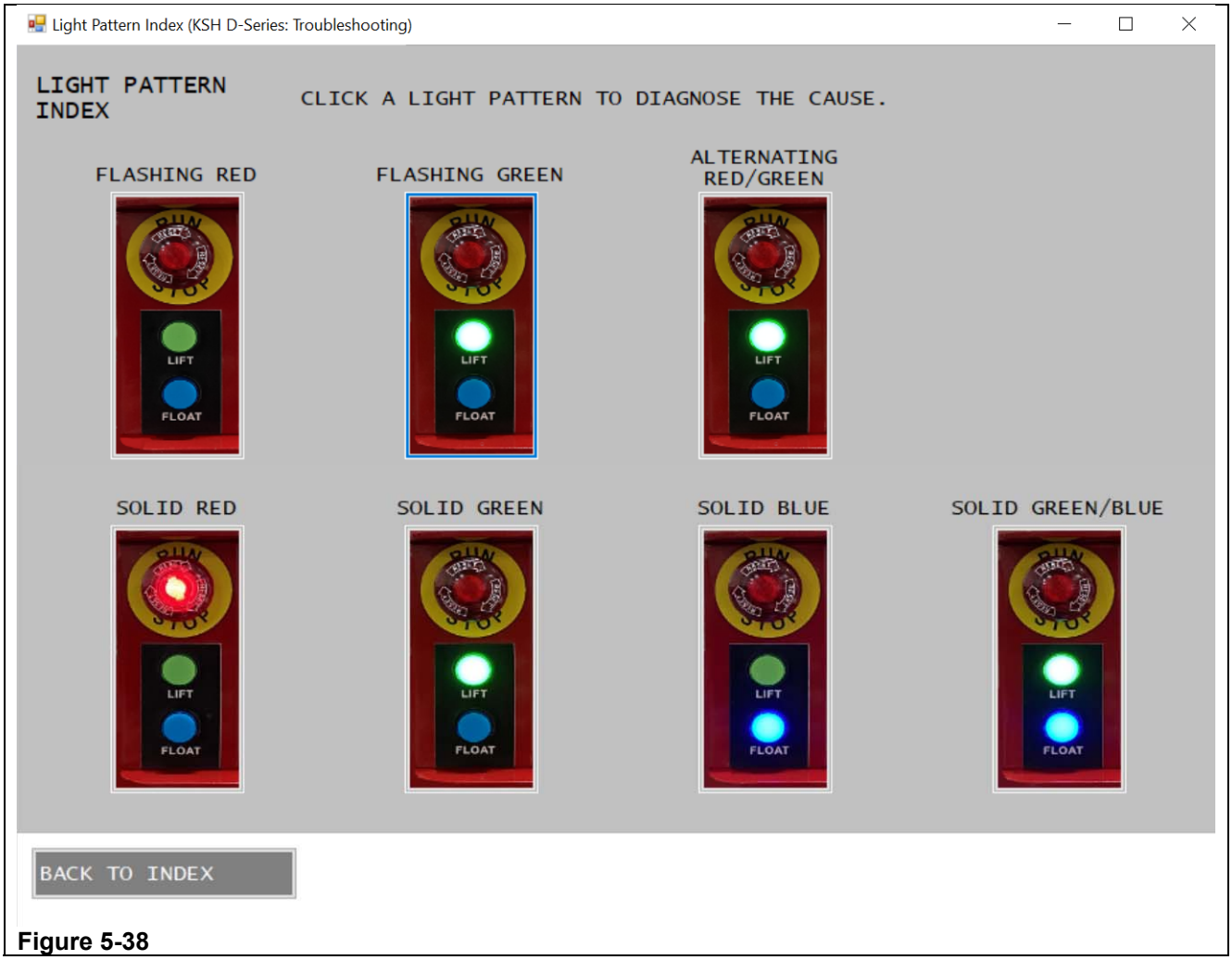


Figure 5-38

Light Pattern Index screen: (Refer to Figure 5-38)

Row #1) Press the ‘FLASHING RED’ button to bring up the “Flashing Red Light” troubleshooting screen.
Press the ‘FLASHING GREEN’ button to bring up the “Flashing Green Light” troubleshooting screen.
Press the ‘ALTERNATING RED/GREEN’ button to bring up the “Alternating Red/Green Lights” troubleshooting screen.

Row #2) Press the ‘SOLID RED’ button to bring up the “Solid Red Light” troubleshooting screen.
Press the ‘SOLID GREEN’ button to bring up the “Solid Green Light” troubleshooting screen.
Press the ‘SOLID BLUE’ button to bring up the “Solid Blue Light” troubleshooting screen.
Press the ‘SOLID GREEN/BLUE’ button to bring up the “Solid Green/Blue Lights” troubleshooting screen.

Button) Press the ‘BACK TO INDEX’ button to return to the LIGHT PATTERN INDEX screen.

Step 15. Press the “FLASHING RED” button on the LIGHT PATTRENS INDEX screen.

Figure 5-39

Flashing Red Index screen: (Refer to Figure 5-39)

Row #1) Press the ‘SLOW FLASHING RED’ button to bring up the “Slow Flashing Red Light” troubleshooting screen.
Press the ‘FAST FLASHING RED’ button to bring up the “Fast Flashing Red Light” troubleshooting screen.

Button) Press the ‘BACK TO LIGHT PSTTERNS’ button to return to the LIGHT PATTERN INDEX screen.

Step 16. Press the “SLOW FLASHING RED” button on the FLASHING RED INDEX screen.

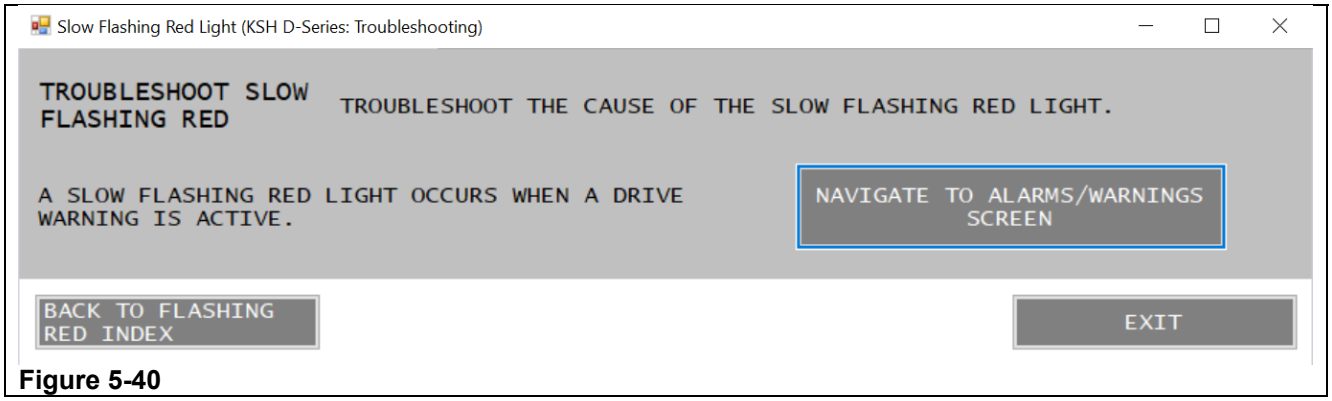


Figure 5-40

Slow Flashing Red Light screen: (Refer to Figure 5-40)

Row #1) Follow the steps listed to troubleshoot the cause.

Buttons) Press the ‘BACK TO LIGHT PSTTERNS’ button to return to the LIGHT PATTERN INDEX screen.
Press the ‘EXIT’ button to close the screen.

Step 17. Press the “FAST FLASHING RED” button on the FLASHING RED INDEX screen.

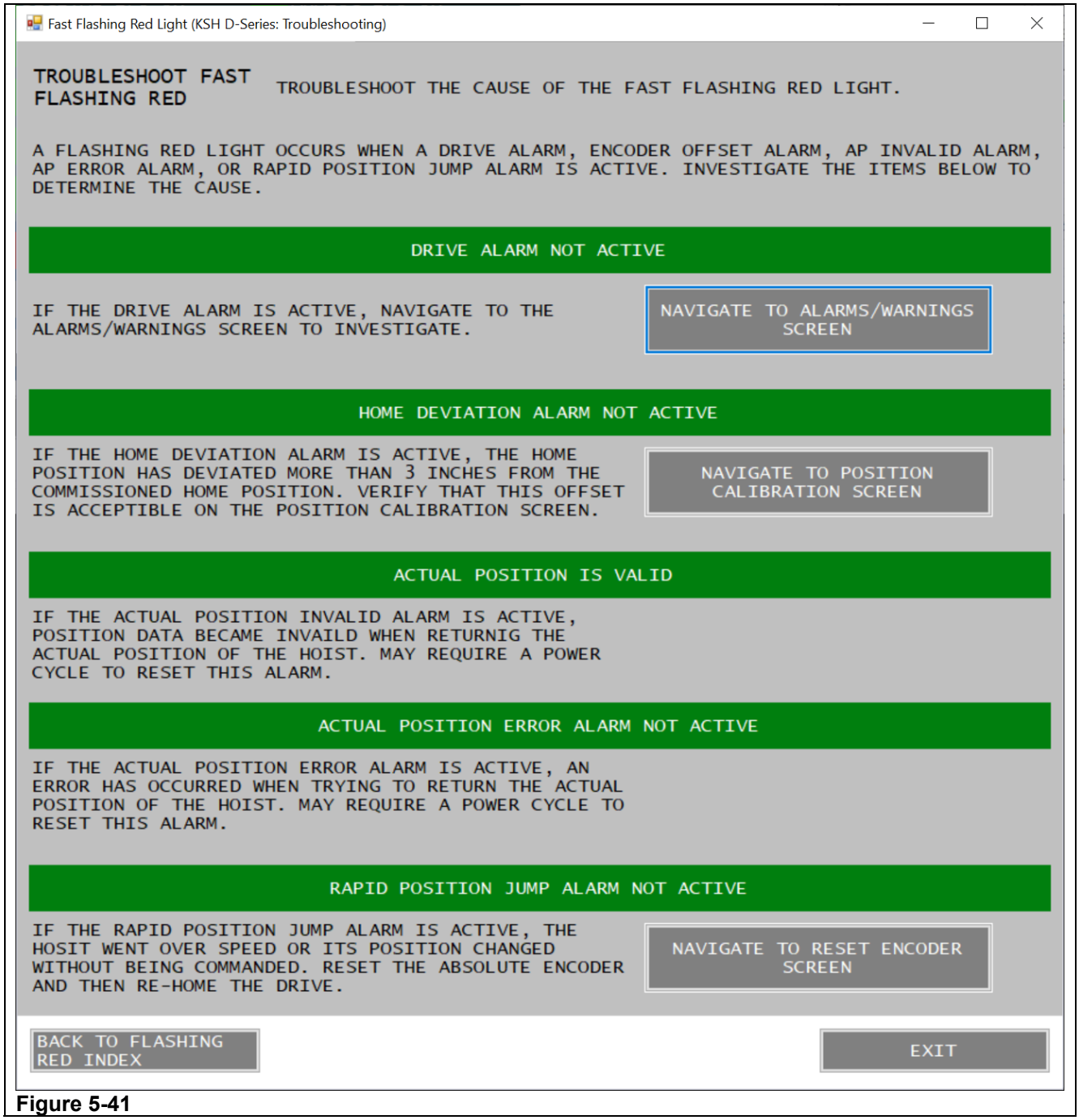


Figure 5-41

Fast Flashing Red Light screen: (Refer to Figure 5-41)

Row #1) Follow the steps listed on the screen to troubleshoot the cause.

Buttons) Press the ‘BACK TO FLASHING RED INDEX’ button to return to the FLASHING RED INDEX screen.
Press the ‘EXIT’ button to close the screen.

Step 18. Press the “FLASHING GREEN” button on the LIGHT PATTERN INDEX screen.

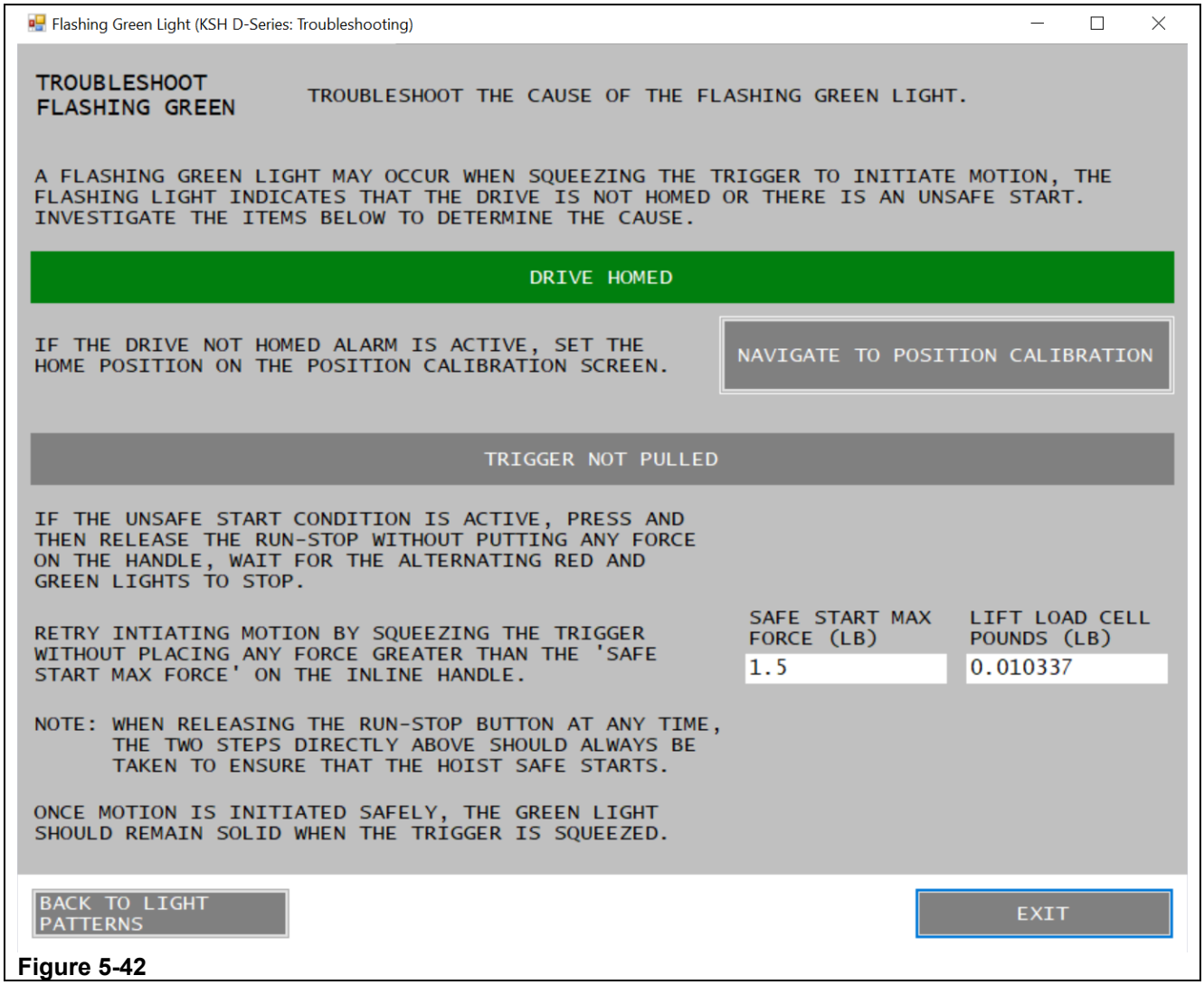


Figure 5-42

Flashing Green Light screen: (Refer to Figure 5-42)

Row #1) Follow the steps listed on the screen to troubleshoot the cause.

Buttons) Press the ‘BACK TO LIGHT PATTERNS’ button to return to the LIGHT PATTERN INDEX screen.

Press the ‘EXIT’ button to close the screen.

Step 19. Press the “ALTERNATING RED/GREEN” button on the LIGHT PATTERN INDEX screen.

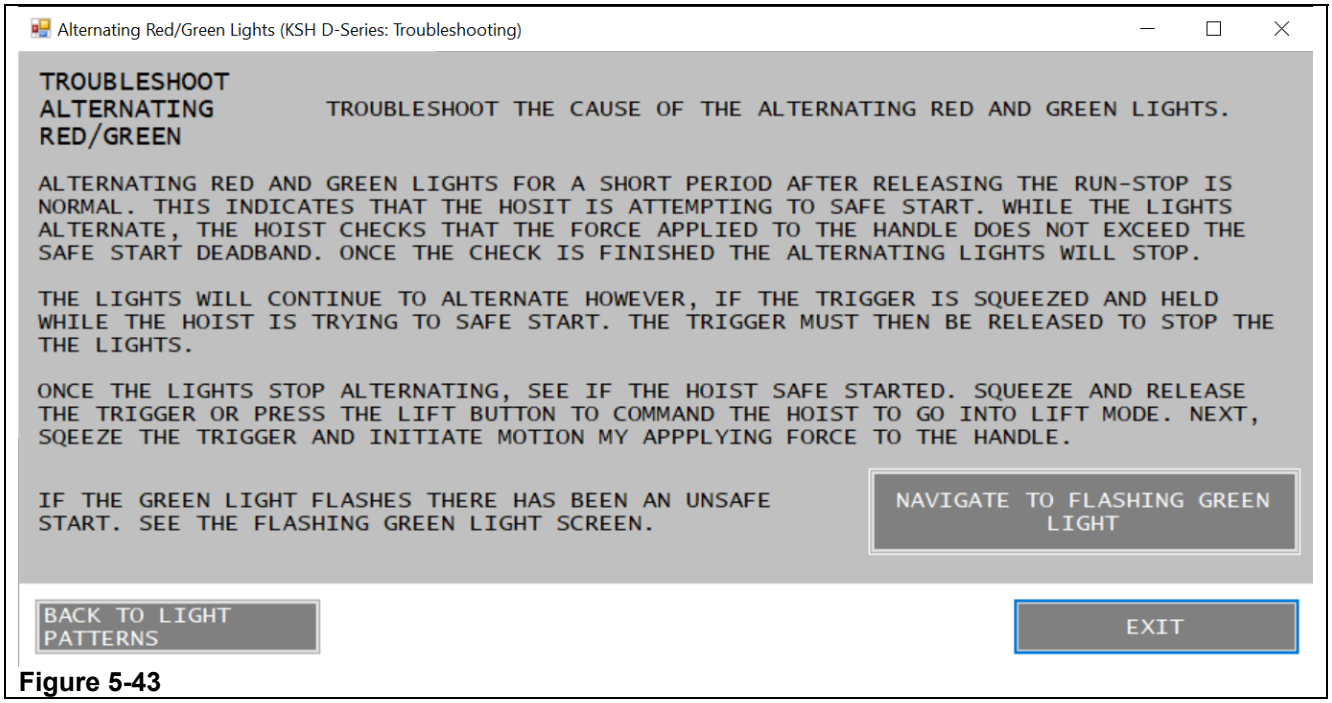


Figure 5-43

Alternating Red/Green Lights screen: (Refer to Figure 5-43)

Row #1) Follow the steps listed on the screen to troubleshoot the cause.

Buttons) Press the ‘BACK TO LIGHT PATTERNS’ button to return to the LIGHT PATTERN INDEX screen.
Press the ‘EXIT’ button to close the screen.

Step 20. Press the “SOLID RED” button on the LIGHT PATTERN INDEX screen.

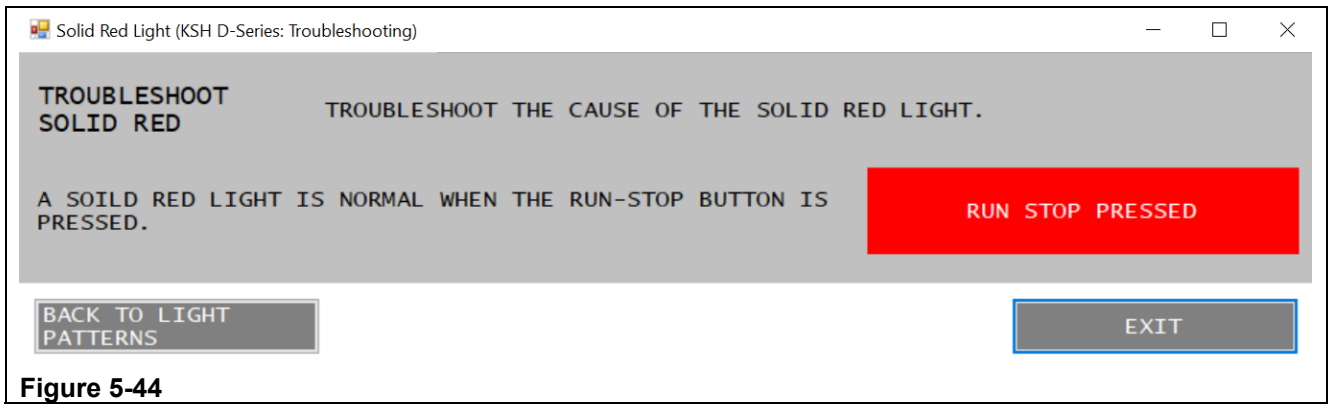


Figure 5-44

Solid Red Light screen: (Refer to Figure 5-44)

Row #1) Follow the steps listed on the screen to troubleshoot the cause.

Buttons) Press the ‘BACK TO LIGHT PATTERNS’ button to return to the LIGHT PATTERN INDEX screen.
Press the ‘EXIT’ button to close the screen.

Step 21. Press the “SOLID GREEN” button on the LIGHT PATTERN INDEX screen.

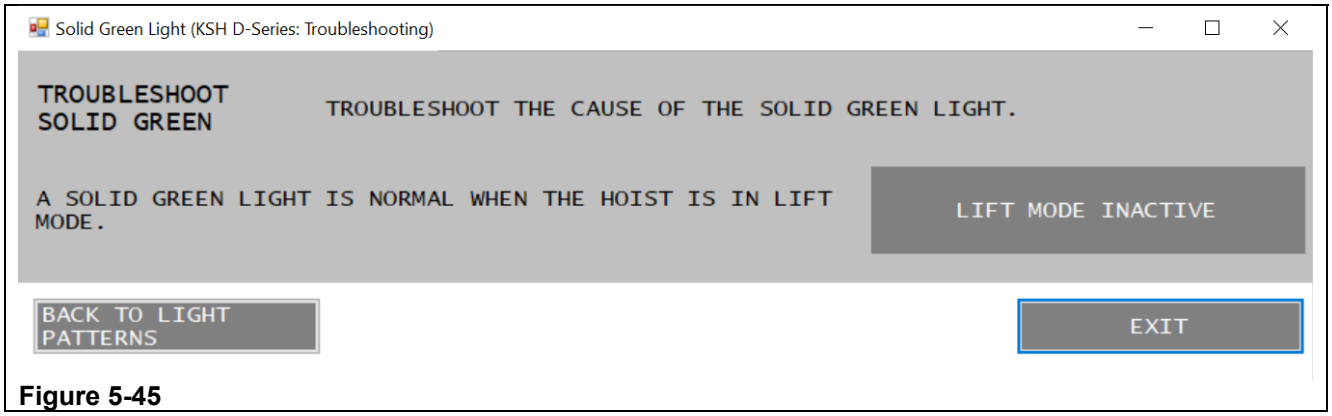


Figure 5-45

Solid Green Light screen: (Refer to Figure 5-45)

Row #1) Follow the steps listed on the screen to troubleshoot the cause.

Buttons) Press the ‘BACK TO LIGHT PATTERNS’ button to return to the LIGHT PATTERN INDEX screen.
Press the ‘EXIT’ button to close the screen.

Step 22. Press the “SOLID BLUE” button on the LIGHT PATTERN INDEX screen.

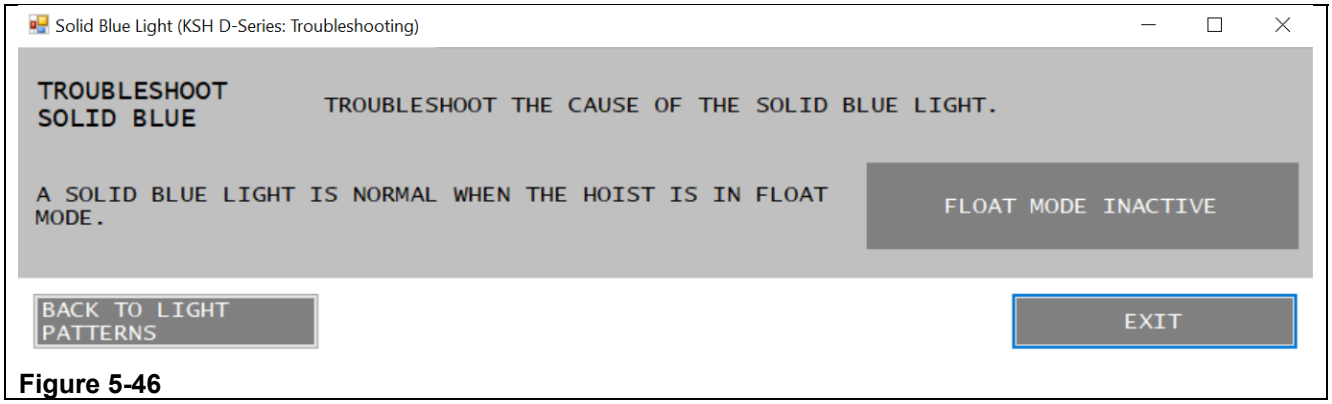


Figure 5-46

Solid Blue Light screen: (Refer to Figure 5-46)

Row #1) Follow the steps listed on the screen to troubleshoot the cause.

Buttons) Press the ‘BACK TO LIGHT PATTERNS’ button to return to the LIGHT PATTERN INDEX screen.
Press the ‘EXIT’ button to close the screen.

Step 23. Press the “SOLID GREEN/BLUE” button on the LIGHT PATTERN INDEX screen.

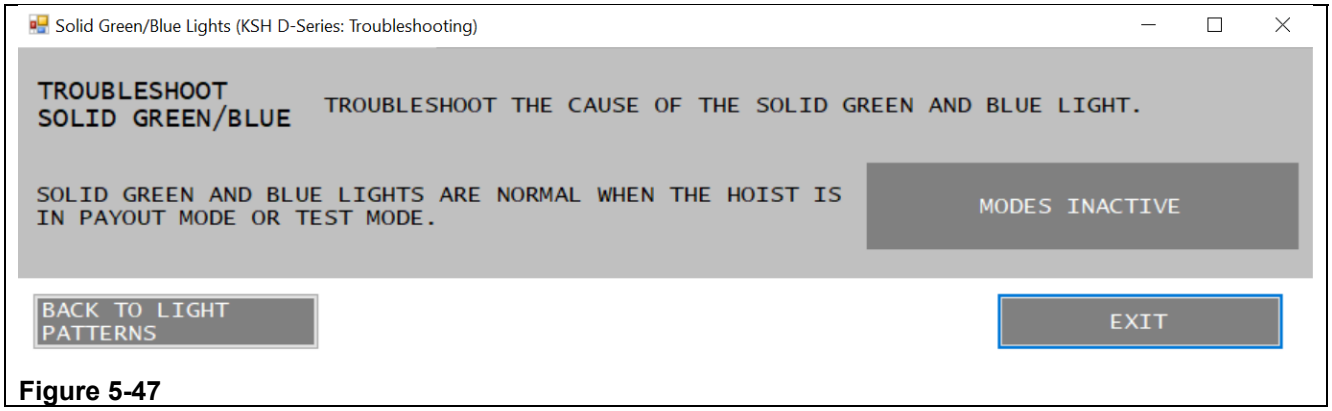


Figure 5-47

Solid Green/Blue Lights screen: (Refer to Figure 5-47)

Row #1) Follow the steps listed on the screen to troubleshoot the cause.

Buttons) Press the ‘BACK TO LIGHT PATTERNS’ button to return to the LIGHT PATTERN INDEX screen.
Press the ‘EXIT’ button to close the screen.

Step 24. Press the “DIAGNOSE MOTION DRIFT” button on the TROUBLESHOOTING INDEX screen.

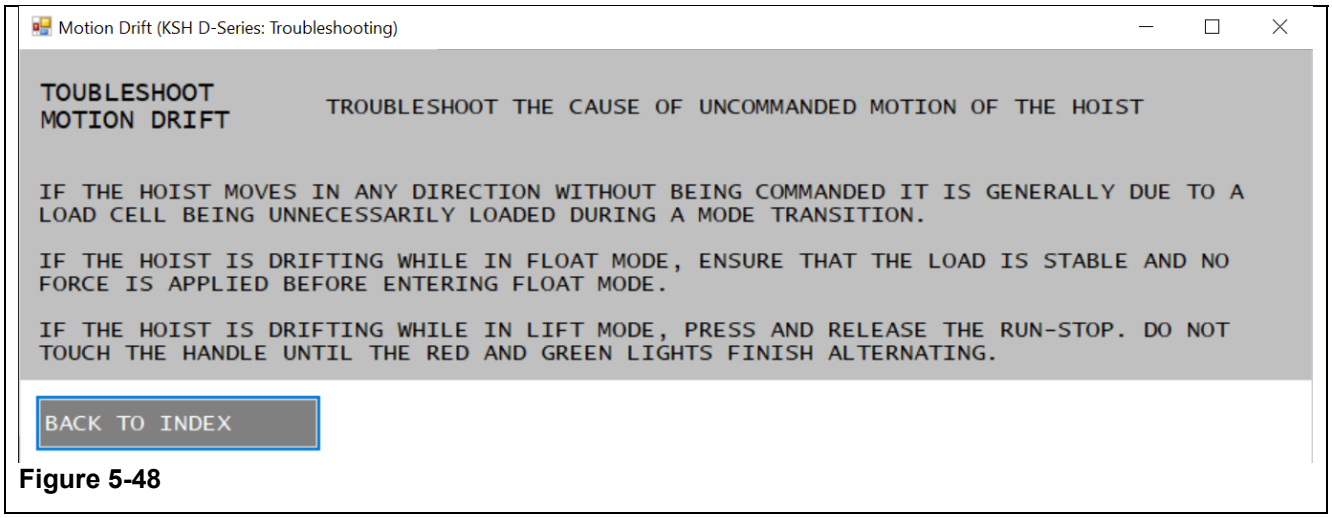


Figure 5-48

Motion Drift screen: (Refer to Figure 5-48)

Row #1) Follow the steps listed on the screen to troubleshoot the cause.

Button) Press the ‘BACK TO INDEX’ button to return to the TROUBLESHOOTING INDEX screen.

Step 25. Press the “MOTION” button on the Start screen.

