SMARTlift Operators Manual

Operation, Maintenance & Service Manual

V3.2

STEELBRO

Container Handling Solutions

Contents

Digital Control and SMARTlift Load Monitoring System

Digital Control is included as standard on most SB330 and all SB361 and SB401 model Sidelifters.

The SMARTlift Load Monitoring System is part of the Steelbro commitment to stay at the cutting edge of Sidelifter design and technology. The system uses advanced electronic technology to enable intelligent control and improved Sidelifter safety.

SMARTlift Load Monitoring is available as an additional factory option, or can be added later as an upgrade to a Sidelifter model equipped with Digital Control.

The SMARTlift Load Monitoring system controls all crane and power pack electrical systems via two electronic controllers, one situated on each crane.

READ THIS SECTION BEFORE USING SMARTLIFT

The SMARTlift Load Monitoring System is NOT a fail-safe safety system. Its purpose is to monitor the load and to make the operator aware of potentially unsafe practices but it will not prevent these from happening should the operator continue with an action.

SMARTlift is not a substitute for responsible operation and operator training. It is essential that operators follow safety procedures, making themselves aware of the operator manual and taking heed of the warnings and cautions contained in it. If in doubt, they should seek further training.

It is essential that the system is properly maintained. In the unlikely event of a fault the owner must report this immediately to the service agent. Until the fault is repaired, the system cannot be considered fully operational.

Voltage

The system voltage is 12v for Sidelifters fitted with a Kubota power pack. For Power Take Off (PTO) versions, the system voltage is supplied from the tractor unit, normally 24v.

Components

The Digital Control system consists of the following components:

- Electronic Control Unit (ECU) x 2, one located on each crane base
- Danfoss electro-hydraulic proportional control actuators
- An LCD display located at the rear of the chassis
- A Hetronic radio remote control.

- Stabiliser deployed microswitch sensors
- Kubota engine run/stop and rpm control
- Hydraulic high/low speed valve solenoids

Hetronic Radio Remote

The Hetronic radio remote offers an exceptional level of performance and reliability.

The receiver features industry standard 2-wire CANbus communication, which eliminates complex wiring looms and an IP65 rated enclosure. The transmitter features proportional joysticks for precise control of crane speed, and a rugged IP65 rated housing. All crane functions including the starting of the onboard powerpack and crane mounted worklamps can be controlled remotely.

The radio remote is protected against electromagnetic fields and radio interference. Hetronic radio remote controls use the latest frequency synthesizer technology to eliminate the problems typically associated with radio remote control systems.

The Hetronic radio remote control system includes a transmitter and a receiver. These systems operate over the 400-470 MHz radio band range (70 cm band) and are FCC approved.

The transmitter generates the electronic signal that communicates with the receiver. The transmitter and receiver are set with identical address codes and frequency channels. This allows operation of multiple Sidelifters within the same area without signal interference.

As an additional safety feature, the Danfoss valves are only energised when the joysticks are moved off-centre. Also the load sense dump solenoid is only energised when the joysticks are moved off-centre, or when the manual override PIN number has been entered.

Overriding the E-Stop Circuit

Sidelifter control valves have manual levers located in the cylindrical container in the side tool box. In the event of an electrical breakdown, the operating cycle can be completed manually by using these levers, but the load sense dump solenoid must be energised first.

You can override the E-stop circuit and energise the load sense pump solenoid by pressing the rubber covered button in the left hand end of the start-key 'E' junction box.

Operator Controls

All operator controls are on the remote control transmitter. This transmitter has :

- Two joystick controls which operate all lift arm and stabiliser leg operations
- A two position stay put switch for high/low speed
- A positional rotary switch which selects Off, module traverse, stabiliser legs or lifting arms, plus any other optional functions.
- A red "mushroom" type stop button for Emergency Stop.

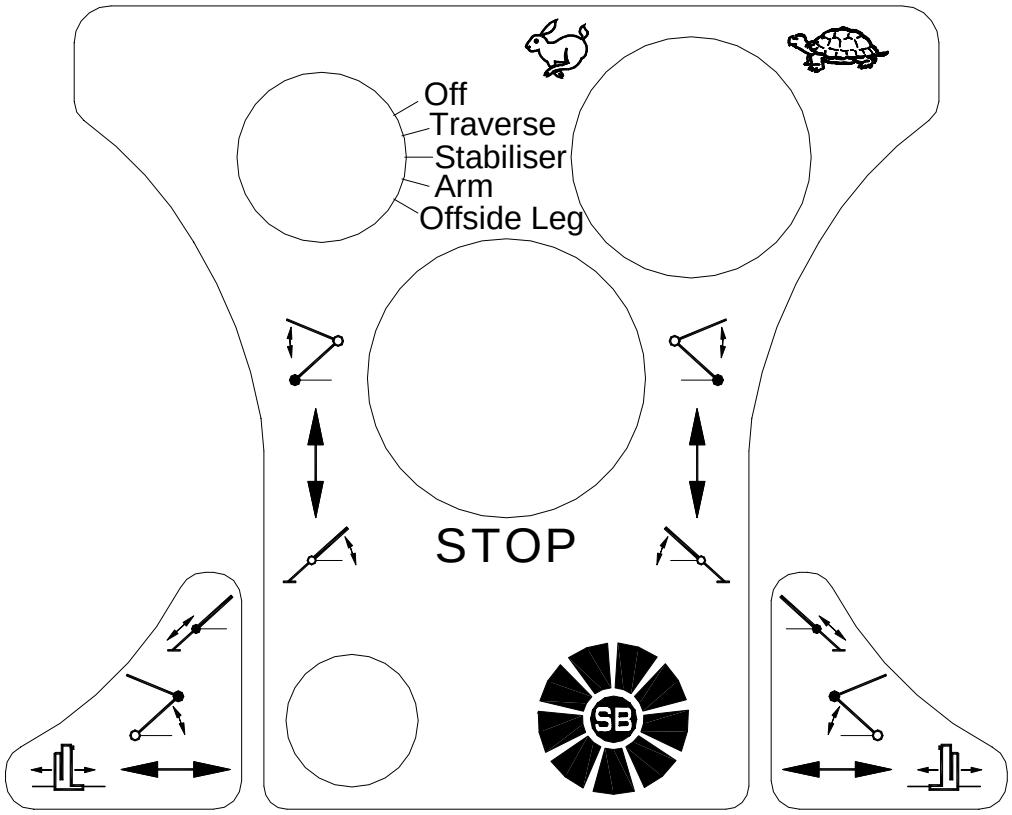


Figure 1 – Joystick Function

Arms Mode:

Function	Movement
Top arm up	Joysticks up
Top arm down	Joysticks down
Bottom arm out	Joysticks out
Bottom arm in	Joysticks in

Stabiliser Mode:

Function	Movement
Stabiliser out	Joysticks out
Stabiliser in	Joysticks in
Tilt ram up	Joysticks up
Tilt ram down	Joysticks down

Traverse Mode:

Function	Movement
Module traverse to 40 foot position	Joystick out

Module traverse to 20 foot position	Joystick in

Emergency Stop

For all emergency situations, push the E-stop pushbutton in.

To restart the system, disengage the E-stop pushbutton and press the Start/Horn pushbutton.

Be sure any dangerous conditions are corrected and follow the Sidelifter Starting Procedure.

Safe Mode

When the transmitter voltage drops below approximately 3.4 volts, the system automatically goes into Safe Mode. A buzzer will sound to indicate a low battery. After a further 30 seconds the transmitter sends the E-stop signal and all Sidelifter motion commands stop.

To restart the system, a fully charged battery must be inserted into the transmitter. Proceed with the Sidelifter Starting Procedure. Always place the discharged battery directly into the charger.

Radio Remote Battery Charging System

The battery charger is connected permanently to the main battery and is available for use even when the Sidelifter start key is turned to the **OFF** position.

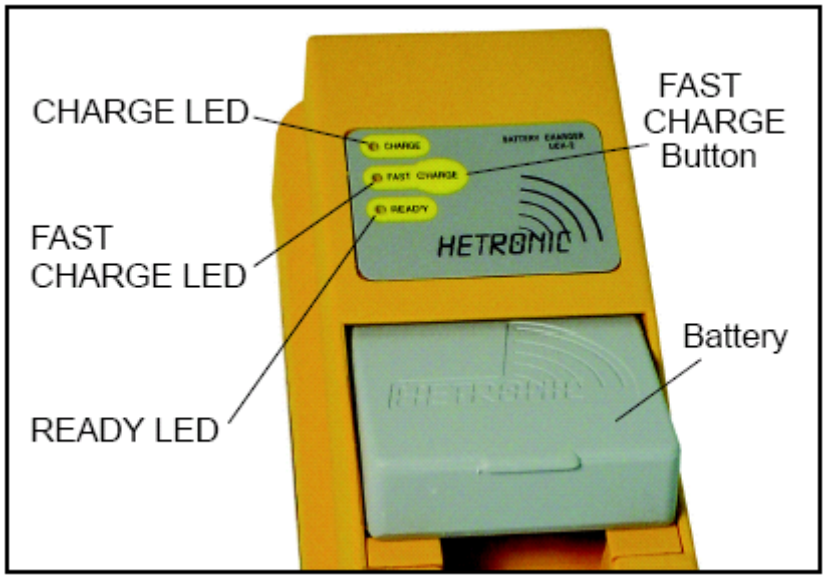


Figure 2

When the battery is inserted into the charger, the charge LED flashes. The charge process is terminated it detects peak battery voltage, or after 5 hours, after which the ready LED glows. While the ready LED is glowing, the charger continues to trickle charge the battery. The battery cannot be damaged by leaving it in the charger. Fast charge is less than 2 hours.

If the battery is bad and has an open cell, no LEDs will light up. If the battery has a shorted cell, the charge LED will blink continuously. In either case, DO NOT USE the battery. Properly dispose of a bad battery.

Sidelifter Starting Procedure

If the Kubota Engine is cold, use the **COLD STARTING PROCEDURE**.

If the Kubota Engine is warm, use the **WARM STARTING PROCEDURE**.

SMARTlift System / Kubota Power Pack Cold Starting Procedure

1. Complete all the pre-operation checks as detailed in the Kubota Operators Manual
2. Ensure that the tractor unit is connected to the trailer and that the pneumatic circuit is fully charged. The throttle actuator and run/stop actuator require air to operate. The engine will not start without a fully charged auxiliary pneumatic circuit.
3. Ensure that all E-stop buttons are released.
4. Turn the start key clockwise one click to the **ON** position.
5. Select the instruction according to the type of remote control:

   Hetronic radio remote: Turn the transmitter key clockwise to the **ON** position. Wait until the second beep – this indicates that the self test routine was successful. Press the green button on the side of the transmitter to energize the E-stop circuit and start the SMARTlift system.

   Cable pendant: Release the E-stop to energize the E-stop circuit and start the SMARTlift system
6. The green E-stop circuit light should illuminate. Turn the start key clockwise to the **GLOW** position and hold for five seconds.
7. Turn the start key clockwise to the **START** position and hold until the engine has started.

   You will know that the start is successful when on the LCD display screen, the wheel pattern rotates to spell out S-M-A-R-T-L-I-F-T on each segment.

   If the engine fails to start refer to the Troubleshooting Section of this manual and the Kubota Operators Manual.

Caution: The Start Key can be left in the ON position during the day, but must be switched to the OFF position at the end of each day to prevent the Control system battery from depleting.

SMARTlift System / Kubota Power Pack Warm Starting Procedure

A warm start is when the start key is left in the **ON** position during the working day.

1. Select the instruction according to the type of remote control:

Hetronic radio remote: Turn the transmitter key clockwise to the **ON** position. Wait until the second beep – this indicates that the self test routine was successful. Press the green button on the side of the transmitter to energize the E-stop circuit and start the SMARTlift system.

Cable pendant: Release the E-stop to energize the E-stop circuit and start the SMARTlift system

2. Press the engine start button on the left hand end of the Hetronic radio remote until the engine starts.

Sidelifter Shutdown Procedure

1. If using the **cable pendant**, press the E-stop button **IN**.
2. If using the **Hetronic radio remote**, turn the transmitter key anti-clockwise to the **OFF** position. The transmitter key is the main black key switch on the side of the radio remote.

Do not use the E-stop button to shutdown the Sidelifter as this button is for emergency use only and should be left in the OUT position.

1. If the Sidelifter is not to be used for more than 3 hours turn the start key anti-clockwise to the **OFF** position to prevent the control system battery from depleting.

Operational Modes

The remote has a Mode dial with the settings:

- Off
- Traverse
- Stabiliser
- Arm

These settings direct the functions of the joysticks. This section explains the purpose of each mode and its characteristics.

Other modes may be available relating to specific additional features. These are explained in the section of the manual relating to their function.

Off Mode

Off mode turns off power to the Danfoss valves. If the vehicle is moved while the SMARTlift system is operating, the dial **MUST** be set to **OFF.** Otherwise, any accidental movement of the joysticks while the vehicle is moving may activate the hydraulics and cause damage.

For on-highway driving it is essential for safety reasons that the SMARTlift system is completely switched off by depressing any of the E-stop buttons, or switching the radio key to the OFF position.

Traverse Mode

Traverse mode is for moving the crane modules along the chassis rails. Not required for truck mounted units.

- While the stabiliser is in contact with the ground, Traverse mode is disabled

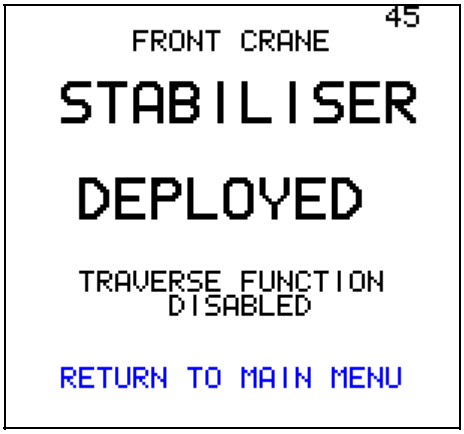


Figure 3

- **HIGH SPEED** is automatically selected for Traverse mode

Stabiliser Mode

Stabiliser mode is for extending and retracting the stabilisers.

- On SB361 and SB401 models with the rack and pinion crane traversing system, Stabiliser mode is disabled when the crane modules are not properly "on station"

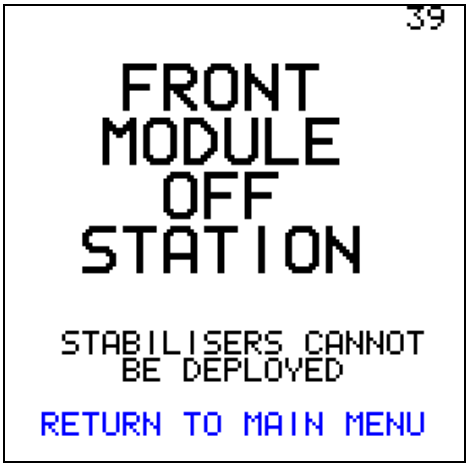


Figure 4

- **HIGH SPEED** is automatically selected for Stabiliser mode

Arm Mode

Arm mode is for extension and retraction of the crane arms.

- Whenever you select Arm mode during an operation, the sensors automatically check that the stabilisers are firmly in contact with the ground or a companion trailer. If there is no contact, Arm mode is disabled and a warning sound (the horn) and screen message are activated

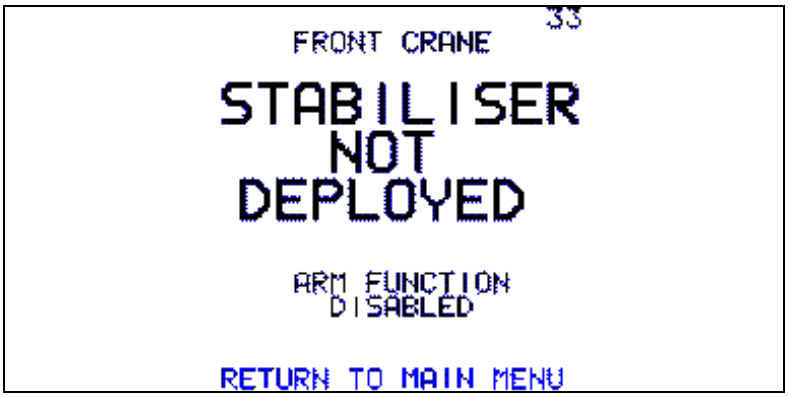


Figure 5

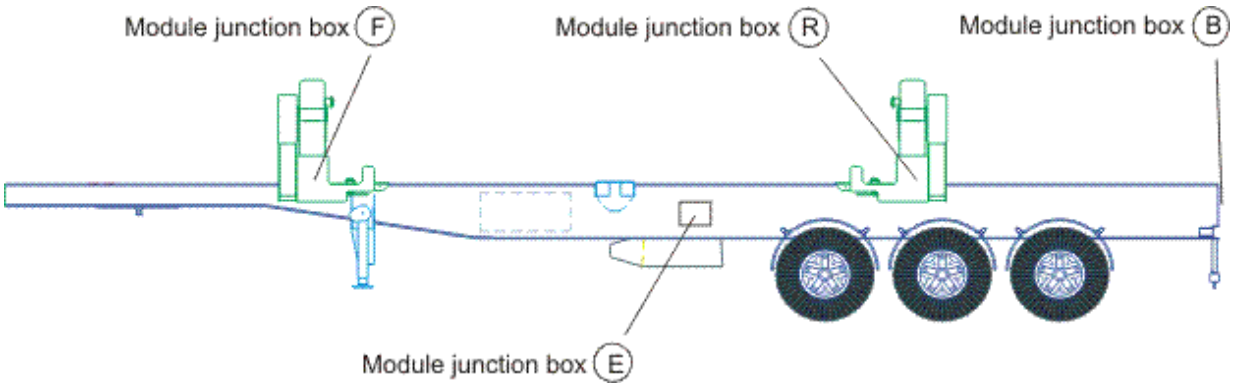
- However, if a stabiliser lifts off the ground during the loading operation, the lift is allowed to continue

Optional Modes

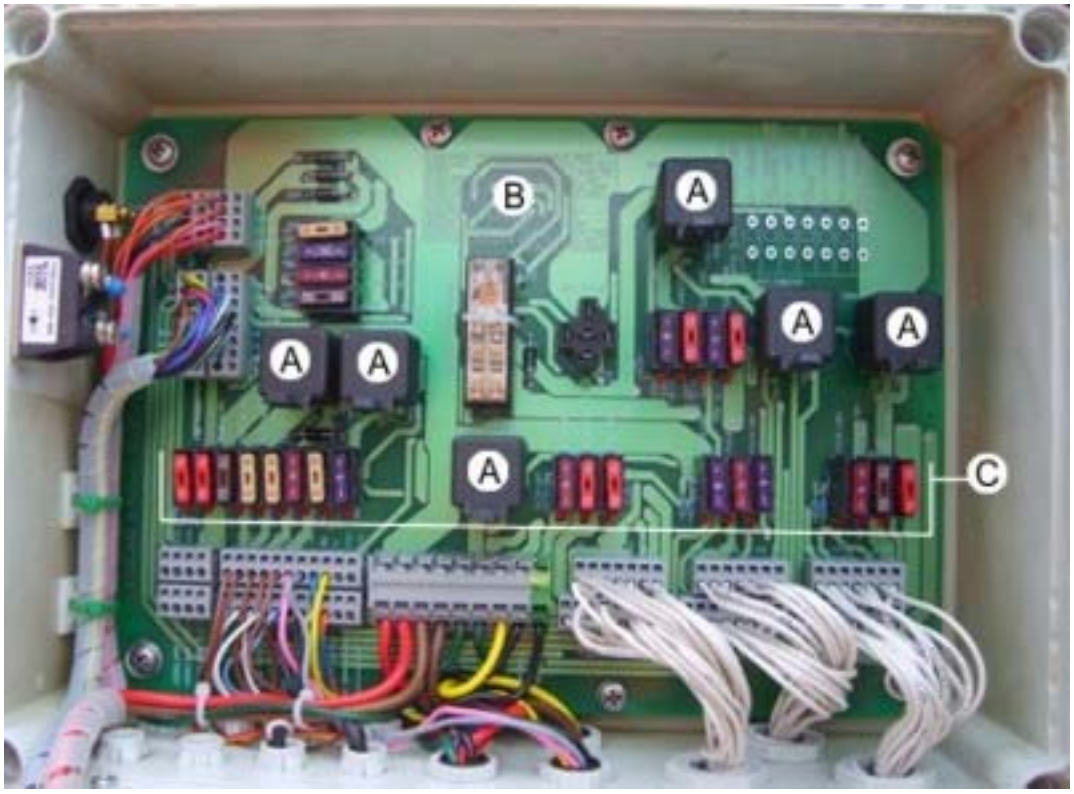
If your unit has bending leg stabilisers, offside stabilisers and/or you use a top-lifting frame, there are corresponding modes marked on the remote control.

