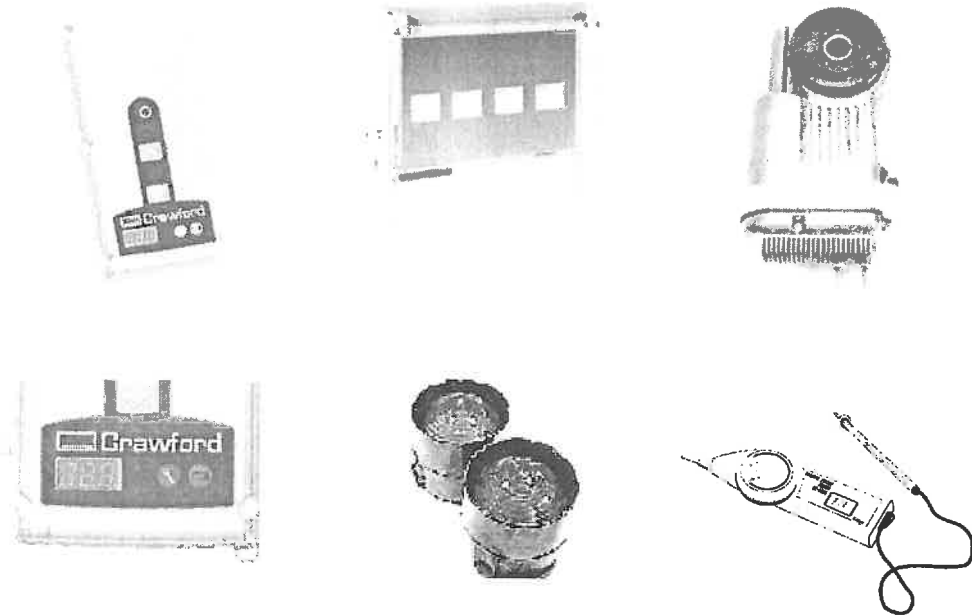




High Speed Door

Trouble Shooting Guide CDM 10HSD - ECS 940A



For Automation, safety and additional

When measuring the voltage, a nominal value of $\pm 10\%$ applies.
Connection block X1:7 is low voltage neutral.

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Trouble shooting CDM10HSD with Control unit ECS940A

What should I do?

If the machinery does not start, check that it has not been disengaged. Engage the operator and check that engagement has taken effect (by pulling the door up and down).

Try to reset the system. Do this by cutting off the supply voltage and switch it on again after 30 seconds.

Always while trouble shooting, disconnect any additional such as for example radar and/or magnetic loop.

If the problem persists, try to operate the door so that you are certain of the fault symptoms which apply:

- Any fault occurring in the safety edge is indicated by the door having impulse operation for opening and hold-to-run for closing. If any fault is detected in the safety edge when the door is closing, the door stops quickly and reverses to fully open position. The door is then put into impulse operation for opening and hold-to-run for closing until the fault is fixed. Refer to separate document "trouble shooting via service tool" and the error code list in the end of this document.
- Any fault occurring on encoder or in some cases in the electronics is indicated by the operator being put into hold-to-run operation for opening as well as closing. Refer to separate document "trouble shooting via service tool" and the error code list in the end of this document
- If an installed operator happens to move in the wrong direction on an installed door, a re-installation is required. Re-install the operator in accordance with the installation instructions in the manual.
- If the door is not properly balanced or has too much friction, the door may either stop on the way down or stop on the way up, due to the overload protection. Refer to separate document "trouble shooting via service tool" and the error code list in the end of this document
- Any fault occurring in the extra photocell (option) is indicated by the door first stopping gently and then reverses to fully open position. Or if a permanent failure has occurred, the door cannot be closed. Refer to Paragraph §14 in this document
- After operator is disengaged/engaged or if power is turned Off/On, the door can only be opened the first cycle (to fully open position, in order to find its upper end position). Refer to separate document "trouble shooting via service tool" and the error code list in the end of this document
- If there seems to be a problem with the upper limit switch or the stop circuit, start the trouble shooting by checking the indication LED:s (D8 and D9) on the manouvering card (only possible on manouvering cards delivered from February 2006). See separate chapter below.

Disengage and put the door into an intermediate position. Engage the operator and check that engagement has taken effect (by pulling the door up and down).

Problems during installation

If the internal encoder (pulse counter) is broken, one will only be able to operate the door in hold-to-run up, but it will stay in fully open position until the fault is fixed. Refer to separate document "trouble shooting via service tool" and the error code list in the end of this document.

If the encoder (pulse counter) is damaged but still counts pulses (but it misses some), the door will lose its position. The door will then not slow down, stop etc at the correct position. Refer to separate document "trouble shooting via service tool" and the error code list in the end of this document.



WARNING! Always disconnect the power when replacing card's or wires or before doing any work on the door that does not require power.

Explanation of part names

Processor card:



When the text within this document mentions the "Processor card" it refers to the electronic circuit board placed on the operator's rear lid inside the operator containing the frequency converter and other electronics. All the cables going out of the operator is connected to the Processor card.