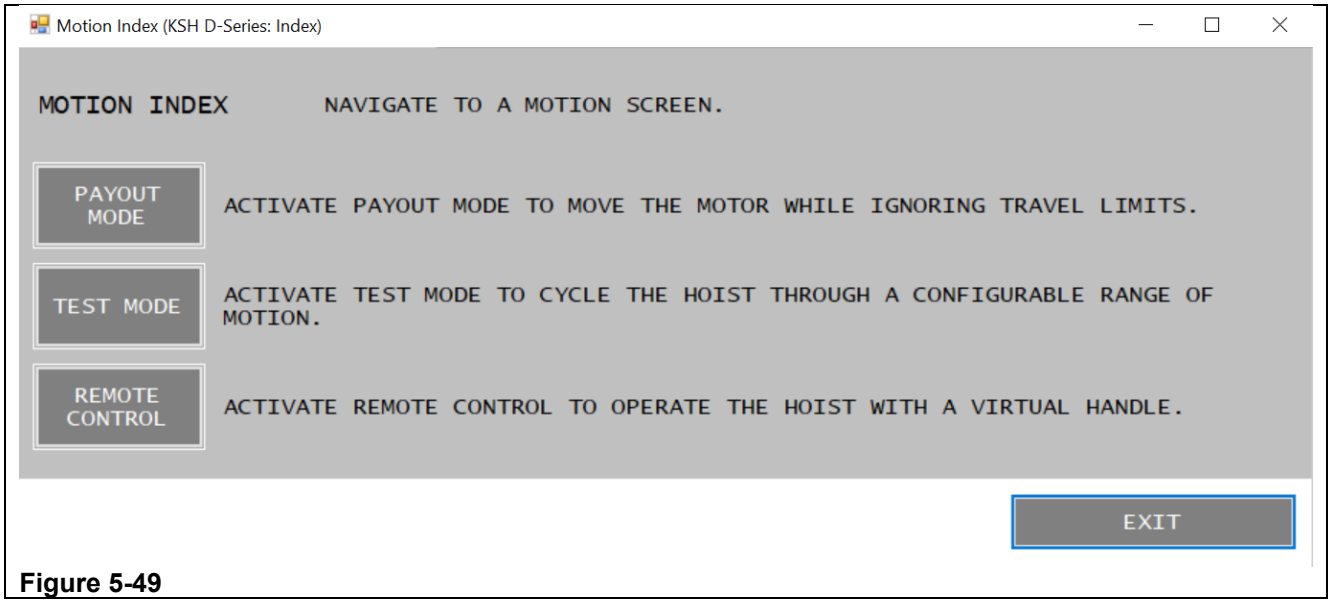


Figure 5-49

Motion Index screen: (Refer to Figure 5-49)

Row #1) The ‘PAYOUT MODE’ button will display the chain payout screen.

Row #2) The ‘TEST MODE’ button will display the Test Mode screen.

Row #3) The ‘REMOTE CONTROL’ button will display the remote-control screen.

Button) Press the ‘EXIT’ button to return to the hoist’s Start screen.

Step 26. Press the “PAYOUT MODE” button on the MOTION INDEX screen.

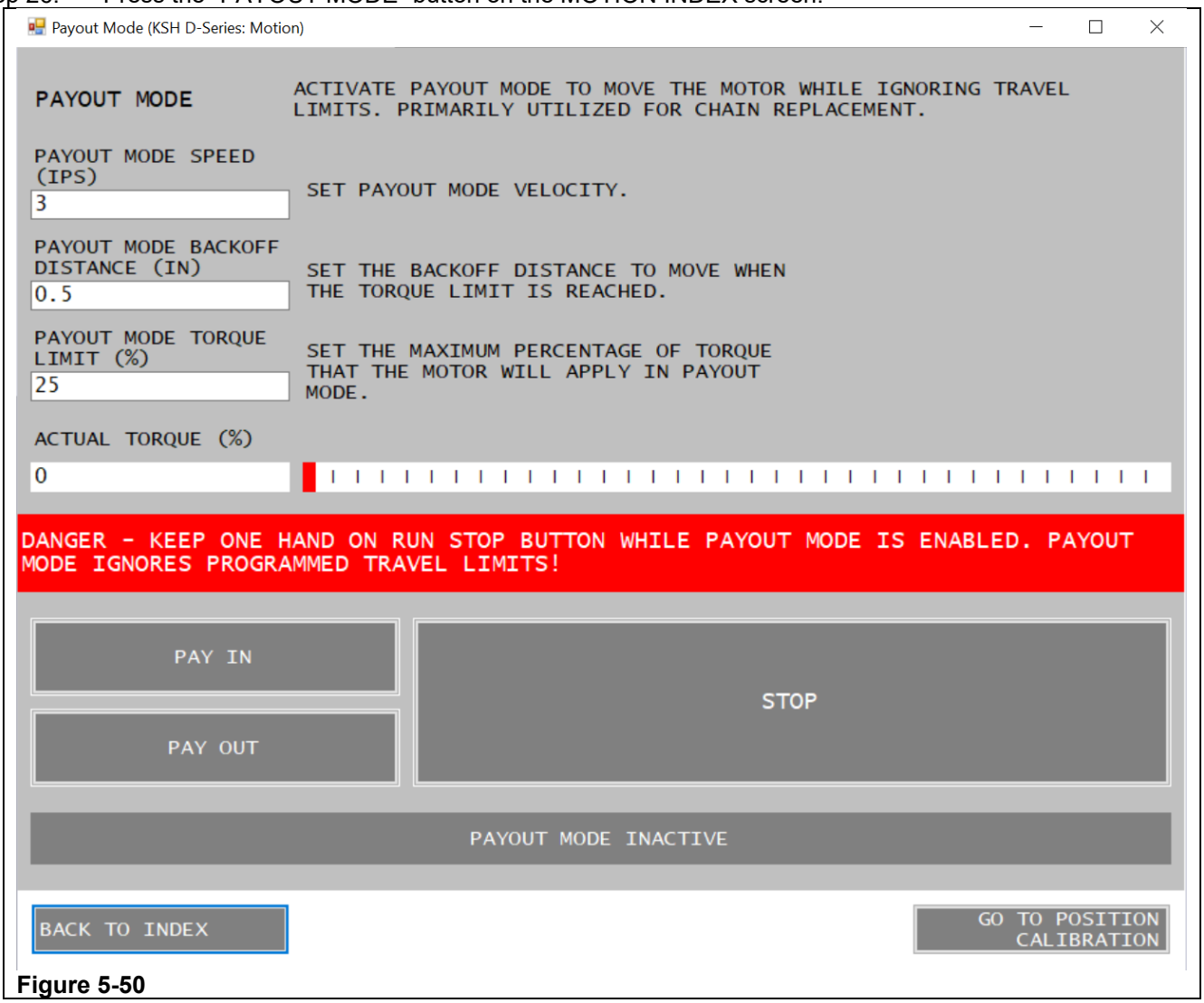


Figure 5-50

Payout Mode screen: (Refer to Figure 5-50)

CAUTION

Payout Mode is completely independent of travel and position limits. Even with limited torque, improper use can cause damage to the hoist and/or cables.

NOTE

Payout Mode uses Torque Limited Speed and is not intended for normal use. The most common use is during chain replacement.

Row #1) The ‘PAYOUT MODE SPEED (IPS)’ display shows the speed that will be commanded while Payout Mode is active. Payout Mode is limited to a maximum 5 Inches per Second.

Row #2) The ‘PAYOUT MODE BACKOFF DISTANCE (IN)’ display shows the position amount that will be used in the opposite direction of travel if the torque limit is reached. This is normally intended to unbind or release tension during chain replacement. Setting this to zero will leave the gearbox in a bound condition, which is usually undesirable.

(Refer to Figure 5-50)

CAUTION

Use Caution if setting the back-off distance higher than necessary as this move will use the full peak torque settings of the drive and motor. This is intended to release any bind created but should be used only for that purpose.

WARNING

Torque limits set higher than 30% can cause damage or injury and should only be used with due caution.

Row #3) The 'PAYOUT MODE TORQUE LIMIT (%)' display shows the amount of torque that the motor will be limited to in Payout Mode when paying in chain, or paying out chain.

Row #4) The 'ACTUAL TORQUE (%)' display shows the amount of torque that the motor is running at.

Row #5) The 'PAY IN' button will issue a reverse/upward direction command. There is normally a 3 second delay after issuing the command before motion starts.

Row #6) The 'PAY OUT' button will issue a run in forward/downward direction command. There is normally a 3 second delay after issuing the command before motion starts.

Row #7) The 'PAYOUT MODE INACTIVE' indicator will change to 'PAYOUT MODE ACTIVE' when the hoist is moving in Payout Mode.

Buttons) Press the 'BACK TO INDEX' button to return to the MOTION INDEX screen. Press the 'GO TO POSITION CALIBRATION' to go to that screen.

Step 27. Press the “TEST MODE” button on the MOTION INDEX screen.

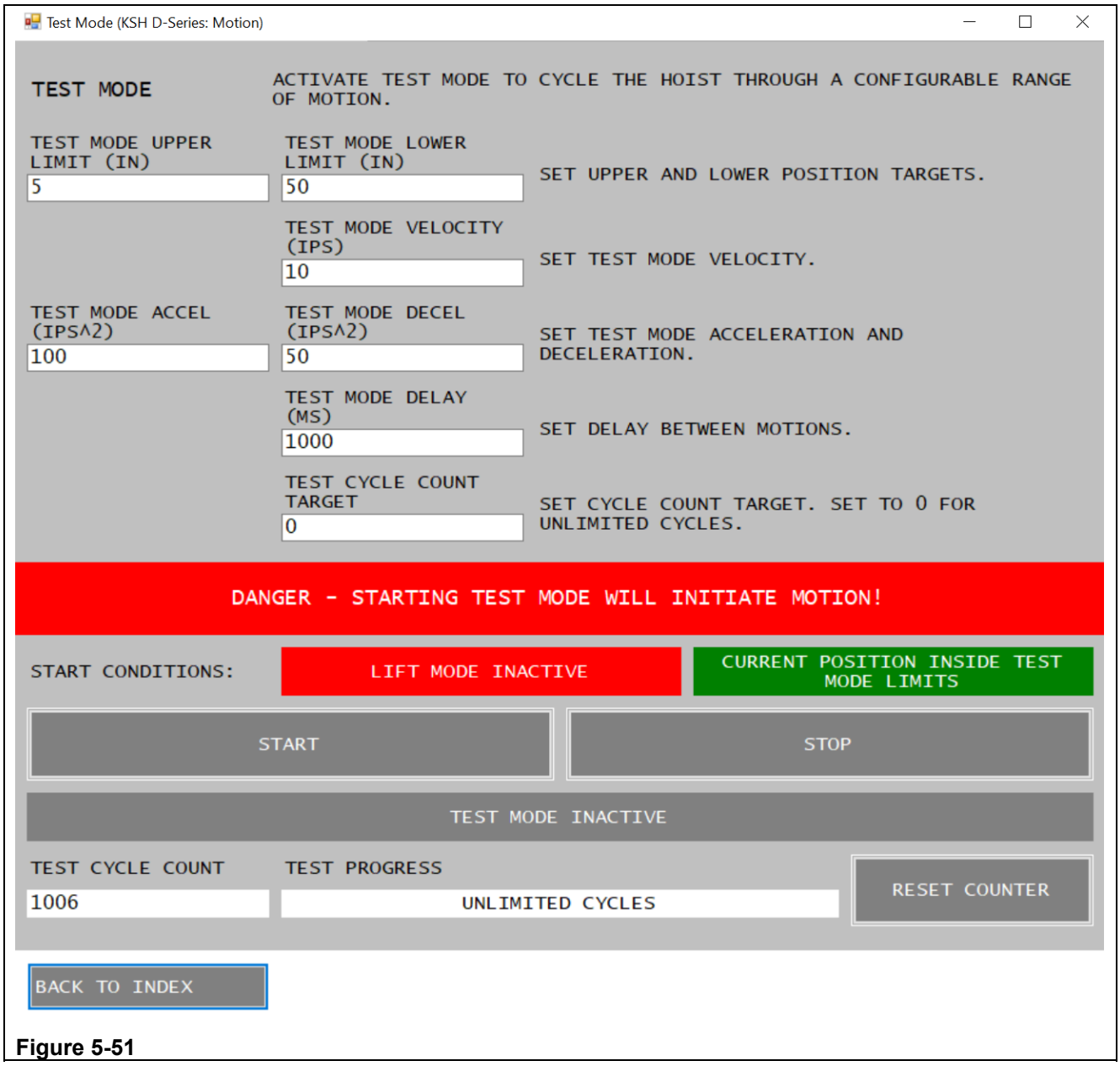


Figure 5-51

Test Mode screen: (Refer to Figure 5-51)

Row #1) The ‘TEST MODE UPPER LIMIT (IN)’ display shows the upper limit that the hoist will travel to while in Test Mode.
The ‘TEST MODE LOWER LIMIT (IN)’ display shows the lower limit that the hoist will travel to while in Test Mode.
Note: When the ‘Start’ button is pressed, the servo will move to the upper limit and then continue the test cycle.

Row #2) The ‘TEST MODE VELOCITY (IPS)’ display shows the speed that will be commanded while Test Mode is active. Test Mode is limited to a maximum 25 Inches per Second.

(Refer to Figure 5-51)

Row #3) The 'TEST MODE ACCEL (IPS^2)' display shows the acceleration setpoint for the hoist while in Test Mode.
The 'TEST MODE DECEL (IPS^2)' display shows the deceleration setpoint for the hoist while in Test Mode.
NOTE: The higher the number placed into the 'ACCEL' or 'DECEL' input text box, the quicker the hoist will come to a stop. The lower the number, the more distance the hoist will take to slow down so it will start slowing down sooner.

Row #4) The 'TEST MODE DELAY (MS)' value should equal or exceed the time it takes for the servo to move from the upper limit to the lower limit during the test cycle. If using the settings on the screen shown, the delay should be set to a minimum of 5000ms or a five second delay.

Row #5) The 'TEST CYCLE COUNT TARGET' display shows the number of test cycles the hoist will perform. The hoist will automatically stop cycling when it reaches this number of cycles.

Row #6) The hoist's test mode starting conditions are displayed here as indicators.

Row #7) The 'START' and 'STOP' buttons are used to begin and end the test cycle.

Row #8) The 'TEST MODE INACTIVE' indicator will change to 'TEST MODE ACTIVE' when the hoist is moving in test mode.

Row #9) The current number of test mode cycles will be displayed here.
The progress bar will keep track of the cycle count.
The "RESET COUNTER" button will reset the number of test counts.

Button) Press the 'BACK TO INDEX' button to return to the MOTION INDEX screen.

Step 28. Press the “REMOTE CONTROL” button on the MOTION INDEX screen.

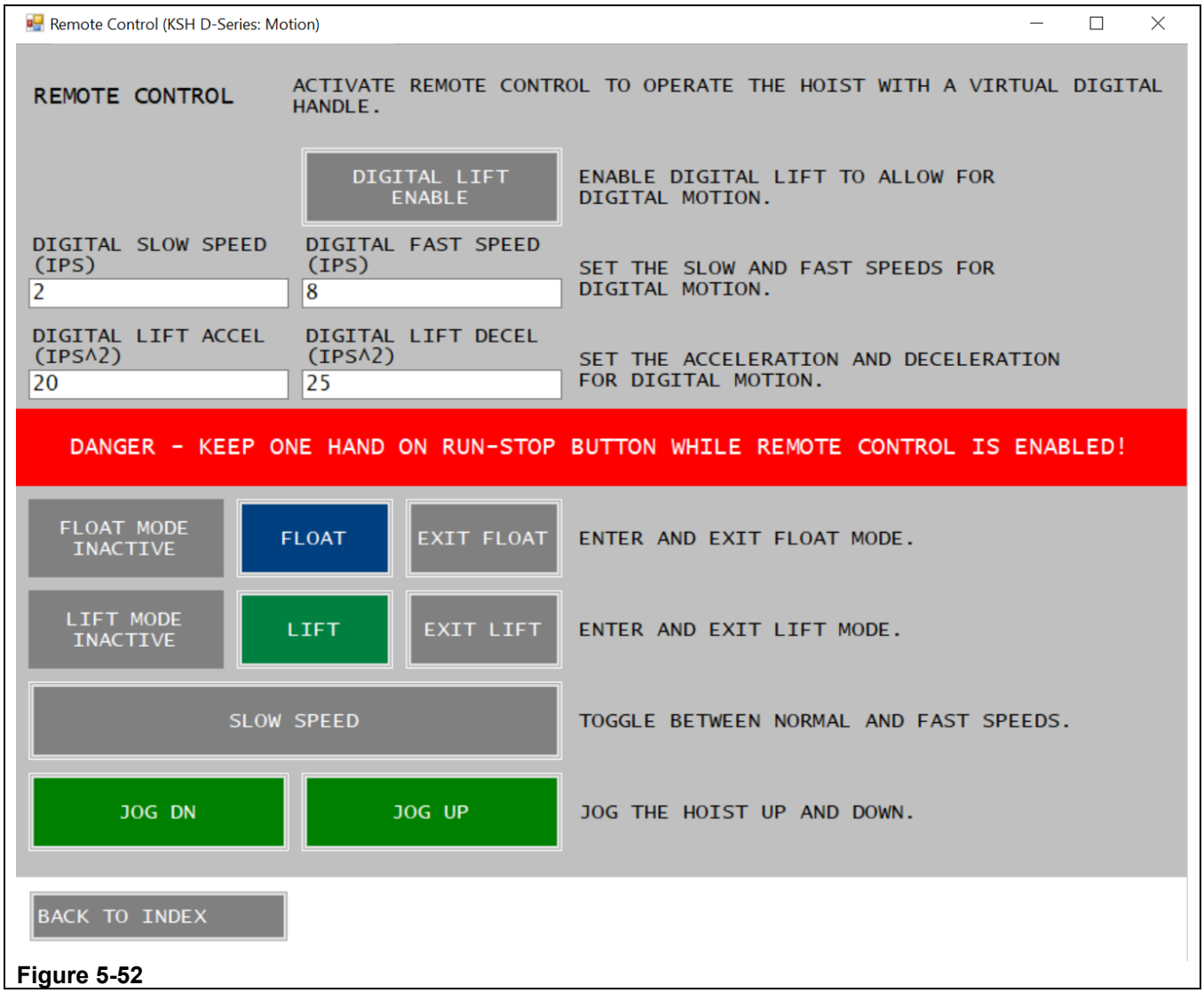


Figure 5-52

Remote Control screen: (Refer to Figure 5-52)

Row #1) The ‘DIGITAL LIFT ENABLE’ button must be pressed for the Remote-Control functions to operate.

Row #2) The ‘DIGITAL SLOW SPEED (IPS)’ display shows the command velocity for the slow jog function.
The ‘DIGITAL FAST SPEED (IPS)’ display shows the command velocity for the fast jog function.

Row #3) The ‘DIGITAL ACCELERATION (IPS^2)’ display shows the acceleration setpoint for digital commanded velocity.
The ‘DIGITAL DECELERATION (IPS^2)’ display shows the deceleration setpoint for digital commanded velocity. This value should be set equal to or higher than the acceleration setpoint for digital commanded velocity.

Row #4) The ‘FLOAT MODE INACTIVE’ indicator will change to ‘FLOAT MODE ACTIVE’ when the hoist is in Float Mode.
The ‘FLOAT’ button will cause the hoist to go into Float mode.
The ‘EXIT FLOAT’ will cause the hoist to go out of Float Mode.

Row #5) The ‘LIFT MOVE INACTIVE’ indicator will change to ‘LIFT MOVE ACTIVE’ when the hoist is in Lift Mode.
The ‘LIFT BUTTON’ will cause the hoist to go into Lift mode.
The ‘EXIT LIFT’ will cause the hoist to go out of Lift Mode.

(Refer to Figure 5-52)

Row #6) The ‘SLOW SPEED’ button will toggle the hoist’s digital movement from ‘SLOW SPEED’ to ‘FAST SPEED’.

Row #7) The ‘JOG DN’ button move the chain downwards as long as the button is active. The ‘JOG UP’ button move the chain upwards as long as the button is active.

Button) Press the ‘BACK TO INDEX’ button to return to MOTION INDEX screen.

Step 29. Press the “SETUP” button on the Start screen.

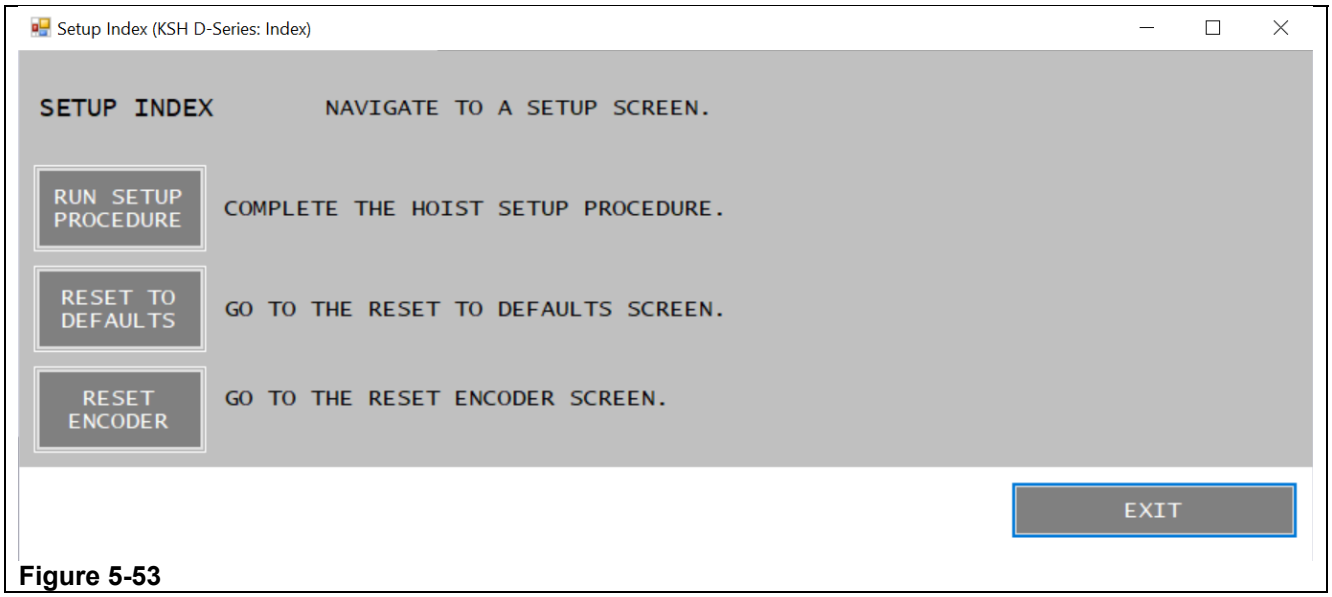


Figure 5-53

Setup Index screen: (Refer to Figure 5-53)

Row #1) The ‘RUN SETUP PROCEDURE’ button will display the first screen of the setup procedure to setup the hoist’s parameters.

Row #2) The ‘RESET TO DEFAULTS’ button will display a screen to set all the hoist’s parameters to factory default.

Row #3) The ‘RESET ENCODER’ button will display a screen to reset the motor’s encoder.

Button) Press the ‘EXIT’ button to return to the hoist’s Start screen.

Step 30. Press the “RUN SETUP PROCEDURE” button on the SETUP INDEX screen.

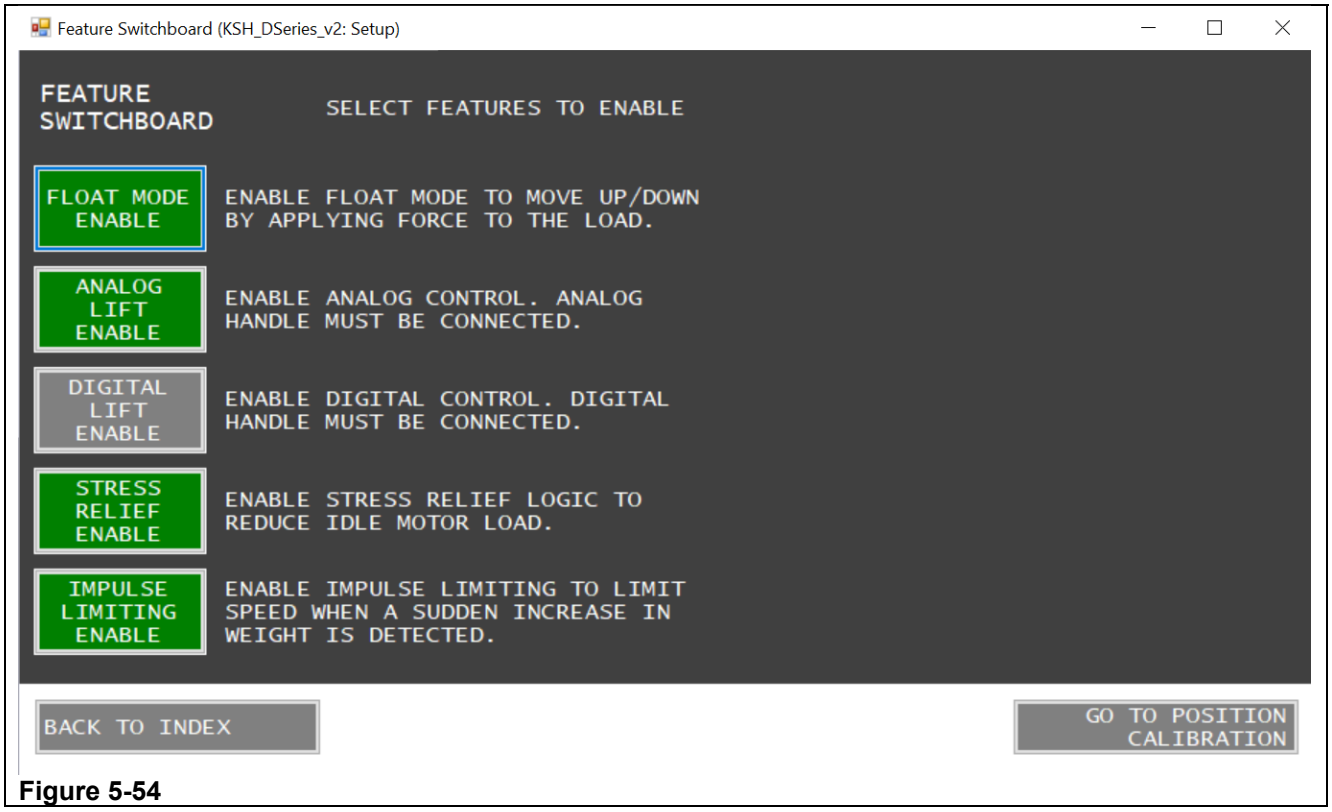


Figure 5-54

Feature Switchboard screen: (Refer to Figure 5-54)

Row #1) The ‘FLOAT MODE ENABLE’ button should be green or in the ON condition by default.
This is required to use the Float Load Cell as a directional control.

Row #2) The ‘ANALOG LIFT ENABLE’ button should be green or in the ON condition by default.
This is required to use the Inline Lift Handle as a directional control.

Row #3) The ‘DIGITAL LIFT ENABLE’ button should be gray or in the OFF condition by default.
This is required to use a digital direction control such as a connected Digital Handle or the jog commands on the ‘REMOTE CONTROL’ screen.

Row #4) The ‘STRESS RELIEF ENABLE’ button should be green or in the ON condition by default.
This feature is occasionally used for very specific situations to load adjust the gearbox.

Row #5) The ‘IMPULSE LIMITING ENABLE’ button should be green or in the ON condition by default.
This feature limits the speed momentarily when a sudden increase in load is detected.
This allows a settling effect on the hoist and decreases the odds of having the hoist impact and loss of control of a part attempting to be picked up.

Buttons) Press the ‘BACK TO INDEX’ button to return to the SETUP INDEX screen.
Press the ‘GO TO POSITION CALIBRATION’ to go to the next screen.

Step 31. Press the “GO TO POSITION CALIBRATION” button on the FEATURE SWITCHBOARD screen.

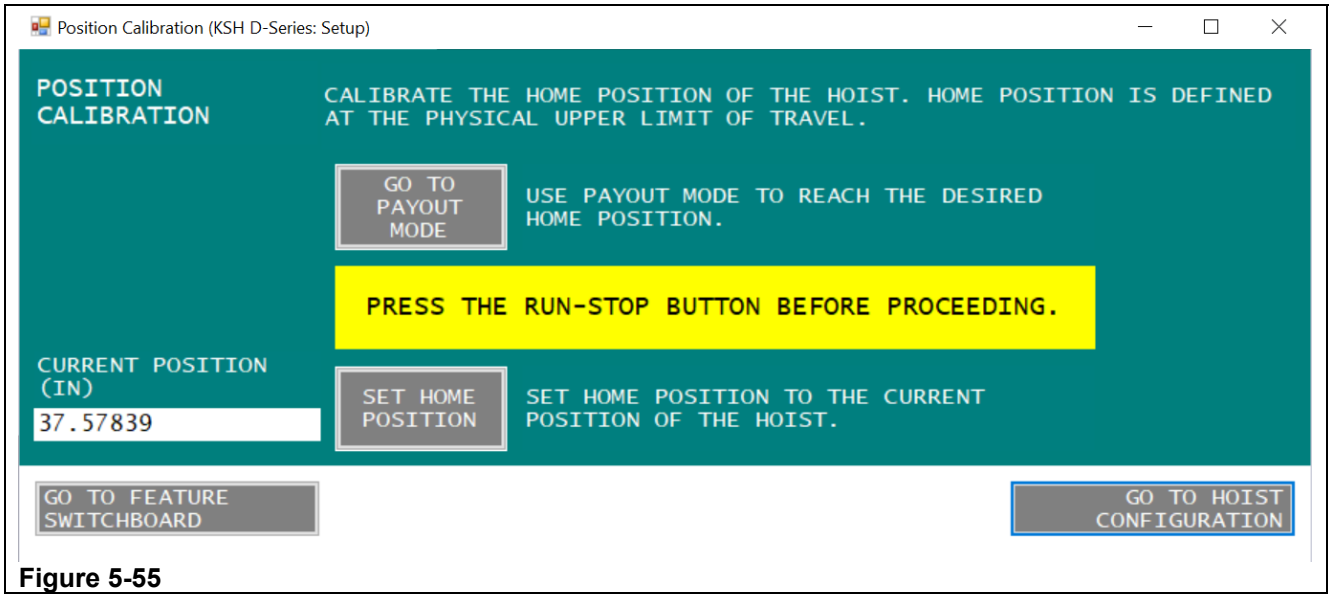


Figure 5-55

Position Calibration screen: (Refer to Figure 5-55)

Row #1) The ‘GO TO PAYOUT MODE’ button displays the Payout Mode screen.