Electrical System

The figure below shows the location of the electrical junction boxes on the Sidelifter. The state of the LEDs in the E box, and the F and R boxes (SB361 and SB401 only) can be used for initial fault finding.



Junction Box E



This is the main junction box where most fuses and relays are found. Controls engine functions.

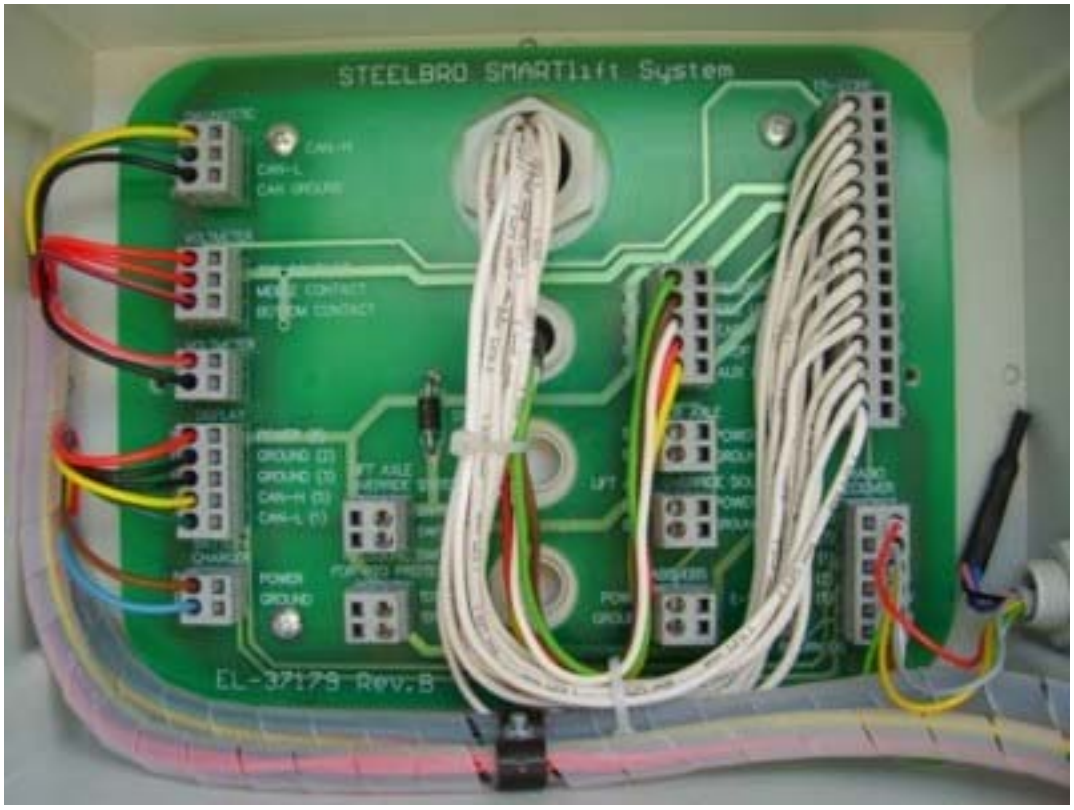
Key:

A Relay switches. A lit green LED signifies that the relay is energised.

B Table showing fuse layout.

C Fuses. A lit red LED indicates that the fuse is blown.

Junction Box B



Junction Box B runs the display screen and radio receiver.

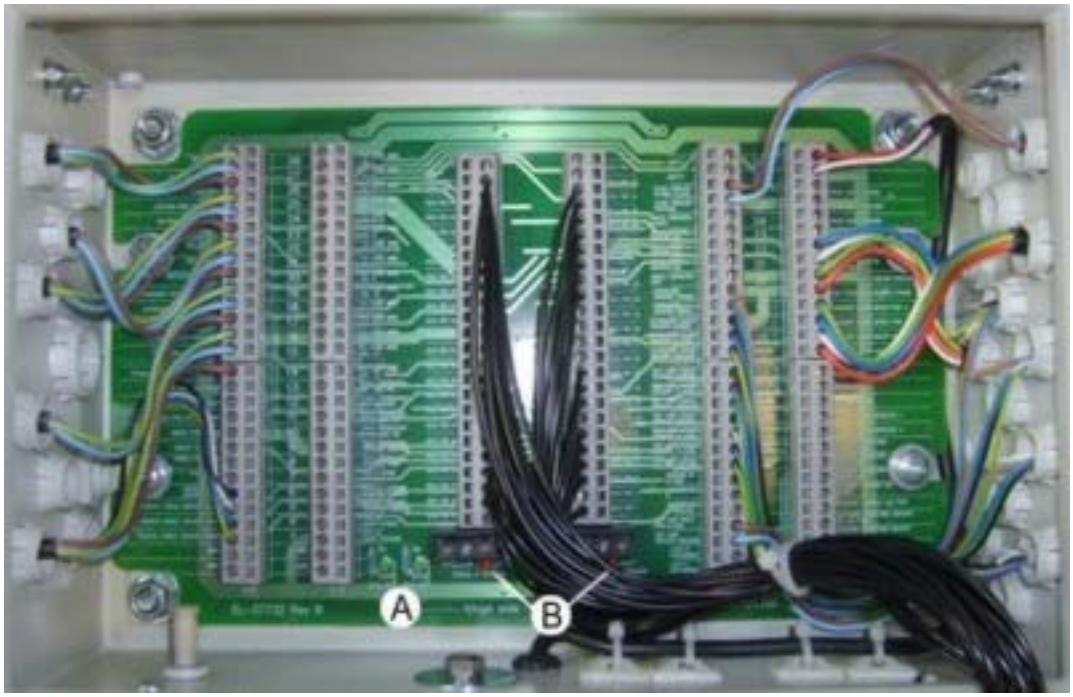
Steer axle lock and lift axle override (where used) are wired from this junction box.

There are no LEDs on the fuses located in Junction box B

Junction Boxes F and R

These junction boxes are located on crane modules. They sensor inputs and control hydraulic valves on the crane modules.

The circuitry layout of the F and R boxes is identical.



SB361 and SB401 F and R junction boxes (above)

Key:

A ECU supply voltage LEDs (green). LED3, UE, is lit continuously when the the SMARTlift system is operational. LED4, D+, is only lit when the green button (horn) on the Hetronic radio remote is pressed.

B Fuse LEDs (red). For LED1, Angle Sensor Ground, and LED2, ECU UE, a lit LED indicates that the fuse is blown.

SB330 F and R junction boxes (above)

Display Screen

The SMARTlift system is equipped with an interactive LCD display screen.

The LCD display screen is used for:

- Displaying system information, warnings, alarms and crane settings.
- Carrying out crane synchronisation and manual override tasks.

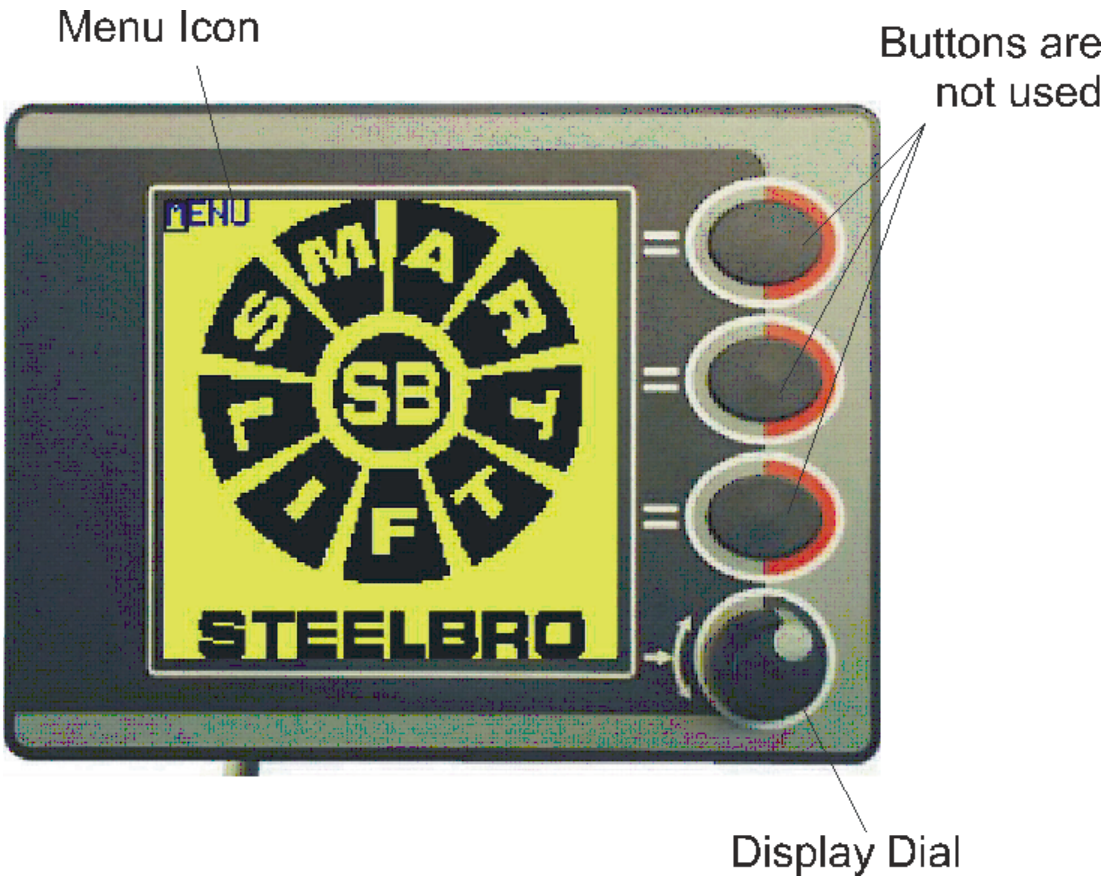


Figure 18

Navigating the Screen

You can navigate the screen using the display dial, positioned as shown in the diagram above. Please note that the three buttons are not used.

To move through the screens and menu items, turn the display dial.

To make a selection from a menu or change a variable, press the display dial.

Accessing the Menu Structure

To access the Menu Structure, from the default screen, turn the display dial until the menu icon is highlighted, then press the dial. Each of the main menu items gives access to the next layer of the menu structure. The lower menus and screens have a Return to the Main Menu or previous menu item, like the one in Figure 24 – Operating Time, which allows you to back out of the menus.

Figure 19 below shows all of the menus and functions available and the paths to follow to access them.

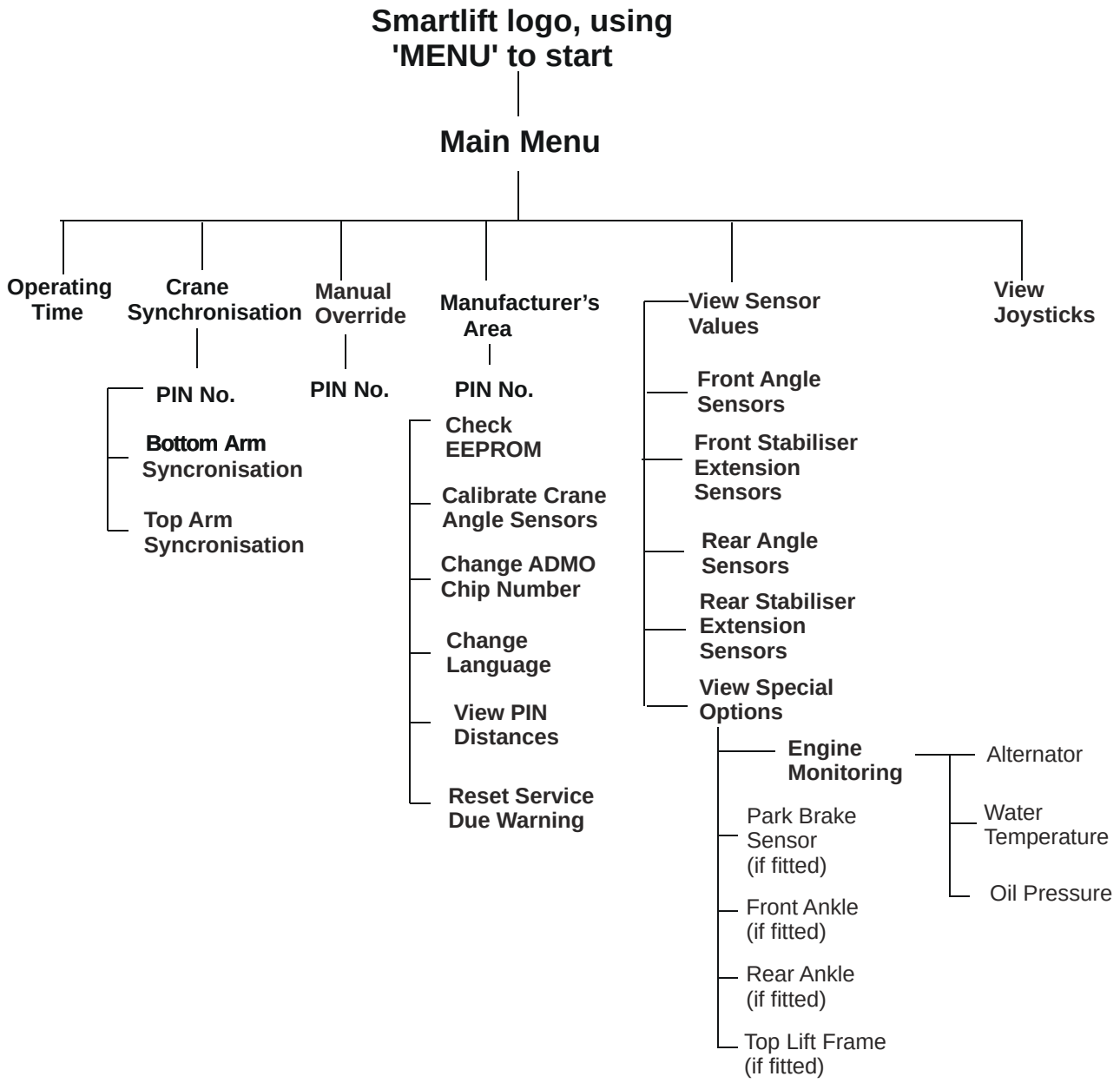


Figure 19 – Display Screen Menu Structure

Operating Time

The operating time of the Sidelifter is available from the LCD display screen by navigating to the Operating Time menu item, see Figure 19 – Display Screen Menu Structure.

Figures 20 to 22 show the screens you navigate to get to the Operating Time screen.

Figure 20 – Default Screen

Figure 21 – Main Menu

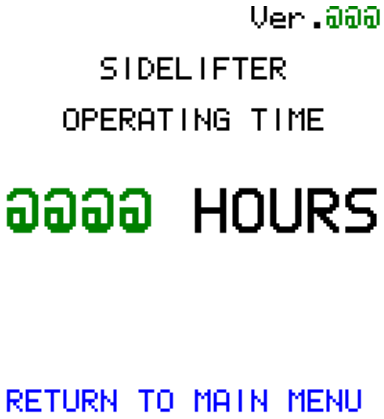


Figure 22 – Operating Time

Manual Override

To access Manual Override mode, via the LCD display screen enter the Single Lift manual override PIN 1970. This will allow you to override the SMARTlift system for one operation only. The system should only be overridden in the event of a system failure.

In manual override mode safety features of the load monitoring system are disabled and the operation of the arms is extra slow.

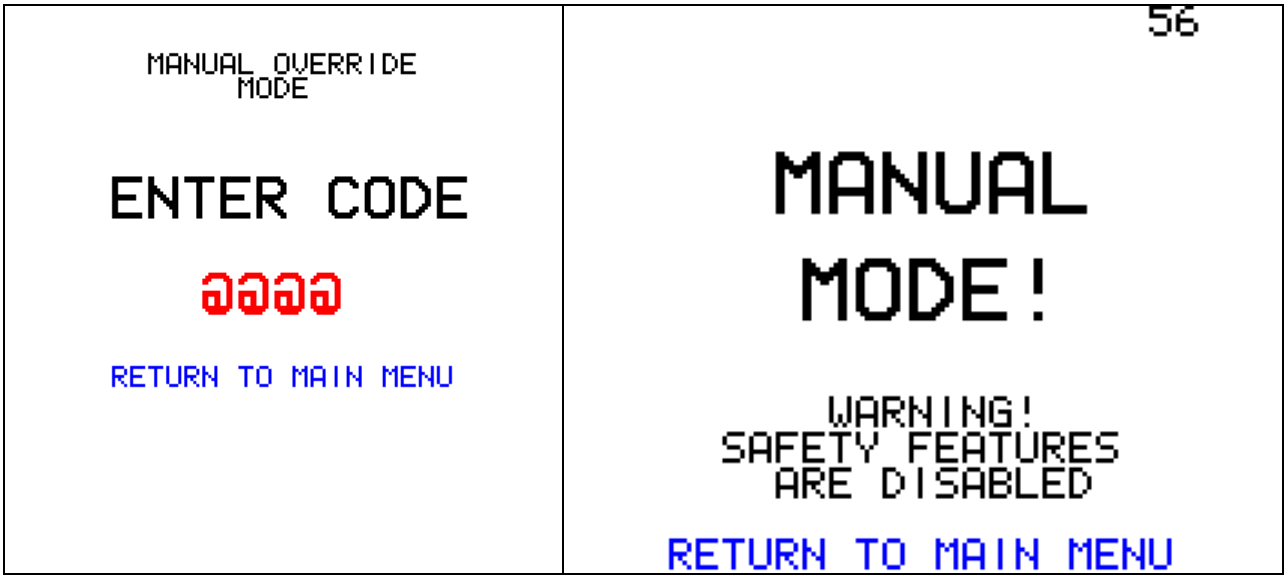
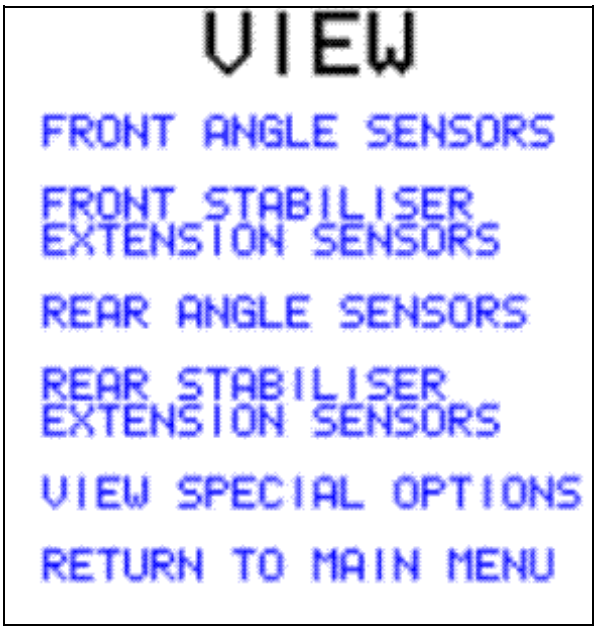


Figure 35

Figure 36

View Sensor Values

The View Sensor Values menu enables access to information useful for diagnostic purposes.



Front Angle Sensors

The Front Angle Sensors option displays information on the extension of the front stabiliser in millimeters, the angle of the stabiliser top and the bottom arms in degrees, and the pressure in the top arm lifting cylinder.

Front Stabiliser Extension Sensors

The Front Stabiliser Extension Sensors option displays information on the magnetic counter and the magnetic reset sensors, and the stabiliser deployed microswitch.

Rear Angle Sensors

The Rear Angle Sensors option displays information on the extension of the front stabiliser in millimeters, the angle of the stabiliser top and the bottom arms in degrees, and the pressure in the top arm lifting cylinder.

Rear Stabiliser Extension Sensors

The Rear Stabiliser Extension Sensors option displays information on the magnetic counter and the magnetic reset sensors and the stabiliser deployed microswitch.

View Special Options

To view engine management information, and information on optional features (if fitted) installed on the Sidelifter, select View Special Options.

The View Special Options menu displays information on:

Engine Monitoring

An Engine Monitoring system continuously monitors the Kubota engine oil pressure, water temperature and the alternator. If there is low oil pressure, high water temperature or the alternator is not charging, then an audible alarm is triggered and a message is displayed on the LCD display screen. If low oil pressure or high water temperature is detected the Kubota engine will shutdown automatically after twenty seconds to prevent permanent damage from occuring.

Park Brake Sensor (if fitted)

The Park Brake Sensor prevents operation of the Sidelifter without first activating the park brake. Either the status ON or OFF is displayed.

Front Ankle (if fitted)/Rear Ankle (if fitted)

The retract, extension and error status of the ankles of the bending leg stabilisers are monitored and displayed.

Top Lift Frame (if fitted)

The Top Lift Frame sensor detects and displays when all four twistlocks on top lift frame have made contact with all four corner casting pocket on the container and the twistlocks have engaged.

View Joysticks Option

Selecting the View Joysticks option displays information useful for diagnostic purposes. Values displayed are useful for determining if there are communication errors between the Hetronic radio remote and the electronic control units located on each crane base.

The possible values displayed for each menu item are described below:

- MODE: one of OFF MODE, TRAVERSE, STABILISER, ARMS, OFFSIDE LEG, BANDY LEG or TOP LIFT FRAME
- SPEED SWITCH: either HIGH or LOW
- ENGINE START, WORKLAMPS and HORN: either 0 (off) or 1 (on)
- EMERGENCY STOP: either OUT or IN
- RIGHT JS X-AXIS and LEFT JS X-AXIS: the function of the joysticks in the up/down position is represented numerically, from 85 to 171, with a neutral position of 127
- RIGHT JS Y-AXIS and LEFT JS Y-AXIS: the function of the joysticks in the in/out position is represented numerically, from 85 to 171, with a neutral position of 127
- RADIO RECEPTION: the level of radio reception beween the radio remote and the electronic control units is displayed via a bar graph

Crane Synchronisation

The Crane Synchronisation menu is protected by a PIN number to prevent unauthorised or untrained access. It is highly recommended that only trained personnel perform crane synchronisation.

Crane synchronisation is the process of matching the speed of the front and rear cranes in **LOW SPEED** only. If they are "out of sync", one function will appear to move faster than the other.

The cranes are synchronised before the trailer leaves the factory. However, if you notice that the cranes are operating at different speeds, it is possible to synchronise the cranes again by following the procedure below. This is not uncommon after about 50 hours of use, by which time the hydraulics have bedded in a little.

How to Synchronise the Cranes

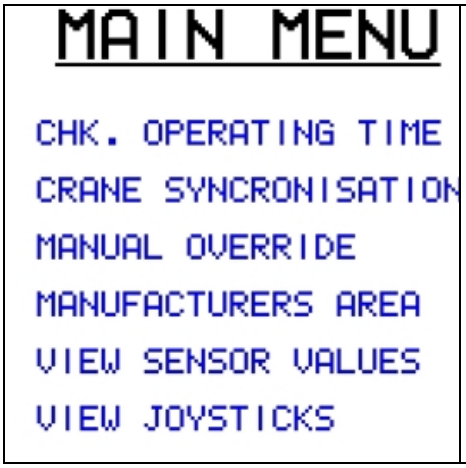


Figure 23 - Main Menu

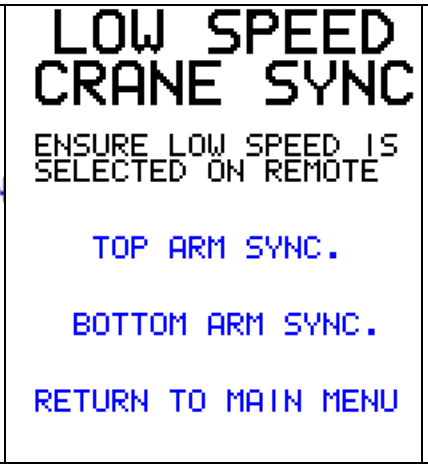


Figure 24 – Crane Sync. Menu

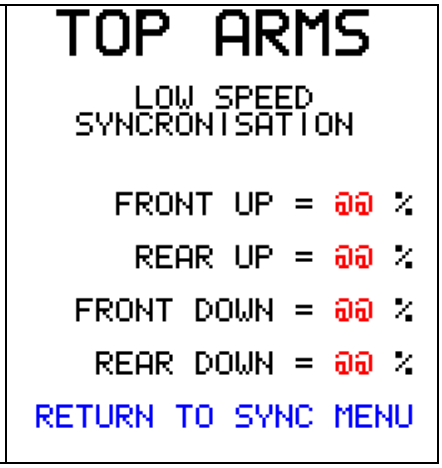


Figure 25 – Top Arm Sync Screen

Crane synchronisation is available through the LCD display screen menu structure. Synchronisation is only effective when **LOW SPEED** is selected on the Hetronic radio remote.

1. Set the correct engine speed.

   If using Power Pack version: Check the engine maximum speed is 2800 rpm.

   If using PTO version: Set the truck engine rpm to obtain 100-120 l/min oil flow to the Sidelifter.

2. On the remote control, select **LOW SPEED** and Arm mode.
3. On the LCD display screen, go to the Main Menu and select Crane Synchronisation.
4. Enter the PIN number provided with this manual by turning the display dial and pressing it when the correct digit appears, then turning the dial to go to the next field and pressing, and turning to select the number etc.
5. When the PIN is correctly submitted, the Crane Synchronisation menu appears as shown in Figure 24.
6. Select Top Arm Sync, and the Top Arm screen appears as shown in Figure 25.

7. On the Hetronic remote control, select both top arms up with the joysticks at full deflection and time the arms in seconds, over their full stroke.

	SB330	SB361	SB400
Top Arm Up	48 sec	52 sec	54 sec
Top Arm Down	30 sec	32 sec	35 sec
Bottom Arm Up	65 sec	90 sec	90 sec
Bottom Arm Down	50 sec	70 sec	70 sec

If the time of either or both does not match the time in the table above, you will need to adjust the percentage values on the screen until it does. To do this, select the appropriate function by turning the dial then pressing it. You can then adjust the value up or down by turning the dial back or forward, and then save the new value by pressing the dial again.

8. Repeat for the bottom arms.

Testing the Synchronisation Settings

Test the settings when lifting a 15-20 tonne container to check that the arms are synchronised under normal loading and unloading conditions. Small adjustments of the percentage values may be required to achieve this.

Try slowing down the fast arm instead of speeding up the slow arm as you run the risk of running out of available oil flow to gain speed / synchronisation. Remember to actuate both front and rear cranes simultaneously when doing the timing.

Navigating the Screen

You can navigate the screen using the display dial, positioned as shown in the diagram above. Please note that the three buttons are not used.

To move through the screens and menu items, turn the display dial.

To make a selection from a menu or change a variable, press the display dial.

Dangerous Goods Specifications

Dangerous goods specification machines are fitted with a dual pole battery isolation switch.

Never turn the battery isolation switch while the Kubota engine is running!

This will cause a Load Dump to occur which will damage the electrical system.

Service Due Warnings

Service due warnings operate at 50hrs, 100hrs and at every 100hrs after that.

Cancelling the current service due warning setting and resetting with the next service interval must be done by an authorised service agent.

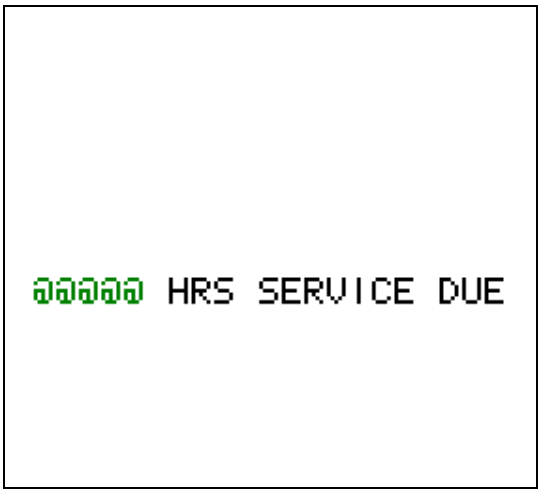


Figure 6

Digital Control Warnings and Alarms

The following screens are used in both the Digital Control and SMART*lift* systems.

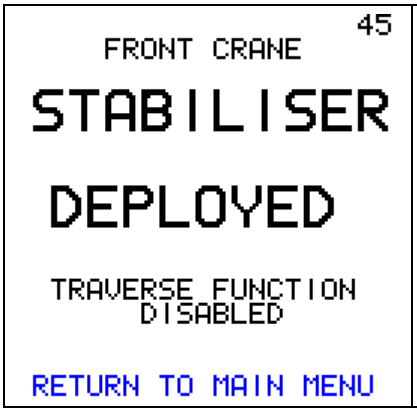


Figure 26

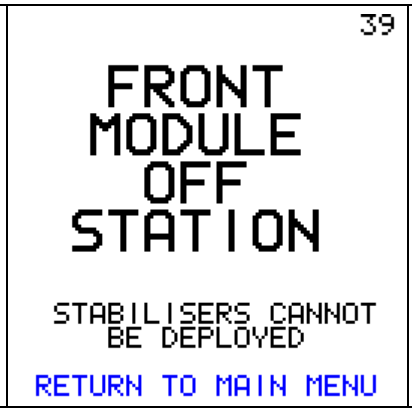


Figure 27 (rack and pinion only)

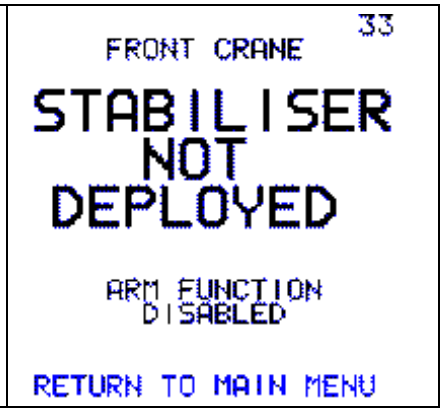


Figure 28

SMARTlift Load Monitoring System, Optional

Use of the SMARTlift LM System is not a replacement for proper operator training. The system is installed as an AID to safe operation of the Sidelifter. The system cannot react to the high momentum generated by a heavy, violently swinging container which WILL result in the Sidelifter becoming unstable. ALWAYS ensure that the load is properly under control.

SMARTlift is available as an addition to Digital Control on most SB330 and all SB361 and SB401 Sidelifters.

SMARTlift uses its intelligent software and sensors to monitor and control the lifting operation with precision and reliability. SMARTlift warns the operator when the load has moved to the limit of the safe working envelope and prevents the operator from moving the load further into an area where stability might be compromised.

Components

The SMARTlift system consists of the following components:

- All of the components listed under SMARTlift Control
- **Top arm angle sensor** x 2, located on each top arm.
- **Bottom arm angle sensor** x 2, located on each bottom arm.
- **Stabiliser angle sensor** x 2, located on each stabiliser housing.
- **Magnetic proximity sensor** x 4, located on each stabiliser housing.
- **Encoder strip** x 2, located on the stabiliser extension.
- **Reset magnet** x 4, located on each end of the stabiliser extensions.
- **Trailer angle sensor** x 1, located on the trailer chassis.

Electrical Control Units

Each crane is equipped with an Electronic Control Unit (ECU) which monitors the following Sidelifter parameters:

- Stabiliser angle
- Stabiliser extension
- Stabiliser foot in contact with ground
- Bottom lifting arm angle
- Top lifting arm angle
- Top lifting arm hydraulic cylinder pressure

- Trailer camber and elevation

Location of Sensors

The sensors are marked by dots and labelled in the diagram below.

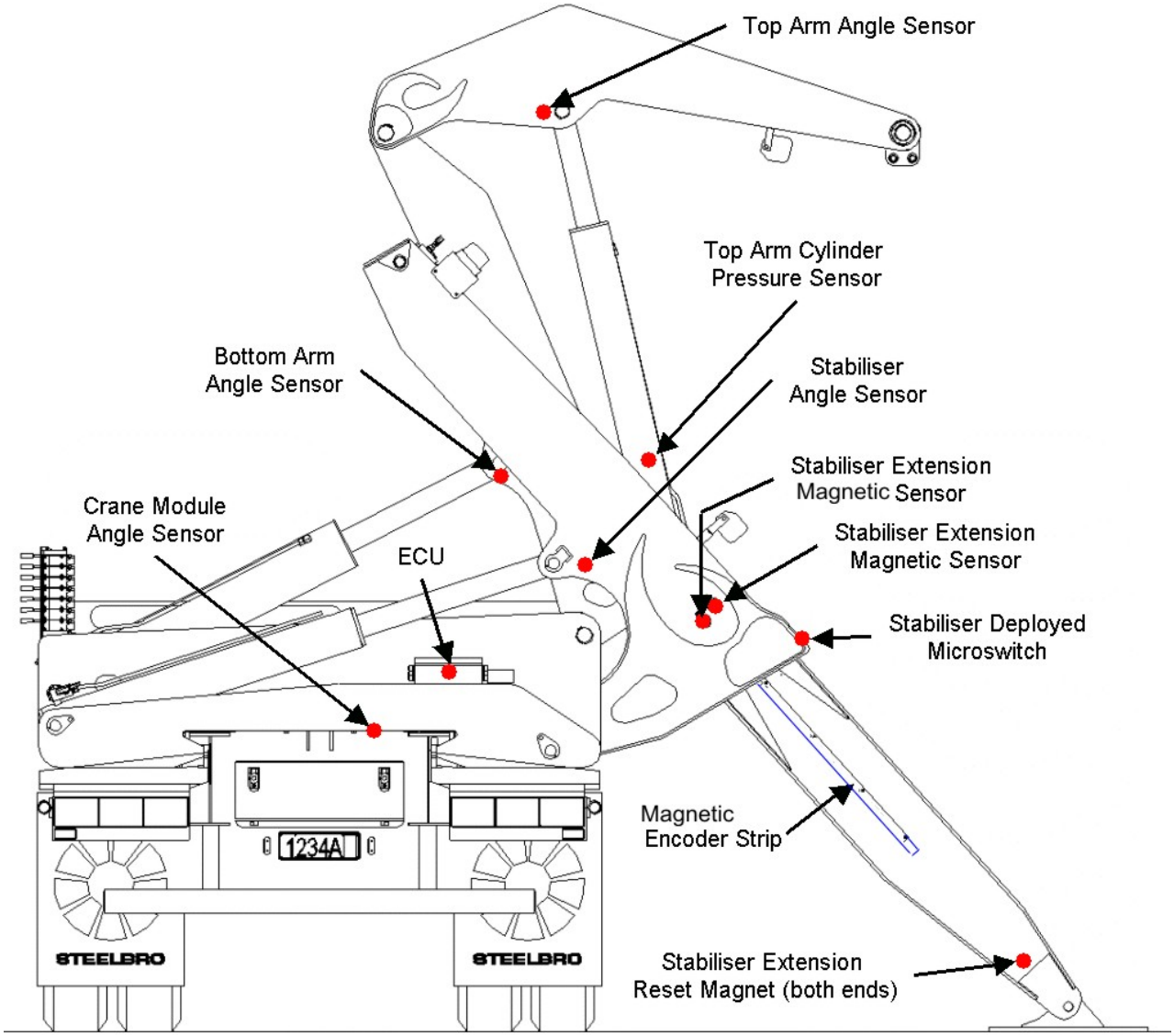


Figure 17

Angle and Pressure Sensor Failures

Angle and pressure sensor failures stop the operation of the Sidelifter. To continue operating the Sidelifter it is necessary to enter manual override mode. To do this, via the LCD display screen enter the Single Lift manual override PIN provided with this manual. This will allow you to override the SMARTlift system for this one operation only.

In manual override mode safety features of the load monitoring system are disabled and the operation of the arms is extra slow.

Operational Modes

This section lists the characteristics that are in addition to those described in the section Operational Modes (on page 12)

Arm Mode

A number of the special functions of SMARTlift are available while in Arm mode.

- Whenever you select Arm mode during an operation, the sensors automatically check that the stabilisers are firmly in contact with the ground or a companion trailer. If there is no contact, Arm mode is disabled and a warning sound (the horn) and screen message are activated
- However, if a stabiliser lifts off the ground during the loading operation, the lift is allowed to continue
- The first time you select Arm mode during an operation, the sensors automatically check the trailer camber and elevation. If these are outside safe working parameters, Arm mode is disabled. In such a case, it may be possible to correct the trailer camber using the stabilisers

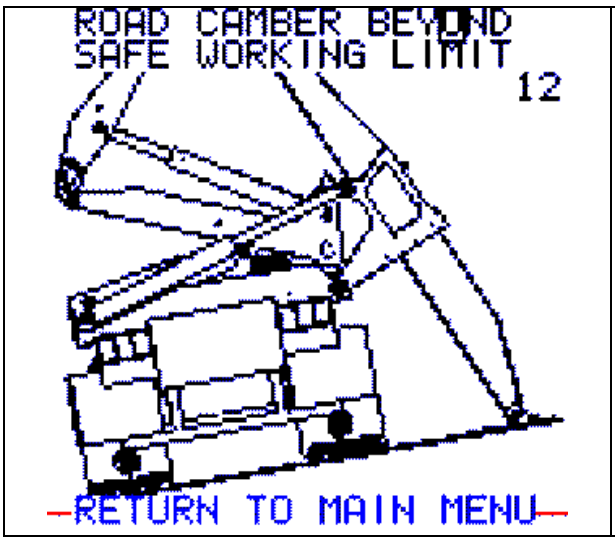


Figure 8

Figure 9

- Offside Stability Alarm: If the lifting **G-PIN** horizontal distance is within 250mm from the trailer centre line on the stabiliser side and the base of the container is higher than the top of the offside bash plates, the offside alarm is engaged. Bottom Arm Down and Top Arm Up functions are disabled. Below this height, the offside bash plates will prevent the container from going too far offside. The SMARTlift system also engages the offside alarm if the **G-PIN** crosses the centre line of the trailer while loaded

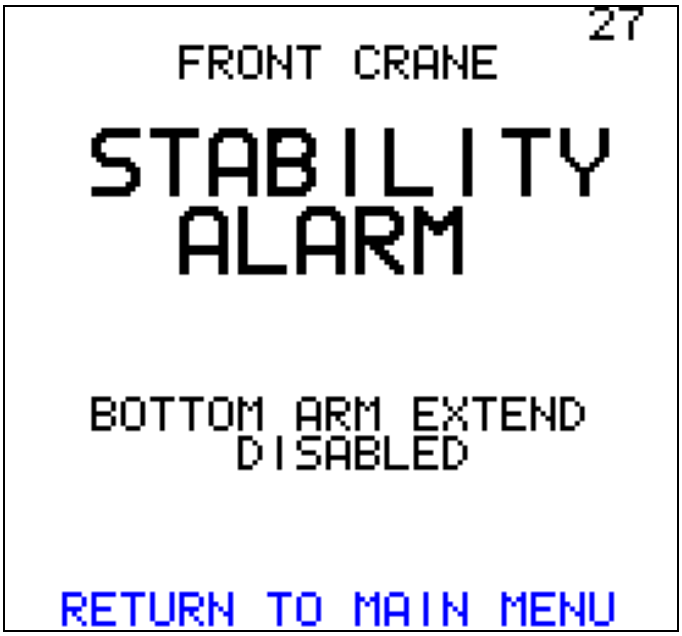


Figure 10

- The pressure in the top arm cylinder is also measured, which enables the system to estimate the mass on the lifting pin. This value is displayed to the nearest tonne whenever the Sidelifter is in Arm mode
- If the road elevation is such that one end of the Sidelifter trailer is higher than the other then the system will allow the high end of the container to be lifted higher than offside bash plate height, so that the container can be placed on the twist-locks
- When lifting two 20-foot containers together it is sometimes necessary to gain extra height above the offside bash plates to position the containers over the centre twist-locks. To gain extra height, press the horn button, the green button on the side of the remote, once to override the SMARTlift height limitation. The SMARTlift system will then beep once in reply. A message on the LCD display screen confirms that Double Twenty mode is operational. The SMARTlift system will stay in Double Twenty mode until either the engine is switched off or the horn button is pressed once. This procedure only works when the Sidelifter is in Arm mode.
- Each crane Electrical Control Unit (ECU) calculates the position of the stabiliser foot and the position of the lifting **G-PIN**. When the **G-PIN** is extended beyond the **STABILISER FOOT (K-PIN)**, the system calculates the stability of the Sidelifter on the loading side. As the **G-PIN** is extended the system first warns that an unstable situation is imminent. If the operator carries on, the system disables the functions that increase the distance of the **G-PIN** from the trailer**.** If the stabiliser is very steeply angled and the container is very heavy, then the SMART*lift* system may prevent the **G-PIN** from even being extended beyond the **K-PIN**.