Row #2) The ‘CURRENT POSITION (IN)’ display shows the hoist’s current position. Pressing the “SET HOME POSITION’ button will set the displayed encoder position of the hoist to zero (Home).

Buttons) Press the ‘GO TO FEATURE SWITCHBOARD’ button to return to that screen. Press the ‘GO TO HOIST CONFIGURATION’ button to go to the next screen.

Note) In most cases, the hoist should be moved up to it upper most position before the “SET HOME POSITION” button is pressed.

	CAUTION
⚠	**The 19-pin coil cable should <u>NOT</u> be compressed when the hoist is in the full up or zero position.** **There should be additional room below the servo so a two-inch (2”) spacer could be inserted between the coils of the 19-pin coil cable when the hoist is in its full up position.**

Step 32. Press the “GO TO HOIST CONFIGURATION” button on the POSITION CALIBRATION screen.

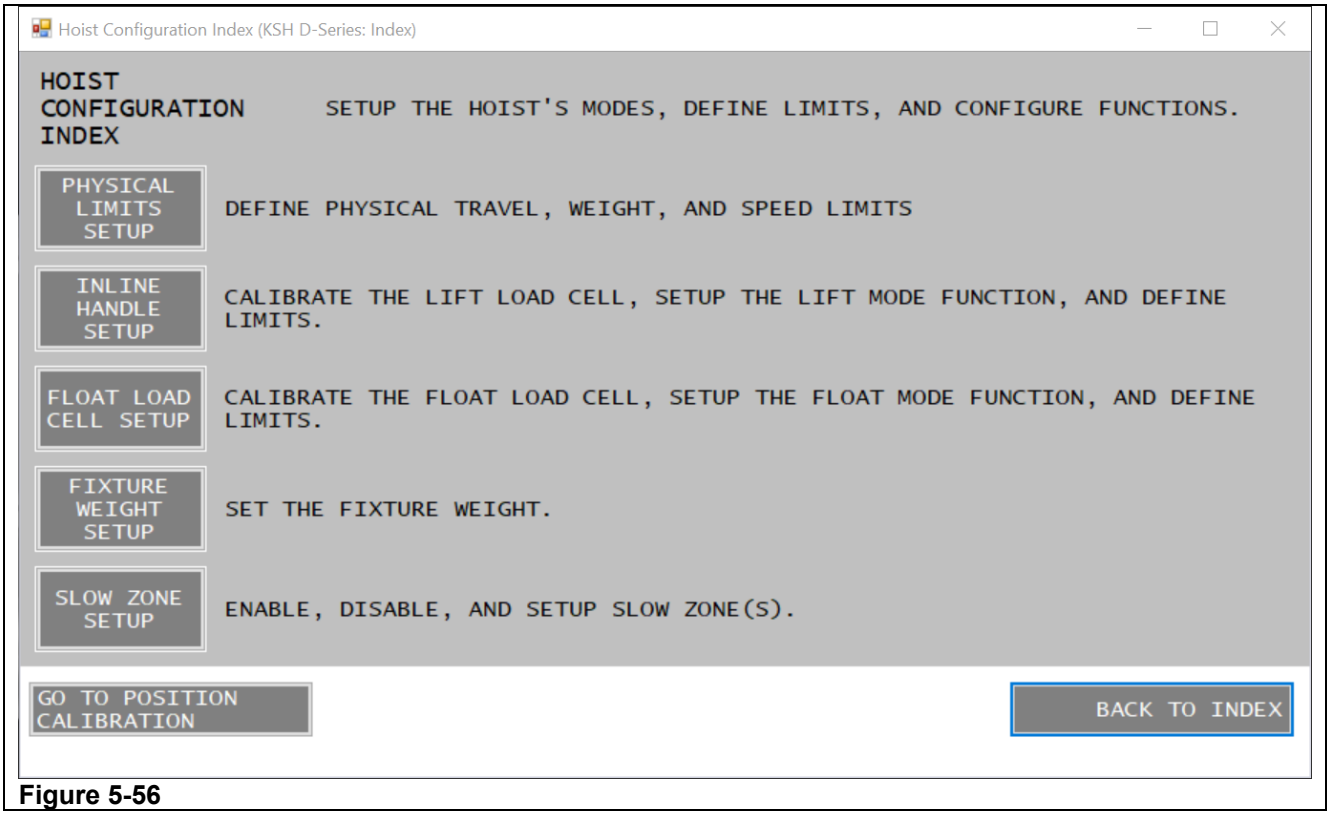


Figure 5-56

Hoist Configuration Index screen: (Refer to Figure 5-56)

Row #1) The ‘PHYSICAL LIMITS SETUP’ button will display screens to setup the hoist’s physical motion limits.

Row #2) The ‘INLINE HANDLE SETUP’ button will display screens to calibrate the lift load cell, setup Lift Mode, and set respective limits.

Row #3) The ‘FLOAT LOAD CELL SETUP’ button will display screens to calibrate the float load cell, setup Float Mode, and set respective limits.
If FLOAT MODE has been disabled on the FEATURE SWITCHBOARD screen, this button will display to the ‘FLOAT LOAD CELL’ screen and the respective FLOAT MODE screens will be accessible via the “Workspace” tab.

Row #4) The ‘FIXTURE WEIGHT SETUP’ button will display a screen to set a connected fixture.

Row #5) The ‘SLOW ZONE SETUP’ button will display a screen to enable and setup slow zones.

Buttons) Press the ‘GO TO POSITION CALIBRATION’ button to return to that screen.
Press the ‘BACK TO INDEX’ button to return to the SETUP INDEX screen.

Step 33. Press the “PHYSICAL LIMITS SETUP” button on the HOIST CONFIGURATION INDEX screen.

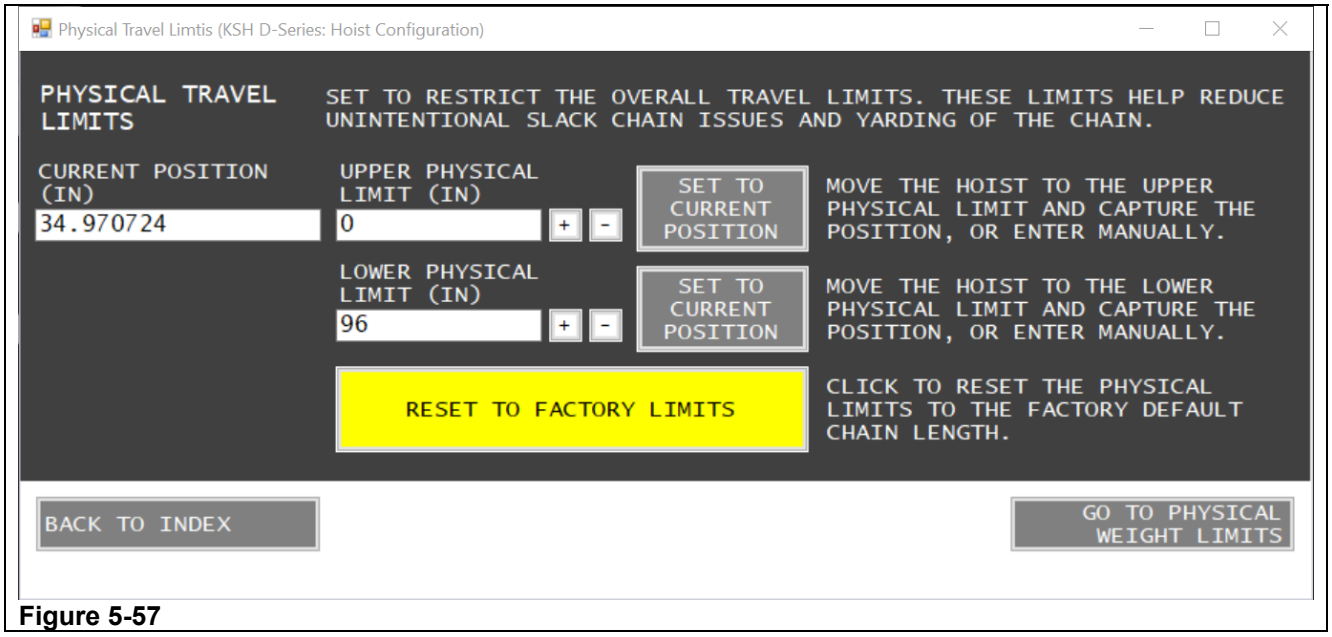


Figure 5-57

Physical Travel Limits screen: (Refer to Figure 5-57)

Row #1) The ‘CURRENT POSITION (IN)’ display shows the vertical height measurement of the hoist. The zero position of the hoist is close to the bottom of the hoist. The height measurements increase in magnitude as the hoist’s control handle move towards the ground.
The ‘UPPER PHYSICAL LIMIT (IN)’ is entered here. The “+” and “-“ buttons will increase or decrease this value by 1” per button-press.
The upper ‘SET TO CURRENT POSITION’ button will set the Upper Physical Limit of the hoist to the Current Position of the hoist.

Row #2) The ‘LOWER PHYSICAL LIMIT (IN)’ of the hoist is entered here. The “+” and “-“ buttons will increase or decrease this value by 1” per button-press.
The lower ‘SET TO CURRENT POSITION’ button will set the Lower Physical Limit of the hoist to the Current Position of the hoist.

Row #3) The ‘RESET TO FACTORY LIMITS’ button will set the hoist’s Physical Travel Limits to the hoist’s Default Physical Limits.

Buttons) Press the ‘BACK TO INDEX’ button to return to the HOIST CONFIGURATION INDEX screen.
Press the ‘GO TO PHYSICAL WEIGHT LIMITS’ button to go to that screen.

Note) The 19-pin coil cable should not be compressed when the hoist is in the full up or at its zero position.
There should be addition room below the servo so a two-inch (2”) spacer could be inserted between the coils of the 19-pin coil cable when the hoist is in the full up position.

Step 34. Press the “GO TO PHYSICAL WEIGHT LIMITS” button on the PHYSICAL TRAVEL LIMITS screen.

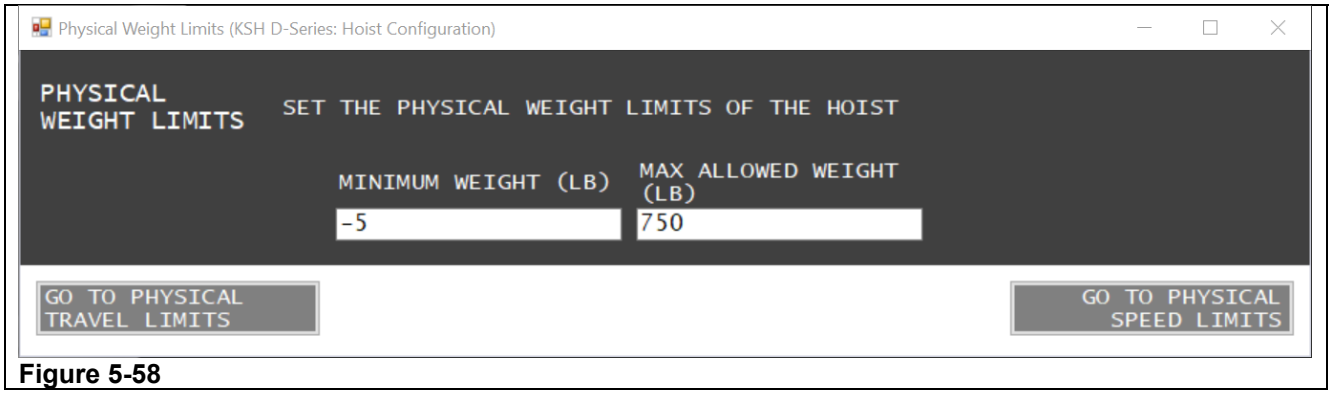


Figure 5-58

Physical Weight Limits screen: (Refer to Figure 5-58)

Row #1) The ‘MINIMUM WEIGHT (LB)’ display shows the amount of weight the hoist will set down on a surface. This value will typically have a Negative sign in front of it, denoting that the weight is set down on a surface. The amount of weight placed on the surface is the absolute value of the displayed number. If this number is significantly increased, chain payout may occur.

The ‘MAXIMUM ALLOWED WEIGHT (LB)’ display shows the maximum static weight that the hoist can lift. It cannot be set higher than the hoist’s capacity. This weight can be set lower so, the hoist can’t lift heavier objects than the parts its designed for, such as dunnage containers, etc.

Buttons) Press the ‘GO TO PHYSICAL TRAVEL LIMITS’ button to go to that screen.
Press the ‘GO TO PHYSICAL SPEED LIMITS’ button to go to that screen.

Step 35. Press the “GO TO PHYSICAL SPEED LIMITS” button on the PHYSICAL WEIGHT LIMITS screen.

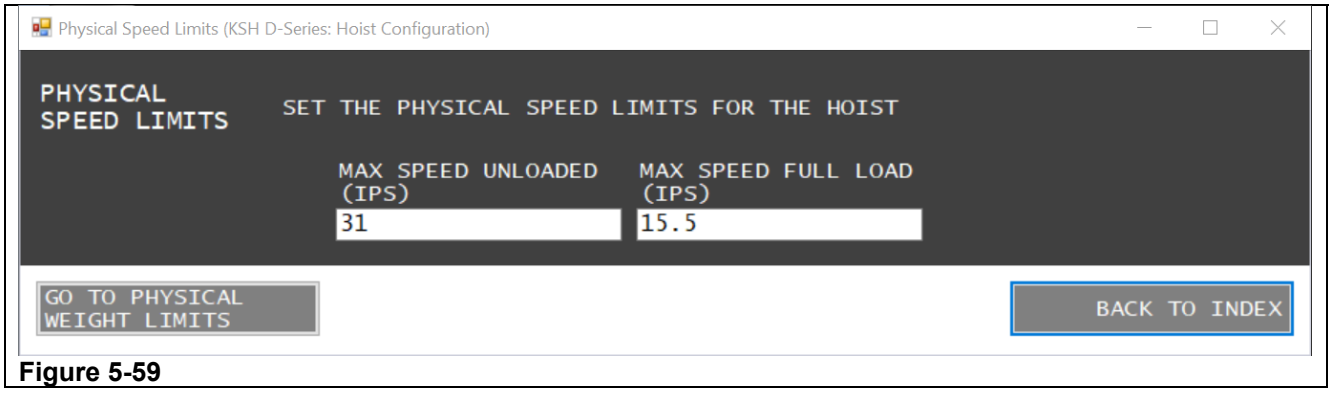


Figure 5-59

Physical Speed Limits screen: (Refer to Figure 5-59)

Row #1) The ‘MAX SPEED UNLOADED (IPS)’ display shows the maximum speed of the hoist when it is not supporting any weight.

The ‘MAX SPEED FULL LOAD (IPS)’ display shows the maximum speed of the hoist when it is supporting its full capacity, typically, this is set to half of the ‘MAX SPEED UNLOADED’.

Buttons) Press the ‘GO TO PHYSICAL WEIGHT LIMITS’ button to go to that screen.
Press the ‘BACK TO INDEX’ button to return to the HOIST CONFIGURATION INDEX screen.

Step 36. Press the “INLINE HANDLE SETUP” button on the HOIST CONFIGURATION INDEX screen.

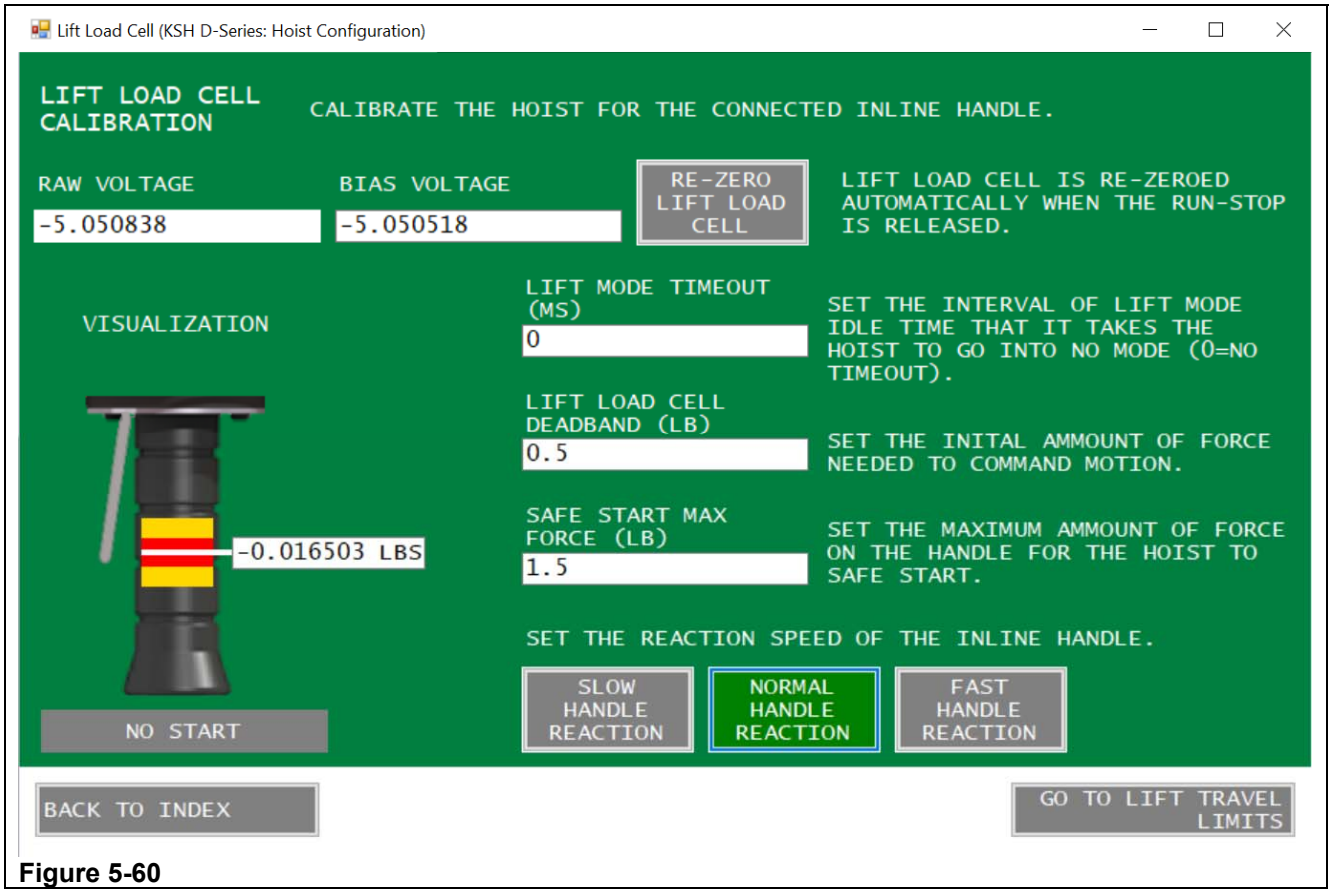


Figure 5-60

Lift Load Cell screen: (Refer to Figure 5-60)

Row #1) The ‘RAW VOLTAGE’ display shows the current voltage of the lift load cell. This is the load cell that measures the force being exerted on the Inline Handle’s grip.
The ‘BIAS VOLTAGE’ display shows the voltage of the lift load cell when there is no force being exerted on it.
The ‘RE-ZERO LIFT LOAD CELL’ button should only be pressed if you need to re-calibrate the lift load cell. Please ensure that there is NO force applied to the Inline Handle before this button is pressed. Also, please note that the lift load cell is automatically re-zeroed every time the Run-Stop button is released.

Row #2) The Inline Handle grip ‘VISUALIZATION’ shows the amount of force applied in white, the set Deadband in red, and the Safe Start Max Force in yellow (this band will only be visible when the Run-Stop is pressed).
The ‘LIFT MODE TIMEOUT (MS)’ display allows setting a sleep time in milliseconds. If there have been no commands for the given timeout, the hoist will go out of Lift mode, disabling the drive and setting the holding brake. A zero timeout will disable this function.

Row #3) The ‘LIFT LOAD CELL DEADBAND (LB)’ sets the minimum amount of force required on the Inline Handle to initiate motion.

Row #4) The ‘SAFE START MAX FORCE (LB)’ display shows the maximum amount of force allowed on the Inline Handle when the trigger is pulled. Typically, if this force is exceeded, the green light will flash indicating an Unsafe Start condition. The force on the handle must be reduced to the acceptable range.

(Refer to Figure 5-60)

Row #5) When the trigger is pulled the indicator underneath the Inline Handle visualization will change from ‘NO START’ to ‘SAFE START’ or ‘UNSAFE START’ depending on if all the starting conditions were met or not. If there is an Unsafe Start, navigate to the ‘FLASHING GREEN LIGHT’ screen in the LIGHT PATTERN INDEX.

The ‘SLOW HANDLE REACTION’ button is used to load special Slow Reaction settings to change the Inline Handle’s response. These settings are less sensitive than the standard setup for the Inline handle. These settings may feel sluggish by comparison, but they give the operator finer control that may be useful in certain applications.

The ‘NORMAL HANDLE REACTION’ button is used to load Standard Reaction settings for the Inline Handle’s response. This will restore the default settings to the Inline Handle.

The ‘FAST HANDLE REACTION’ button is used to load special Fast Reaction settings to change the Inline Handle’s response. These settings are more sensitive than the standard setup for the Inline handle. These settings may feel much more responsive by comparison, but generates the quickest overall cycle times for the application. Caution should be used when setting this reaction as some operators may feel a lack of control because of these more responsive settings.

Buttons) Press the ‘BACK TO INDEX’ button to return to then HOIST CONFIGURATION INDEX screen.

Press the ‘GO TO LIFT TRAVEL LIMTIS’ button to go that screen.

Step 37. Press the “GO TO LIFT TRAVEL LIMITS” button on the LIFT LOAD CELL screen.

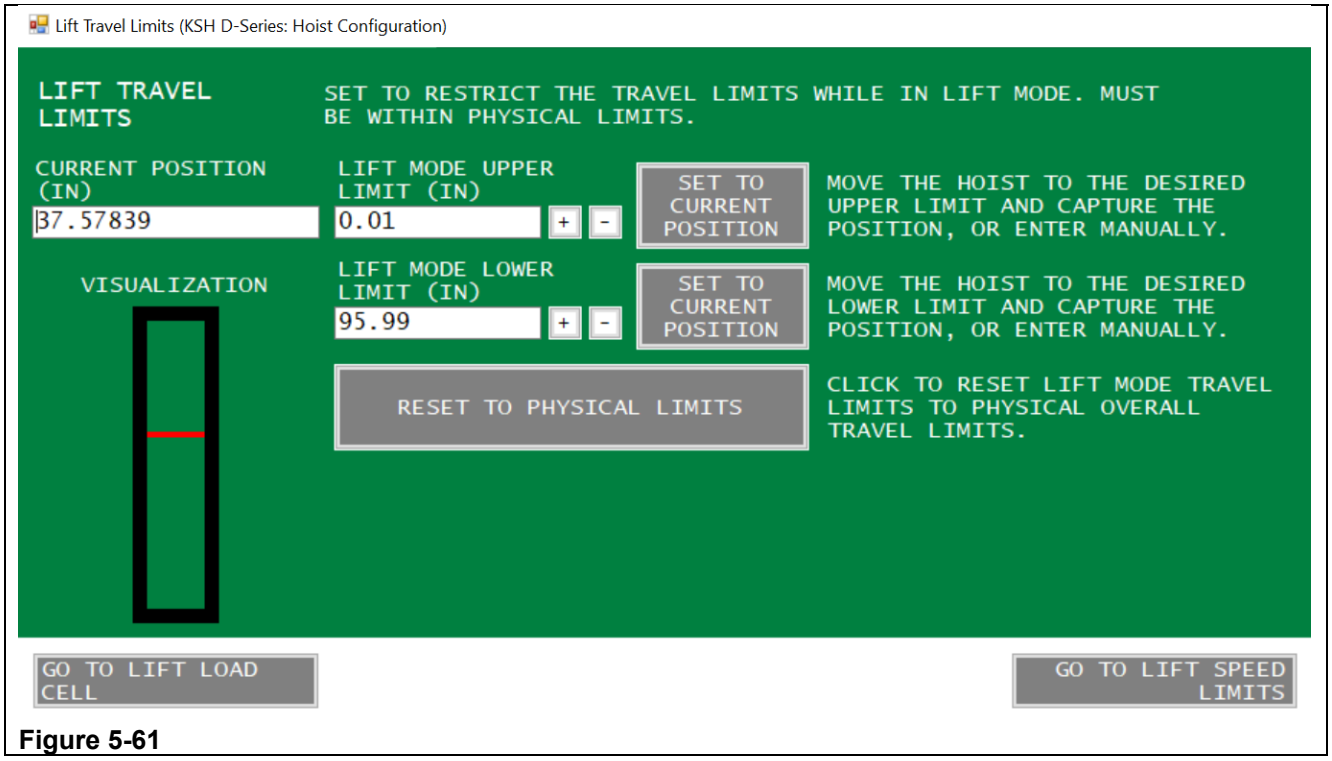


Figure 5-61

Lift Travel Limits screen: (Refer to Figure 5-61)

Row #1) The ‘CURRENT POSITION (IN)’ display shows the vertical height measurement of the hoist. The zero position of the hoist is close to the bottom of the hoist. The height measurements increase in magnitude as the hoist’s control handle move towards the ground.
The ‘LIFT MODE UPPER LIMIT (IN)’ is entered here. The “+” and “-“ buttons will increase or decrease this value by 1” per button-press.
The upper ‘SET TO CURRENT POSITION’ button will set the Lift Mode Upper Limit of the hoist to the Current Position of the hoist.

Row #2) The vertical ‘VISUALIZATION’ bar shows the available travel limits of the hoist in Green.
The ‘LIFT MODE LOWER LIMIT (IN)’ of the hoist is entered here. The “+” and “-“ buttons will increase or decrease this value by 1” per button-press.
The lower ‘SET TO CURRENT POSITION’ button will set the Lift Mode Lower Limit of the hoist to the Current Position of the hoist.

Row #3) The ‘RESET TO PHYSICAL LIMITS’ button will set the hoist’s Lift Travel Limits to the hoist’s Physical Limits.

Buttons) Press the ‘GO TO LIFT LOAD CELL’ button to go to that screen.
Press the ‘GO TO LIFT SPEED LIMITS’ button to go to that screen.

Step 38. Press the “GO TO LIFT SPEED LIMITS” button on the LIFT TRAVEL LIMITS screen.

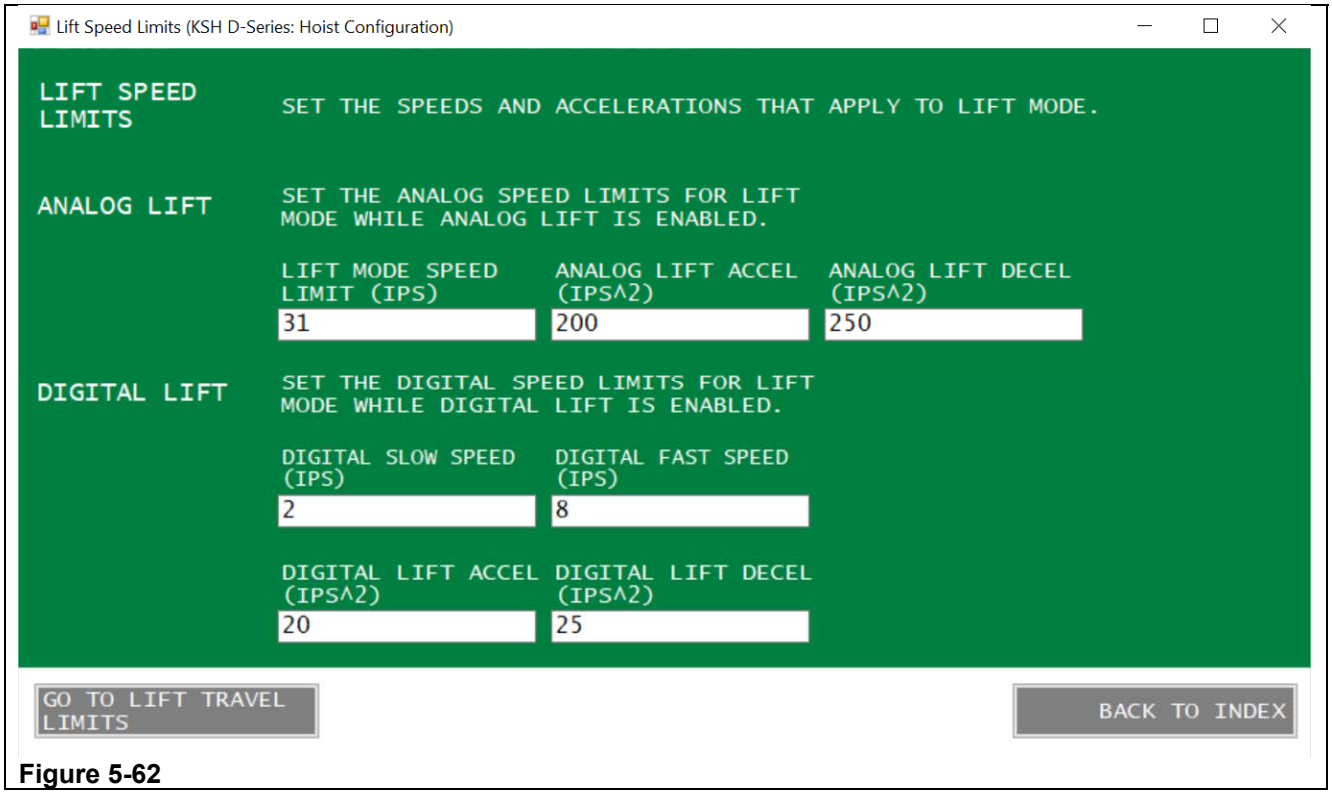


Figure 5-62

Lift Speed Limits screen: (Refer to Figure 5-62)

Row #1) The ‘LIFT MODE SPEED LIMIT (IPS)’ display shows the highest speed allowed to be commanded while in LIFT MODE.
The ‘ANALOG LIFT ACCEL (IPS^2)’ display shows the acceleration setpoint for analog commanded velocity while in LIFT MODE.
The ‘ANALOG LIFT DECEL (IPS^2)’ display shows the deceleration setpoint for analog commanded velocity while in LIFT MODE. This value should be set equal to or higher than the acceleration setpoint for analog commanded velocity.

Row #2) The ‘DIGITAL SLOW SPEED (IPS)’ display shows the command velocity for the slow jog function while in LIFT MODE.
The ‘DIGITAL FAST SPEED (IPS)’ display shows the command velocity for the fast jog function while in LIFT MODE.

Row #3) The ‘DIGITAL LIFT ACCEL (IPS^2)’ display shows the acceleration setpoint for digital commanded velocity while in LIFT MODE.
The ‘DIGITAL LIFT DECEL (IPS^2)’ display shows the deceleration setpoint for digital commanded velocity while in LIFT MODE. This value should be set equal to or higher than the acceleration setpoint for digital commanded velocity.