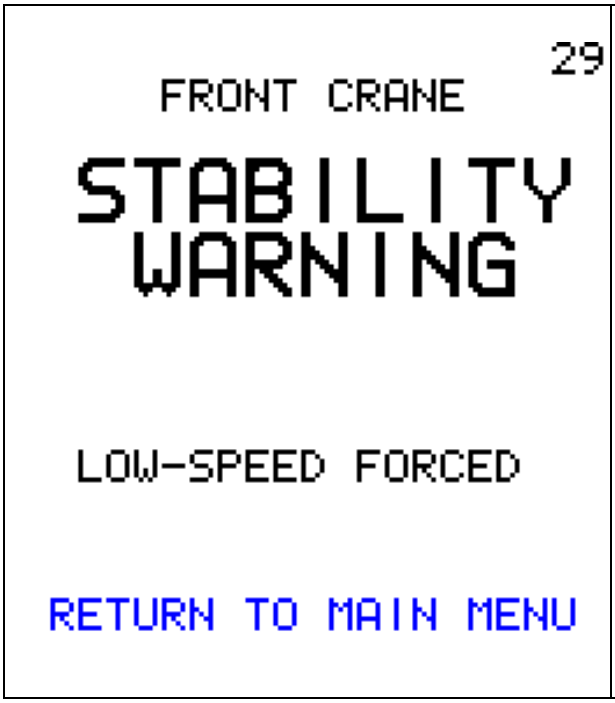


Figure 11

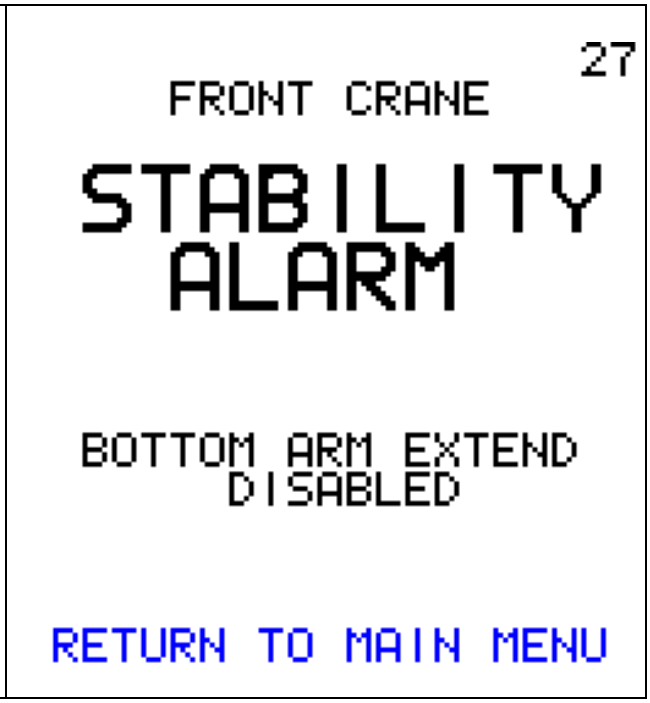


Figure 12

- Figure 13 shows a situation where a container has been unevenly loaded on the side nearest the Sidelifter. During loading it is necessary for the operator to:

  a) lift the container higher than normal above the twist-locks and

  b) move the **G-PIN** further over the offside than normal.

  These situations can cause the SMARTlift offside protection to activate earlier than desired. There are three ways to work around the issue.

1. Move the Sidelifter and pick the container up from the other side.
2. Shorten the chains so the container can be lifted higher.
3. If in the experience of the operator it is safe to attempt the lift, then via the LCD display screen enter the Single Lift manual override PIN provided with this manual. This will allow you to override the SMARTlift system for this one operation only.

In manual override mode safety features of the load monitoring system are disabled and the operation of the arms is extra slow.

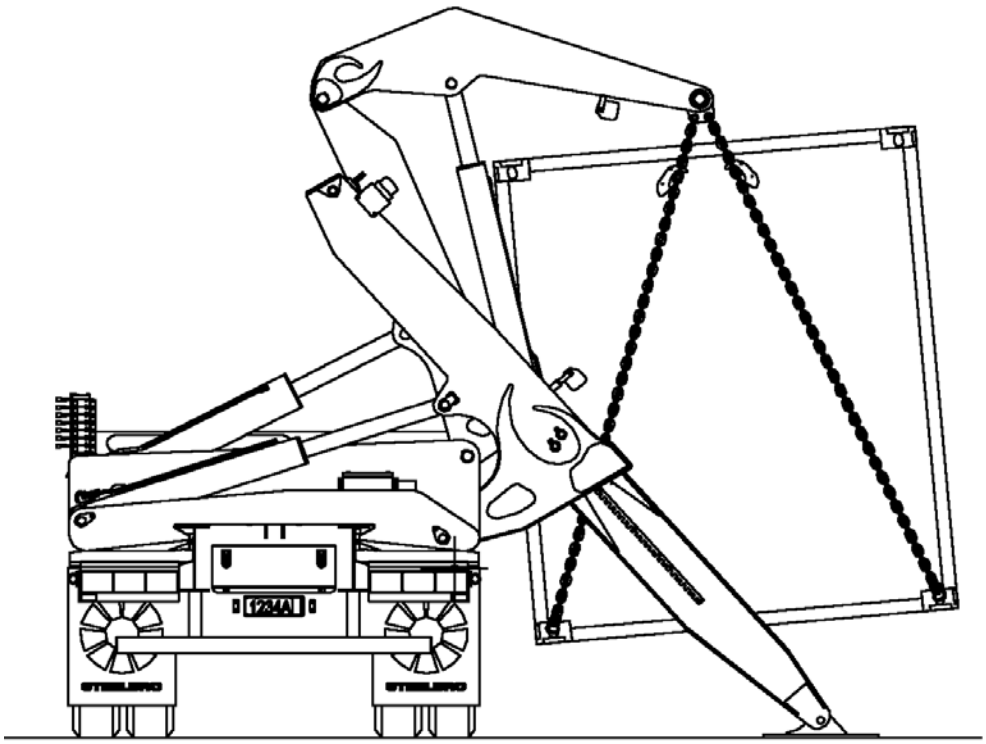


Figure 13

Stabiliser Mode

- Stabiliser mode is disabled if there is any load on the lifting pin and a warning sound (the horn) and screen message are activated

Figure 7

Traverse Mode

- If the stabiliser is extended for any distance, Traverse mode is disabled and a warning sound (the horn) and screen message are activated.

Lifting Containers on Steep Elevations

When lifting containers on steep elevations it is necessary to lift one end of the container higher than the other so that it can be located on the twist-locks.

The procedure is always to lift the up-hill end of the container higher than the downhill end.

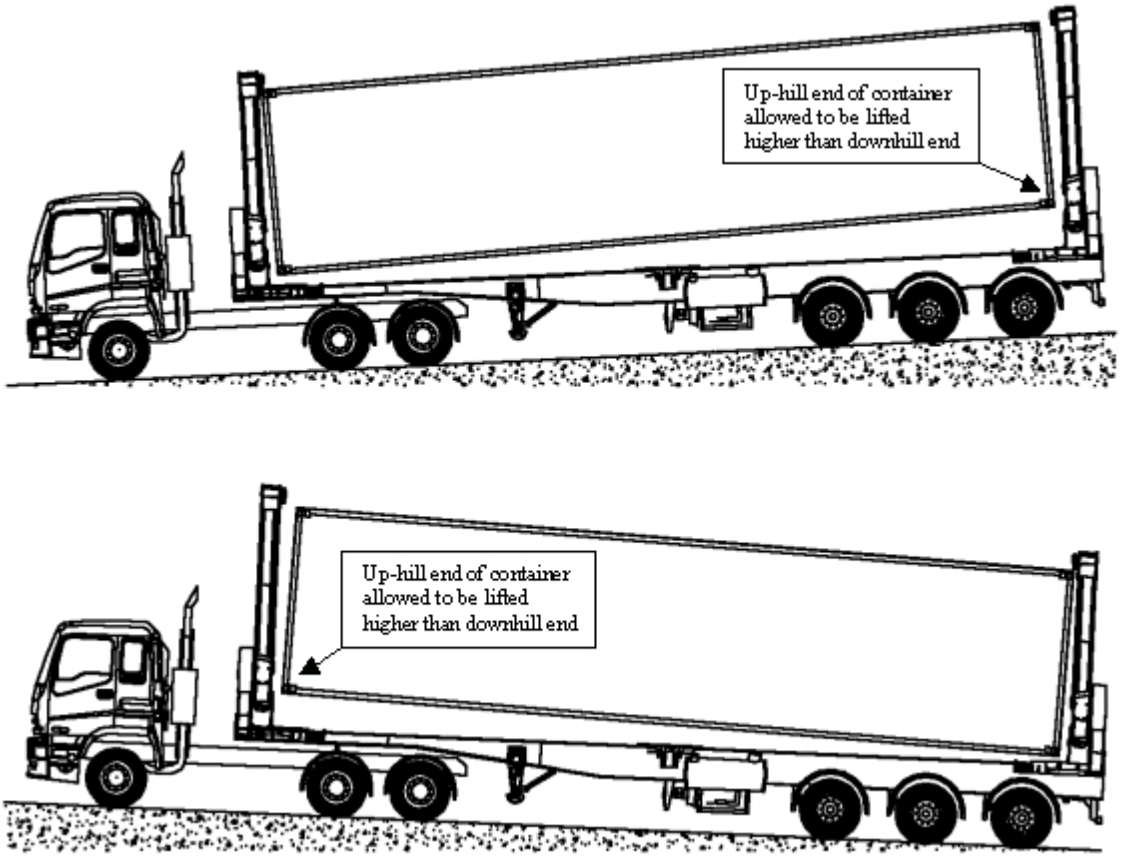


Figure 16

The SMARTlift system measures the road elevation and allows the uphill end of the container to be lifted higher than normal, so as to allow the downhill end to be located on the twist-locks.

Automatic Fault Detection

The system will detect common electrical faults such as wire breakages and short-circuits in the angle sensors, pressure sensors and the stabiliser deployed microswitch.

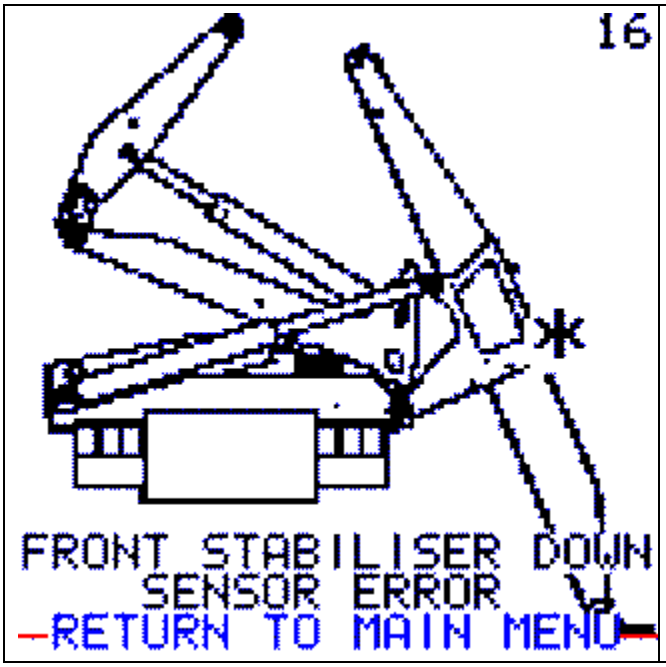


Figure 14

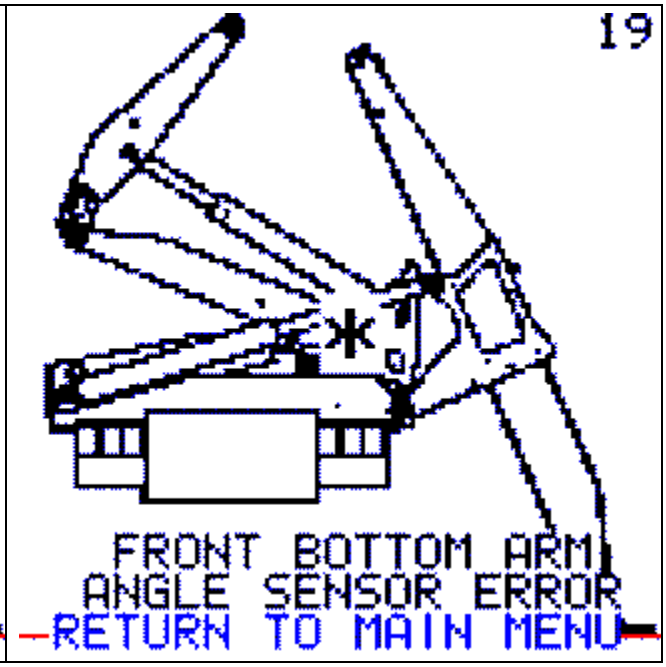


Figure 15

Troubleshooting

With the SMARTlift system, there is a comprehensive range of error messages including screens and sounds.

This chapter covers:

- Message screens - why they appear and what to do if this happens
- Miscellaneous other troubleshooting or fix information

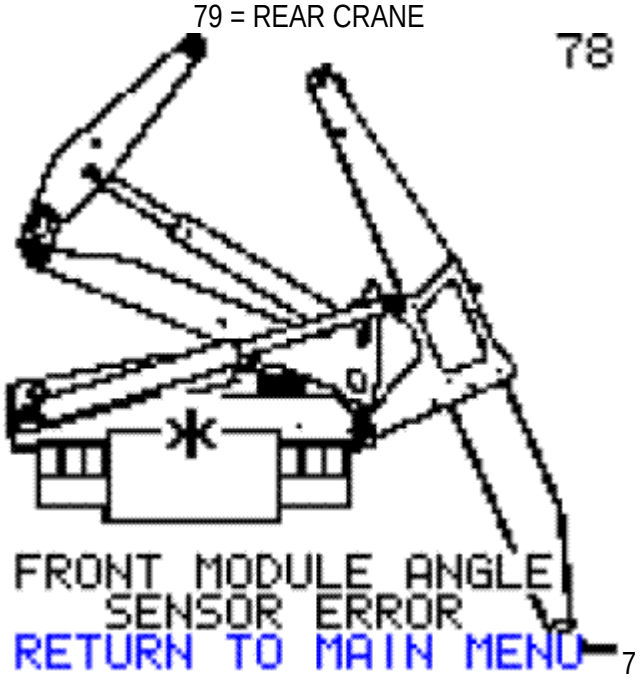
LCD Error or Warning Screens

This section references each of the error or warning screens and possible causes and fixes.

If contacting Product Support over a system issue, it is very helpful to be able to give them the number of the screen or screens that have displayed.

Module Angle Sensor Error F78 R79

78 = FRONT CRANE
79 = REAR CRANE



Front (or Rear) ECU is receiving an angle sensor signal outside 0.5 .. 4.5V range

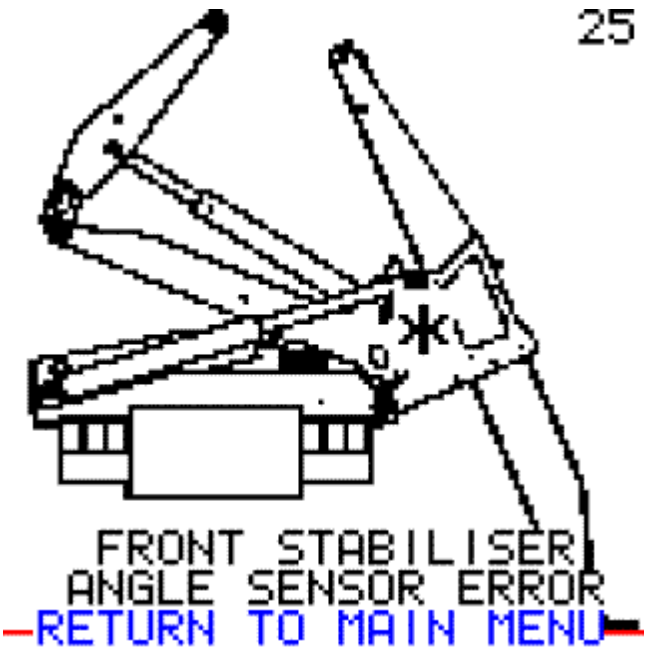
The module angle sensor measures the elevation and camber of the trailer.

Check:

- For damage to the sensor cable and ingress of moisture into connecting plug
- Replace the sensor (correct orientation is important) and recalibrate using procedure SL0005_2GB
- With the trailer parked on level ground the elevation should be 0° and the camber should be 0°. These values can be seen at View Sensor Values
- Remember, all angle sensors are the same component so it is possible to swap sensors in order to help diagnose faulty wiring or a faulty sensor. Just remember to recalibrate any sensor that is moved!

Stabiliser Angle Sensor Error F25 R26

25 = FRONT CRANE
26 = REAR CRANE



Front (or Rear) ECU is receiving an angle sensor signal outside 0.5 .. 4.5V range

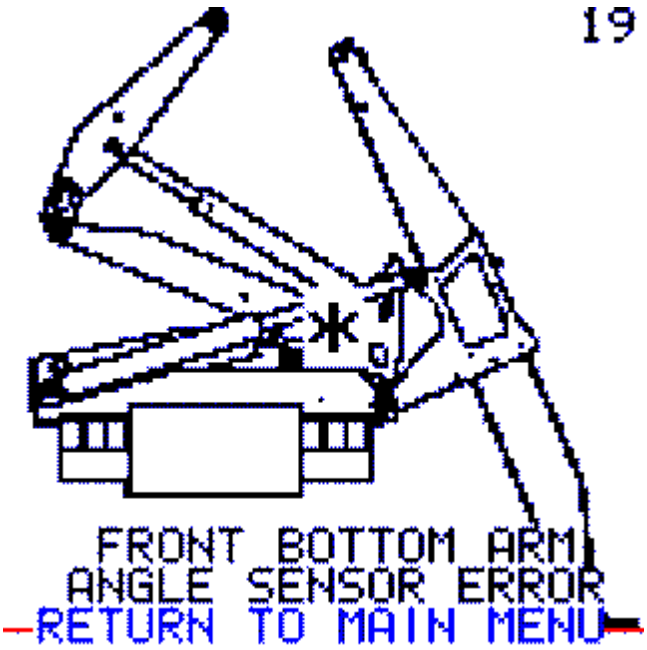
The Stabiliser Angle Sensor measures the angle of the stabiliser.

Check:

- For damage to the sensor cable and ingress of moisture into connecting plug
- Replace the sensor (correct orientation is important i.e. with the cable pointing upwards) and recalibrate using procedure SL0005_2GB
- Check the calibration by hanging a Plumb-Bob from the L-Pin and move the Stabiliser so that L-Pin is vertical to the H-Pin
- With the diesel engine not running but SMARTlift switched on, go to **MANUFACTURERS AREA – VIEW PIN DISTANCES-VIEW FRONT OR REAR PIN DISTANCES-VIEW HORIZONTAL DISTANCE HL**.The distance should be zero +/- 10mm.
- Remember, all angle sensors are the same component so it is possible to swap sensors in order to help diagnose faulty wiring or a faulty sensor. Just remember to recalibrate any sensor that is moved!

Bottom Arm Angle Sensor Error F19 R20

19 = FRONT CRANE
20 = REAR CRANE



Fault detected between Crane Junction Box and Bottom Arm Angle Sensor

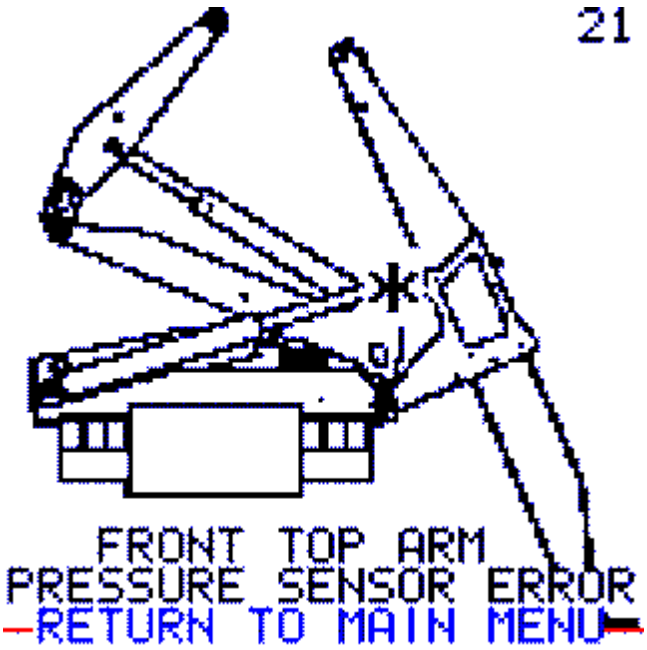
The Bottom Arm Angle Sensor measures the angle of the bottom arm.

Check:

- For damage to the sensor cable and ingress of moisture into connecting plug.
- Replace the sensor (correct orientation is important i.e. with the cable. pointing upwards) and recalibrate using procedure SL0005_2GB.
- Check the calibration by hanging a Plumb-Bob from the D-Pin and position the bottom arm in the vertical position so that the D-Pin is vertical to the A-Pin.
- With the diesel engine not running but SMARTlift switched on, go to **MANUFACTURERS AREA – VIEW PIN DISTANCES-VIEW FRONT OR REAR PIN DISTANCES-VIEW HORIZONTAL DISTANCE AD**. The distance should be zero +/- 10mm.
- Remember, all angle sensors are the same component so it is possible to swap sensors in order to help diagnose faulty wiring or a faulty sensor. Just remember to recalibrate any sensor that is moved!

Top Arm Pressure Sensor Error F21 R23

21 = FRONT CRANE
23 = REAR CRANE



Front (or Rear) ECU is receiving a Pressure Sensor signal outside 4.20mA range

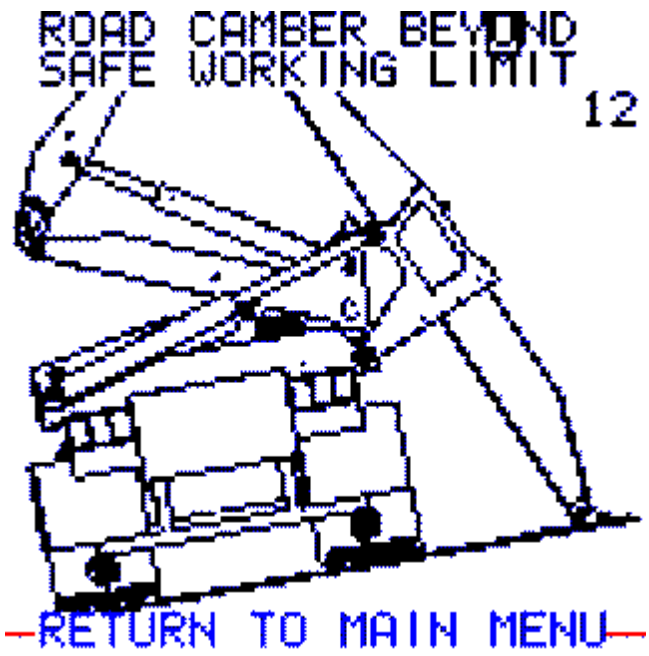
The Pressure Sensor measures the hydraulic pressure in the piston side of the top arm cylinder and is located on the A-port of the top arm lifting cylinder.

Check:

- For damage to the sensor cable and ingress of moisture into connecting plug
- Go to **VIEW SENSOR VALUES, VIEW FRONT** (or **REAR**) **ANGLE SENSORS** and check that when the top arm is fully extended that the pressure reading increases as expected
- Replace sensor if pressure does not change or is incorrect when cross checked with the analogue pressure gauge mounted on the rear crane

Top Arm Angle Sensor Error F11 R18

11 = FRONT CRANE
18 = REAR CRANE



Fault detected between Crane ECU and Top Arm Angle Sensor

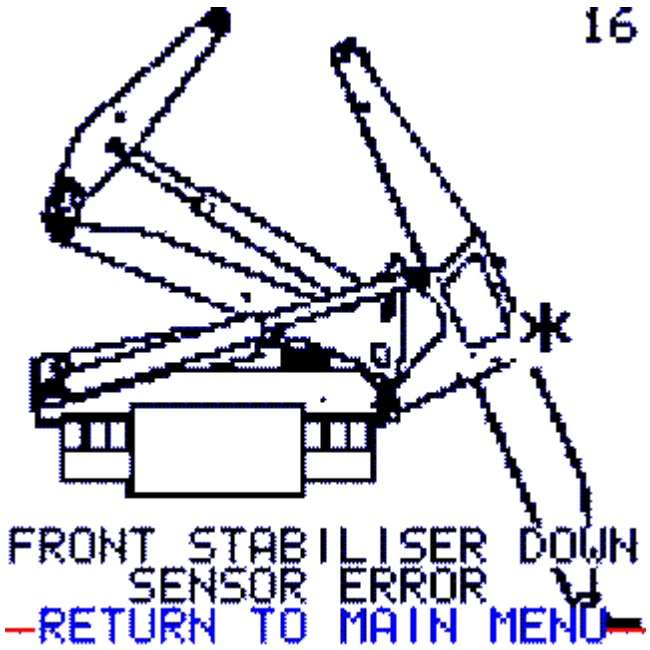
The Top Arm Angle Sensor measures the angle of the Top Arm.

Check:

- For damage to the sensor cable and ingress of moisture into connecting plug
- Replace the sensor (correct orientation is important i.e. with the cable pointing upwards) and recalibrate using procedure SL0005_2GB
- Check the calibration by hanging a Plumb-Bob from the G-Pin and position the bottom arm in the vertical position so that the G-Pin is vertical to the D-Pin
- With the diesel engine not running but SMARTlift switched on, go to **MANUFACTURERS AREA – VIEW PIN DISTANCES-VIEW FRONT OR REAR PIN DISTANCES-VIEW HORIZONTAL DISTANCE DG**. The distance should be zero +/- 10mm
- Remember, all angle sensors are the same component so it is possible to swap sensors in order to help diagnose faulty wiring or a faulty sensor. Just remember to recalibrate any sensor that is moved!

Stabiliser Down Sensor Error F16 R15

16 = FRONT CRANE
15 = REAR CRANE

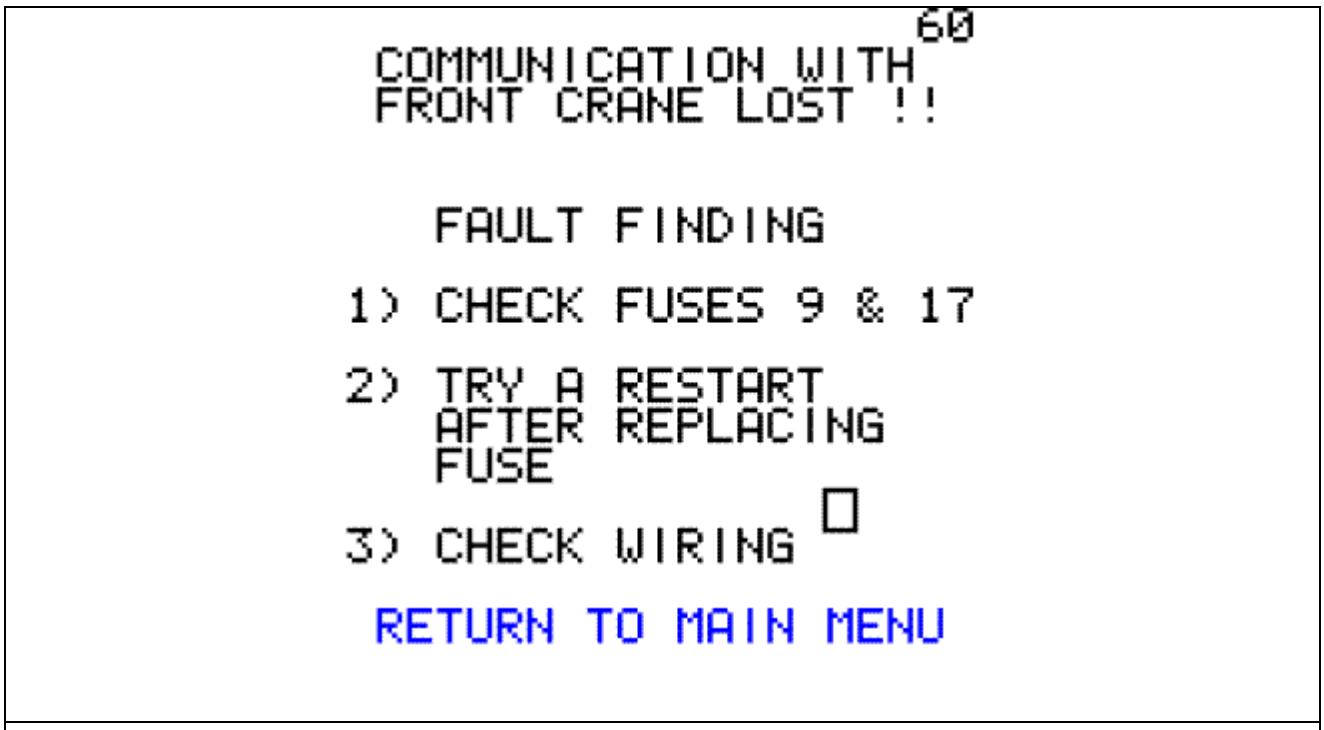


Stabiliser Down Microswitch is not operating correctly

The microswitch has a Normally Open (NO) and a Normally Closed (NC) contact.

- On the LCD screen go to **VIEW SENSOR VALUES** then **FRONT** (or **REAR**) **STABILISER EXTENSION SENSORS**. At the bottom of the screen the switch state is displayed
- With the Stabiliser on the ground NO = 1 and NC = 0, with the stabiliser foot not in contact with the ground NO = 0 and NC = 1
- If NO=0 and NC=0, or NC=1 and NO=1 if then the above error page will be displayed

Communication With Front Crane Lost! 60

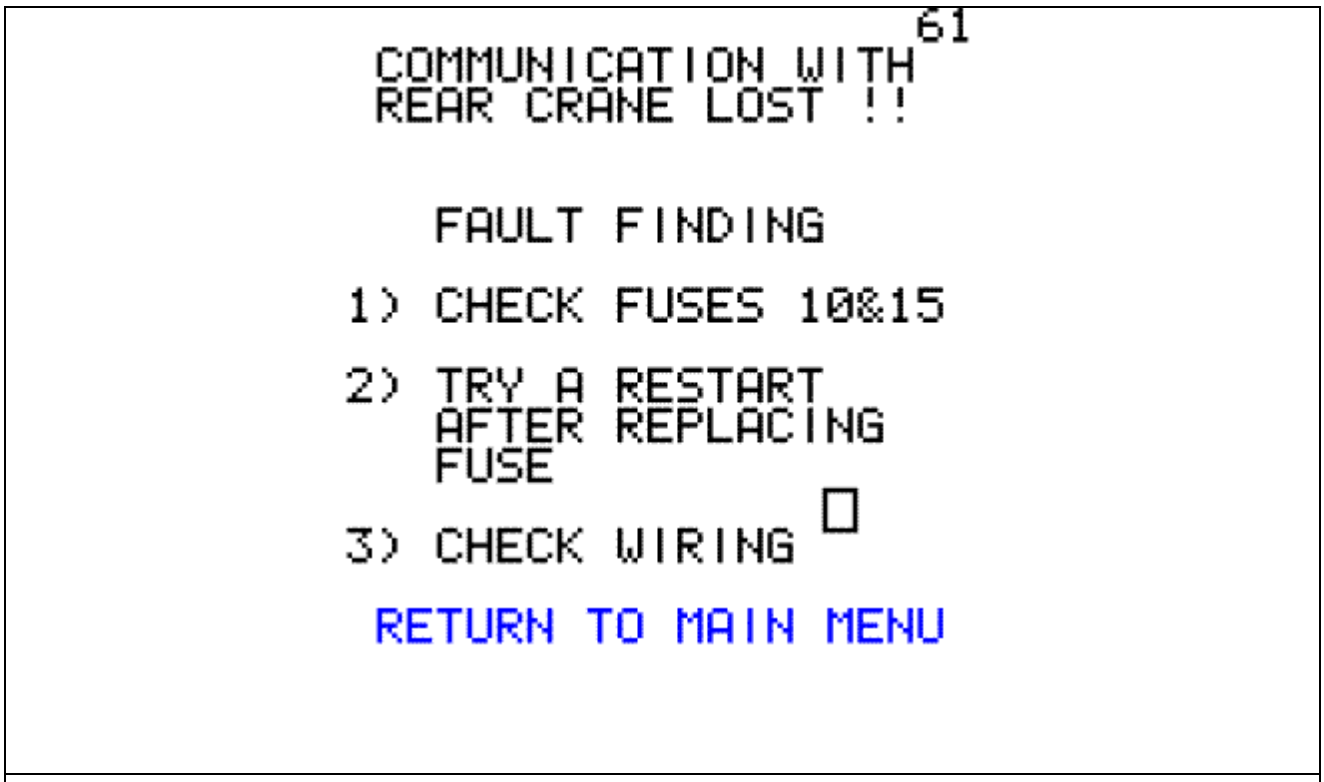


The rear crane ECU has lost communication with the front crane ECU

Possible causes:

- Check fuses, blown fuse could be caused by a pinched sensor wire
- Power has been lost to the ECU, check:
  - ECU D+, Pin 28
  - ECU UE, Pin 54
  - ECU Ground, Pin 55
- Check CANbus continuity by measuring resistance between CAN-H and CAN-L at the diagnostic plug, remember to turn key switch off before trying this. 60Ω = good, 120 Ω = break in CANbus

Communication With Rear Crane Lost ! 61



The front crane ECU has lost communication with the rear crane ECU.

Possible causes:

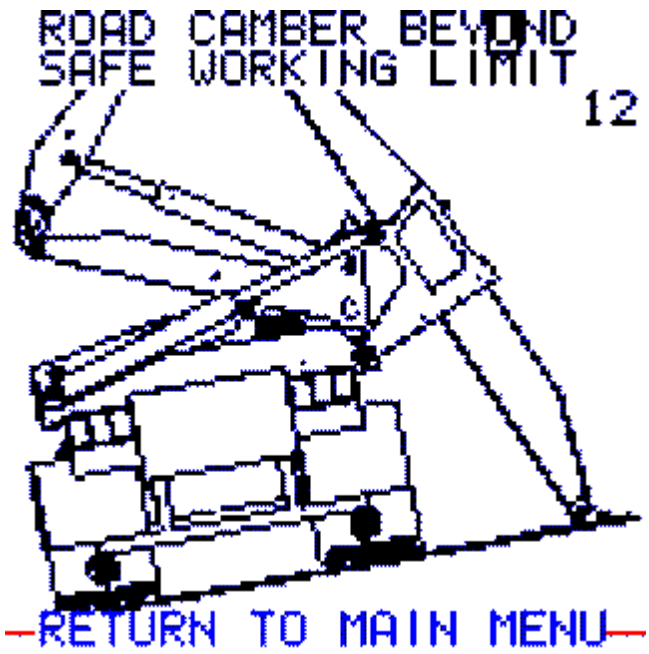
- Check fuses, blown fuse could be caused by a pinched sensor wire
- Power has been lost to the ECU, check:
  - ECU D+, Pin 28
  - ECU UE, Pin 54
  - ECU Ground, Pin 55
- Check CANbus continuity by measuring resistance between CAN-H and CAN-L at the diagnostic plug, remember to turn key switch off before trying this. 60Ω = good, 120 Ω = break in CANbus

Low Control System Voltage 62

The voltage in the motorbike battery located on the Kubota engine frame has fallen to below 11V

- This is caused by the system being left 'ON' while the Kubota engine is not running
- The motorbike battery is only used to provide a stable voltage to the electronic components of the SMARTlift system while the Kubota engine is being started
- Once the Alternator is spinning the system voltage will rise to 14.2V then current can flow across the diode to allow the motorbike battery to charge from the main battery
- If this message is displayed during operation of the machine check that the Alternator is operating correctly

Road Camber Beyond Safe Working Limit 12

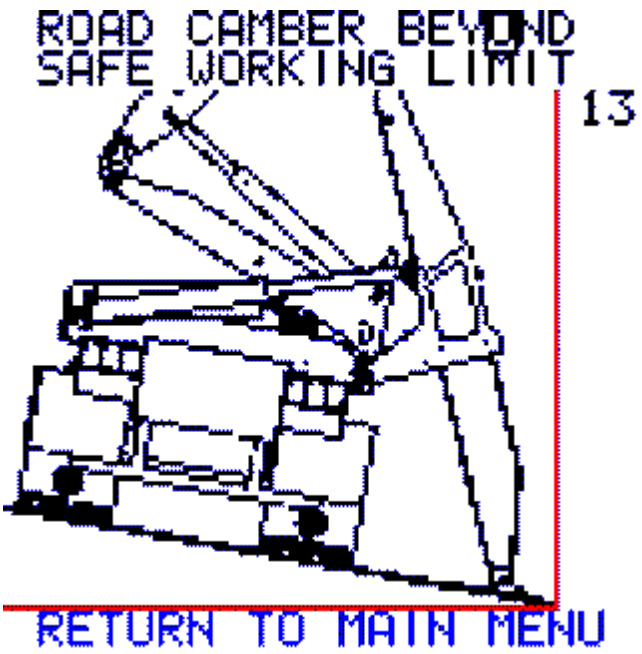


Either the front, rear or both crane bases are angled beyond acceptable limits

If this is clearly not the issue:

- Park the trailer on level ground and go to **VIEW SENSOR VALUES** then **VIEW FRONT** (or **REAR**) **ANGLE SENSORS**
- The trailer camber and elevation angle sensor readings should = 0 degrees
- If not then first check that the angle sensor has not come loose before recalibrating using procedure SL0005_2GB
- If the recalibration fails then check the wiring before replacing the sensor.
- Remember, all angle sensors are the same component so it is possible to swap sensors in order to help diagnose faulty wiring or a faulty sensor. Just remember to recalibrate any sensor that is moved!