Buttons) Press the ‘GO TO LIFT TRAVEL LIMITS’ button to go to that screen.
Press the ‘BACK TO INDEX’ Button to go to the HOIST CONFIGURATION INDEX screen.

Note: This screen will show speed limits for what is enabled on the Feature Switchboard screen (Refer to 5.E. Step 30).

Step 39. Press the “FLOAT MODE SETUP” button on the HOIST CONFIGURATION INDEX screen.

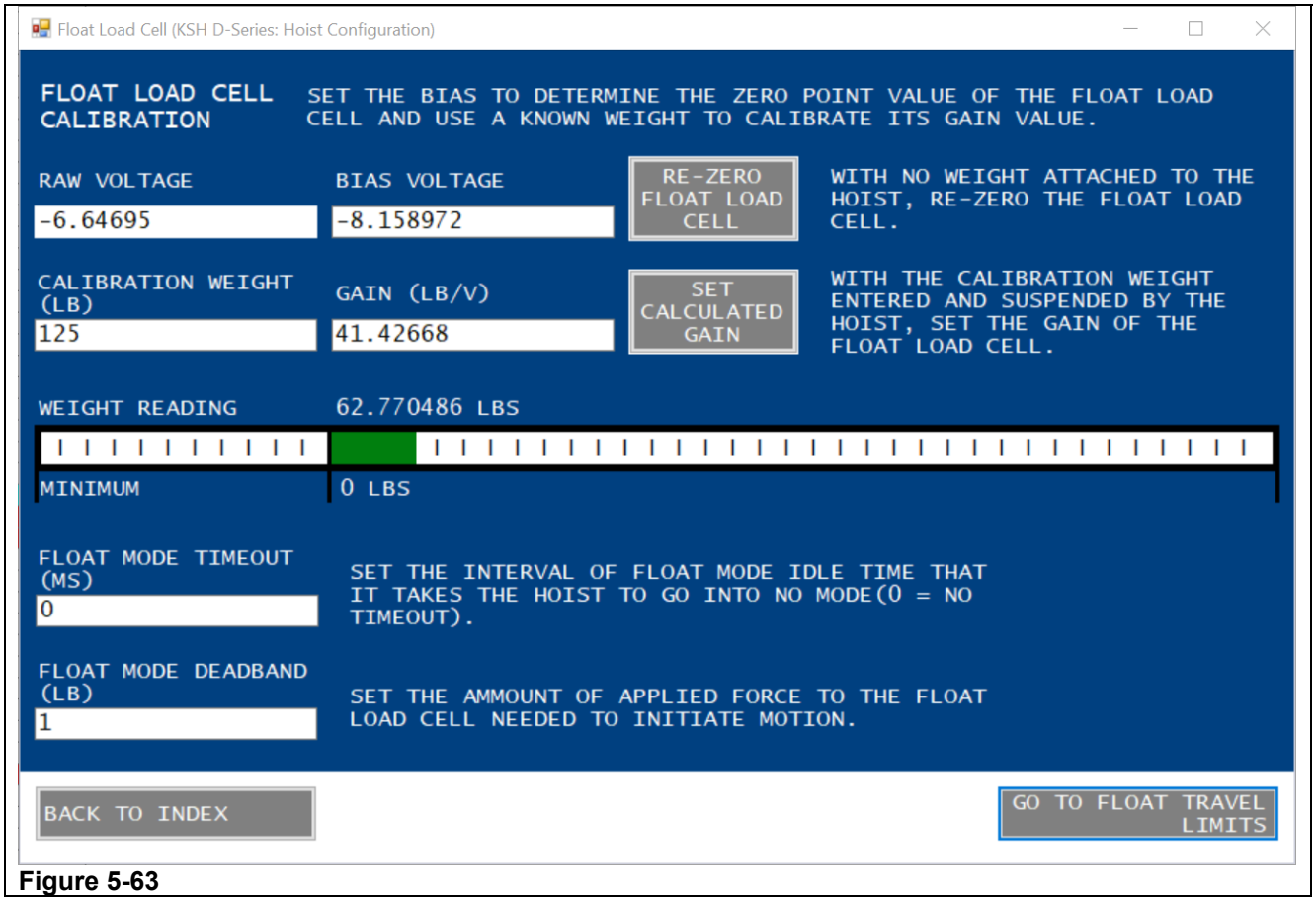


Figure 5-63

Float Load Cell screen: (Refer to Figure 5-63)

Row #1) The ‘RAW VOLTAGE’ display shows the current voltage of the float load cell. The float load cell that measures the weight being suspended from the system.
The ‘BIAS VOLTAGE’ display shows the voltage of the float load cell when there is no weight suspended by the system. This Bias determines the zero point as voltage.
The ‘RE-ZERO FLOAT LOAD CELL’ button should only be pressed if you need to zero the float load cell. Please ensure there is NO weight suspended from the shackle before this button is pressed.

Row#2) The ‘CALIBRATION WEIGHT (LB)’ display shows the known weight that will be hung from the shackle to calibrate the float load cell’s gain. If you need to recalibrate the float load cell, a known weight within the range of half to full capacity of the hoist is preferred.
The ‘GAIN (LB/V)’ display shows the gain value of the float load cell.
The ‘SET CALCULATED GAIN’ button should only be pressed if you need to re-calibrate the float load cell’s gain value. Please ensure that the weight listed in the ‘CALIBRATION WEIGHT’ display is suspended from the inline handle BEFORE this button is pressed.

Row #3) The current weight reading of the float load cell is shown on the ‘WEIGHT READING’ display and the Horizontal weight reading bar.

Row#4) The ‘FLOAT MODE TIMEOUT (MS)’ display allows setting a sleep time in milliseconds. If there have been no commands for the given timeout, Float Mode will disable, disabling the drive and setting the holding brake. A zero timeout will disable this function.

Row#5) The ‘FLOAT MODE DEADBAND’ sets the minimum amount of force required to act upon the suspended load to initiate motion while in FLOAT MODE.

Buttons) Press the ‘BACK TO INDEX’ button to go to the HOIST CONFIGURATION INDEX screen.
If FLOAT MODE is enabled on the FEATRUE SWITCHBOARD screen, Press the ‘GO TO FLOAT TRAVEL LIMITS’ screen to go to that screen.

Note: Rows #4-5 will be shown only if Float Mode is enabled on the Feature Switchboard screen (Refer to 5.E. Step 30).

Step 40. Press the “GO TO FLOAT TRAVEL LIMITS” button on the FLOAT LOAD CELL screen.

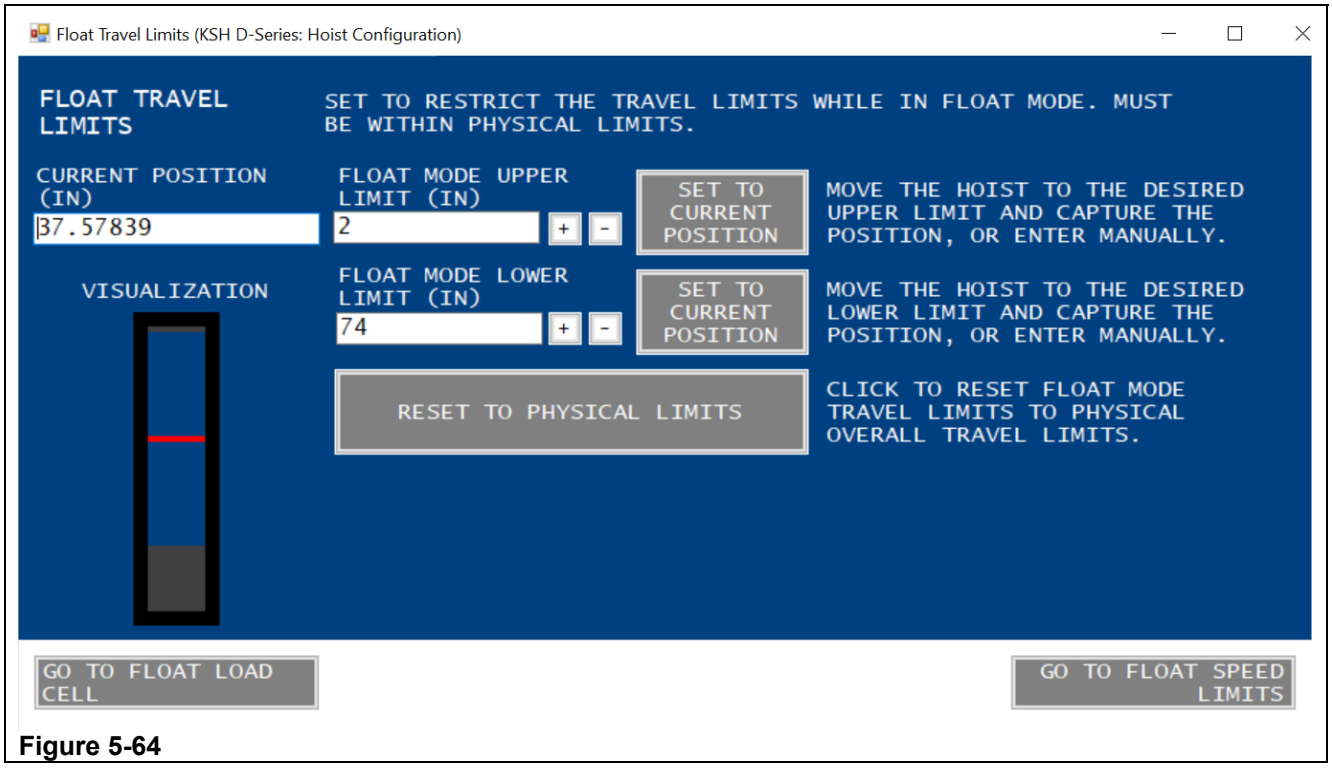


Figure 5-64

Float Travel Limits screen: (Refer to Figure 5-64)

Row #1) The ‘CURRENT POSITION (IN)’ display shows the vertical height measurement of the hoist. The zero position of the hoist is close to the bottom of the hoist. The height measurements increase in magnitude as the hoist’s control handle move towards the ground.
The ‘FLOAT MODE UPPER LIMIT’ is entered here. The “+” and “-“ buttons will increase or decrease this value by 1” per button-press.
The upper ‘SET TO CURRENT POSITION’ button will set the Float Mode Upper Limit of the hoist to the Current Position of the hoist.

Row #2) The vertical ‘VISUALIZATION’ bar shows the available travel limits of the hoist in blue.
The ‘FLOAT MODE LOWER LIMIT’ of the hoist is entered here. The “+” and “-“ buttons will increase or decrease this value by 1” per button-press.
The lower ‘SET TO CURRENT POSITION’ button will set the Float Mode Lower Limit of the hoist to the Current Position of the hoist.

Row #3) The ‘RESET TO PHYSICAL LIMITS’ button will set the hoist’s Float Travel Limits to the hoist’s Physical Limits.

Buttons) Press the ‘GO TO FLOAT LOAD CELL’ button to go to that screen.
Press the ‘GO TO FLOAT SPEED LIMITS’ button to go to that screen.

Step 41. Press the “GO TO FLOAT SPEED LIMITS” button on the FLOAT TRAVEL LIMITS screen.

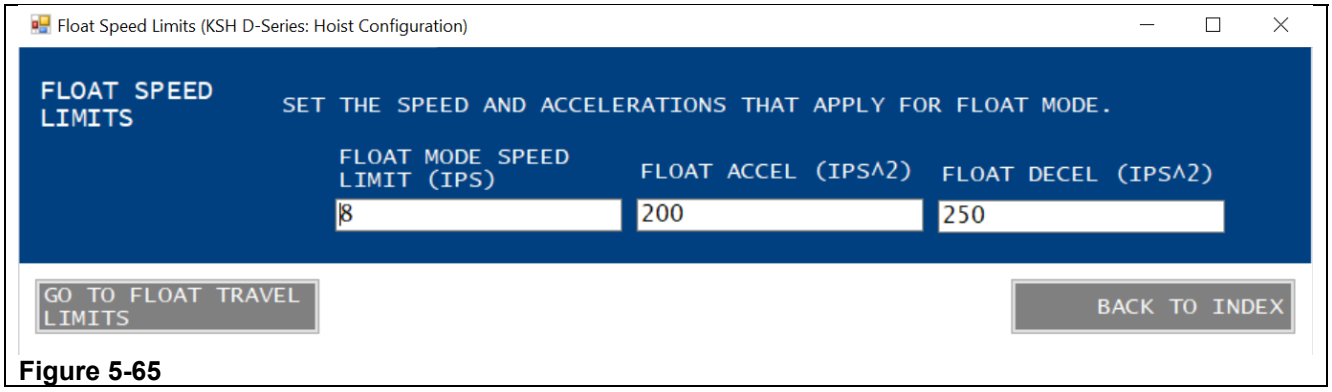


Figure 5-65

Float Speed Limits screen: (Refer to Figure 5-65)

Row #1) The ‘FLOAT MODE SPEED LIMIT (IPS)’ display shows the highest speed allowed to be commanded while in FLOAT MODE.
The ‘FLOAT ACCEL(IPS^2)’ display shows the acceleration setpoint for analog commanded velocity while in FLOAT MODE.
The ‘FLOAT DECEL (IPS^2)’ display shows the deceleration setpoint for analog commanded velocity while in FLOAT MODE. This value should be set equal to or higher than the acceleration setpoint for analog commanded velocity.

Buttons) Press the ‘GO TO FLOAT TRAVEL LIMITS’ button will go to that screen.
Press the ‘BACK TO INDEX’ button to go to the HOIST CONFIGURATION INDEX screen.

Step 42. Press the “FIXTURE WEIGHT” button on the HOIST CONFIGURATION INDEX screen.

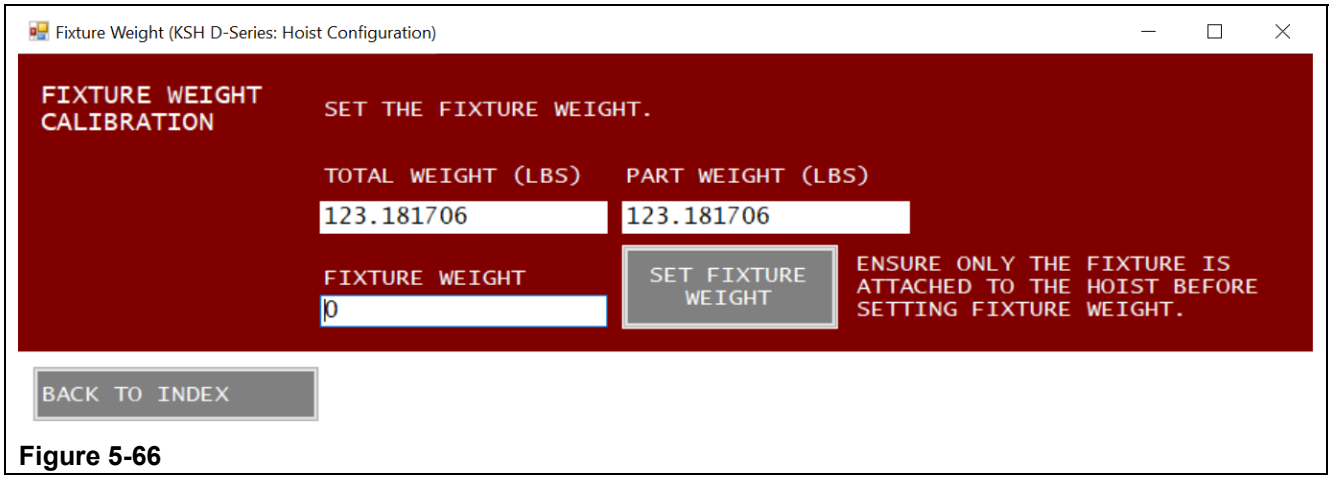


Figure 5-66

Fixture Weight screen: (Refer to Figure 5-66)

Row #1) The ‘TOTAL WEIGHT (LBS)’ display shows the full weight being suspended from the shackle under the inline handle of the hoist. This total weight includes the weight of the part plus the weight of the fixture (if there is a fixture).
The ‘PART WEIGHT (LBS)’ display shows the weight suspended from the shackle of the hoist minus the weight of fixture. (Part Wt. = Total Wt. – Fixture Wt.)

Row #2) The ‘FIXTURE WEIGHT’ display shows the weight of the fixture.
You can enter a known fixture weight directly, or use the ‘SET FIXTURE WEIGHT’ button to capture the weight. This button should not be pressed unless only the weight of the fixture is being suspended from the Inline Handle’s shackle.

Button) Press the ‘BACK TO INDEX’ button to go to the HOIST CONFIGURATION INDEX screen.

Step 43. Press the “SLOW ZONE SETUP” button on the HOIST CONFIGURATION INDEX screen.

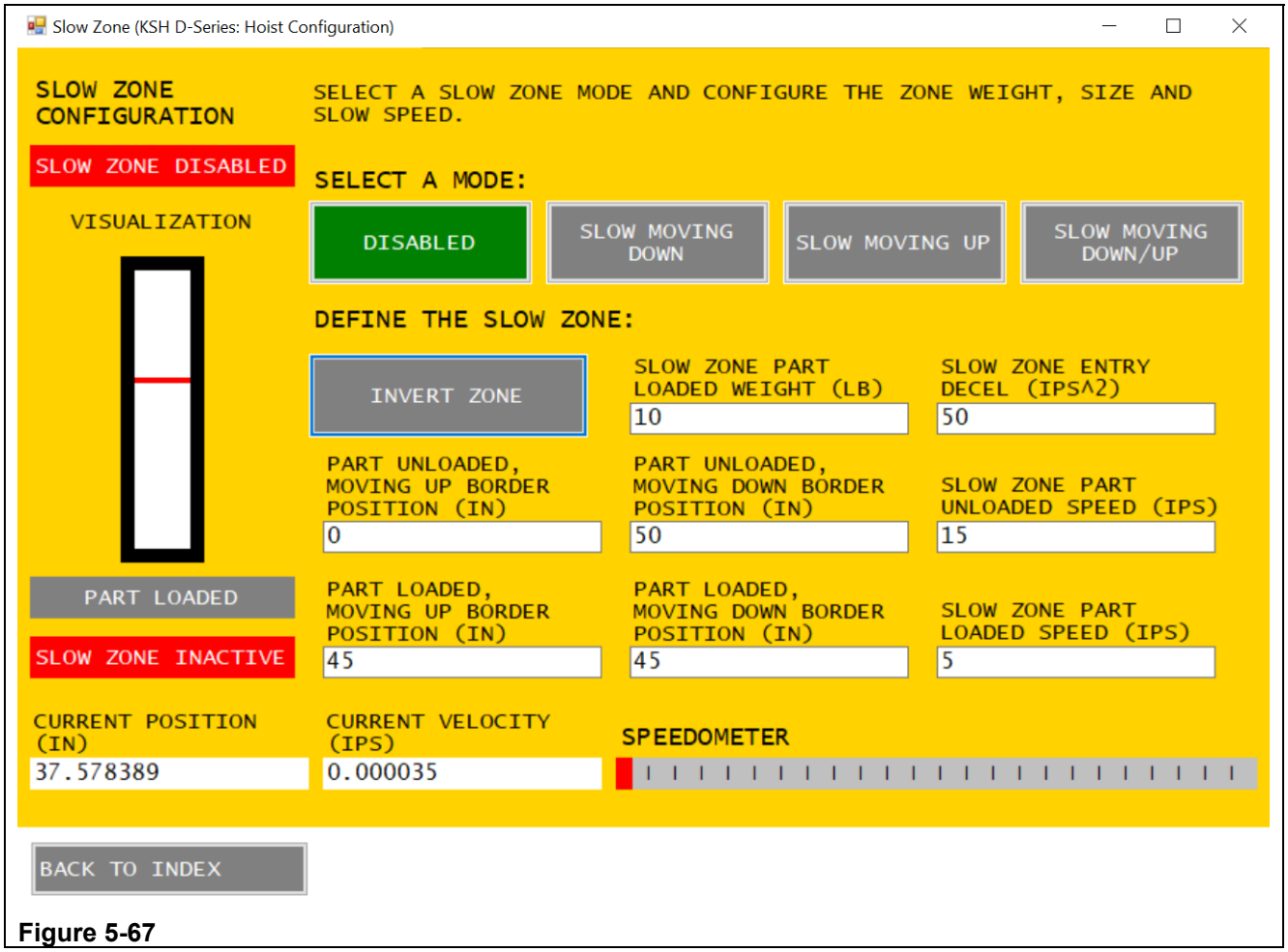


Figure 5-67

Slow Zone Mode screen: (Refer to Figure 5-67)

Row #1) The Slow Zone Enabled Indicator. Green = ON, Red = OFF
The Vertical ‘VISUALIZATION’ bar shows the set Slow Zones in yellow and will change depending on if the hoist is loaded or unloaded.
NOTE: Only one of the four buttons on this row can be active at a time.
The ‘SLOW ZONE DISABLE’ will turn off all Slow Zone Functions.
The ‘SLOW MOVING DOWN’ will activate Slow Zone functions while moving in a downward direction based upon the hoist’s loaded/unloaded conditions and their corresponding position setpoints.
The ‘SLOW MOVING UP’ will activate Slow Zone functions while moving in an upward direction based upon the hoist’s loaded/unloaded conditions and their corresponding position setpoints.
The ‘SLOW MOVING DOWN/UP’ will activate Slow Zone functions while moving in either direction based upon the hoist’s loaded/unloaded conditions and their corresponding position setpoints.

Row #2) The ‘INVERT ZONE’ inverts the function of the Slow Zone position. Normal operation will activate Slow Zone below the position setpoint. If Slow Zone Invert is on then Slow Zone Functions apply above the setpoints instead of below.
The ‘SLOW ZONE PART LOADED WEIGHT (LB)’ display shows the weight setpoint that that determines the Part Loaded condition. This allows switching between different speeds based upon weight, typically with the unloaded speeds being faster.
The ‘SLOW ZONE ENTRY DECEL (IPS^2)’ The maximum deceleration that will be used when entering an active Slow Zone.

(Refer to Figure 5-67)

Row #3) The ‘PART UNLOADED, MOVING UP BORDER POSITION (IN)’ display shows the travel setpoint that triggers Slow Zone functions while the hoist is unloaded and moving upwards.
The ‘PART UNLOADED, MOVING DOWN BORDER POSITION (IN)’ display shows the travel setpoint that triggers Slow Zone functions while the hoist is unloaded and moving downwards.
The ‘SLOW ZONE PART UNLOADED SPEED (IPS)’ display shows the highest velocity that will be commanded while the hoist is unloaded.

Row #4) The gray indicator directly below the visualization will display ‘PART LOADED’ if the weight attached to the hoist is greater than or equal to the ‘SLOW ZONE PART LOADED WEIGHT’ or ‘PART UNLOADED’ if the weight is less than the setpoint. This also indicates which loaded/unloaded Slow Zone border positions are active and is displayed by the visualization.
The ‘SLOW ZONE ACTIVE’ indicator. Green = Active, Red = Inactive.
The ‘PART LOADED, MOVING UP BORDER POSITION (IN)’ display shows the travel setpoint that triggers Slow Zone functions while the hoist is loaded and moving upwards.
The ‘PART LOADED, MOVING DOWN BORDER POSITION (IN)’ display shows the travel setpoint that triggers Slow Zone functions while the hoist is loaded and moving downwards.
The ‘SLOW ZONE PART LOADED SPEED (IPS)’ display shows the highest velocity that will be commanded while the hoist is loaded.

Row #5) The ‘CURRENT POSITION (IN)’ display shows the current position of the hoist in inches.
The current speed of the hoist is shown on the “CURRENT VELOCITY (IPS)’ display and the horizontal ‘SPEEDOMETER’ bar.

Button) Press the ‘BACK TO INDEX’ to go to the HOIST CONFIGURATION INDEX screen.

Step 44. Press the “RESET TO DEFAULTS” button on the SETUP INDEX screen.

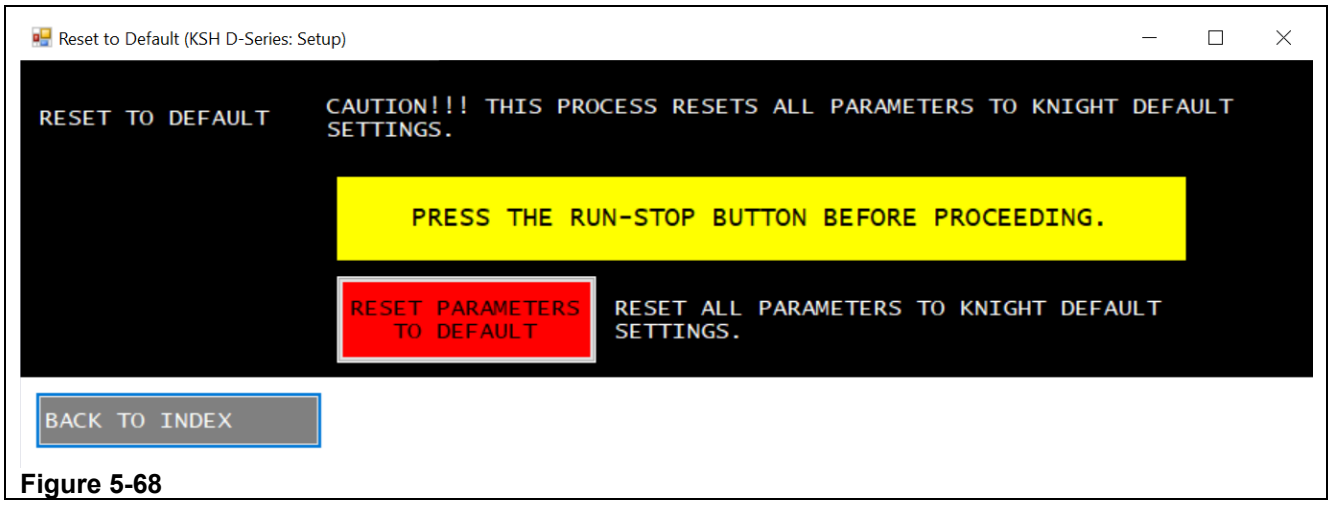


Figure 5-68

Reset to Default screen: (Refer to Figure 5-68)

Row #1) Ensure that the Run-Stop button is pressed before the resetting all parameters to default.

Row #2) The ‘RESET TO DEFAULT’ button will reset a large number of parameters. These settings will return the hoist to a default set of parameters. If all the hardware is connected and in good condition this will restore the hoist to an operable condition, with a generic set of parameters. Use caution when operating the hoist after this change. As an example, the default parameters will overwrite the travel limits and are set up for an eight-foot (8’) coil cord.
If your system has a shorter cord installed you could overstretch the cable and potentially damage it or the hoist.
After a Reset to Default occurs the Total weight reading may be off. If so, recalibrate the Float Load Cell safely.

Button) Press the ‘BACK TO INDEX’ button to return to the SETUP INDEX screen.

Step 45. Press the “RESET ENCODER” button on the SETUP INDEX screen.

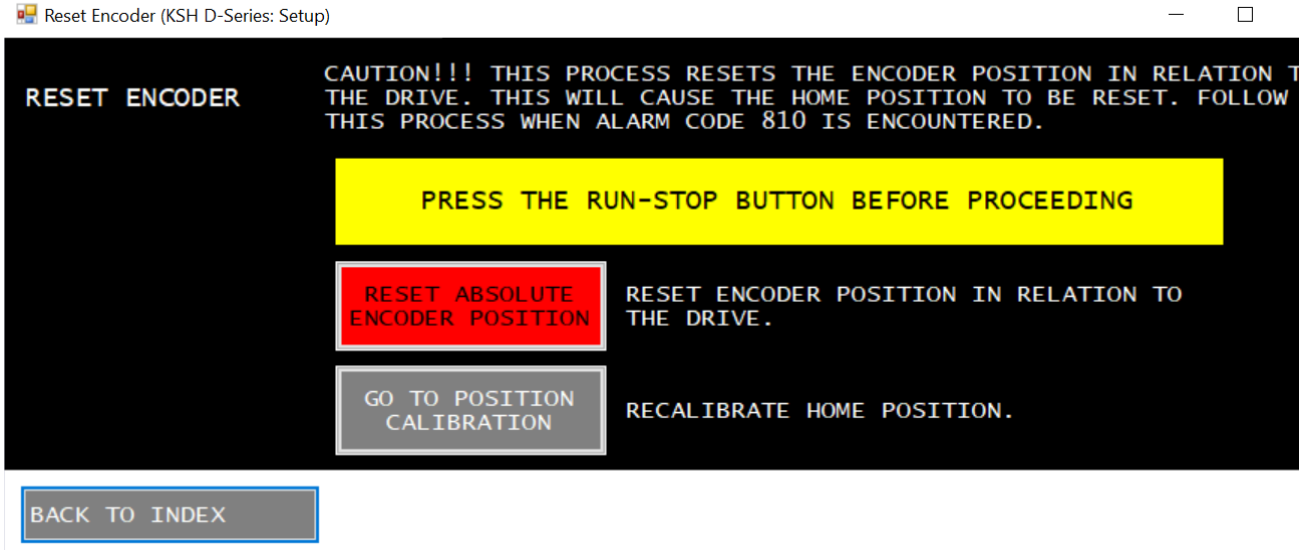


Figure 5-69

Reset Encoder screen: (Refer to Figure 5-69)

Row #1) Ensure that the Run-Stop is pressed before resetting the absolute encoder’s position.

Row #2) Pressing the ‘RESET ABSOLUTE ENCODER POSITION’ will reset the encoder position in relation to the drive and the zero ‘Home’ position will need to be established again (see Step 18). This will also reset the Yaskawa Alarm Code 810.

Row #3) The ‘GO TO POSITION CALIBRATION’ button goes to the Position Calibration screen.

Button) Press the ‘BACK TO INDEX’ button to return to the SETUP INDEX screen.

F. Accessing the Servo Hoist's Fault Log

The servo drive's Fault Log is accessible from its web page.

Step 1. Open your web browser and enter the hoist's IP Address in the address bar. This will be 192.168.2.101 in most cases.

Step 2. The web page will be similar to what is shown in Figure 5-67. The information shown listed under the 'Alarms History' TAB includes the 'Error Class', '(Axis) Error Id', 'Source', 'Timestamp', and 'Description'.