Road Camber Beyond Safe Working Limit 13

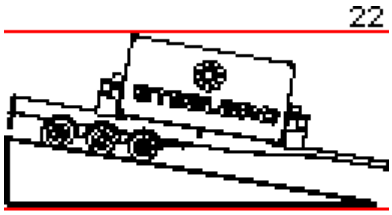


Either front, rear or both crane bases are angled beyond acceptable limits

If this is clearly not the issue:

- Park the trailer on level ground and go to **VIEW SENSOR VALUES** then **VIEW FRONT** (or **REAR**) **ANGLE SENSORS**
- The trailer camber and elevation angle sensor readings should = 0 degrees.
- If not then first check that the angle sensor has not come loose before recalibrating using procedure SL0005_2GB
- If the recalibration fails then check the wiring before replacing the sensor.
- Remember, all angle sensors are the same component so it is possible to swap sensors in order to help diagnose faulty wiring or a faulty sensor. Just remember to recalibrate any sensor that is moved!

Road Elevation Beyond Safe Working Limit 22



ROAD ELEVATION BEYOND
SAFE WORKING LIMIT

RETURN TO MAIN MENU

Either front, rear or both crane bases are angled beyond acceptable limits

If this is clearly not the issue:

- Park the trailer on level ground and go to **VIEW SENSOR VALUES** then **VIEW FRONT** (or **REAR**) **ANGLE SENSORS**
- The trailer camber and elevation angle sensor readings should = 0 degrees.
- If not then first check that the angle sensor has not come loose before recalibrating using procedure SL0005_2GB
- If the recalibration fails then check the wiring before replacing the sensor.
- Remember, all angle sensors are the same component so it is possible to swap sensors in order to help diagnose faulty wiring or a faulty sensor. Just remember to recalibrate any sensor that is moved!

Road Elevation Beyond Safe Working Limit 24

Either front, rear or both crane bases are angled beyond acceptable limits

If this is clearly not the issue:

- Park the trailer on level ground and go to **VIEW SENSOR VALUES** then **VIEW FRONT** (or **REAR**) **ANGLE SENSORS**
- The trailer camber and elevation angle sensor readings should = 0 degrees.
- If not then first check that the angle sensor has not come loose before recalibrating using procedure SL0005_2GB
- If the recalibration fails then check the wiring before replacing the sensor.
- Remember, all angle sensors are the same component so it is possible to swap sensors in order to help diagnose faulty wiring or a faulty sensor. Just remember to recalibrate any sensor that is moved!

Warning Angle Sensors Not Calibrated F53 R113

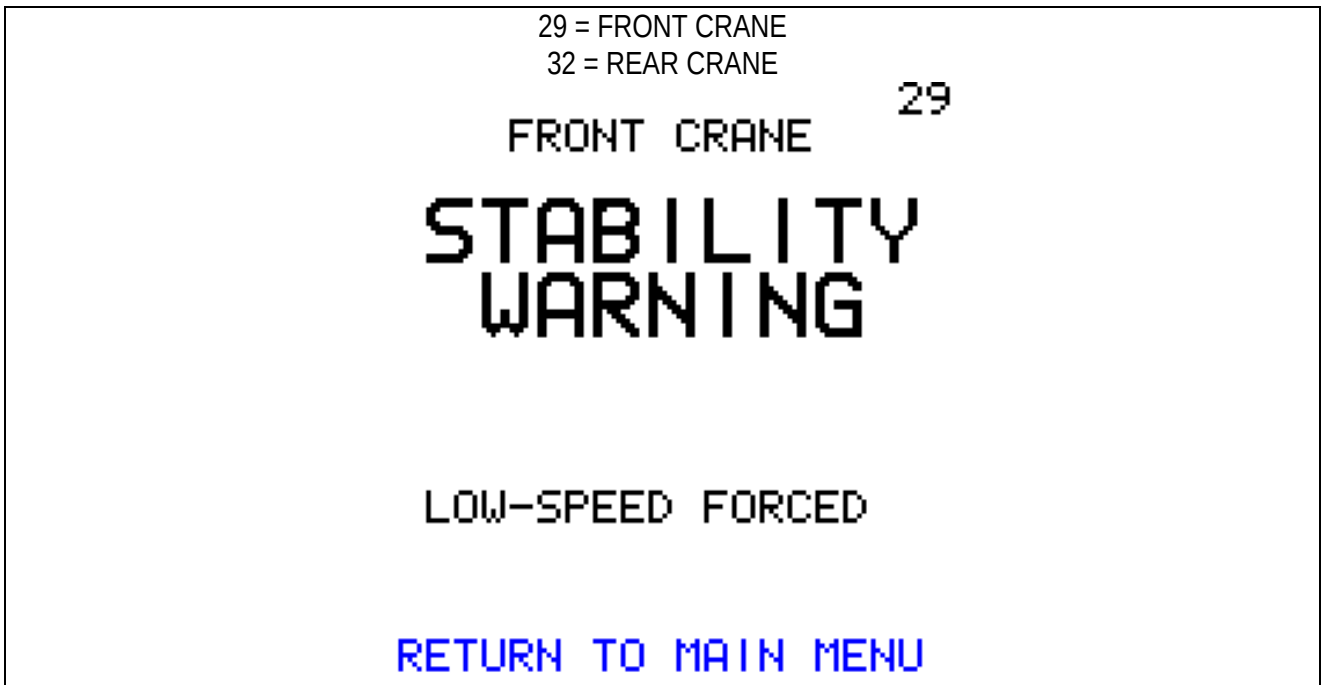
53 = FRONT CRANE
113 = REAR CRANE

The ECU has detected that the angle sensor calibration data has been lost, this may cause unexpected stability alarms to be activated

- Sidelifter should be recalibrated using the Plumb-Bob Calibration Method
- Ensure that the latest software version is being used, confirm with Steelbro
- Report the problem to Steelbro

Stability Warning F29 R32

29 = FRONT CRANE
32 = REAR CRANE



The Arms have been extended within 250mm of the edge of the safe working envelope on the Stabiliser side of the Sidelifter

- If High speed is selected then Low speed automatically activates
- High speed can be re-entered only if the Arm extension is reduced and both joysticks are in the neutral position

If this is clearly not the issue:

- Check that the Stabiliser Extension measurement is operating correctly
- Check the calibration of the Stabiliser, Bottom and Top Arm Angle Sensors. Do this by hanging a plum bob one at a time between pins A&D, D&G and H&L as described in the calibration procedure SL0005_2GB and then go to the **MANUFACTURERS AREA** then **VIEW PIN DISTANCES** and check that the HORIZONTAL DISTANCES, AD, DG and HL are zero mm (±10mm) when the plumb bob is lined up

Stability Alarm F27 F30

27 = FRONT CRANE
30 = REAR CRANE

The arms have been extended to the edge of the Safe Working Envelope on the stabiliser side of the Sidelifter

- All arm functions that could move the load further away from the trailer are disabled
- If the Top Arm is above horizontal, then only Top Arm up will be allowed
- If the Top Arm is below horizontal then only Top Arm Down will be allowed
- Bottom Arm Up is disabled
- Bottom Arm Down is enabled

If this is clearly not the issue:

- Check the operation of the stabiliser extension magnetic counter by going to **VIEW SENSOR VALUES** then **FRONT** (or **REAR**) **STABILISER EXTENSION SENSORS**. As the Stabiliser Extension is deployed the LCD display screen should display a changing count as the magnetic counter reads the magnetic strip. With the Stabiliser Extension fully extended, the magnetic counter should display as 1 and the top reset magnet should display as 0. With the Stabiliser Extension arm fully retracted the magnetic counter should display as 0 and the top reset magnet should display as 1
- Check the calibration of the Stabiliser, Bottom and Top Arm Angle Sensors. Do this by hanging a plum bob one at a time between pins A&D, D&G and H&L as described in the calibration procedure SL0005_2GB and then go to the **MANUFACTURERS AREA** then **VIEW PIN DISTANCES** and check that the HORIZONTAL DISTANCES, AD, DG and HL are zero mm (±10mm) when the plumb bob is lined up

Offside Stability Alarm F28 R31

28 = FRONT CRANE
31 = REAR CRANE

The most likely causes are:

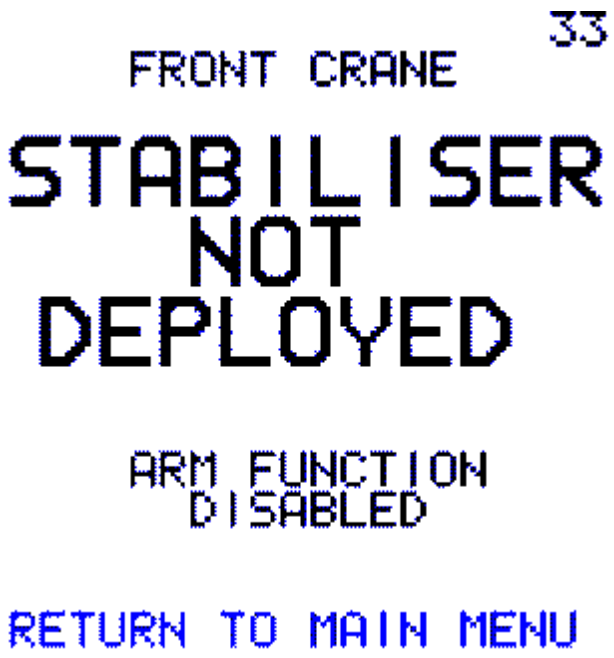
- The lifting pin (G-Pin) has crossed the centreline of the trailer with load
- The operator has lifted the container too high and has come within 200mm of the centreline of the trailer. In this case the operator must lower the container to a more suitable height for landing on the trailer twistlocks

If this is clearly not the issue:

- Check the calibration of the Bottom and Top Arm Angle Sensors. Do this by hanging a plum bob one at a time between pins A&D and D&G as described in the calibration procedure SL0005_2GB and then go to the **MANUFACTURERS AREA** then **VIEW PIN DISTANCES** and check that the HORIZONTAL DISTANCES, AD and DG are zero mm (±10mm) when the plumb bob is lined up.

Stabiliser Not Deployed – Arm Function Disabled F33 R34

33 = FRONT CRANE
34 = REAR CRANE



Arms Mode has been entered without the stabiliser being properly deployed

That is, enough pressure being put on the foot so that the gap between the Stabiliser Extension and Stabiliser Housing closes, thereby activating the Stabiliser Down Microswitch.

If this is clearly not the issue:

- Check that the Stabiliser Down Microswitch is functioning correctly
- On the LCD screen go to **VIEW SENSOR VALUES** then **FRONT** (or **REAR**) **STABILISER EXTENSION SENSORS**. At the bottom of the screen the switch state is displayed
- With the Stabiliser on the ground NO = 1 and NC = 0, with the stabiliser foot not in contact with the ground NO = 0 and NC = 1

Load On Lifting Pin – Stabilisers Cannot Be Deployed F37 R38

37 = FRONT CRANE
38 = REAR CRANE

Stabiliser Mode has been entered while there is still load on the lifting pin (G-Pin)

If this is clearly not the issue:

- Check the Top Arm Pressure Sensor Value by going to **VIEW SENSOR VALUES** then **FRONT** (or **REAR**) **ANGLE SENSORS**. At the bottom of the page the Pressure in the Top Arm Cylinder will be displayed. With no load on the G-Pin the pressure should be less than 20bar
- If the reading is stuck no matter what weight is on the G-Pin then replace the pressure sensor
- When replacing the sensor make sure that the top Arm is fully folded down and that all hydraulic pressure in the cylinder is released by using the manual lever on the Danfoss PVG valve. Wear eye protection

Module Off Station – Stabilisers Cannot Be Deployed F39 R40

39 = FRONT CRANE
40 = REAR CRANE

This is only possible on SB361/401 with rack and pinion crane traverse fitted

Stabiliser Deployed – Traverse Function Disabled F45 R44

45 = FRONT CRANE
44 = REAR CRANE

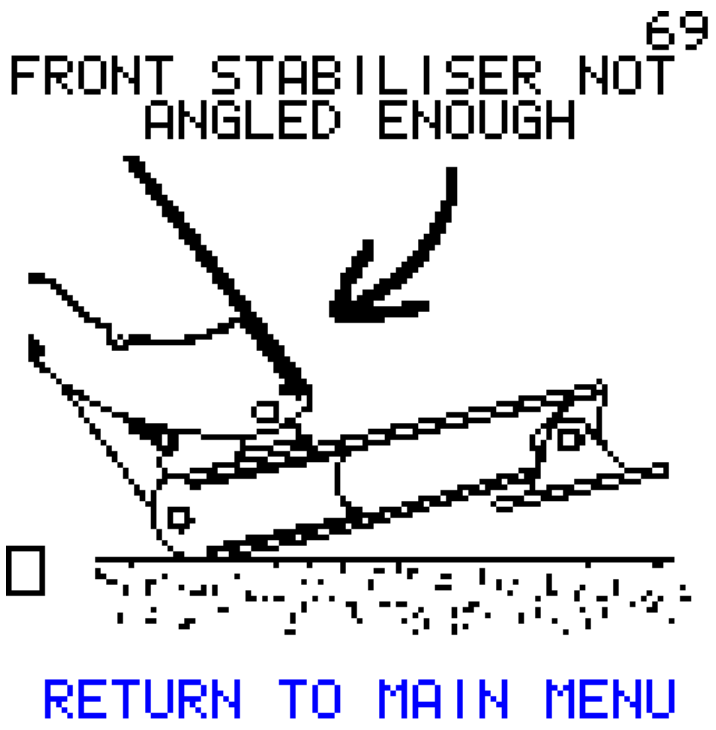
Operator has entered traverse Mode without the Stabiliser first being fully retracted

If this is clearly not the issue:

- On the LCD screen go to **VIEW SENSOR VALUES**, then **FRONT** (or **REAR**) **STABILISER EXTENSION SENSORS**. Check that the foot down micro switch values change when the foot is placed on the ground and lifted off the ground. When the foot is on the ground, the values displayed should read NORMALLY OPEN=1, NORMALLY CLOSED=0. When the foot is off the ground, the values displayed should read NORMALLY OPEN=1, NORMALL CLOSED=1. If the stabiliser is fully folded and retracted, but the foot down switch's indicate that the foot is on the ground check, and if needed, adjust the microswitch on the stabiliser housing
- Check that the magnet located on the side of the stabiliser extension near the foot end is still in place
- Check that the stabiliser counts in and out correctly by looking at the LCD screen during operation of the stabiliser. During retraction the counter should reach zero mm by the end of the magnetic strip. During extension the counter will only start when the first magnet of the magnetic strip is reached
- Go to **VIEW SENSOR VALUES** then **FRONT** (or **REAR**) **STABILISER EXTENSION SENSORS**. With the stabiliser extension fully retracted the values displayed should read MAGNETIC COUNTER =1, RESET MAGNET = 0. With the stabiliser extension fully extended the values displayed should read MAGNETIC COUNTER =1, RESET MAGNET = 1

Stabiliser not angled enough F69 R70

69 = FRONT CRANE
70 = REAR CRANE

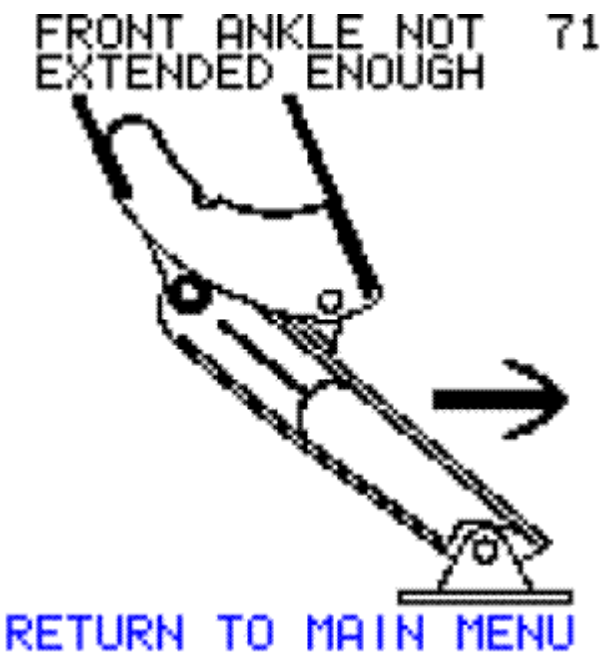


The Stabiliser must be sufficiently angled so that when the Bending Leg is deployed the foot comes into contact with the ground, not the ankle

- The Stabiliser Angle is checked when the **MODE SELECT SWITCH** is turned to **BENDING LEG MODE**.
- If the Stabiliser is already at maximum angle and this message still appears then ensure that the trailer camber is not over +3° (i.e. chassis leaning towards the non-stabiliser side). If this is the case it may not be possible to safely deploy the Bending Leg.
- Check the calibration of the Stabiliser Angle Sensor by hanging a Plumb-Bob from the L-Pin and move the Stabiliser so that L-Pin is vertical to the H-Pin.
- With the diesel engine not running but SMARTlift switched on, go to MANUFACTURERS AREA, VIEW PIN DISTANCES, VIEW FRONT OR REAR PIN DISTANCES, VIEW HORIZONTAL DISTANCE HL. The distance should be zero +/- 10mm.

Ankle not extended enough F71 R72

71 = FRONT CRANE
72 = REAR CRANE



The Bending Leg must be fully deployed (or fully retracted) before any lifting can take place

- When **ARMS MODE** is selected SMARTlift checks if the Bending Leg is fully extended or fully retracted.
- If the Bending Leg is either fully extended or fully retracted but this screen still displays, then it is most likely that either the Bending Leg Fully Extended Sensor or Bending Leg Fully Retracted Sensor is faulty or requires adjustment.
- The easiest method of checking the operation of the sensors is by going to **VIEW SENSOR VALUES**, **VIEW SPECIAL OPTIONS**, **FRONT** (or **REAR**) **ANKLE**.
- Actuate the Bending Leg between the fully retracted and fully extended positions. Observe that the ANKLE POSITION should change from Fully Retracted to Partially Extended to Fully Extended. The individual switch values can also be viewed and they should be as follows.

	Leg Retracted Sensor NO Switch	Leg Retracted Sensor NC Switch	Leg Extended Sensor NO Switch
Fully retracted	CLOSED	OPEN	OPEN
Partially Extended	OPEN	CLOSED	OPEN
Fully extended	OPEN	CLOSED	CLOSED

Ankle Retract Sensor Error F104 R105

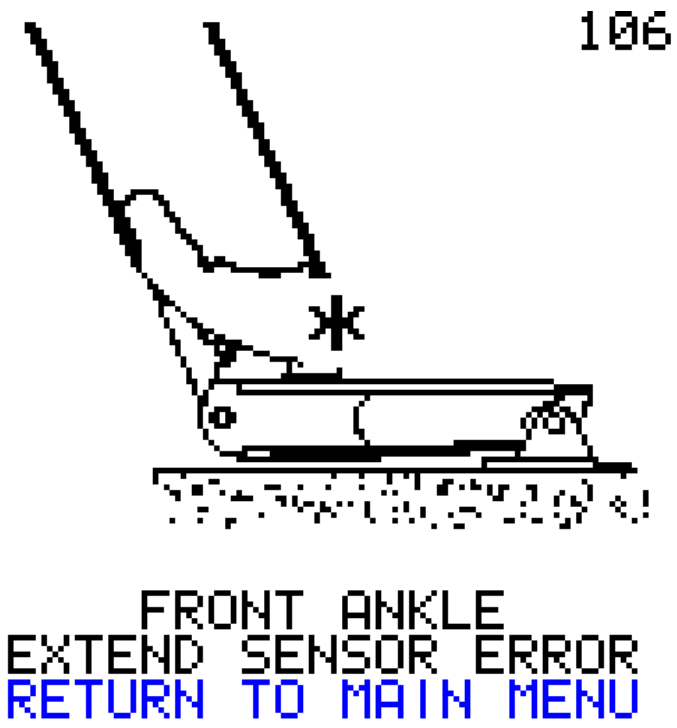
104 = FRONT CRANE
105 = REAR CRANE

The Bending Leg Retract Sensor is faulty

- Check the operation of the sensor is by going to **VIEW SENSOR VALUES**, **VIEW SPECIAL OPTIONS**, **FRONT** (or **REAR**) **ANKLE**.
- The error message appears when the both the Leg Retracted Switches are in the CLOSED state or when both switches are in the OPEN state.
- If both switches are in the CLOSED state then it is most likely there is a wiring fault, a short circuit or a sensor failure.
- If both switches are in the OPEN state then it is most likely there is a damaged wire, a wiring fault, loss of power to the sensor, or a sensor failure.

Ankle Extend Sensor Error F106 R107

106 = FRONT CRANE
107 = REAR CRANE



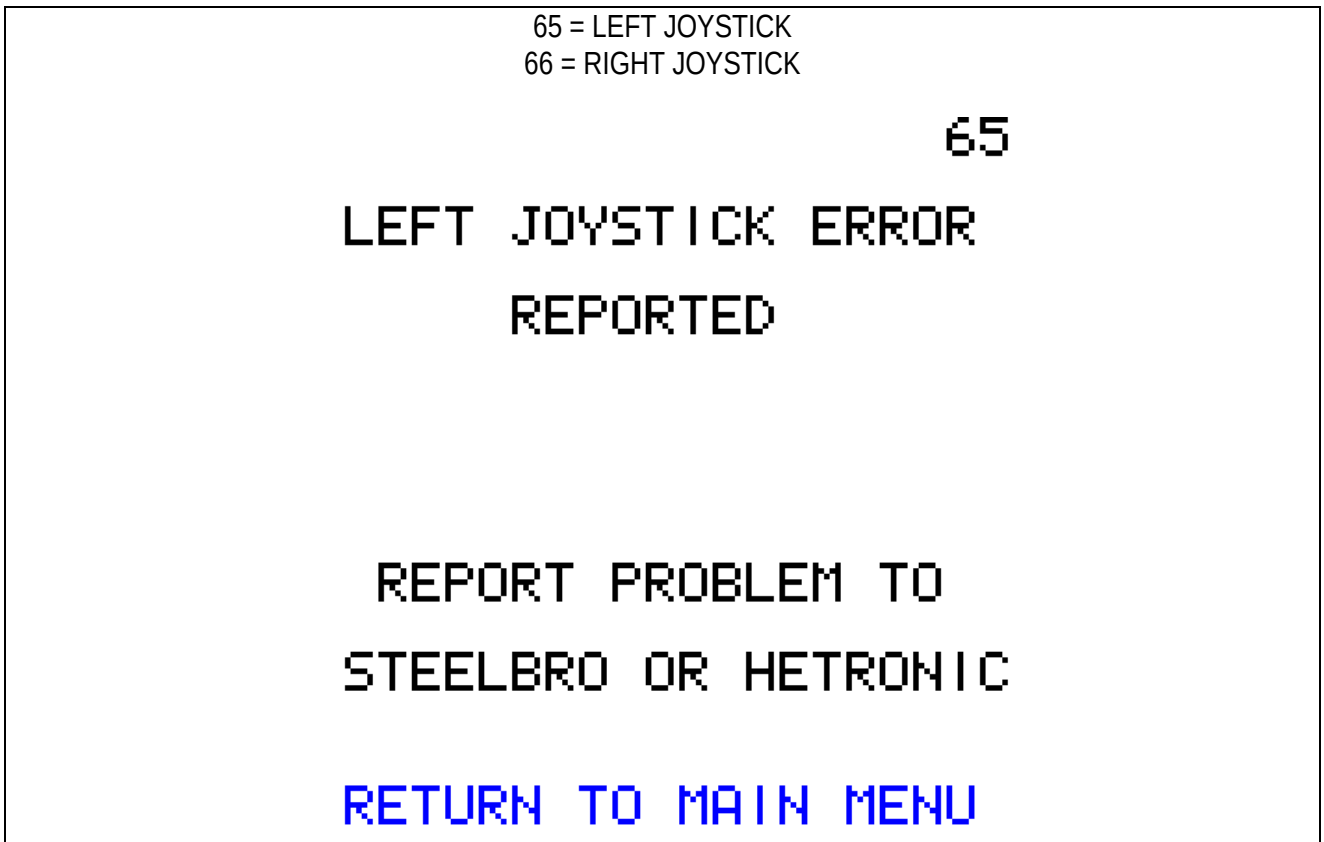
The Bending Leg Extend Sensor may be faulty, or most likely requires adjustment

- This sensor only has one switch, so it cannot be diagnosed in the same way as the Retract Sensor.
- The screen appears when the both the Fully Retract Sensor and the Fully Extend Sensor are sensing the Bending Leg. Clearly it is not possible for the leg to be fully retracted and fully extended at the same time.
- If this error page shows only when the Bending Leg is fully retracted then it is most likely that the Extend Sensor just needs adjusting slightly away from pivot.

▪ Refer to the table below for the correct switch states;	Leg Retracted Sensor NO Switch	Leg Retracted Sensor NC Switch	Leg Extended Sensor NO Switch
Fully retracted	CLOSED	OPEN	OPEN
Partially Extended	OPEN	CLOSED	OPEN
Fully extended	OPEN	CLOSED	CLOSED

Joystick Error Reported L65 R66

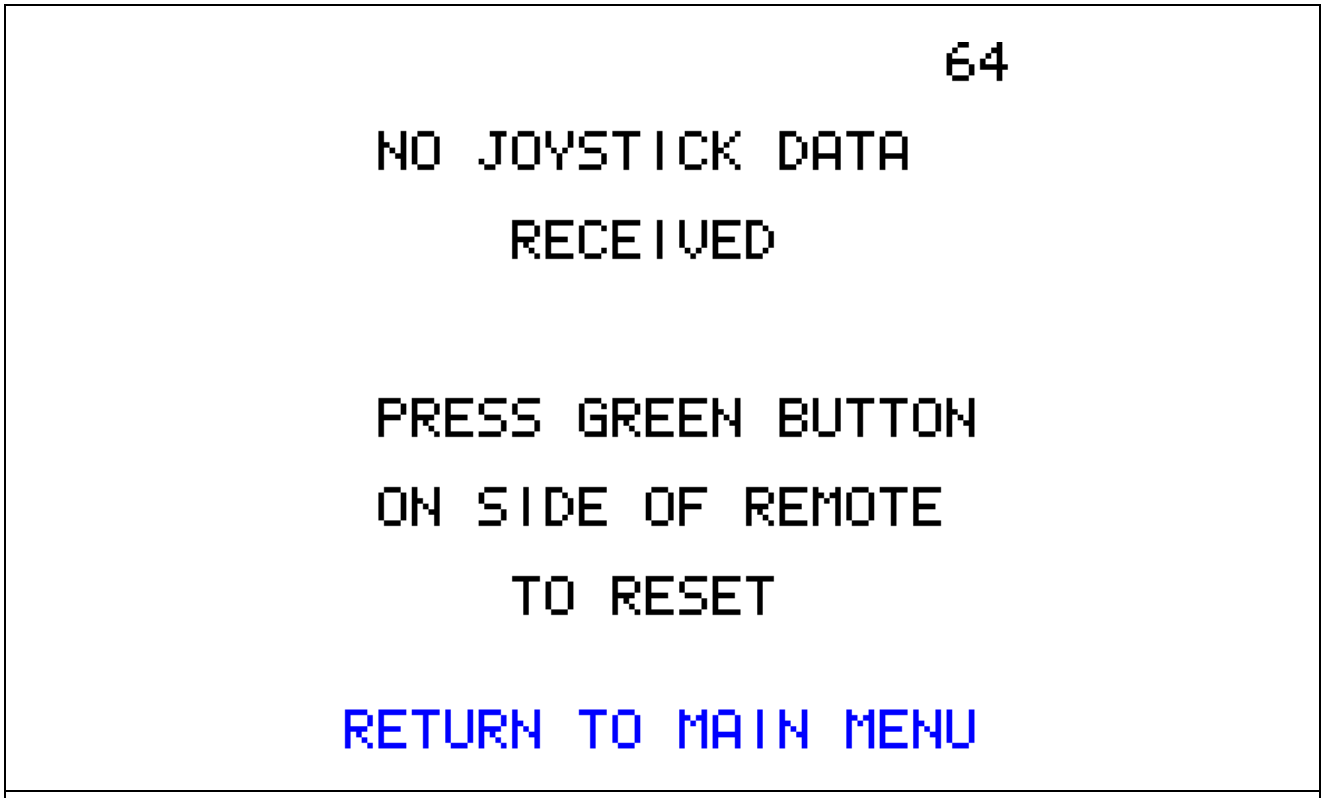
65 = LEFT JOYSTICK
66 = RIGHT JOYSTICK



This error occurs if a Control Pendant Joystick has a fault

- It may appear intermittently, but the Joystick should be replaced
- It is not possible to service the Joystick, it should be returned to Hetronic or Steelbro

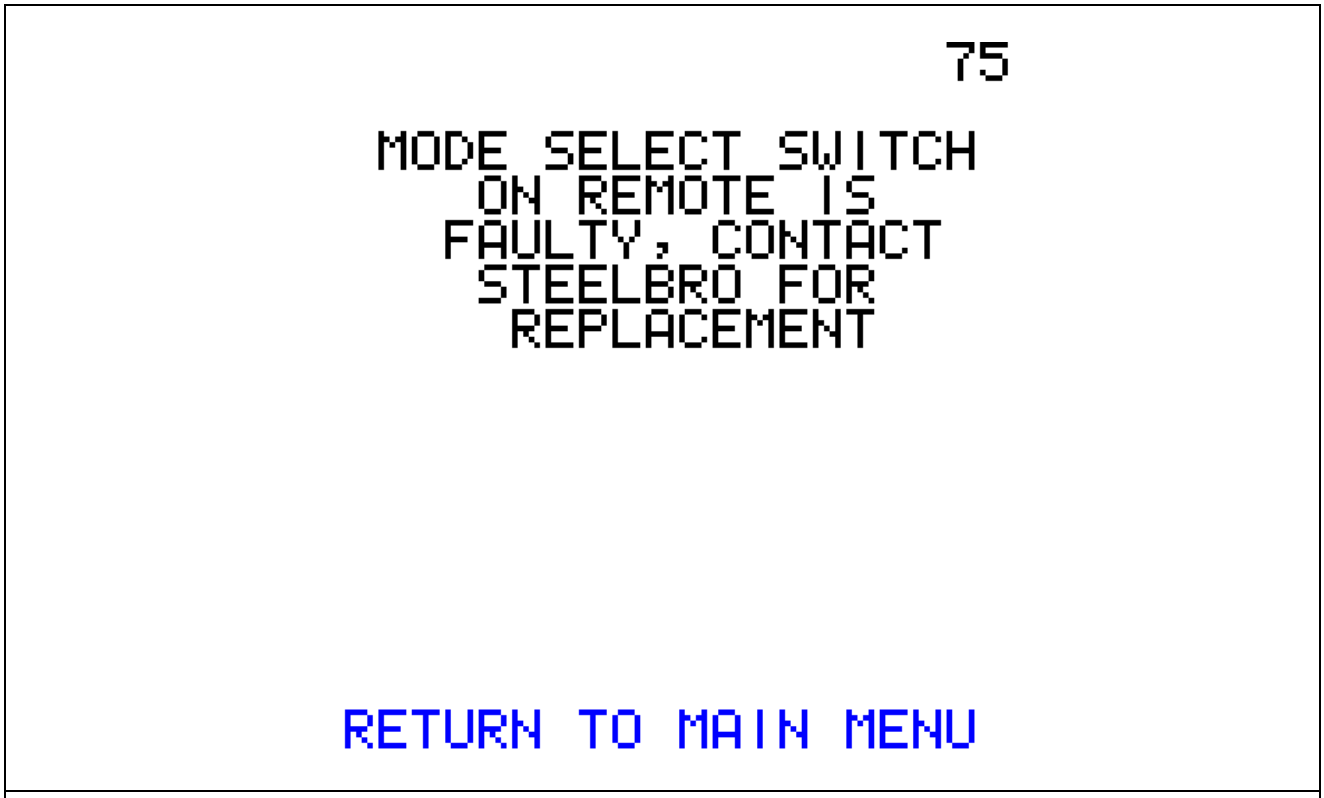
No Joystick Data Received 64



The Hetronic radio has detected minor radio interference, or there has been an internal error with the data from the Hetronic radio receiver

- This has not been sufficient to trigger the E-Stop Circuit, and the problem can be resolved by pressing the Green button on the side of the remote.

Mode Select Switch Error 75

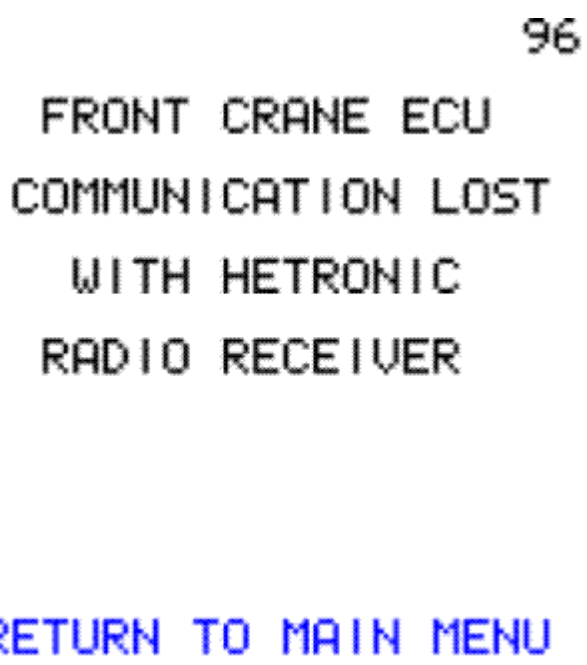


The Mode Select switch is not in any valid mode

- Valid Modes are (clockwise from the switch OFF position):
  - Off
  - Traverse
  - Stabiliser
  - Arm
  - Off-Side Stabiliser
  - Bending Leg
  - Top Lift Frame
- Go to **VIEW JOYSTICKS**, and observe how the Mode changes on the screen as the rotary switch is rotated. The switch is equipped with a stop pin so that unused modes are not available
- If the Modes are not in the order listed above then the switch is faulty

ECU communication lost with Radio Receiver F96 R97

NT ECU
97 = REAR ECU

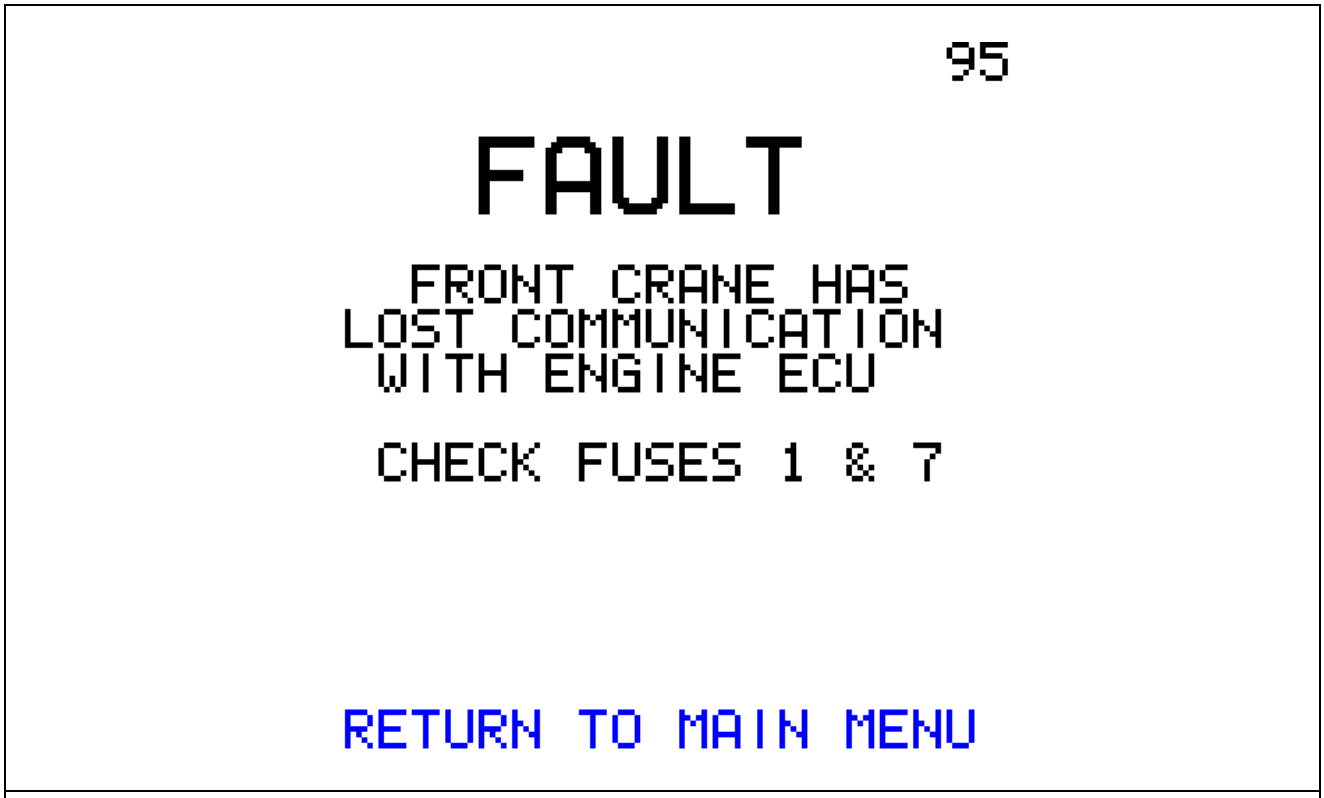


The front (or rear) crane ECU is not receiving any Joystick data on the CANbus from the radio receiver

Check:

- Go to **VIEW JOYSTICKS** to confirm that there is no communication
- Check the integrity of the CANbus
- Check the state of the LED's inside the radio receiver

Front Crane Has Lost Communication with Engine ECU 95



The front crane ECU has lost communication with the engine ECU

Possible causes:

- Check fuses 1 and 7
- Check CANbus continuity by measuring resistance between CAN-H and CAN-L at the diagnostic plug, remember to turn key switch off before trying this. 60Ω = good, 120 Ω = break in CANbus
- Power may have been lost to the engine ECU, check:
  - ECU UE, Pin 3
  - ECU Ground, Pin 11

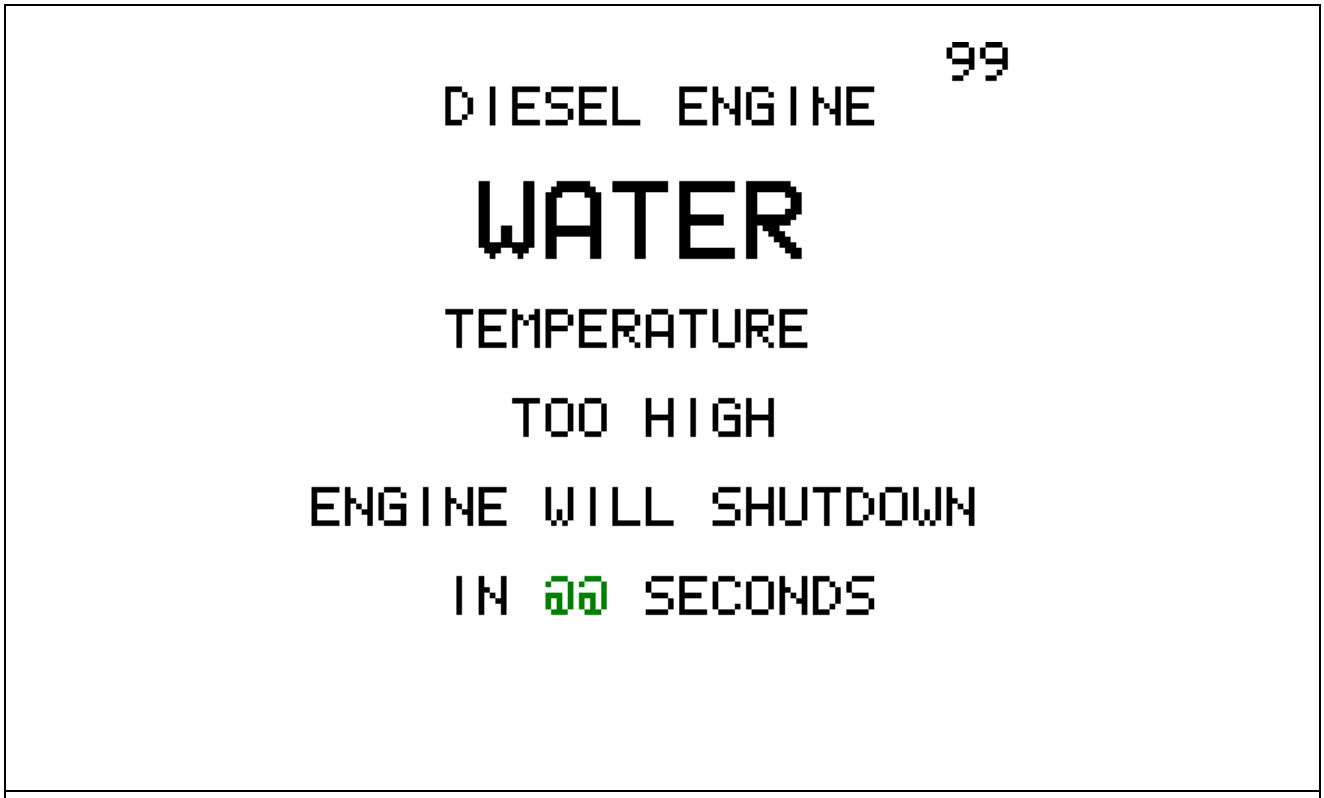
Diesel Engine Oil Pressure too low 100

From SMARTlift 2.0 (SB7661) onward

If the Oil Pressure is too low while the engine is running then this screen will appear and the Sidelifter will shutdown after 20 seconds to protect the engine from further damage.