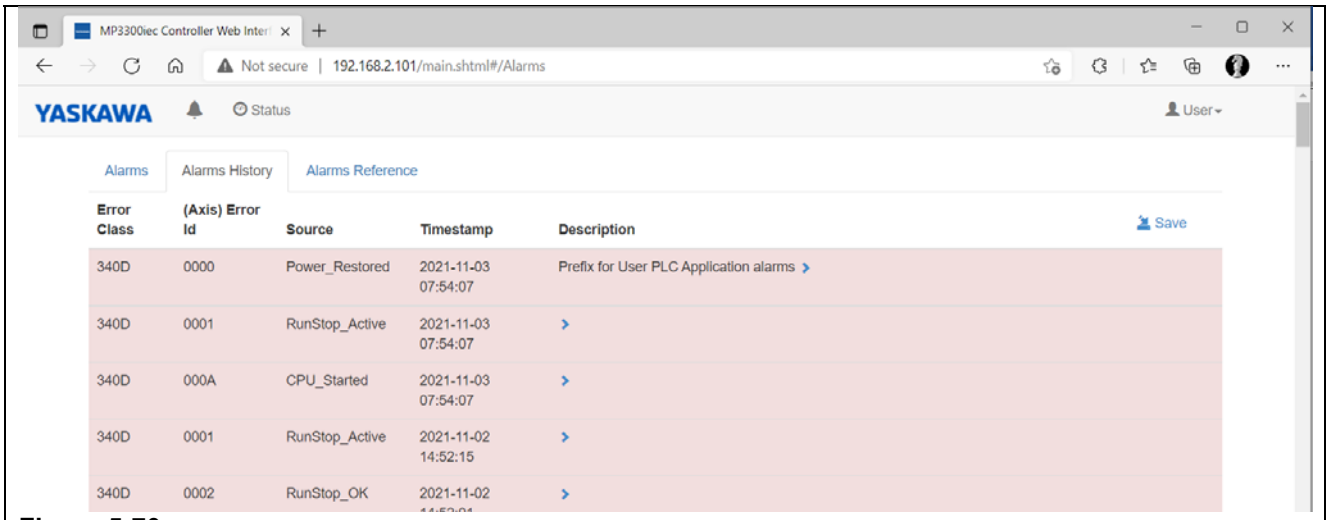


Figure 5-70

Step 3. To receive a more complete description of the fault press the 'Alarms Reference' TAB. Find the row that has the matching 'Error Class' and '(Axis) Error Id' of the fault in question. (Refer to Figure 5-71)

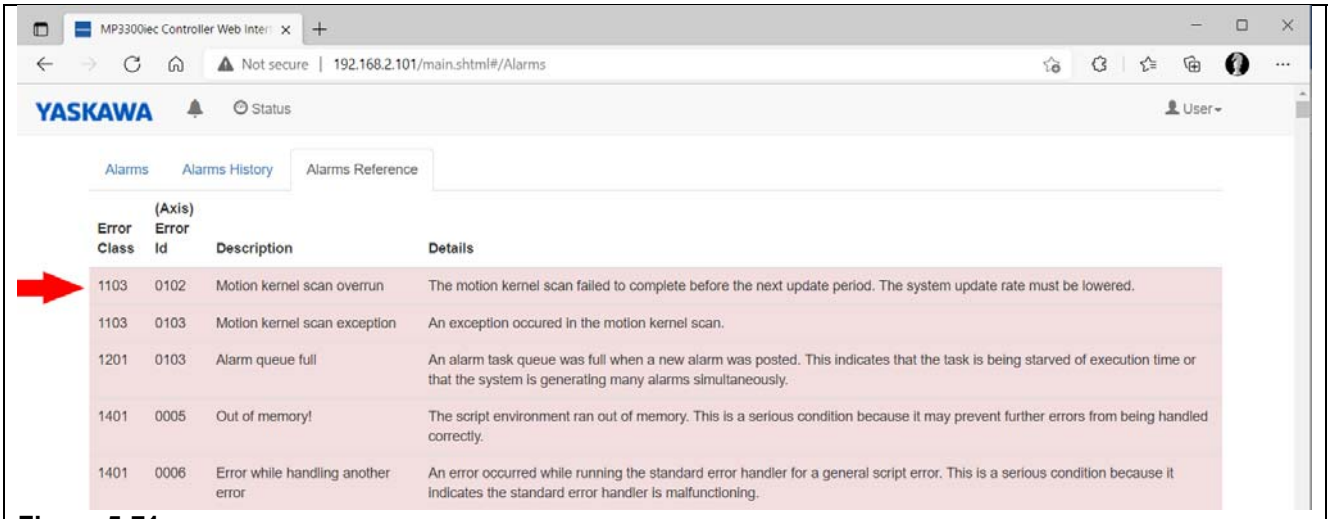


Figure 5-71

Step 4. Any Drive Fault that is currently affecting the system can be found on the screen: KSS Workspace tree location: Status \ Alarms/Warnings. (Refer to Figure 5-72)

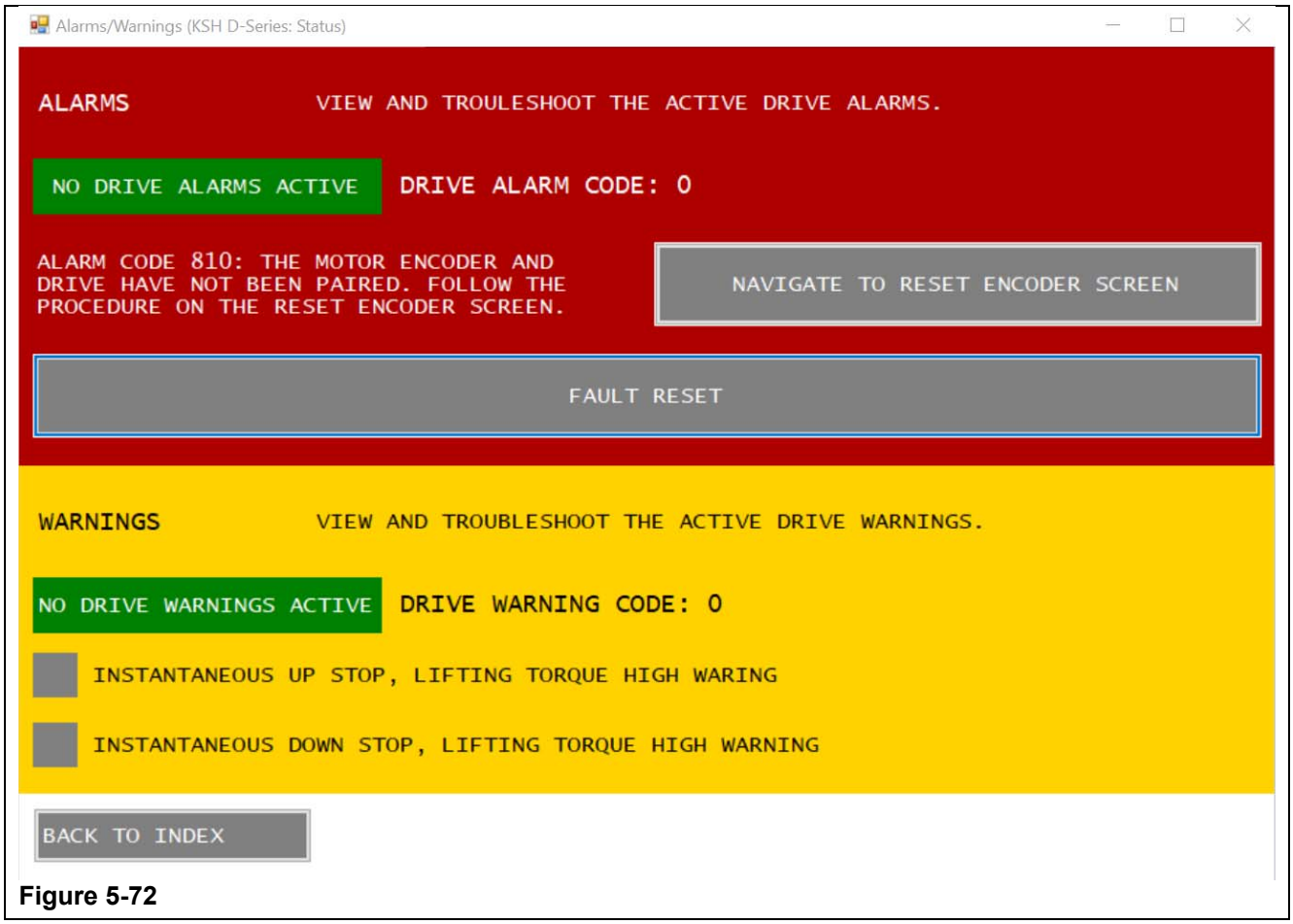


Figure 5-72

6. PARAMETER DESCRIPTIONS

Many of these parameters have equivalent displays located on various Knight Servo Studio (KSS) screens. The location of these screens is listed at the end of each parameter's description. See section 5. 'Software' for an explanation of the shorthand used.

These references are for KSS version 2.2.0

There are several parameter status arrays described in this section:

6.A.) bPRM Parameter Array
6.B.) bSTS Status Array
6.C.) iPRM Parameter Array
6.D.) iSTS Status Array
6.E.) dPRM Parameter Array
6.F.) dSTS Status Array
6.G.) tPRM Parameter Array
6.H.) fPRM Parameter Array
6.I.) fSTS Status Array

A. bPRM Parameter Array

This parameter array lists the settable Boolean Parameter variables of the Servo Hoist that are made available to Knight Servo Studio (KSS).

The parameters listed in the bPRM array are Boolean bits being sent to and from the hoist to the Knight Servo Studio and are displayed at:
KSS Workspace tree location: Knight WO# \ Parameters \ bPRM.

bPRM:0 – Fault Reset
Variable Units: Boolean (0=Off, 1=On)
Description: Command bit sent from KSS to the drive to reset current faults.
KSS Workspace tree location: Knight WO# \ Status \ Alarms/Warnings \ Row 3.

bPRM:1 – Spare

bPRM:2 – Exit Mode
Variable Units: Boolean (0=Off, 1=On)
Description: Command sent from KSS telling the host to exit its current mode.
KSS Workspace tree location: Knight WO# \ Motion \ Remote Control \ Row 4/5.

bPRM:3 – Lift Mode Request
Variable Units: Boolean (0=Off, 1=On)
Description: Request from KSS to enter Lift Mode.
KSS Workspace tree location: Knight WO# \ Motion \ Remote Control \ Row 5.

bPRM:4 – Float Mode Request
Variable Units: Boolean (0=Off, 1=On)
Description: Request from KSS to enter Float Mode.
KSS Workspace tree location: Knight WO# \ Motion \ Remote Control \ Row 4.

bPRM:5 – Pay In
Variable Units: Boolean (0=Off, 1=On)
Description: Command from KSS to start feeding chain into the hoist.
KSS Workspace tree location: Knight WO# \ Motion \ Payout Mode \ Row 5.

bPRM:6 – Pay Out
Variable Units: Boolean (0=Off, 1=On)
Description: Command from KSS to start feeding chain out of the hoist.
KSS Workspace tree location: Knight WO# \ Motion \ Payout Mode \ Row 6.

bPRM:7 – Pay Mode Stop
Variable Units: Boolean (0=Off, 1=On)
Description: Command from KSS to stop Pay out mode from feeding chain into or out of the hoist.
KSS Workspace tree location: Knight WO# \ Motion \ Payout Mode \ Row 5/6.

bPRM:8 – Spare

bPRM:9 – Test Mode Stop
Variable Units: Boolean (0=Off, 1=On)
Description: Command sent from KSS to hoist to stop Test Mode.
KSS Workspace tree location: Knight WO# \ Motion \ Test Mode \ Row 7.

bPRM:10 – Test Mode Start
Variable Units: Boolean (0=Off, 1=On)
Description: Command sent from KSS to the hoist to start Test Mode.
KSS Workspace tree location: Knight WO# \ Motion \ Test Mode \ Row 7.

bPRM:11 – Test Counter Reset
Variable Units: Boolean (0=Off, 1=On)
Description: Command sent from KSS telling the hoist to reset the test counter to zero.
KSS Workspace tree location: Knight WO# \ Motion \ Test Mode \ Row 9.

bPRM:12 – Spare

bPRM:13 – Digital Up
Variable Units: Boolean (0=Off, 1=On)
Description: A digital up command from KSS. The 'JOG UP' button on the Remote Control screen has been pressed.
KSS Workspace tree location: Knight WO# \ Motion\ Remote Control \ Row 7.

bPRM:14 – Digital Down
Variable Units: Boolean (0=Off, 1=On)
Description: A digital Down command from KSS. The 'JOG DOWN' button on the Remote Control screen has been pressed.
KSS Workspace tree location: Knight WO# \ Motion\ Remote Control \ Row 7.

bPRM:15 – Digital Fast
Variable Units: Boolean (0=Off, 1=On)
Description: The 'FAST' Button on the Remote Control screen has been toggled on.
KSS Workspace tree location: Knight WO# \ Motion\ Remote Control \ Row 6.

bPRM:16 – Set Home Position
Variable Units: Boolean (0=Off, 1=On)
Description: The 'SET HOME POSITION' button on the Position Calibration screen has been pressed.
KSS Workspace tree location: Knight WO# \ Setup \ Position Calibration \ Row 3.

bPRM:17 – Float LC Zero
Variable Units: Boolean (0=Off, 1=On)
Description: The 'RE-ZERO FLOAT LOAD CELL' button on the Float Load Cell screen has been pressed.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Float Load Cell \ Row 1.

bPRM:18 – Lift LC Zero
Variable Units: Boolean (0=Off, 1=On)
Description: The 'RE-ZERO LIFT LOAD CELL' button on the Lift Load Cell screen has been pressed.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Load Cell \ Row 1.

bPRM:19 – Float LC Set Gain
Variable Units: Boolean (0=Off, 1=On)
Description: The 'SET GAIN' button on the Float Load Cell screen has been pressed.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Float Load Cell \ Row 2.

bPRM:20 – Spare

bPRM:21 – Reset to Factory Chain
Variable Units: Boolean (0=Off, 1=On)
Description: The 'RESET TO FACTORY DEFAULTS' button in the Physical Limits screen has been pressed.
KSS Workspace tree location (User Level = Basic): Knight WO# \ Hoist Configuration \ Physical Travel Limits \ Row 3.

bPRM:22 – Set Overall Upper Travel Limit
Variable Units: Boolean (0=Off, 1=On)
Description: The 'SET TO CURRENT POSITION' button in the Physical Limits screen has been pressed.
KSS Workspace tree location (User Level = Basic): Knight WO# \ Hoist Configuration \ Physical Travel Limits \ Row 1.

bPRM:23 – Set Overall Lower Travel Limit
Variable Units: Boolean (0=Off, 1=On)
Description: The 'SET TO CURRENT POSITION' button in the Physical Limits screen has been pressed.
KSS Workspace tree location (User Level = Basic): Knight WO# \ Hoist Configuration \ Physical Travel Limits \ Row 2.

bPRM:24 – Reset Lift to Overall Limits
Variable Units: Boolean (0=Off, 1=On)
Description: The 'RESET TO PHYSICAL LIMITS' button in the Lift Travel Limits screen has been pressed.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Travel Limits \ Row 3.

bPRM:25 – Set Lift Upper Travel Limit
Variable Units: Boolean (0=Off, 1=On)
Description: The 'SET CURRENT POSITION' button on the Lift Travel Limits screen has been pressed.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Travel Limits \ Row 1.

bPRM:26 – Set Lift Lower Travel Limit
Variable Units: Boolean (0=Off, 1=On)
Description: The 'SET CURRENT POSITION' button on the Lift Travel Limits screen has been pressed.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Travel Limits \ Row 2.

bPRM:27 – Reset Float to Overall Limits
Variable Units: Boolean (0=Off, 1=On)
Description: The 'RESET TO PHYSICAL LIMITS' button in the Float Travel Limits screen has been pressed.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Float Travel Limits \ Row 3.

bPRM:28 – Set Float Upper Travel Limit
Variable Units: Boolean (0=Off, 1=On)
Description: The 'SET CURRENT POSITION' button on the Float Travel Limits screen has been pressed.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Float Travel Limits \ Row 1.

bPRM:29 – Set Float Lower Travel Limit
Variable Units: Boolean (0=Off, 1=On)
Description: The 'SET CURRENT POSITION' button on the Float Travel Limits screen has been pressed.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Float Travel Limits \ Row 2.

bPRM:30 – Spare

bPRM:31 – Set Fixture Weight
Variable Units: Boolean (0=Off, 1=On)
Description: The 'SET FIXTURE WEIGHT' button on the Fixture Weight screen has been pressed.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Fixture Weight \ Row 2.

bPRM:32 – Enable Stress Relief
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter is used to enable or disable the Stress Relief function.
KSS Workspace tree location: Knight WO# \ Setup \ Feature Switchboard \ Row 4.

bPRM:33 – Enable Impulse Limiting
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter is used to enable or disable the Impulse Limiting function.
KSS Workspace tree location: Knight WO# \ Setup \ Fixture Switchboard \ Row 5.

bPRM:34 – Slow Zone Invert
Variable Units: Boolean (0=Off, 1=On)
Description: The 'INVERT ZONE' button in the Slow Zone screen has been pressed
KSS Workspace tree location: Knight WO# \ Setup \ Slow Zone \ Row 2.

bPRM:35 – Spare

bPRM:36 – Enable Float Mode
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter is used to enable or disable Float Mode.
KSS Workspace tree location: Knight WO# \ Setup \ Feature Switchboard \ Row 1.

bPRM:37 – Enable Digital Lift Mode
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter is used to enable or disable Digital Lift Mode.
KSS Workspace tree location: Knight WO# \ Setup \ Feature Switchboard \ Row 3.
KSS Workspace tree location: Knight WO# \ Motion \ Remote Control \ Row 1

bPRM:38 – Enable Analog Lift Mode
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter is used to enable or disable Analog Lift Mode.
KSS Workspace tree location: Knight WO# \ Setup \ Feature Switchboard \ Row 2.

bPRM:39 through bPRM:40 – Spare

bPRM:41 – Handle Slow Reaction
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter is used to load Slow Reaction settings to change the Inline Handle's response.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Load Cell \ Row 5.

bPRM:42 – Handle Normal Reaction
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter is used to load the Standard Reaction settings for the Inline Handle's response.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Load Cell \ Row 5.

bPRM:43 – Handle Fast Reaction
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter is used to load Fast Reaction settings to change the Inline Handle's response.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Load Cell \ Row 5.

bPRM:44 through bPRM:95 – Spare

bPRM:96 – Reset to Knight Default
Variable Units: Boolean (0=Off, 1=On)
Description: The 'RESET TO DEFAULT' button on the Reset to Default screen has been pressed. This will load factory default values into many of the common parameters. The hoist should move up and down after these values have been loaded. Job specific values may have to be reinputted to various parameters to reflect customer requirements.
KSS Workspace tree location: Knight WO# \ Setup \ Reset to Default \ Row 1.

bPRM:97 – Absolute Encoder Position Reset
Variable Units: Boolean (0=Off, 1=On)
Description: The 'RESET ABSOLUTE ENCODER POSITION' is being pressed. This resets the encoder position in relation to the drive, and the zero 'Home' position will need to be established again immediately after taking this step. DO NOT operate the Hoist without setting or validating the zero or home position.
KSS Workspace tree location: Knight WO# \ Setup \ Reset Encoder \ Row 1.

bPRM:98 – Set Commission Offset
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter is used to record the encoder offset when the system is commissioned.

bPRM:99 – Set New Encoder Offset
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter is used to acknowledge that the Home Position has deviated more than 3" and to set this new offset.
KSS Workspace tree location: Knight WO# \ Setup \ Position Calibration \ Row 4.

bRPM:100 through bPRM:111 – Spare

B. bSTS Status Array

This parameter array lists the Boolean Status variables of the Servo Hoist that are made available to the Knight Servo Studio (KSS).

The parameters listed in the bSTS array are Boolean bits being sent from the hoist to the Knight Servo Studio and are displayed at:
KSS Workspace tree location: Knight WO# \ Parameters \ bSTS.

bSTS:0 – Run-Stop Released
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the Run-Stop button is in the run position and the 19-pin coil cable is connected to the Servo Hoist. It will be a '0' if the Run-Stop button is pressed in or if the 19-pin coil cable is disconnected.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 8.

bSTS:1 – Ready to Enable.
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive is error free and ready to enter a mode.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 1.

bSTS:2 – Drive is Enabled
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive is in a mode, the brake is released, and the hoist is ready for motion.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 2.

bSTS:3 – Axis Alarm Active
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive is experiencing an axis fault.
KSS Workspace tree location: Knight WO# \ Status \ Alarms/Warnings \ Row 1.

bSTS:4 – Axis Stop NOT OK Signal
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's Safe Torque Off circuit is not closed. The Drive will display "HBB" on its 7-segment display if this fault occurs.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 4.

bSTS:5 – Axis Main Circuit Power On
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive is powered on by Line Voltage AC Power.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 1.

bSTS:6 – Axis Servo On
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's axis is in an ON condition.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 2.

bSTS:7 – Axis Warning Active
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive is experiencing an axis warning.
KSS Workspace tree location: Knight WO# \ Status \ Alarms/Warnings \ Row 4.

bSTS:8 – Analog I/O OK
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's analog input and outputs have no faults.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 3.

bSTS:9 – Digital I/O OK
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive is communicating with the VIPA remote I/O.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 3.

bSTS:10 – Drive Homed
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive home position has been established.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 5.

bSTS:11 – MECHATROLINK Error (Power Cycle Required)
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if MECHATROLINK-III communication has been established.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 4.

bSTS:12 – Rapid Position Jump
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive has detected motion that was not commanded or over speeds.
KSS Workspace tree location: Knight WO# \ Status \ Alarms/Warnings \ Row 6.

bSTS:13 – Hardware Match
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the system has passed the validation check.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 5.

bSTS:14 – Drive Warning Active
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive is experiencing a warning. The warning code will be listed on Row #5 of the screen.
KSS Workspace tree location: Knight WO# \ Status \ Alarms/Warnings \ Row 4.

bSTS:15 – Drive Alarm Active
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive is experiencing a fault. The fault code will be listed on Row #1 of the screen.
KSS Workspace tree location: Knight WO# \ Status \ Alarms/Warnings \ Row 1.

bSTS:16 – Lift Mode Active
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive is currently in Lift mode.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 9.

bSTS:17 – Float Mode Active
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive is currently in Float mode.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 10.

bSTS:18 – Payout Mode Active
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive is currently in Payout mode.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 8.

bSTS:19 – Payout Allowed
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if all of the servo drive's hardware and software are ready to go into Payout mode.

bSTS:20 – Test Mode Active
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive is currently in Test mode.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 9.

bSTS:21 – Test Mode Allowed
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive may enter Test mode.

bSTS:22 – Test Counts Complete
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the Test mode has competed the number of cycles listed in 'CYCLE COUNT TARGET' display.
KSS Workspace tree location: Knight WO# \ Motion \ Test Mode \ Row 9.

bSTS:23 – Slow Zone Part Loaded
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the weight attached to the hoist is greater or equal to the fPRM:55 Slow Zone Part Loaded Weight.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Slow Zone \ Row 4.

bSTS:24 – Slow Zone Enabled
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if any of the Slow Zone modes are enabled.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Slow Zone \ Row 1.

bSTS:25 – Safe Start
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the hoist completed a safe start.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Load Cell \ Row 5.

bSTS:26 – Unsafe Start
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the hoist was unable to safe start.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Load Cell \ Row 5.

bSTS:27 through bSTS:31 – Spare

bSTS:32 – Up Stop Active
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive has stopped moving up due to several possibilities. The maximum capacity of the hoist has been exceeded or certain software conditions have been met.
KSS Workspace tree location: Knight WO# \ Status \ Alarms/Warnings \ Row 5.
KSS Workspace tree location: Knight WO# \ Troubleshooting \ Can't Move Up \ Step 5.

bSTS:33 – Down Stop Active
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive has stopped moving down due to several possibilities. The minimum weight of the hoist has been reached or certain software conditions have been met.
KSS Workspace tree location: Knight WO# \ Status \ Alarms/Warnings \ Row 6.
KSS Workspace tree location: Knight WO# \ Troubleshooting \ Can't Move Down \ Step 5.

bSTS:34 – Impulse Limiting Active
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's software has stopped the upwards movement of the hoist due to Impulse Limiting. When this code is enabled, the hoist will sense an instantaneous increase in weight registered by the float load cell and slow the hoist to reduce the impact on the system. Instead of suddenly moving the load upwards, the hoist senses the impulse and automatically slows down to a controlled speed.
KSS Workspace tree location: Knight WO# \ Troubleshooting \ Can't Move Up \ Step 5.
KSS Workspace tree location: Knight WO# \ Troubleshooting \ Can't Move Down \ Step 5.

bSTS:35 – Immediate Stop Active
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's software has initiated an Immediate Stop.
KSS Workspace tree location: Knight WO# \ Troubleshooting \ Can't Move Up \ Step 5.
KSS Workspace tree location: Knight WO# \ Troubleshooting \ Can't Move Down \ Step 5.

bSTS:36 – Slow Zone Active
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the Slow Zone is enabled (bSTS:24 'Slow Zone Enabled') and the inline handle has reached the loaded or unloaded slow zone height.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Slow Zone \ Row 4.

bSTS:37 – Spare

bSTS:38 – Home Deviation
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's home position has deviated more than 3 inches from the commissioned home position.
KSS Workspace tree location: Knight WO# \ Troubleshooting \ Fast Flashing Red Light.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 6.

bSTS:39 – AP_Invalid
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if position data became invalid when returning the actual position of the hoist.
KSS Workspace tree location: Knight WO# \ Troubleshooting \ Fast Flashing Red Light.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 7.

bSTS:39 – AP_Error
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if an error occurred when trying to return the actual position of the hoist.
KSS Workspace tree location: Knight WO# \ Troubleshooting \ Fast Flashing Red Light.
KSS Workspace tree location: Knight WO# \ Status \ System Status \ Row 7.

bSTS:41 through bSTS:95 – Spare

bSTS:96 – M1-DI-0 Run Stop Ok
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #1's digital input #0 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:97 – M1-DI-1 Reserved
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #1's digital input #1 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:98 – M1-DI-2 Reserved
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #1's digital input #2 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:99 – M1-DI-3 Reserved
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #1's digital input #3 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:100 – M1-DI-4 Analog Trigger
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #1's digital input #4 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:101 – M1-DI-5 Green PB
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #1's digital input #5 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:102 – M1-DI-6 Blue PB
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #1's digital input #6 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:103 – M1-DI-7
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #1's digital input #7 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:104 – M2-DI-0
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #2's digital input #0 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:105 – M2-DI-1
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #2's digital input #1 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:106 – M2-DI-2
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #2's digital input #2 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:107 – M2-DI-3
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #2's digital input #3 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:108 – M2-DI-4
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #2's digital input #4 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:109 – M2-DI-5
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #2's digital input #5 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:110 – M2-DI-6
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #2's digital input #6 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:111 – M2-DI-7
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #2's digital input #7 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:112 – M3-DO-0 Red Light
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #3's digital output #0 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:113 – M3-DO-1 Green Light
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #3's digital output #1 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:114 – M3-DO-2 Blue Light
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #3's digital output #2 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:115 – M3-DI-3
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #3's digital output #3 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:116 – M3-DI-4
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #3's digital output #4 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:117 – M3-DI-5
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #3's digital output #5 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:118 – M3-DI-6
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #3's digital output #6 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:119 – M3-DO-7 Motor Brake Released
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays a '1' if the servo drive's module #3's digital output #7 is ON.
KSS Workspace tree location: Knight WO# \ Status \ I/O Status.

bSTS:120 through bSTS:127 – Spare

C. iPRM Parameter Array

This parameter array lists the Integer Parameter variables of the Servo Hoist that are made available to the Knight Servo Studio (KSS).

The parameters listed in the iPRM array are integer values being sent from the Knight Servo Studio to the hoist and are displayed at:
KSS Workspace tree location: Knight WO# \ Parameters \ iPRM.

iPRM:0 – Slow Zone Mode
Variable Units: Choice (0=off, 1=down, 2=up, 3=up and down)
Description: This parameter configures the hoist's automatic slow zone.
This parameter works with the variables fPRM:52 to fPRM:59 to configure the automatic slow zone.
0 = Slow Zone feature is disabled.
1 = Program will automatically decrease the speed of the hoist only when moving down.
2 = Program will automatically decrease the speed of the hoist only when moving up.
3 = Program will automatically decrease the speed of the hoist when moving up or down.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Slow Zone \ Row 1.

NOTE: If using this function, all parameters (fPRM:52 to fPRM:59) must be non-zero for the Slow Zone to function correctly.

iPRM:1 through iPRM:7 – Spare

D. iSTS Parameter Array

This parameter array lists the Integer Status variables of the Servo Hoist that are made available to the Knight Servo Studio (KSS).

The parameters listed in the iSTS array are integer values being sent from the hoist to the Knight Servo Studio and are displayed at:
KSS Workspace tree location: Knight WO# \ Parameters \ iSTS.

iSTS:0 – Drive Warning ID
Variable Units: Software Warning Code
Description: This parameter displays any warning codes that the system is currently experiencing. Please see section 5.F. 'Accessing the Servo Hoist's Fault Log' for instructions on how to access the servo's fault history.
KSS Workspace tree location: Knight WO# \ Status \ Alarms/Warnings \ Row 4.

iSTS:1 – Drive Alarm ID
Variable Units: Software Alarm Code
Description: This parameter displays any fault codes that the system is currently experiencing. See section 5.F. 'Accessing the Servo Hoist's Fault Log' for instructions on how to access the servo's fault history.
KSS Workspace tree location: Status \ Alarms/Warnings \ Row 1.

iSTS:2 – System Number
Description: This parameter displays a second portion of the Knight Global Job Number. The system number increments if there are multiple hoists on the same job number. This second portion always follows the Knight Global Job Number preceded by a dash.
Example: If a '2' is displayed here, then the system's full job number would be: 186042-2
KSS Home screen location: Quick View panel \ Row 6 (Lower right-hand portion of the screen)

iSTS:3 through iSTS:7 – Spare

E. dPRM Parameter Array

This parameter array lists the Double Integer Parameter variables of the Servo Hoist that are made available to the Knight Servo Studio (KSS).

The parameters listed in the dPRM array are double integer values being sent from the Knight Servo Studio to the hoist and are displayed at:
KSS Workspace tree location: Knight WO# \ Parameters \ dPRM.

dPRM:0 – Test Cycle Count Target
Variable Units: Integer
Description: This parameter controls the number of cycles that the servo will execute in Test Mode after it is initiated unless a stop or fault occurs. Setting this parameter to zero will result in the servo not automatically stopping during Test Mode.
KSS Workspace tree location: Knight WO# \ Motion \ Test Mode \ Row 5.

dPRM:1 through dPRM:7 – Spare

F. dSTS Parameter Array

This parameter array lists the Double Integer Parameter variables of the Servo Hoist that are made available to the Knight Servo Studio (KSS).

The parameters listed in the dSTS array are Double Integer values being sent from the hoist to the Knight Servo Studio and are displayed at:
KSS Workspace tree location: Knight WO# \ Parameters \ dSTS.

dSTS:0 – Firmware Version
Variable Units: Integer
Description: This parameter displays the firmware version that the servo is currently running.
KSS Home screen location: Quick View panel \ Row 4 (Lower right-hand portion of the screen).

dSTS:1 – Job Number
Variable Units: Integer
Description: This parameter displays the Knight Global Job Number of the system. Example: 186042.
KSS Home screen location: Quick View panel \ Row 5 (Lower right-hand portion of the screen)

dSTS:2 – Spare

dSTS:3 – Test Cycle Count
Variable Units: Boolean (0=Off, 1=On)
Description: This parameter displays the current count or number of cycles the servo has performed while in Test Mode. This count is resettable.
KSS Workspace tree location: Knight WO# \ Motion \ Test Mode \ Row 9.

dPRM:4 through dPRM:7 – Spare

G. tPRM Parameter Array

This parameter array lists the Timer Parameter variables of the Servo Hoist that are made available to the Knight Servo Studio (KSS).

The parameters listed in the tPRM array are Timer values being sent from the hoist to the Knight Servo Studio and are displayed at:
KSS Workspace tree location: Knight WO# \ Parameters \ tPRM.

tPRM:0 – Test Mode Delay (ms)
Variable Units: Milliseconds
Description: This parameter sets the time delay between upward and downward cycles of the hoist while it is in Test Mode. The hoist will move up, delay at its upper position for this number of milliseconds, move down and then delay at its lower position for this number of milliseconds. This delay should be at least as long as the travel time of the hoist from its upper to its lower limit during the Test Cycle.
KSS Workspace tree location: Knight WO# \ Motion \ Test Mode \ Row 4.

tPRM:1 – Float Mode Timeout (ms)
Variable Units: Milliseconds
Description: This parameter sets the length of time that the hoist will stay in Float Mode without receiving a command. When idle for longer than this specified time, the hoist will disable itself and revert to No Mode. If this variable is set to zero, the hoist will not automatically switch from Float Mode to No Mode.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Float Load Cell \ Row 5.

tPRM:2 – Lift Mode Timeout (ms)
Variable Units: Milliseconds
Description: This parameter sets the length of time that the hoist will stay in Lift Mode without receiving a command. When idle for longer than this specified time, the hoist will disable itself and revert to No Mode. If this variable is set to zero, the hoist will not automatically switch from Lift Mode to No Mode.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Load Cell \ Row 2.

tPRM:3 through tPRM:31 – Spare

H. fPRM Parameter Array

This parameter array lists the Floating-Point Parameter variables of the Servo Hoist that are made available to the Knight Servo Studio (KSS).

NOTE: All measurements increase in value as the fixture moves downward towards the ground.
The parameters listed in the fPRM array are Floating-Point values being sent from the Knight Servo Studio to the hoist and are displayed at:
KSS Workspace tree location: Knight WO# \ Parameters \ fPRM.

fPRM:0 – Overall Reverse/Upper Limit
Variable Units: Inches
Description: This parameter sets the upper travel limit for the hoist. This value should be set to a number greater than or equal to zero. The home position or absolute physical top limit of the hoist's movement is set to zero inches.
KSS Workspace tree location (User Level = Advanced): Knight WO# \ Hoist Configuration \ Physical Limits \ Row 1.

fPRM:1 – Overall Forward/Lower Limit
Variable Units: Inches
Description: This parameter sets the lower travel limit for the hoist. This value should be set to the lowest height you wish the hoist to be able to travel in any mode, but should never exceed the length of the installed coil cable.
KSS Workspace tree location (User Level = Advanced): Knight WO# \ Hoist Configuration \ Physical Limits \ Row 2.

fPRM:2 – Lift Mode Reverse/Upper Limit
Variable Units: Inches
Description: This parameter sets the upper travel limit for the hoist when it is in Lift Mode. This is used to restrict the Lift Mode travel to a position greater than or equal to the overall upper limit set in fPRM:0 'Overall Reverse/Upper Limit'.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Travel Limits \ Row 1.

fPRM:3 – Lift Mode Forward/Lower Limit
Variable Units: Inches
Description: This parameter sets the lower travel limit for the hoist when it is in Lift Mode. This is used to restrict the Lift Mode travel to a position less than or equal to the overall lower limit set in fPRM:1 'Overall Forward/Lower Limit'.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Travel Limits \ Row 2.

fPRM:4 – Float Mode Reverse/Upper Limit
Variable Units: Inches
Description: This parameter sets the upper travel limit for the hoist when it is in Float Mode. This is used to restrict the Float Mode travel to a position greater than or equal to the overall upper limit set in fPRM:0 'Overall Reverse/Upper Limit'. It is recommended that this value be set to a value greater than zero after it is installed. Usually this should be set to a value so the handle cannot inadvertently Float up above the operator's reach.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Float Travel Limits \ Row 1.

fPRM:5 – Float Mode Forward/Lower Limit
Variable Units: Inches
Description: This parameter sets the lower travel limit for the hoist when it is in Float Mode. This is used to restrict the Float Mode travel to a position less than or equal to the overall lower limit set in fPRM:1 'Overall Forward/Lower Limit'.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Float Travel Limits \ Row 2.

fPRM:6 through fPRM:7 – Spare

fPRM:8 – Max Allowed Weight
Variable Units: Pounds
Description: This sets the maximum total static load that the servo hoist is allowed to lift. This includes the weight of the fixture and the part. This cannot be set greater than the rated capacity of the hoist.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Physical Weight Limits \ Row 1.

fPRM:9 – Minimum Weight
Variable Units: Pounds
Description: This parameter limits the weight that the servo hoist will set down on a surface. In other words, if the amount of part weight supported by the hoist measures below this value, the servo hoist will not set down any more weight and hence will not pay out any more chain.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Physical Weight Limits \ Row 1.

fPRM:10 – Fixture Weight
Variable Units: Pounds
Description: This parameter is used to set the static weight of all equipment hanging below the hoist's inline handle. This equipment includes the hook, shackle and fixture.
Note: This parameter must be adjusted if the fixture is modified or replaced.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Fixture Weight \ Row 2.

fPRM11 – AD LF Constant
Variable Units: Real Number
Description: This parameter is used in conjunction with fPRM:12 'AD LF Gain' to reduce low frequency vibrations occurring at the suspended load.
KSS Workspace tree location (User Level = Advanced): Knight WO# \ Tuning \ Active Dampening \ Row 1.

fPRM:12 – AD LF Gain
Variable Units: Real Number
Description: This parameter is used in conjunction with fPRM:11 'AD LF Constant' to reduce low frequency vibrations occurring at the suspended load.
KSS Workspace tree location: Knight WO# \ Tuning \ Active Dampening \ Row 1.

fPRM:13 – AD HF Constant
Variable Units: Real Number
Description: This parameter is used in conjunction with fPRM:14 'AD HF Gain' to reduce high frequency vibrations occurring at the suspended load.
KSS Workspace tree location (User Level = Advanced): Knight WO# \ Tuning \ Active Dampening \ Row 2.

fPRM:14 – AD HF Gain
Variable Units: Real Number
Description: This parameter is used in conjunction with fPRM:13 'AD HF Constant' to reduce high frequency vibrations occurring at the suspended load.
KSS Workspace tree location (User Level = Advanced): Knight WO# \ Tuning \ Active Dampening \ Row 2.

fPRM:15 – AD Ramp Down Min Gain
Variable Units: Real Number
Description: This parameter sets the lowest point the velocity-based ramp-down multiplier can reach.
KSS Workspace tree location (User Level = Advanced): Knight WO# \ Tuning \ Active Dampening \ Row 3.

fPRM:16 – AD Ramp Down Start Position
Variable Units: Inches
Description: This parameter sets the point at which the active damping velocity starts to ramp down based on position.
KSS Workspace tree location (User Level = Advanced): Knight WO# \ Tuning \ Active Dampening \ Row 3.

fPRM:17 – AD Ramp Down End Position
Variable Units: Inches
Description: This parameter sets the point at which the position-based ramp reaches its minimum multiplier value.
KSS Workspace tree location (User Level = Advanced): Knight WO# \ Tuning \ Active Dampening \ Row 3.

fPRM:18 – Spare

fPRM:19 – Max Speed Unloaded
Variable Units: Inches per second
Description: This parameter sets the maximum speed of the hoist when it is not supporting any weight.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Physical Speed Limits \ Row 1.

fPRM:20 – Max Speed Full Load
Variable Units: Inches per second
Description: This parameter sets the maximum speed of the hoist when it is supporting its rated capacity.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Physical Speed Limits \ Row 1.

fPRM:21 – Spare

fPRM:22 – Safe Start Max Force
Variable Units: Pounds
Description: This parameter sets the maximum force that can be exerted on the Inline Handle when a motion request is initiated by the operator. Force on the handle must be less than this parameter when the enabling trigger is pulled or the system will stay in Unsafe Start mode and the green light will flash.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Load Cell \ Row 4.

fPRM:23 through fPRM:25 – Spare

fPRM:26 – Float Mode Speed Limit
Variable Units: Inches per second
Description: This parameter sets the maximum velocity of the hoist when it is in Float Mode.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Float Speed Limits \ Row 1.

fPRM:27 – Lift Mode Speed Limit
Variable Units: Inches per second
Description: This parameter sets the maximum lift velocity for the hoist while in Lift Mode.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Speed Limits \ Row 1.

fPRM:28 – Digital Fast Speed
Variable Units: Inches per second
Description: This parameter sets the command velocity of the hoist when a digital up or down command is processed and the parameter bPRM:15 'Digital Fast' is set to a '1'.
Note: This can be activated from the screen located at Knight WO# \ Motion \ Remote Control \ Row 6.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Speed Limits \ Row 2.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Motion \ Remote Control \ Row 2.

fPRM:29 – Digital Slow Speed
Variable Units: Inches per second
Description: This parameter sets the command velocity of the hoist when a digital up or down command is processed and the parameter bPRM:15 'Digital Fast' is set to a '0'.
Note: This can be activated from the screen located at Knight WO# \ Motion \ Remote Control \ Row 6.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Speed Limits \ Row 2.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Motion \ Remote Control \ Row 2.

fPRM:30 – Digital Lift Accel
Variable Units: Inches per second^2
Description: This parameter sets the command acceleration for the hoist when a digital up or down command is initiated.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Speed Limits \ Row 3.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Motion \ Remote Control \ Row 3.

fPRM:31 – Digital Lift Decel
Variable Units: Inches per second^2
Description: This parameter sets the command deceleration for the hoist when a digital up or down command is completed.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Speed Limits \ Row 3.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Motion \ Remote Control \ Row 3.

fPRM:32 – Analog Lift Accel
Variable Units: Inches per second^2
Description: This parameter sets the acceleration of the hoist when using analog up/down controls such as the Inline Handle.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Speed Limits \ Row 1.

fPRM:33 – Analog Lift Decel
Variable Units: Inches per second^2
Description: This parameter sets the deceleration of the hoist when using analog up/down controls such as the Inline Handle.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Speed Limits \ Row 1.

fPRM:34 – Float Accel
Variable Units: Inches
Description: This parameter sets the acceleration of the hoist when in Float Mode.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Float Speed Limits \ Row 1.

fPRM:35 – Float Decel
Variable Units: Inches
Description: This parameter sets the deceleration of the hoist when in Float Mode.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Float Speed Limits \ Row 1.

fPRM:36 – Lift LC Command Force Limit
Variable Units: Pounds
Description: This parameter sets the maximum lift command that can be given to the hoist via an analog handle. Any force that exceeds this limit when applied to an analog handle, will be truncated to this limit in either direction.

fPRM:37 – Lift LC Deadband
Variable Units: Pounds
Description: This parameter sets the minimum amount of input force that is required to be registered on an inline handle to start motion.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \Lift Load Cell \ Row 3.

fPRM:38 – Spare

fPRM:39 – Test Mode Reverse/Upper Limit
Variable Units: Inches
Description: This parameter sets the upper travel limit for the hoist when it is moving in Test Mode. This is used to restrict the Test Mode travel to a position greater than the overall upper limit set in fPRM:0 'Overall Reverse/Upper Limit'.
KSS Workspace tree location: Knight WO# \ Motion \ Test Mode \ Row 1.

fPRM:40 – Test Mode Forward/Lower Limit
Variable Units: Inches
Description: This parameter sets the lower travel limit for the hoist when it is moving in Test Mode. This is used to restrict the Test Mode travel to a position less than the overall lower limit set in fPRM:1 'Overall Forward/Lower Limit'.
KSS Workspace tree location: Knight WO# \ Motion \ Test Mode \ Row 1.

fPRM:41 – Test Mode Velocity
Variable Units: Inches per second
Description: This parameter sets the velocity of the hoist while it is in Test Mode.
KSS Workspace tree location: Knight WO# \ Motion \ Test Mode \ Row 2.

fPRM:42 – Test Mode Accel
Variable Units: Inches per second^2
Description: This parameter sets the acceleration of the hoist while it is in Test Mode.
KSS Workspace tree location: Knight WO# \ Motion \ Test Mode \ Row 3.

fPRM:43 – Test Mode Decel
Variable Units: Inches per second^2
Description: This parameter sets the deceleration of the hoist while it is in Test Mode.
KSS Workspace tree location: Knight WO# \ Motion \ Test Mode \ Row 3.

fPRM:44 – Spare

fPRM:45 – Float Deadband
Variable Units: Pounds
Description: This parameter sets the amount of input force that is required to be registered on the fixture or part to start motion while the hoist is in Float Mode.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Setup \ Float Load Cell \ Row 6.

fPRM:46 and fPRM:47 – Spare

fPRM:48 – Payout Mode Torque Limit (%)
Variable Units: Percentage
Description: This parameter sets the maximum torque that is generated by the servo motor while the servo is in Payout Mode.
KSS Workspace tree location: Knight WO# \ Motion \ Payout Mode \ Row 3.

fPRM:49 – Payout Mode Speed (ips)
Variable Units: Inches per second
Description: This parameter sets the velocity of the hoist while the servo is in Payout Mode.
KSS Workspace tree location: Knight WO# \ Motion \ Payout Mode \ Row 1.

fPRM:50 – Payout Backoff Distance (in)
Variable Units: Inches
Description: This parameter sets the distance the hoist will attempt to move in the opposite direction after the payout mode's torque limit has been exceeded. This is typically a small distance intended to reduce the binding effect experienced during chain replacement or upon reaching the end of the chain or chain stop.
KSS Workspace tree location: Knight WO# \ Motion \ Payout Mode \ Row 2.

fPRM:51 – Spare

fPRM:52 – Slow Zone Part Loaded Speed
Variable Units: Inches per second
Description: This parameter limits the speed of the hoist when a part is loaded and it is below the fPRM:53 'Slow Zone Part Loaded Position' parameter.
This parameter is only processed if the Slow Zone is turned on. i.e. [iPRM:0 'Slow Zone Mode' is non-zero].
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Slow Zone \ Row 4.

fPRM:53 – Slow Zone Part Loaded Position
Variable Units: Inches
Description: This parameter sets the height that the hoist will start to run at a reduced speed when a part is loaded and the hoist is moving down.
This parameter is only processed if the Slow Zone is turned on. i.e. [iPRM:0 'Slow Zone Mode' is non-zero].
NOTE: The current position of the hoist is visible in fSTS:0 'Current Position (in)' or on the Quick View panel / Row 1 (Lower right-hand portion of the screen).
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Slow Zone \ Row 4.

fPRM:54 – Slow Zone Part Loaded Position2
Variable Units: Inches
Description: This parameter sets the height that the hoist will start to run at a reduced speed when a part is loaded and the hoist is moving up.
This parameter is only processed if the Slow Zone is turned on. i.e. [iPRM:0 'Slow Zone Mode' is non-zero].
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Slow Zone \ Row 4.

fPRM:55 – Slow Zone Part Loaded Weight
Variable Units: Pounds
Description: This parameter sets the number of pounds that the hoist needs to register in order to determine that a part is loaded on the hoist/fixture.
This parameter is only processed if the Slow Zone is turned on. i.e. [iPRM:0 'Slow Zone Mode' is non-zero].
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Slow Zone \ Row 2.

fPRM:56 – Slow Zone Part Unloaded Speed
Variable Units: Inches per second
Description: This parameter limits the speed of the hoist when a part is not loaded and it is below the fPRM:57 'Slow Zone Part Unloaded Position' parameter.
This parameter is only processed if the Slow Zone is turned on. i.e. [iPRM:0 'Slow Zone Mode' is non-zero].
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Slow Zone \ Row 3.

fPRM:57 – Slow Zone Part Unloaded Position
Variable Units: Inches
Description: This parameter sets the height that the hoist will start to run at a reduced speed when a part is not loaded and the hoist is moving down.
This parameter is only processed if the Slow Zone is turned on. i.e. [iPRM:0 'Slow Zone Mode' is non-zero].
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Slow Zone \ Row 3.

fPRM:58 – Slow Zone Part Unloaded Position2
Variable Units: Inches
Description: This parameter sets the height that the hoist will start to run at a reduced speed when a part is not loaded and the hoist is moving up.
This parameter is only processed if the Slow Zone is turned on. i.e. [iPRM:0 'Slow Zone Mode' is non-zero].
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Slow Zone \ Row 3.

fPRM:59 – Slow Zone Max Decel
Variable Units: Inches per second^2
Description: This parameter sets the deceleration constant when the hoist approaches the slow zone and transitions from the normal speed to the reduced speed.
This parameter is only processed if the Slow Zone is turned on. i.e. [iPRM:0 'Slow Zone Mode' is non-zero].
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Slow Zone \ Row 2.

fPRM:60 – Spare

fPRM:61 – Impulse Limiting Speed
Variable Units: Inches per second
Description: This parameter sets the speed that the hoist will slow to when impulse limiting is enabled and a sudden increase in weight is detected.
KSS Workspace tree location (User Level = Advanced): Knight WO# \ Tuning \ Impulse Limiting \ Row 1.

fPRM:62 – Impulse Limiting Max Speed
Variable Units: Seconds
Description: This parameter limits the command reference while impulse limiting is active to create a better transition when coming out of impulse limiting and returning to normal operation.
KSS Workspace tree location (User Level = Advanced): Knight WO# \ Tuning \ Impulse Limiting \ Row 2.

fPRM:63 – Impulse Limiting Scale Factor
Variable Units: Real Number
Description: Multiplier for impulse filter weight used when determining impulse limiting threshold weight.
KSS Workspace tree location (User Level = Advanced): Knight WO# \ Tuning \ Impulse Limiting \ Row 3.

fPRM:64 – Impulse Limiting Offset
Variable Units: Pounds
Description: Impulse offset in pounds used to determine minimum impulse threshold weight.
KSS Workspace tree location (User Level = Advanced): Knight WO# \ Tuning \ Impulse Limiting \ Row 4.

fPRM:65 – Impulse Limiting Filter Constant
Variable Units: Real Number
Description: Filter Constant for Impulse Detection.
KSS Workspace tree location (User Level = Advanced): Knight WO# \ Tuning \ Impulse Limiting \ Row 5.

fPRM:66 – Spare

fPRM:67 – Calibration Weight
Variable Units: Pounds
Description: This parameter sets the weight that is hung from the shackle in order to calibrate the float load cell's gain when pressing the 'SET GAIN' button on Float Load Cell screen. This weight should be greater than one half the hoist capacity as a minimum, up to the maximum capacity of the hoist.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Float Load Cell \ Row 2.

fPRM:68 – Lift LC Gain
Variable Units: Pounds / Volt
Description: This parameter is typically static and should not be changed. It shows the gain value of the 750lb lift load cell located inside the inline handle. The nominal value is 26 lb/v.

fPRM:69 – Float LC Gain
Variable Units: Pounds / Volt
Description: This parameter shows the gain value of the float load cell. The nominal value is 44 lb/v.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Float Load Cell \ Row 2.

fPRM:70 – Spare

fPRM:71 – Lift LC Bias
Variable Units: Volts
Description: This parameter represents the voltage of the lift load cell captured when there is no force being exerted on it. Normal operation captures this shortly after the Run-Stop button is released.
NOTE: This represents the 'zero' state of the load cell that measures the force being exerted on the inline handle.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Load Cell \ Row 1.

fPRM:72 – Float LC Bias
Variable Units: Volts
Description: This parameter represents the voltage of the float load cell when no weight is suspended from the inline handle.
NOTE: This represents the 'zero' state of the load cell that measures the force exerted by the load suspended from the hoist.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Float Load Cell \ Row 1.

fPRM:73 through fPRM:79 – Spare

I. fSTS Status Array

This parameter array lists the Floating-Point Status variables of the Servo Hoist that are made available to the Knight Servo Studio (KSS).

The parameters listed in the fSTS array are Floating-Point values being sent from the hoist to the Knight Servo Studio and are displayed at:
KSS Workspace tree location: Knight WO# \ Parameters \ fSTS.

fSTS:0 – Current Position (in)
Variable Units: Inches
Description: This parameter shows the height of the inline handle at this moment. It is measured in inches downward from where the zero position was set.
KSS Workspace tree location: Knight WO# \ Setup \ Position Calibration \ Row 3.
KSS Home screen location: Quick View panel \ Row 1 (Lower right-hand portion of the screen).

fSTS:1 – Total Weight (lbs)
Variable Units: Pounds
Description: This parameter shows the current weight that the hoist is supporting below the inline handle. This includes both the fixture weight and part weight.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Float Load Cell \ Row 4.
KSS Home screen location: Quick View panel \ Row 3 (Lower right-hand portion of the screen).

fSTS:2 – Lift LC Raw Voltage (V)
Variable Units: Volts
Description: This parameter shows the actual unbiased voltage of the lift load cell. This is the load cell that measures the force being exerted on the inline handle.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Load Cell \ Row 1.

fSTS:3 – Feedback Torque (%)
Variable Units: Percentage
Description: This parameter shows the servo motor's actual Feedback Torque.
KSS Workspace tree location: Knight WO# \ Motion \ Payout Mode \ Row 4.

fSTS:4 – Float LC Raw Voltage (V)
Variable Units: Volts
Description: This parameter shows the actual unbiased voltage of the float load cell. This is the load cell that measures the weight being suspended by the system.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Float Load Cell \ Row 1.

fSTS:5 – Part Weight (lbs)
Variable Units: Pounds
Description: This parameter shows the weight that is currently suspending from the inline handle minus the system's fixture weight.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Fixture Weight \ Row 1.

fSTS:6 – Active Up Stop Weight (lbs)
Variable Units: Pounds
Description: This parameter shows the active weight limit that will trigger an Up Stop fault which will inhibit further upwards motion. This parameter changes depending on which mode has currently been selected.
KSS Workspace tree location: Knight WO# \ Troubleshooting \ Can't Move Up \ Step 2.

fSTS:7 – Active Down Stop Weight (lbs)
Variable Units: Pounds
Description: This parameter shows the active weight limit that will trigger a Down Stop fault which will inhibit further downwards motion. This parameter changes depending on which mode has currently been selected.
KSS Workspace tree location: Knight WO# \ Troubleshooting \ Can't Move Down \ Step 2.

fSTS:8 – Active Reverse/Upper Limit (in)
Variable Units: Inches
Description: This parameter shows the upper travel limit that is currently in effect. This parameter changes depending on which mode has currently been selected.
KSS Workspace tree location: Knight WO# \ Troubleshooting \ Can't Move Up \ Step 3.

fSTS:9 – Active Forward/Lower Limit (in)
Variable Units: Inches
Description: This parameter shows the lower travel limit that is currently in effect. This parameter changes depending on which mode has currently been selected.
KSS Workspace tree location: Knight WO# \ Troubleshooting \ Can't Move Down \ Step 3.

fSTS:10 – Command Velocity (ips)
Variable Units: Inches per second
Description: This parameter displays the instantaneous commanded velocity of the hoist.

fSTS:11 – Current Velocity (ips)
Variable Units: Inches per second
Description: This parameter displays the current feedback velocity of the hoist.
KSS Home screen location: Quick View panel \ Row 2 (Lower right-hand portion of the screen).

fSTS:12 – Lift Load Cell Pounds (lb)
Variable Units: Pounds
Description: This parameter displays the amount of force applied to the lift load cell in pounds.
KSS Workspace tree location: Knight WO# \ Hoist Configuration \ Lift Load Cell \ Row 4.

fSTS:13 – Encoder Offset Record
Variable Units: Inches
Description: This parameter displays the recorded offset of the encoder at the hoist's home position.
KSS Workspace tree location: Knight WO# \ Setup \ Position Calibration \ Row 3.

fSTS:14 – Active Encoder Offset
Variable Units: Inches
Description: This parameter displays the active offset of the encoder at the hoist's home position.
KSS Workspace tree location: Knight WO# \ Setup \ Position Calibration \ Row 4.

fSTS:15 – Commissioned Encoder Offset
Variable Units: Inches
Description: This parameter displays the offset of the encoder at the hoist's home position when the system was commissioned

fSTS:16 through fSTS:127 – Spare

7. TROUBLESHOOTING

There are several troubleshooting screens described in this section:

7.A.) Troubleshooting Screens
7.B.) System Activity screens including Faults, Warnings and Error Codes
7.C.) Troubleshooting Inputs and Outputs
7.D.) Troubleshooting Chart

A. Troubleshooting Screens

There are several Troubleshooting screens covered in this section. Each of these screens is listed below and can be accessed inside the Knight Servo Studio (KSS) software from:

KSS Workspace tree location: Troubleshooting \ …

7.1) Unable to Connect
7.2) Can't Enter Lift Mode screen
7.3) Can't Enter Float Mode screen
7.4) Can't Move Up screen
7.5) Can't Move Down screen
7.6) Slow Flashing Red Light screen
7.7) Fast Flashing Red Light screen
7.8) Flashing Green Light screen
7.9) Alternating Red/Green Light screen
7.10) Solid Red Light screen
7.11) Solid Green Light screen
7.12) Solid Blue Light screen
7.13) Solid Green/Blue Light screen
7.14) Motion Drift screen

7.1) Unable to Connect

This screen lists the steps to trace down the reason why Knight Servo Studio is unable to connect to the hoist. (Refer to Figure 7-1)

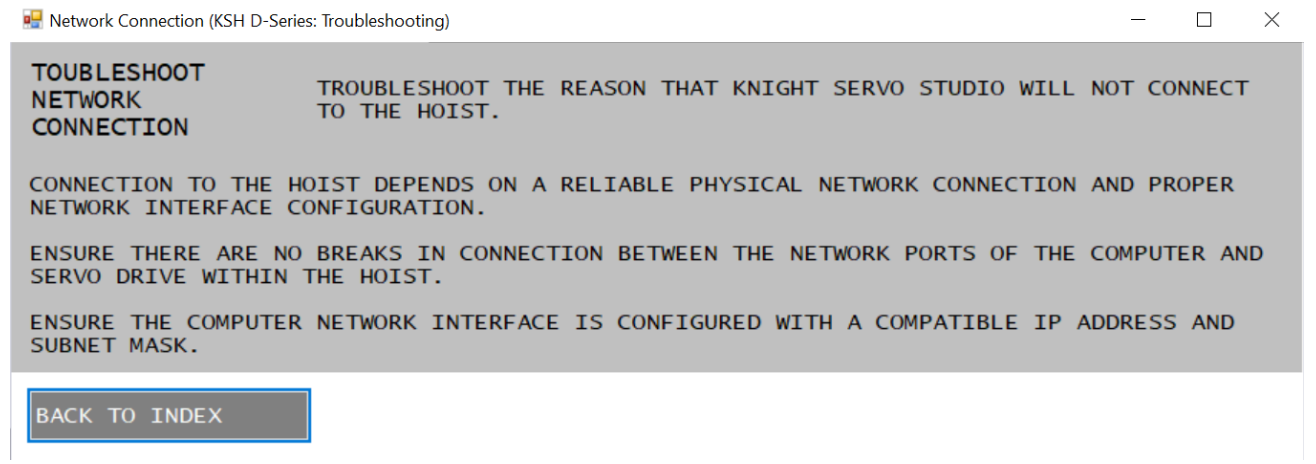


Figure 7-1

7.2) Can't Enter Lift Mode screen

This screen lists the steps to trace down the reason why the hoist will not enter Lift Mode.

In section (I), if the indicator box is green then the function is on, but if the indicator box is gray or red then the function is off or faulted.
In section (II), if the indicator box is green then the function is on, but if the indicator box is gray then the function is off.

If the hoist will not enter Lift Mode, ensure all of the conditions listed on the screen below are met. (Refer to Figure 7-2)

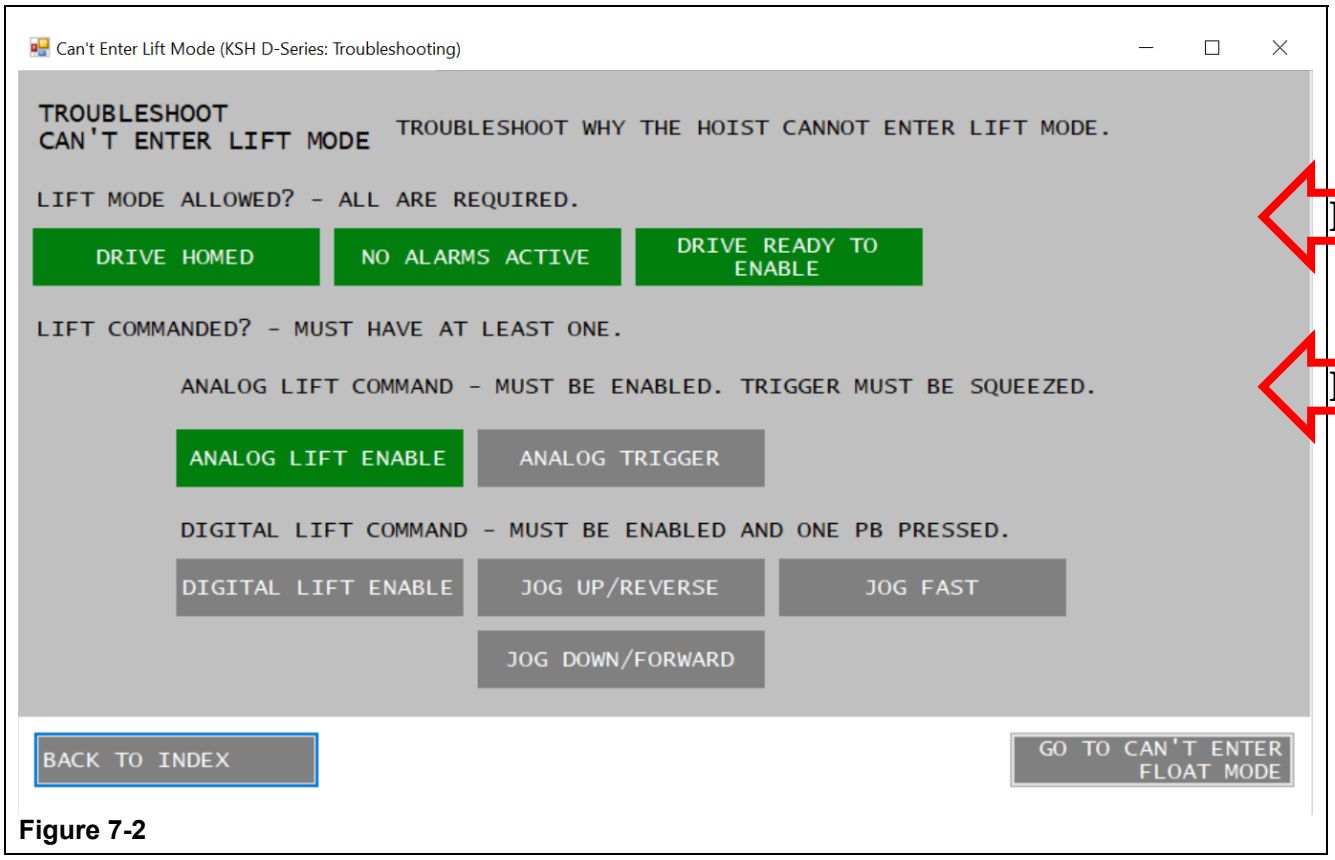


Figure 7-2

7.3) Can't Enter Float Mode screen

This screen lists the steps to trace down the reason why the hoist will not enter Float Mode.