- Check the oil level.
- If the ORANGE wire to the Oil Pressure switch has continuity with earth while the engine is running (i.e. when the supply voltage is over 13volts) then the screen will appear.
- Check that the Oil Pressure Switch contact does not have continuity with earth when the engine is running.
- Disconnect the orange wire and see if the message disappears, if not check the continuity of the wire between the Oil Pressure Switch and Pin 17 on the Front ECU. There must be no shorts to earth.

Diesel Engine Water Temperature too High 99



From SMARTlift 2.0 (SB7661) onwards

If the water temperature is too high this screen with appear and the Sidelifter will be shutdown after 20 seconds to protect the engine from damage.

- Allow the radiator to cool before checking the coolant level
- If the YELLOW wire to the Temperature Switch has continuity with earth while the engine is running (i.e. when the supply voltage is over 13volts) then the screen will appear
- Check that the Temperature Switch contact does not have continuity with earth when the engine has cooled
- Disconnect the yellow wire and see if the message disappears, if not check the continuity of the wire between the Temperature Switch and Pin 16 on the Front ECU. There must be no shorts to earth

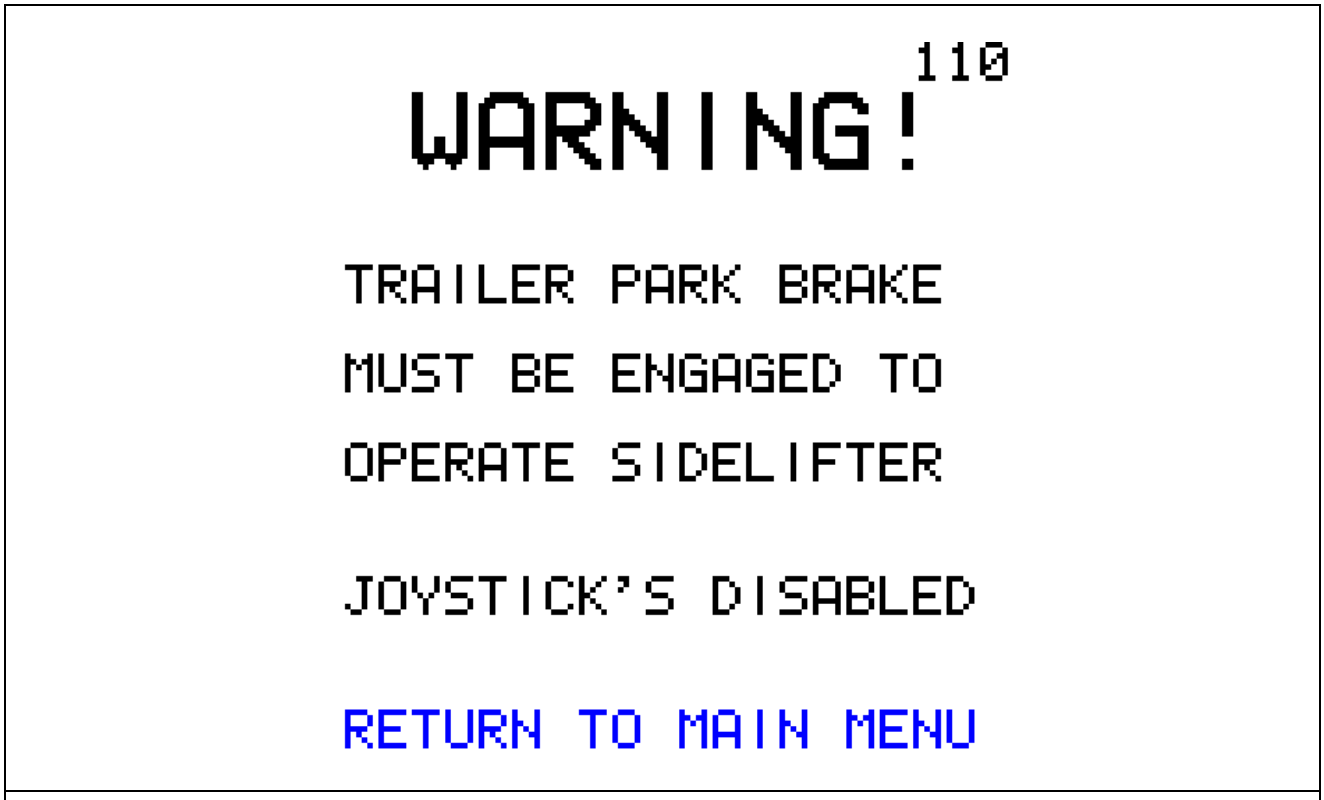
Alternator Not Charging 109

From SMARTlift 2.0 (SB7661) onwards

The Alternator on the Kubota Diesel Engine is not charging the battery.

- If the BLUE wire to the Alternator has continuity with earth while the engine is running (i.e. while oil pressure is sensed) then the above screen will be displayed
- Check the voltage at the Alternator and ensure that it reaches at least 14.1V when the engine is running
- Disconnect the spade connector from the Alternator and see if the message disappears
- If the message does not disappear check the continuity of the wire between the Alternator and Pin 38 on the Rear ECU. There must be no shorts to earth
- Otherwise check directly on the alternator to ensure that the contact floats when the Alternator is spinning

Trailer Park Brake Not Applied 110



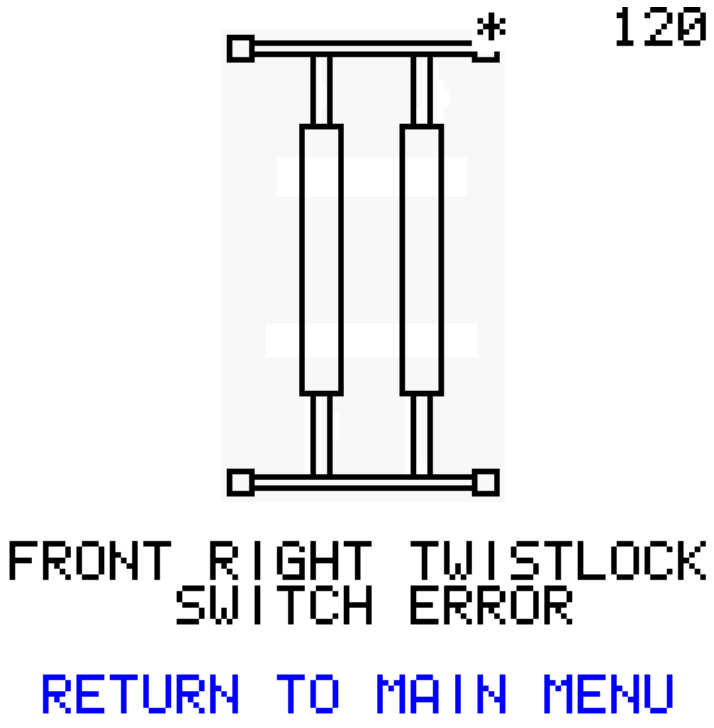
Optional feature

This is an optional feature for customers who may wish to prevent the operation of the Sidelifter until the park brake has been engaged. An additional sensor is added to the brake circuit. This screen shows if the operator attempts to operate the Sidelifter without the Park Brake 'ON'.

- If the sensor becomes disconnected or the connecting wire is damaged then this screen will show
- With the park brake 'ON' the Park Brake sensor closes between contacts 1 & 4. With the park brake 'OFF' between 1 & 2. Contact 1 is connected to the Rear ECU via wire 8. Contact 2 is not connected. Contact 4 is connected to earth in junction box 'E'
- Check the continuity of the wire from contact 1 on the sensor to pin 39 on the rear ECU
- If the switch does not close between contacts 1&4 when the park brake is applied then adjust the switching point by removing the electrical plug and turning the adjusting screw

Top Lift Frame - Twistlock Switch Error FR120 FL121 RR 122 RR 123

120 = FRONT RIGHT
121 = FRONT LEFT
122 = REAR RIGHT
123 = REAR LEFT

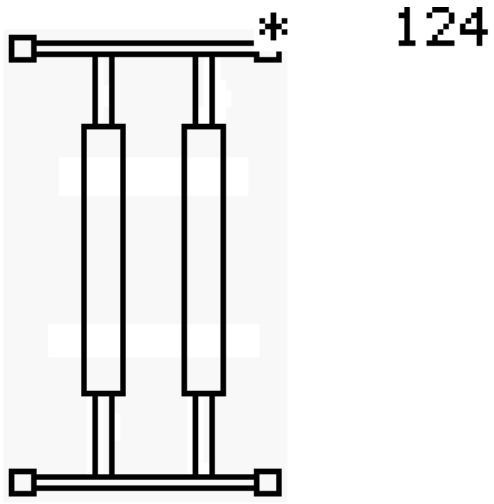


The Twistlock Switches sense the position of the top lift frame twistlocks

- Each individual switch has complementary outputs (i.e. Normally Open and Normally Closed switches). If the Front ECU detects that both switches are the same state then the error screen will be displayed.
- This means that the switch cable is either shorting or broken, or that the switch has failed.
- If unsure swap the switch with another corner and see if the error moves with the switch.

Top Lift Frame - Contact Sensor Error FR124 FL125 RR126 RL127

124 = FRONT RIGHT
125 = FRONT LEFT
126 = REAR RIGHT
127 = REAR LEFT



The Contact Sensors sense when the Top Lift Frame is resting on top of the container. There is a sensor for each corner of the Top lift Frame

- Each individual sensor has complementary outputs (i.e. Normally Open and Normally Closed outputs). If the Front ECU detects that both sensor outputs are the same state then the error screen will be displayed
- This means that the sensor cable is either shorting or broken, or that the sensor has failed
- If unsure swap the sensor with another corner and see if the error moves with the sensor

Top Lift Frame – Twistlocks Are In-between Open and Closed 128

If any of the Twistlocks are sensed to be between the fully open or fully closed positions then the Sidelifter Arms will be disabled

- Enter Top Lift Frame Mode and open or close the twistlocks.

If this is clearly not the issue:

- It is easy to determine which corner of the top lift frame is giving problems by going to **VIEW SENSOR VALUES, VIEW SPECIAL OPTIONS, TOP LIFT FRAME**, **TWISTLOCKS**, here individual twistlock states can be seen. Activate the twistlocks and observe the changing states
- Check the twistlock switches are operating correctly by removing the inspection covers on top of the problem corner

Top Lift Frame Is Not Fitted 129

If the Mode Select Switch on the remote is set to Top Lift Frame Mode but the Top Lift Frame is not fitted then this message will appear

- If the Top Lift Frame is plugged in and this message appears then there is no communication between the Front ECU and the top lift frame controllers
- Check the continuity of the CANbus and also check that power is reaching both top lift frame control cards

Max Rated Load Exceeded 58

Optional feature

This is an optional feature for customers who may want to electronically de-rate their Sidelifter.

The message appears if the operator attempts to lift a load that is greater than the allowed load.

- The maximum rated load can be set via the Manufacturers Area Menu – Change Crane Rating screen. This option will only be effective if the feature has been enabled in the factory
- Note that the maximum rated load will have to be set approximately 1000kg above the actual max load because the force induced in the hydraulic cylinder during lifting is greater than the actual load

Stabiliser Extension Magnetic Counter Sensor F130 R131

30 = FRONT ECU
131 = REAR ECU

IF THE UNIT HAS OPTICAL SENSORS AND A CASTELLATED PLASTIC STRIP CONTACT STEELBRO PRODUCT SUPPORT FOR ASSISTANCE.

The ECU has counted the number of steps on the plastic strip between the stabiliser fully retracted and the stabiliser fully extended positions and has either over-counted or under-counted compared to the correct number of steps.

This could mean that the magnetic sensor is too close or too far away from the magnets embedded in the plastic strip.

- Check the sensor values screen under stabilisers and observe the count as the leg travels up and down. It is often possible to see where exactly on the strip the magnetic sensor cannot read the magnets properly. A proper set up will count evenly as the leg moves. If the counting stops in certain sections this indicates where the problem might be.
- Ensure the plastic strip is lined up along the length of the leg. To do this, take the magnetic sensor off the stabiliser housing and look through the hole as the leg moves in and out. The plastic strip should remain centered in the hole through the entire length. If it does not it may need to be moved into better alignment.
- If the magnetic sensor is not reading anything at all check wiring and power to the sensor. If there are no problems with the wiring the sensor may be faulty and could need replacing.

Angle Sensor Calibration Failure

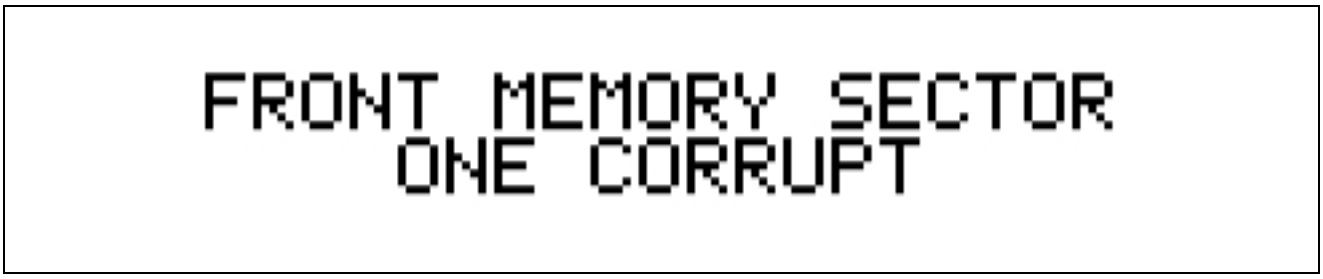
This message can refer to any of the eight angle sensors on the Sidelifter

The message only occurs during angle sensor calibration.

Check:

- The Angle Sensor is bolted to the correct side of the Arm or Stabiliser and that the orientation is correct (i.e. wire pointing upwards)
- The angle sensor selected on the display menu corresponds with the Arm or Stabiliser that has been set-up with the Plumb-Bob
- If difficulty is encountered with calibrating the Top Arm Angle Sensor, then try swapping it with the Bottom Arm Angle Sensor and recalibrate both

Memory Sector One Corrupt



This message can appear for either the Front or Rear ECU

- Memory Sector One of the Rear ECU saves the:
  - Last Stabiliser Extension
  - Last Load
  - Operating Hours
  - Estimated Number of Lifts (only from 2007)
  - Next Service Due
- The Rear ECU Memory Sector One variables are accessible via the LCD screen
- The variables are saved back to memory every time the SMARTlift system is switched off
- Data corruption can occur if the battery supply is interrupted while the system is operating. i.e. The motorcycle battery is disconnected while SMARTlift is 'ON'

- In the event of the Rear Memory Sector being corrupted it is likely that the Operating Hours will need to be reset. Also the Next Service Due Hours should also be reset
- The Front ECU contains a duplicate of the above information but it is **NOT** accessible via the LCD screen

Procedure for resetting the Operating Hours

- Enter the MANUFACTURERS AREA using the PIN 2111

- Using the Dial select the point in the top right hand corner of the screen
- The Change Operating Hours Screen will appear, enter the PIN number (STEELBRO must be contacted for authorisation) using the dial
- Once the PIN number is entered a moving OK will display next to the PIN number
- The Estimated Operating Hours can now be set
- The Service Due Hours can be set in the normal way by following procedure SL0025_1GB

Memory Sector Two Corrupt

This message can appear for either the Front or Rear ECU

- Memory Sector Two of each ECU saves the Angle Sensor Calibration Data
- If this message appears then the Front or Rear Crane will have to be recalibrated according to procedure SL0005_2GB

Memory Sector Three Corrupt

This message can appear for either the Front or Rear ECU

- Memory Sector Three of each ECU saves the Crane Synchronisation Data
- If this message appears then the cranes will have to be re-synchronised according to the procedure described in the Sidelifter Operators Manual

Manufacturer's Area

The Manufacturer's Area menu is protected by a PIN number to prevent unauthorised access. Only appropriately authorised personnel can access this area.

Flat ECU Battery

When the ECU battery (Motor-cycle battery) becomes too weak, it is not possible to start the Sidelifter the usual way.

If this weakness is due to the Sidelifter being unused for a period of time or during below zero ºC temperatures, use the procedure below to 'jump start' the unit.

If the ECU battery continually cannot hold a charge then it must be replaced as soon as possible.

Models and Markets:

All SMARTlift models using Hetronic Radio remotes (This procedure does not work when using a cable remote).

Procedure:

Follow instructions below using the E-stop Override Button:

1. Make sure all three E-stops are OUT (located on radio remote, E Box and front of trailer respectively)
2. Bring the radio remote over to the Start Key Enclosure (E Box) so both are within reach. Ensure there is a charged battery in the radio remote. Turn the radio remote on.
3. Press the E-stop Override button located on the left side of the Start Key Enclosure. Keep your finger on this button. See photo below (indicated by red arrow):

4. With the other hand start the engine by turning the start key. Wait 5-10 seconds for the alternator to charge the ECU battery slightly.
5. While still pressing the E-stop Override button, push the green start button on the radio remote.
6. Release the E-stop Override button.
7. If all three E-stops are depressed, the engine should continue to run and the Sidelifter should work normally. Give the ECU battery a chance to charge (5-10 minutes) before turning the engine off again.

Only use this as a temporary fix. If the ECU battery continually cannot hold a charge