In section (I), if the indicator box is green then the function is on, but if the indicator box is gray or red then the function is off or faulted.

If the hoist will not enter Float Mode, ensure all of the conditions listed on the screen below are met. (Refer to Figure 7-3)

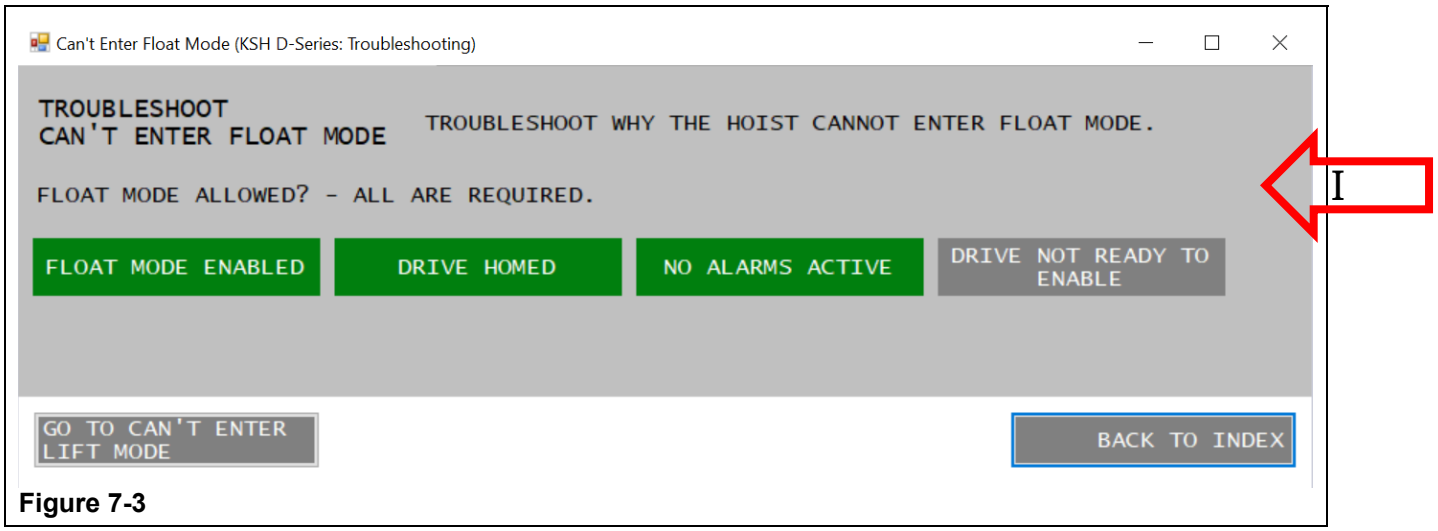


Figure 7-3

7.4) Can't Move Up screen

This screen lists the steps to trace down the reason why the hoist won't move upwards.

In section (I), if the indicator box is green then the function is on, but if the indicator box is gray then the function is off.
In section (II), the current measured weight is shown as well as the Up Stop weight.
In section (III), the current position is shown as well as the upper limit of the hoist.
In section (IV), both of the load cell voltages are shown in real time.
In section (V), is listing four different functions:

(1) If this indicator box is red then the hoist's Rapid Position Jump condition is active, but if it is green this condition is off. If the Rapid Position Jump is active then the software is preventing the hoist from moving up. Reset the encoder and re-home the drive to clear this condition.
(2) If this indicator box is red then the hoist's Up Stop condition is active, but if it is green this condition is off. If an Up Stop is active then the software is preventing the hoist from moving up.
(3) If this indicator box is red then the hoist's Immediate Stop condition is active, but if it is green this condition is off. If an Immediate Stop is active then the software is preventing the hoist from moving up.
(4) If this indicator box is red then the hoist's Impulse Limiting function is active, but if it is green this function is off. If Impulse Limiting is active then the software is preventing the hoist from moving up.

If the hoist won't move up, ensure all of the conditions listed on the screen below are met. (Refer to Figure 7-4)

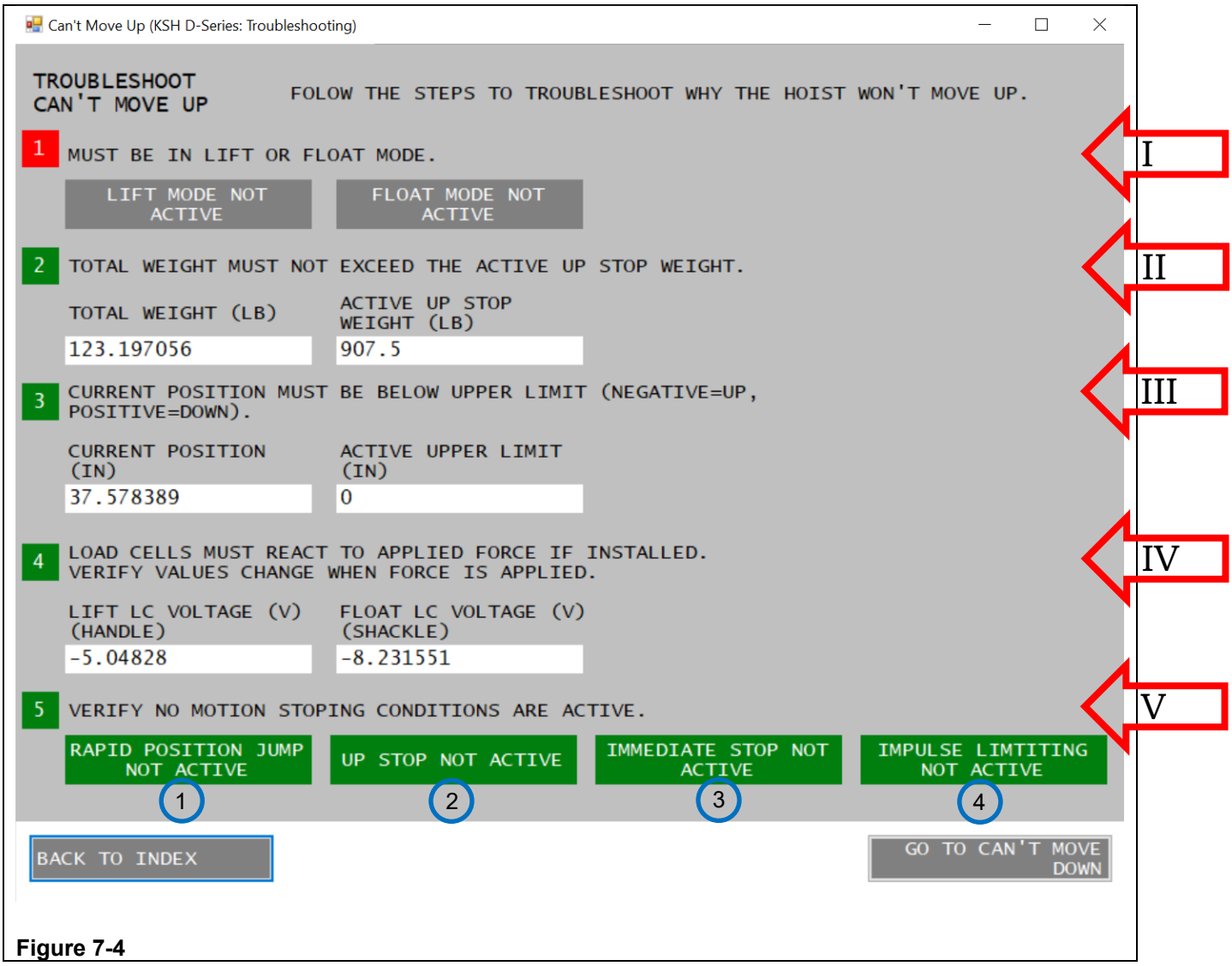

Can't Move Up (KSH D-Series: Troubleshooting)
TROUBLESHOOT CAN'T MOVE UP
FOLOW THE STEPS TO TROUBLESHOOT WHY THE HOIST WON'T MOVE UP.
1 MUST BE IN LIFT OR FLOAT MODE.
LIFT MODE NOT ACTIVE
FLOAT MODE NOT ACTIVE
2 TOTAL WEIGHT MUST NOT EXCEED THE ACTIVE UP STOP WEIGHT.
TOTAL WEIGHT (LB)
123.197056
ACTIVE UP STOP WEIGHT (LB)
907.5
3 CURRENT POSITION MUST BE BELOW UPPER LIMIT (NEGATIVE=UP, POSITIVE=DOWN).
CURRENT POSITION (IN)
37.578389
ACTIVE UPPER LIMIT (IN)
0
4 LOAD CELLS MUST REACT TO APPLIED FORCE IF INSTALLED. VERIFY VALUES CHANGE WHEN FORCE IS APPLIED.
LIFT LC VOLTAGE (V) (HANDLE)
-5.04828
FLOAT LC VOLTAGE (V) (SHACKLE)
-8.231551
5 VERIFY NO MOTION STOPING CONDITIONS ARE ACTIVE.
RAPID POSITION JUMP NOT ACTIVE
UP STOP NOT ACTIVE
IMMEDIATE STOP NOT ACTIVE
IMPULSE LIMTITING NOT ACTIVE
1
2
3
4
BACK TO INDEX
GO TO CAN'T MOVE DOWN
I
II
III
IV
V

Figure 7-4

7.5) Can't Move Down screen

This screen lists the steps to trace down the reason why the hoist won't move down.

In section (I), if the indicator box is green then the function is on, but if the indicator box is gray then the function is off.
In section (II), the current part weight is shown as well as the Down Stop weight.
In section (III), the current position is shown as well as the lower limit of the hoist.
In section (IV), both of the load cell voltages are shown in real time.
In section (V), is listing three different functions:

(1) If this indicator box is red then the hoist's Rapid Position Jump condition is active, but if it is green this condition is off. If the Rapid Position Jump is active then the software is preventing the hoist from moving up. Reset the encoder and re-home the drive to clear this condition.

(2) If this indicator box is red then the hoist's Down Stop condition is active, but if it is green this condition is off. If a Down Stop is active then the software is preventing the hoist from moving down.

(3) If this indicator box is red then the hoist's Immediate Stop condition is active, but if it is green this condition is off. If an Immediate Stop is active then the software is preventing the hoist from moving down.

If the hoist won't move down ensure all of the conditions listed on the screen below are met. (Refer to Figure 7-5)

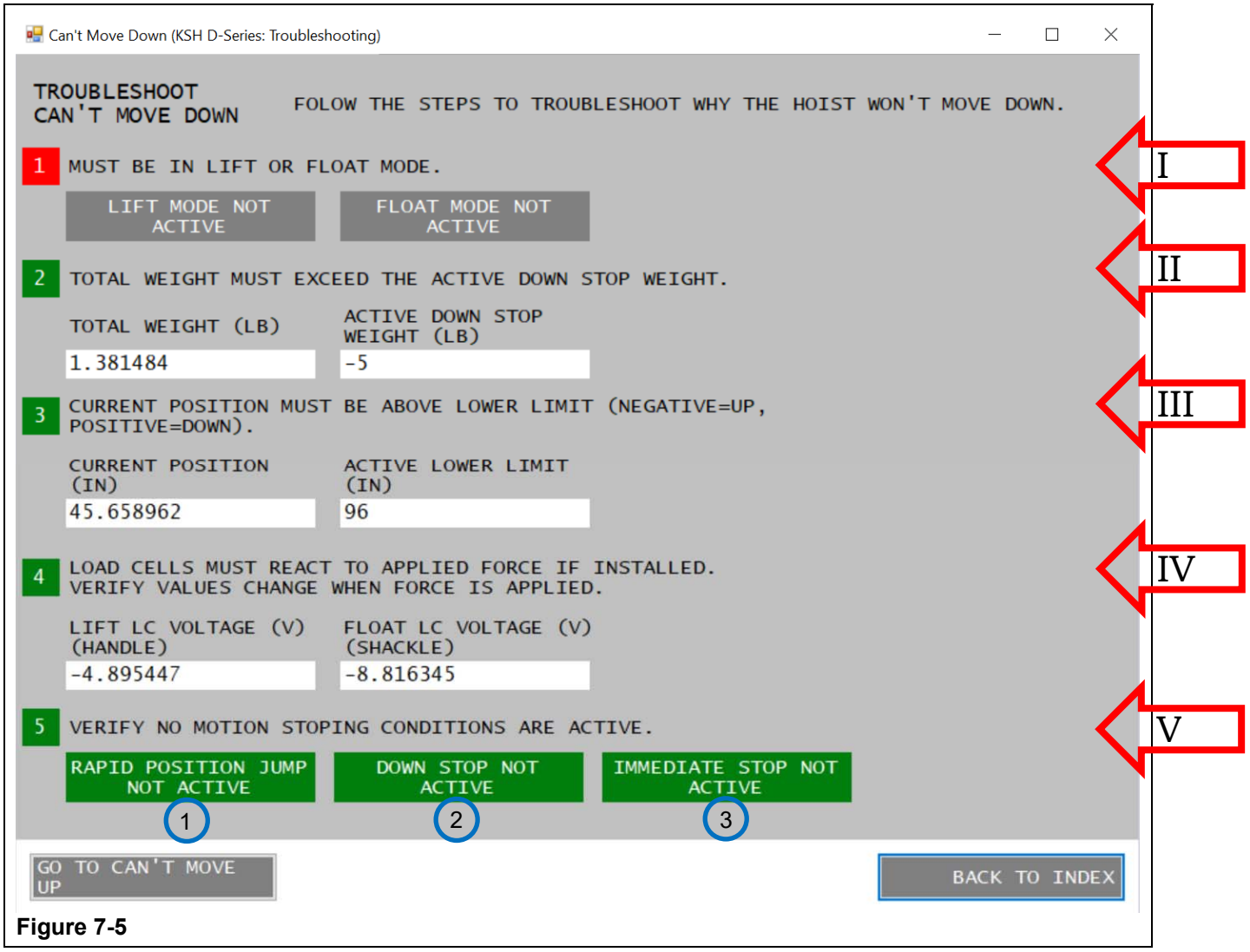


Figure 7-5

7.6) Slow Flashing Red Light screen

This screen lists the steps to trace down the reason why the hoist's red light is flashing slowly.

In section (I), is the navigation button to go to the Alarms/Warnings screen.

If the hoist's red light is flashing slowly, press the 'GO TO ALARMS / WARNINGS' button.
(Refer to Figure 7-6)

Also, refer to section 5.F. 'Accessing the Servo Hoist's Fault Log' for instructions on how to access the system's fault log through the servo's web page.

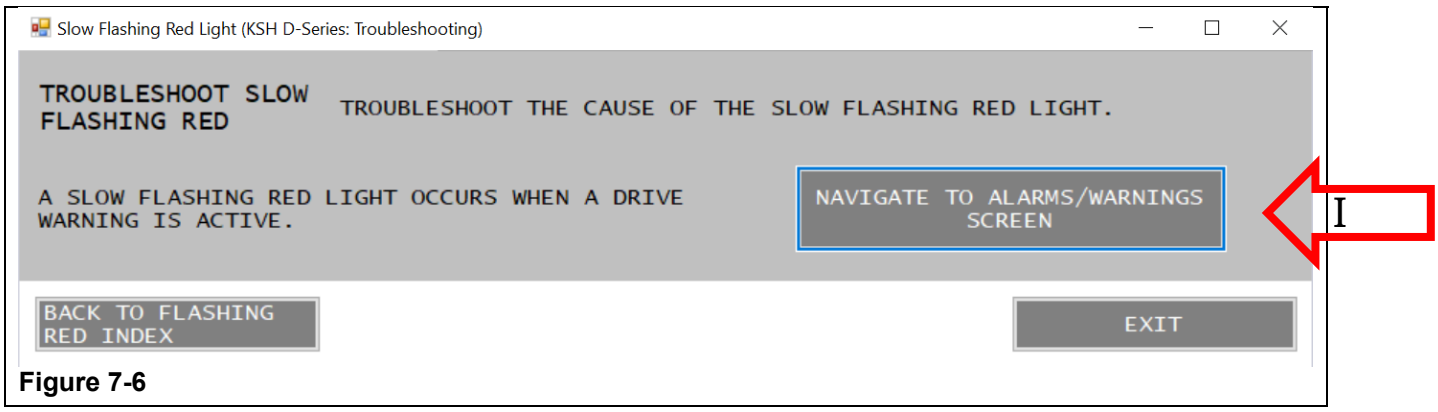


Figure 7-6

7.7) Fast Flashing Red Light screen

This screen lists the steps to trace down the reason why the hoist's red light is flashing fast.

In section (I), if the indicator banner is green then the Drive Alarm is not active, but if banner the is red then the Drive Alarm is active.
In section (II), is the navigation button to go to the Alarms / Warning screen.
In section (III), if the indicator banner is green then the Home Deviation Alarm is not active, but if the banner is red then the Home Deviation Alarm is active.
In section (IV), is the navigation button to go to the Position Calibration screen.
In section (V), if the indicator banner is green then the AP (Actual Position) Invalid Alarm is not active, but if the banner is red then the AP Invalid Alarm is active.
In section (VI), if the indicator banner is green then the AP Error Alarm is not active, but if the banner is red then the AP Error Alarm is active.
In section (VII), if the indicator banner is green then the Rapid Position Jump Alarm is not active, but if the banner is red then the Rapid Position Jump Alarm is active.
In section (VIII), is the navigation button to go to the Reset Encoder screen.

If the hoist's red light is flashing fast, follow the steps clear the active alarm(s) on the screen
(Refer to Figure 7-7)

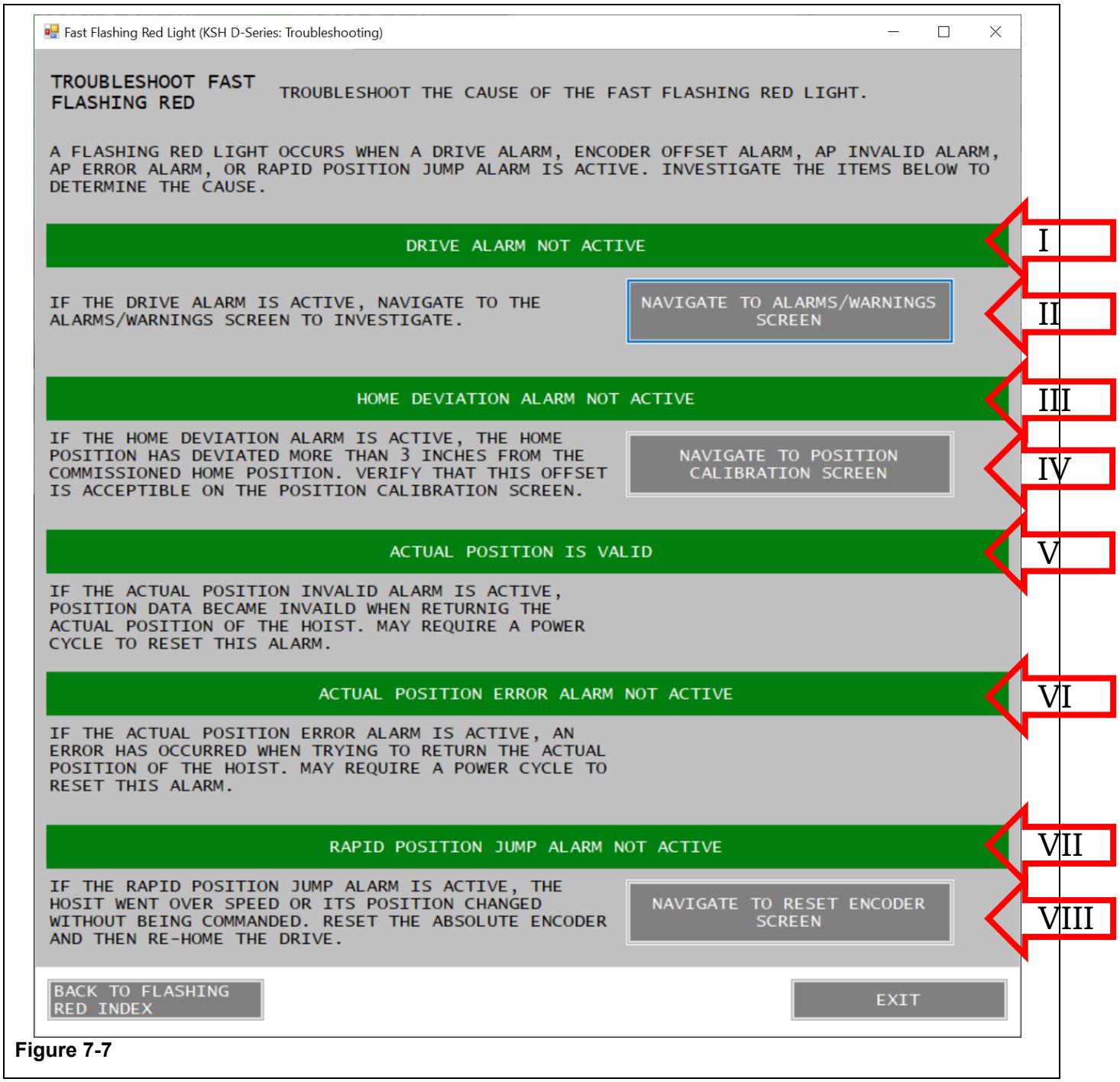

Fast Flashing Red Light (KSH D-Series: Troubleshooting)
TROUBLESHOOT FAST FLASHING RED
TROUBLESHOOT THE CAUSE OF THE FAST FLASHING RED LIGHT.
A FLASHING RED LIGHT OCCURS WHEN A DRIVE ALARM, ENCODER OFFSET ALARM, AP INVALID ALARM, AP ERROR ALARM, OR RAPID POSITION JUMP ALARM IS ACTIVE. INVESTIGATE THE ITEMS BELOW TO DETERMINE THE CAUSE.
DRIVE ALARM NOT ACTIVE
I
IF THE DRIVE ALARM IS ACTIVE, NAVIGATE TO THE ALARMS/WARNINGS SCREEN TO INVESTIGATE.
NAVIGATE TO ALARMS/WARNINGS SCREEN
II
HOME DEVIATION ALARM NOT ACTIVE
III
IF THE HOME DEVIATION ALARM IS ACTIVE, THE HOME POSITION HAS DEVIATED MORE THAN 3 INCHES FROM THE COMMISSIONED HOME POSITION. VERIFY THAT THIS OFFSET IS ACCEPTIBLE ON THE POSITION CALIBRATION SCREEN.
NAVIGATE TO POSITION CALIBRATION SCREEN
IV
ACTUAL POSITION IS VALID
V
IF THE ACTUAL POSITION INVALID ALARM IS ACTIVE, POSITION DATA BECAME INVAILD WHEN RETURNIG THE ACTUAL POSITION OF THE HOIST. MAY REQUIRE A POWER CYCLE TO RESET THIS ALARM.
ACTUAL POSITION ERROR ALARM NOT ACTIVE
VI
IF THE ACTUAL POSITION ERROR ALARM IS ACTIVE, AN ERROR HAS OCCURRED WHEN TRYING TO RETURN THE ACTUAL POSITION OF THE HOIST. MAY REQUIRE A POWER CYCLE TO RESET THIS ALARM.
RAPID POSITION JUMP ALARM NOT ACTIVE
VII
IF THE RAPID POSITION JUMP ALARM IS ACTIVE, THE HOSIT WENT OVER SPEED OR ITS POSITION CHANGED WITHOUT BEING COMMANDED. RESET THE ABSOLUTE ENCODER AND THEN RE-HOME THE DRIVE.
NAVIGATE TO RESET ENCODER SCREEN
VIII
BACK TO FLASHING RED INDEX
EXIT

Figure 7-7

7.8) Flashing Green Light screen

This screen lists the steps to trace down the reason why the hoist's green light is flashing.

In section (I), if the indicator banner is green then the drive is homed, but if the banner is red then the drive is not homed.
In section (II), is the navigation button to go to the Position Calibration screen.
In section (III), if the indicator banner is gray then the enabling trigger on the Inline Handle has not been pulled. If the indicator banner is red then the trigger has been pulled and an Unsafe Start condition is active, but if the banner is green then the trigger has been pulled and hoist Safe Started.
In section (IV), the Safe Start Max Force and the Lift Load Cell Pounds are displayed here.

If the hoist's green light is flashing, follow the steps to home the drive or safe start the hoist. (Refer to Figure 7-8)

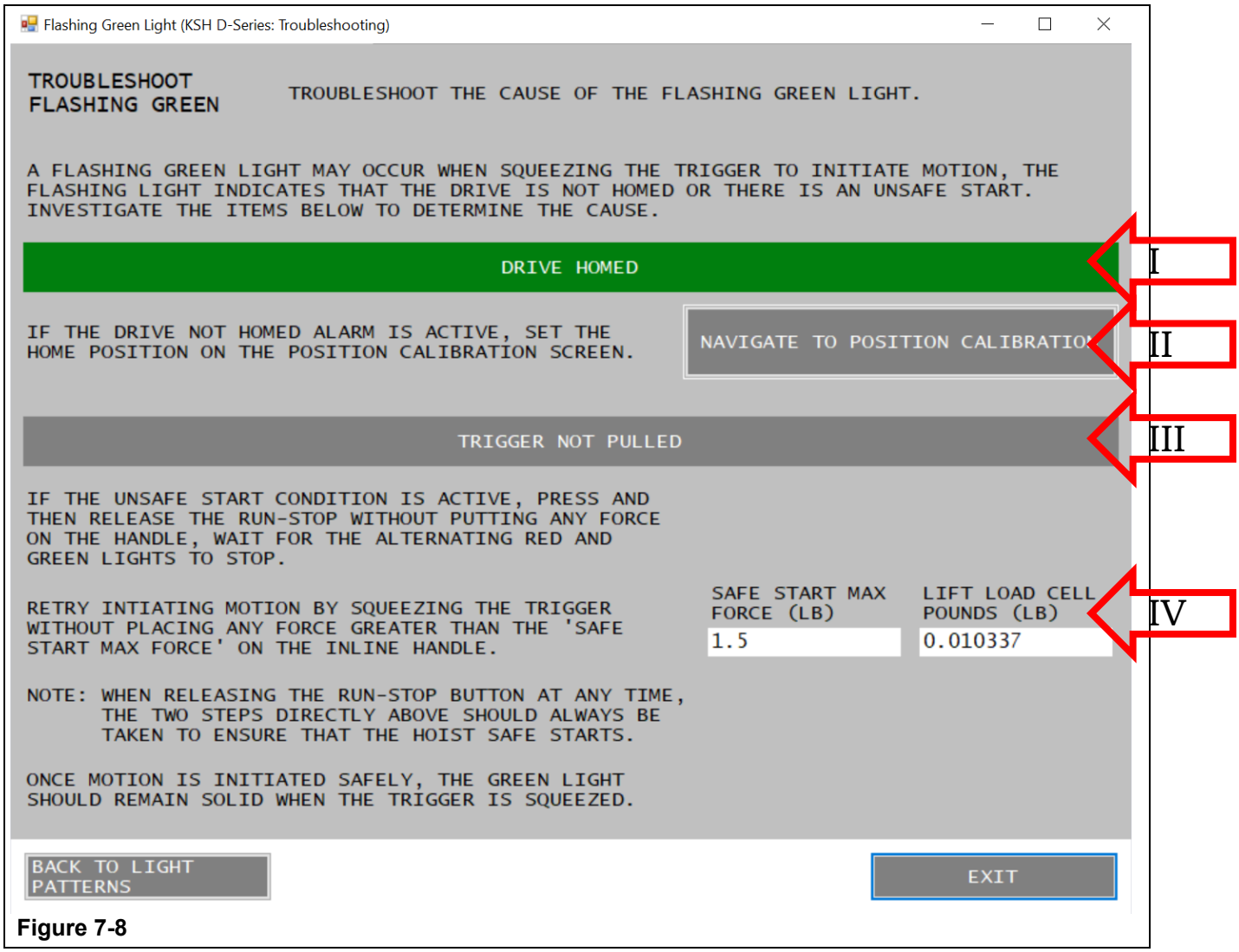


Figure 7-8

7.9) Alternating Red/Green Lights screen

This screen lists the steps to trace down the reason why the hoist's red and green lights are flashing in an alternating pattern.

In section (I), is the navigation button to go to the Flashing Green Light screen.

If the hoist's red and green lights are flashing in an alternating pattern then follow the steps listed on the screen below. (Refer to Figure 7-9)

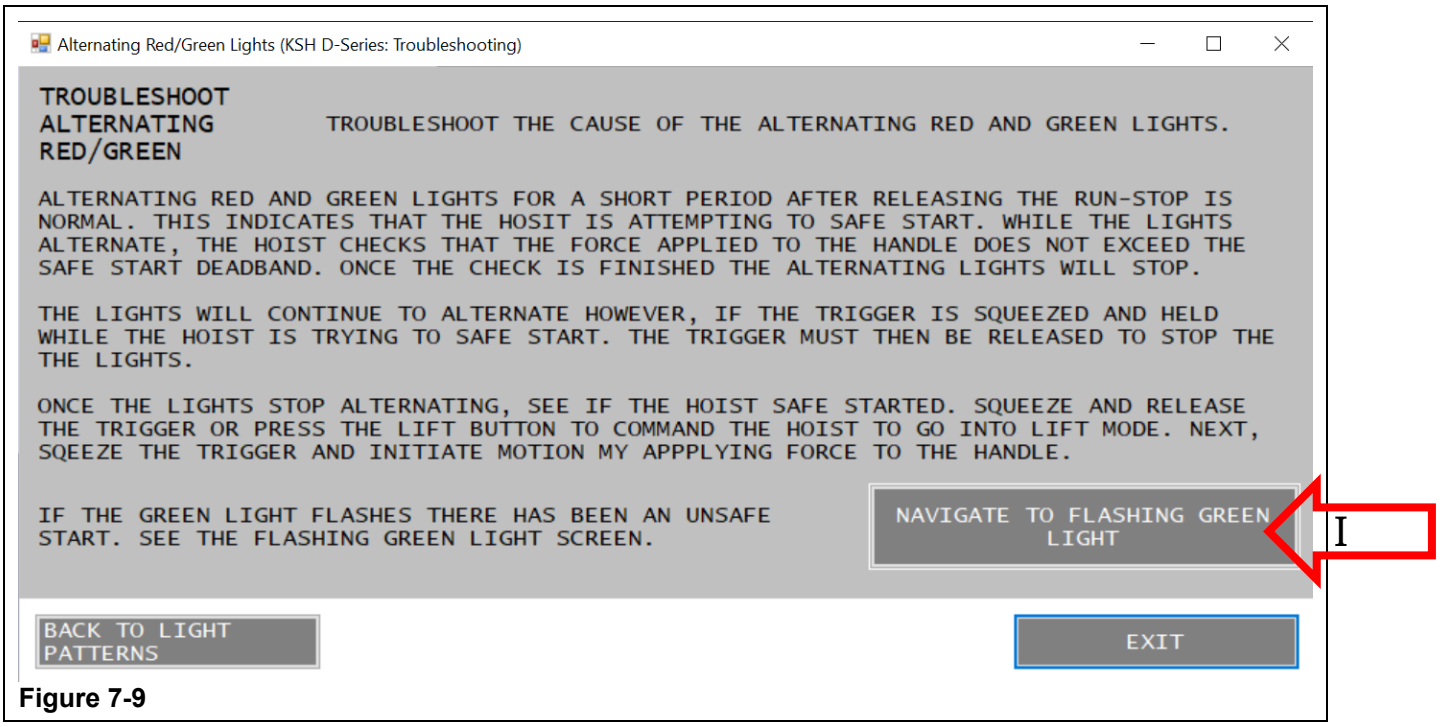


Figure 7-9

7.10) Solid Red Light screen

This screen lists the steps to trace down the reason why the hoist's red light is solid.

In section (I), if the indicator box is green then the Run-Stop is released, but if the indicator box is red then the Run-Stop has been pressed.

If the hoist's red light is solid then follow the steps listed on the screen below. (Refer to Figure 7-10)

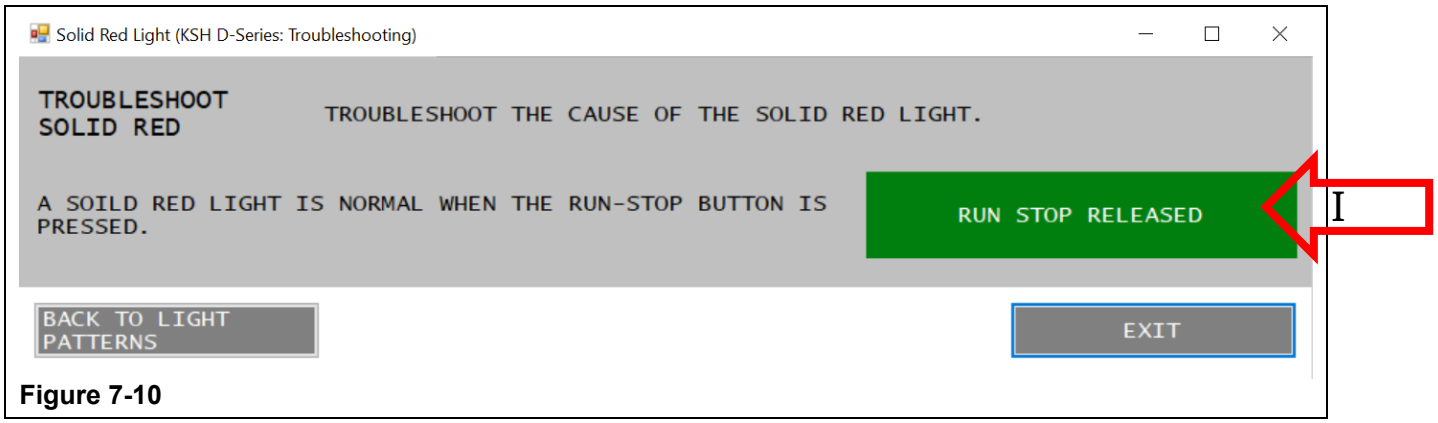


Figure 7-10

7.11) Solid Green Light screen

This screen lists the steps to trace down the reason why the hoist's green light is solid.

In section (I), if the indicator box is gray then the hoist's Lift Mode is not active, but if the indicator box is green then Lift Mode is active.

If the hoist's green light is solid then follow the steps listed on the screen below. (Refer to Figure 7-11)

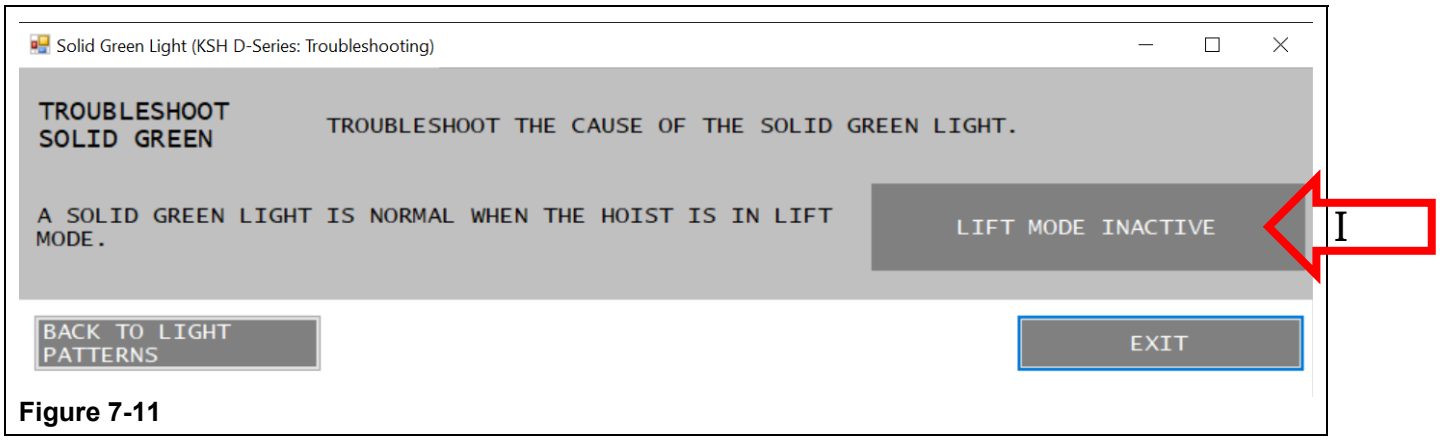


Figure 7-11

7.12) Solid Blue Light screen

This screen lists the steps to trace down the reason why the hoist's blue light is solid.

In section (I), if the indicator box is gray then the hoist's Float Mode is not active, but if the indicator box is blue then Float Mode is active.

If the hoist's blue light is solid then follow the steps listed on the screen below. (Refer to Figure 7-12)

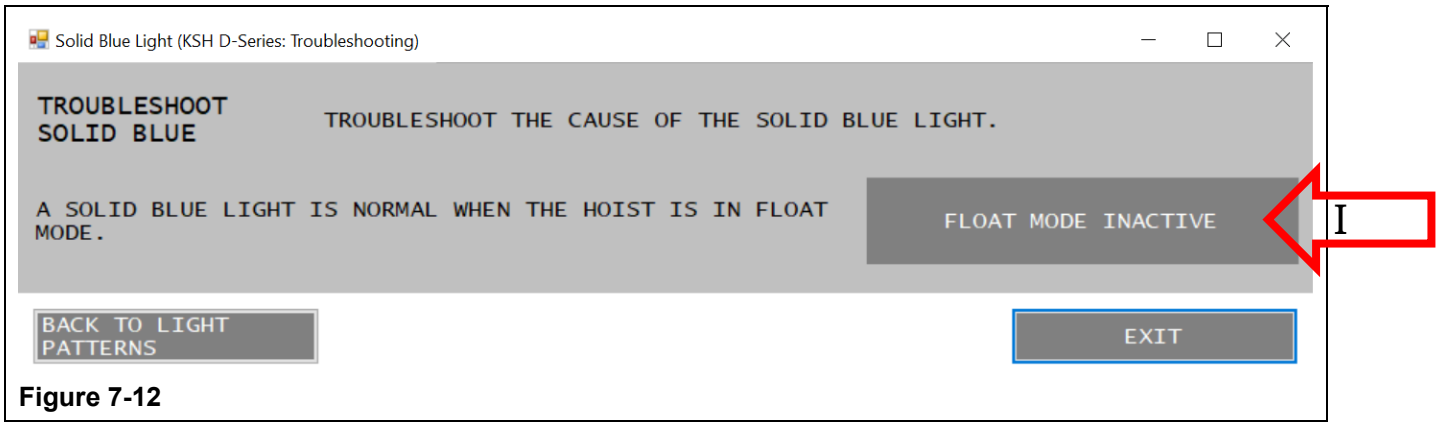


Figure 7-12

7.13) Solid Green/Blue Lights screen

This screen lists the steps to trace down the reason why the hoist's green/blue lights are solid.

In section (I), if the indicator box is gray then the hoist's Payout Mode and Test Mode are not active, but if the indicator box is green then it will specify which mode is currently active.

If the hoist's green/blue lights are solid then follow the steps listed on the screen below. (Refer to Figure 7-13)

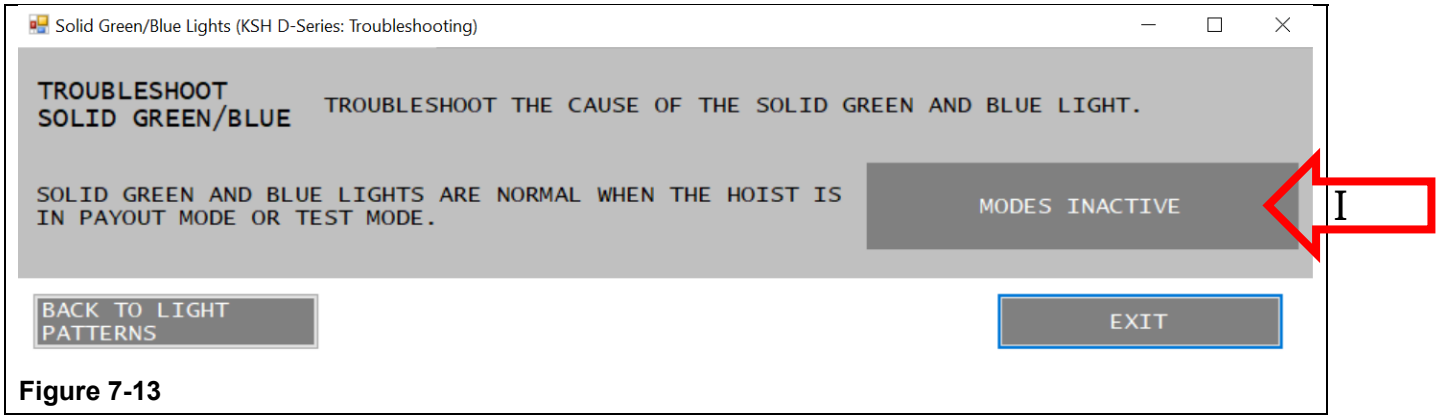


Figure 7-13

7.14) Motion Drift screen

This screen lists the steps to trace down the reason why the hoist's may be drifting up or down.

If the hoist is drifting in any direction, then follow the steps listed on the screen below. (Refer to Figure 7-14)

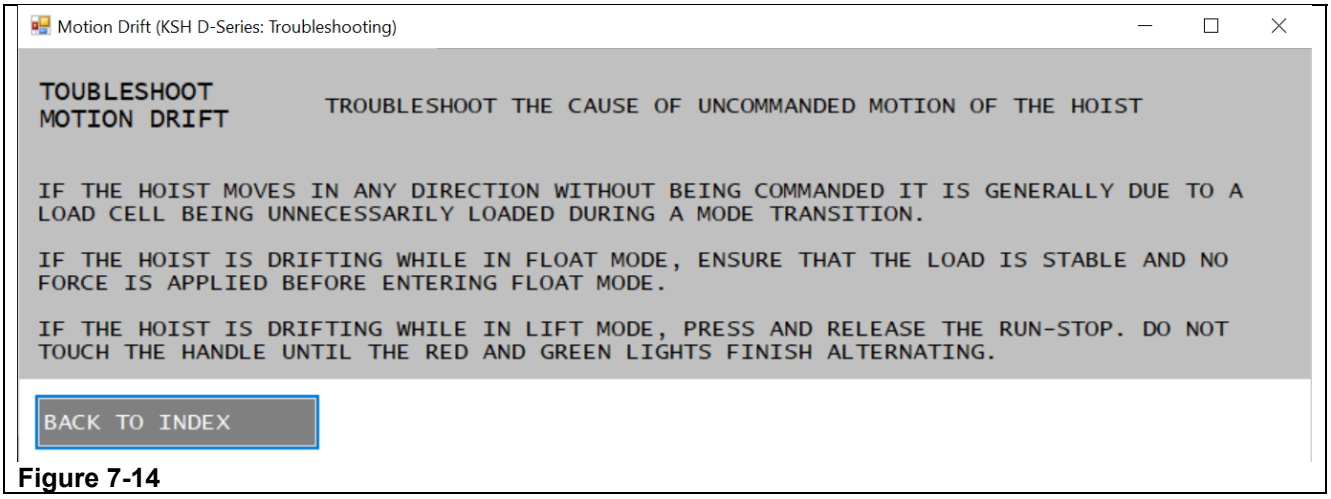


Figure 7-14

B. System Activity screens including Faults, Warnings and Error Codes

There are two System Activity screens covered in this section. Each of these screens is listed below and can be accessed inside the Knight Servo Studio (KSS) software from:
KSS Workspace tree location: Status \ …

7.15) System Status screen
7.16) Active Faults and Warnings screen

7.15) System Status screen

This screen shows many aspects of the hoist's systems in real time.

In section (I), if the indicator box is green then that particular hoist's function is on, but if the indicator box is gray or red then that particular hoist's function is off or faulted.
In section (II), if the indicator box is green then that particular hoist's function is on, but if the indicator box is gray or red then that particular hoist's function is off.

This screen gives an overview of the hoist's readiness. (Refer to Figure 7-15)

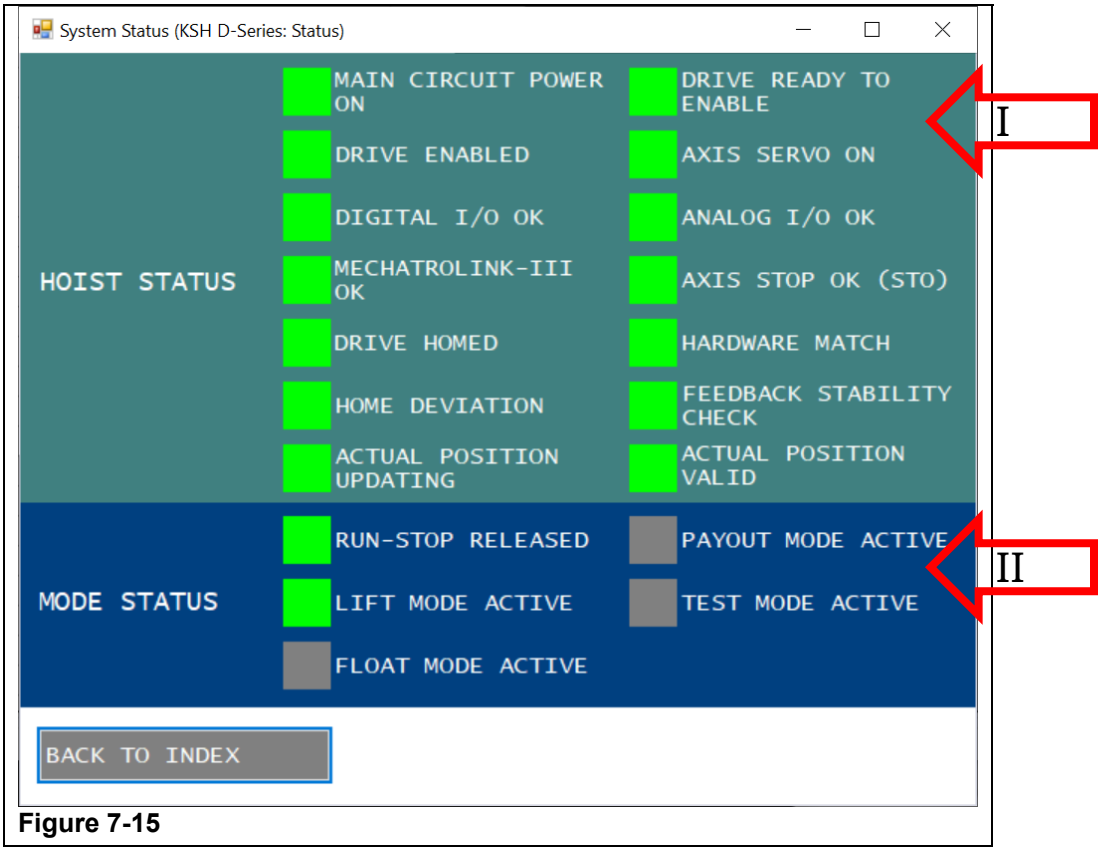


Figure 7-15

7.16) Alarms / Warnings screen

This screen shows all drive alarms or faults as well as any warnings that may be active on the hoist.

In section (I), if the 'DRIVE ALARM' indicator box is red then an alarm is active and an alarm code will be listed. If the indicator box is green then there are no active drive alarms.
In section (II), if the 'DRIVE WARNING' indicator box is yellow then that alarm is active and an alarm code will be listed. If the indicator box is green then there are no active warnings.
In section (III), if the indicator box is yellow then that particular user warning is on, but if the indicator box is gray then that particular warning is off.

This screen gives an overview of active drive alarms and warnings. (Refer to Figure 7-16)

Also, refer to section 5.F. 'Accessing the Servo Hoist's Fault Log' for instructions on how to access the system's fault log through the servo's web page.

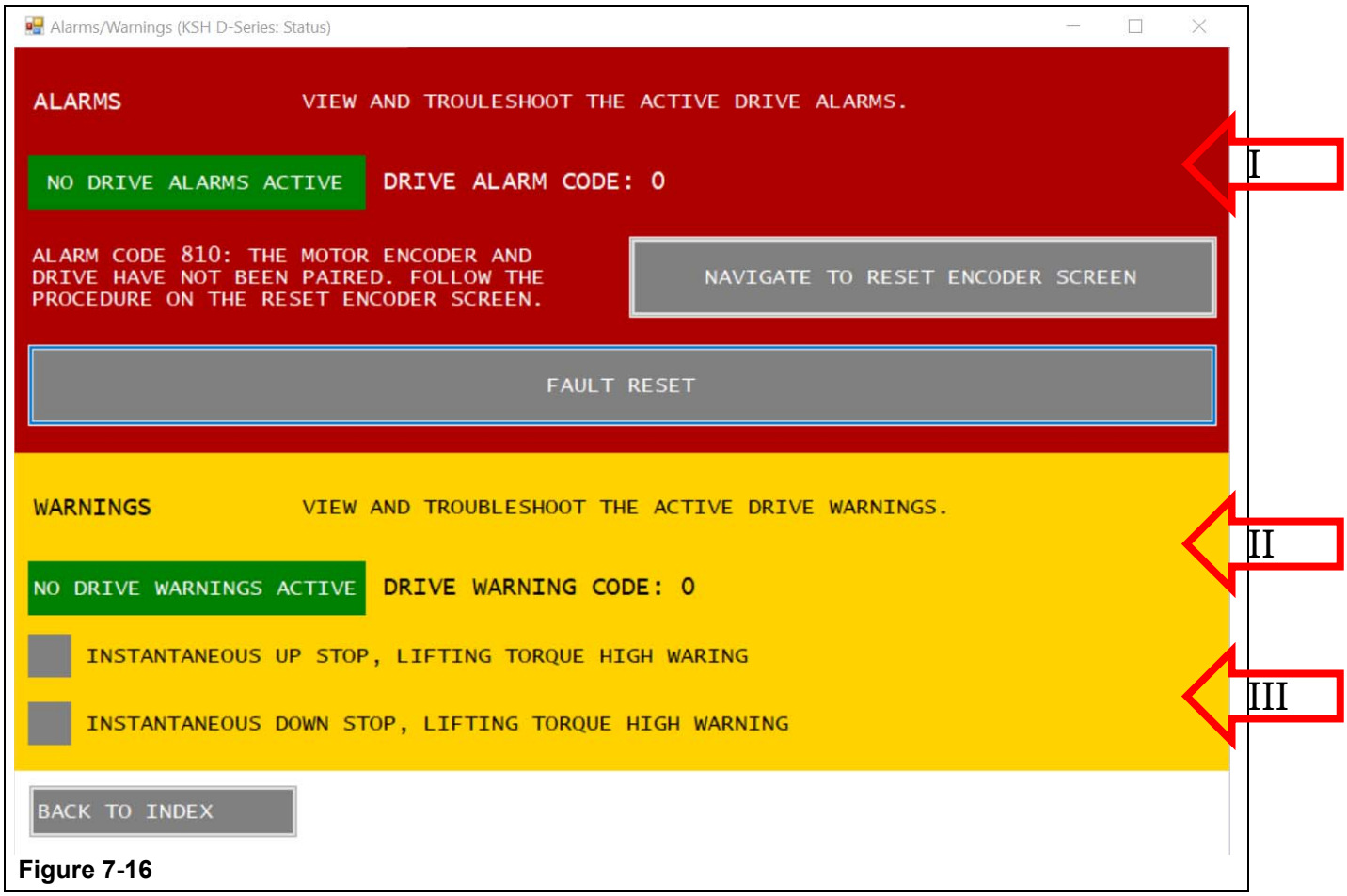


Figure 7-16

C. Troubleshooting Inputs and Outputs

This screen can be used to inspect the hoist's Inputs and Outputs. This screen can be accessed inside the Knight Servo Studio (KSS) software from:
KSS Workspace tree location: Status \ I/O Status.

7.17) I/O Status screen

7.17) I/O Status screen

This screen shows each of the onboard inputs and outputs.

In section (I), if the indicator box is green then that I/O point is ON, but if that indicator box is gray then that I/O point is OFF. (Refer to Figure 7-17)

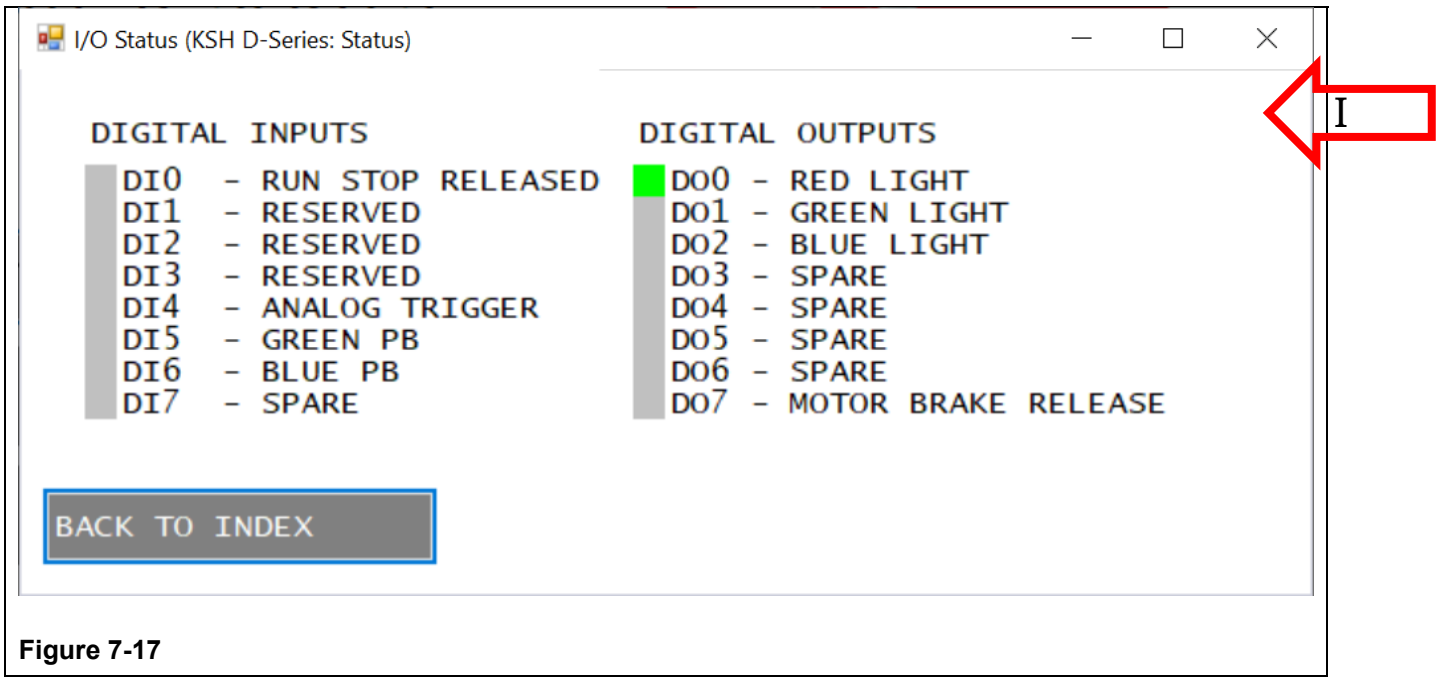


Figure 7-17

D. Troubleshooting Chart

The Servo Hoist operation may be affected by various factors. If your hoist is not performing as well as expected, follow the table below to diagnose the problem. If unable to resolve the issue, contact the Knight Global Service Department at 248-375-7962 or via e-mail at service@knightglobal.com.

Problem	Cause	Solution
Hoist does not lift or lower	Power loss	Check switches, and connections of all power lines. Check Run-Stop button, reset if necessary.
	Incorrect voltage	Check supply voltage and frequency of power supply to ensure it is correct for the Servo Hoist.
	Electrical fault	Secure power to the hoist; check all wiring and connections on the Servo Hoist.
	Hoist capacity exceeded	Reduce the weight of the load to within the rated or programmed capacity of the Servo Hoist.
Servo Hoist lifts but does not lower	"Lower Limit" set incorrectly	Check parameters: fPRM:1 ‘Overall Forward/Lower Limit’, fPRM:3 ‘Lift Mode Forward/Lower Limit’, fPRM:5 ‘Float Mode Forward/Lower Limit’.
	Damaged pendent cord	Check each conductor in the pendent cable for continuity. Replace damaged cable as required.
Servo Hoist lowers but will not lift	"Top Limit" set incorrectly	Check parameters: fPRM:0 ‘Overall Reverse/Upper Limit’, fPRM:2 ‘Lift Mode Reverse/Upper Limit’, fPRM:4 ‘Float Mode Reverse/Upper Limit’.
	Damaged pendent cord	Check each conductor in the pendent cable for continuity. Replace damaged cable as required.
	Hoist capacity exceeded	Reduce the weight of the load to within the rated capacity of the Servo Hoist.
	Low voltage in power supply	Determine the cause of low voltage and restore voltage back to within +/-10% of required voltage supply.
Servo Hoist does not lift at proper speed	Hoist capacity exceeded	Reduce the weight of the load to within the rated or programmed capacity of the Servo Hoist.
	Low voltage in power supply	Determine the cause of low voltage and restore voltage back to within +/-10% of required voltage supply.
Servo Hoist operates intermittently	Open / Short circuit	Check circuit for loose connections or broken conductors. Repair or replace as necessary.
	Damaged pendent cord	Check each conductor in the pendent cable for continuity. Replace damaged cable as required.
	Damaged handle	Check each conductor in the pendent cable for continuity. Replace damaged conductors as required. Check connections and replace if necessary.

Table 7-1

8. SPARE PARTS LIST

Because Knight is continuously improving and updating its products, all product drawings and spare parts lists for this Servo Hoist are provided as supporting documentation accompanying this manual and delivered with the system.

9. DECOMMISSIONING OF A SERVO HOIST

Knight Servo Hoists contain various materials which, at the end of the service life, must be disposed of or recycled (where appropriate), in accordance with statutory regulations.

Decommissioning:

WARNING

Knight Servo Hoists must be decommissioned by qualified personnel.

- Ensure there is not a load on the hoist.
- Remove power from hoist.
- Remove hoist from rail or support structure.
- If desired, Knight Global will properly dispose of the hoist. Contact a Knight Global representative to obtain a Return Material Authorization form.

10. KNIGHT'S PERFORMANCE WARRANTY

Knight warrants that its products and parts shall meet all applicable specifications, performance requirements, and be free from defects in material and workmanship for one year, (Servo Systems for (2) two years, Pneumatic Lift Tables for (5) five years), from the date of invoice, unless otherwise noted.

Knight warrants the Servo Hoist, Arms, and Tractors to be free from defects in material or workmanship for a period of two years or 6000 hours use from the date of shipment.

On design and build jobs, the customer is the owner of the equipment once they authorize shipment. The purchased equipment cannot be returned for reimbursement or credit.

Exclusions

This warranty shall not cover the failure or defective operation caused by inadequate training provided by customer regarding the operation and/ or maintenance of the tool, misuse, negligence, misadjustment, or any alteration not approved by Knight Global. Knight's obligation is limited to the replacement or repair of Knight's products at a location designated by Knight Global. Buyer is responsible for all associated internal removal and reinstallation costs as well as freight charges to and from Knight Global. Knight's maximum liability shall not in any case exceed the contract price for the products claimed to be defective.

Any field modification made to Knight Products or Systems without the written authorization by Knight Global shall void Knight's warranty obligation.

Any purchased components not manufactured by Knight Global and their specific individual warranties are not covered. Paint defects, scratches and marring from shipping are also excluded on all Knight Global products and products not manufactured by Knight Global.

Knight Distributors/ Agents are not authorized to circumvent or change any of these terms and/ or conditions of this warranty unless prior approval is received in writing by Knight Global Management. Verbal statements made by Knight Distributors/ Agents do not constitute warranties.

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