Transformer card:



When the text within this document mentions the "Transformer Card" it refers to the electronic circuit board placed inside the operator containing the transformer to the 24VAC and the sensor for detecting the disengagement of the operator. The transformer card is slid into the operator and in order to remove it you need to first unscrew the two torx screws on the side of the operator (of you have the old revision of the transformer card) and then remove the operators' rear lid cautiously.

OSE:

OSE is a shortening of Optical Safety Edge. The OSE system consists of a spiral cable, safety classed photocells, break-away sensors and a OSE-card

OSE-card:



When the text within this document mentions "OSE-card" it refers to the electronic circuit board placed inside the bottom bar inside the plastic housing. Brake-away switches and the safety edge photocells are connected to the OSE-card.

C-card:



When the text within this document mentions "C-card" it refers to the electronic circuit board containing the standard functions for the ECS 940A control box. The C-card is placed physically inside the lid of the ECS 940A control box.

Mechanical unit:

When the text within this document mentions "the mechanical unit" it refers to the mechanical parts of the operator mounted onto the main drum axis.

Control box:

When the text within this document mentions "the control box" it refers to the ECS 940A control box used on the Crawford 855 door. The Control box contains the C-card, the manoeuvring card and the optional D-kits.

Service tool:



When the text within this document mentions "the service tool" it refers to the special tool only available to certified Crawford service technicians. The service tool is an electronic box that can be used to display the error codes and to set and clear service intervals. See separate user manual for the service tool.

Spring brake sensors:

When the text within this document mentions "the spring brake sensors" it refers to the 4 micro switches used to sense if the balancing spring or the tension spring has broke.

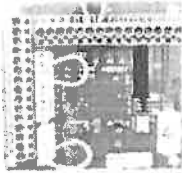
Upper limit switch:

When the text within this document mentions "upper limit switch" it refers to the magnetic sensor placed in the side column of the door. This sensor is used as a limit switch telling the operator that the door is fully open. This switch is essential at installation of the door. The switch has a built in diode across the two terminals.

Break-away switch:

When the text within this document mentions "break-away switch" it refers to the 2 magnetic sensors placed on both sides of the bottom bar. This sensor is used to sense if the bottom bar is separated from the door (I.e. a break out situation). The break-away switch is a NC (Normally Closed) switch meaning that when the door is functioning as normal, this switch is closed.

Manoeuvring card:



When the text within this document mentions "manoeuvring card" it refers to the electronic circuit board used to connect the cables from the operator to the ECS940A control box. This manoeuvring card is fitted with the installation switch used during installation. The card includes the 2 lamps (LED:s) that indicates the status of the stop circuit and upper limit switch.

Junction box:

When the text within this document mentions "junction box" JX1 or JX2, it refers to the white plastic junction box, placed inside the side columns, used to connect the cables from the switches on the door that are a part of the stop circuit. Chain hoist switch, upper limit switch and tension spring switch/door switch are connected to these two junction boxes called JX1 and JX2.

Stop-circuit:

When the text within this document mentions the "Stop-Circuit" it refers to the electrical circuit that activates the emergency stop function of the door. The switches connected to this Stop-circuit are the spring brake sensors, the Chain-hoist switch (optional), and the side cover switches. Any failure/activation of the Stop-circuit is indicated by the error code E08. The Upper limit switch is also connected to the Stop-circuit via a diode. The upper limit switch activation does NOT give error code E08.

1:6 Trouble shooting the upper limit switch and/or the stop circuit

If there seems to be a problem with the upper limit switch (door not possible to install or door does not leave the fully open position) start by checking the upper limit switch.

Possible causes of failure could be;

- Cabling not correctly connected: Check the wiring diagram for the connection boxes JX1 and JX2 and the connections to the manouvering card X1:9 and X1:10. Note that it is NOT allowed to have any external equipment such as for example magnet loop connected to X1:10.
- Check the D8 and D9 LED:s on the manouvering card. See Table 1 below:

Function	D8	D9
Stop circuit broken	OFF	OFF
Upper limit switch not activated	ON	ON
Upper limit switch activated	One of the LED:s D8 or D9 is ON and the other is OFF	

Table 1

- If the door is in fully open position and the D8 and D9 is both lit, then the upper limit switch is not activated or the bottom bar has not reached the roof or the upper limit switch or magnet is broken.

2. The door does not move when the Up button is activated.

Open the lid of the control box and check that contacts X4 and X5 for the lid are connected correctly and check also that the contact block with jumpers is mounted on X2 and X3. Check in the normal mode (not the installation mode) that there is no 24VAC between X1:7 and X1:1 or X1:3, when neither the Up or Down button is active, (if 24V AC is present, one of the buttons may be stuck).

Make sure that the stop circuit is not broken i.e. that the column doors are completely closed and locked, that the chain hoist is completely disengaged, and that no springs are broken causing the spring brake sensor to stop the door. All these faults in the stop circuit will give a error code E08. See separate document for user manual of the service tool and the Error code list in the end of this document.

2:1 24V AC between X1:6 and X1:7?

Yes
↓

No → Check the supply voltage to the operator—230V AC. OK?

Yes
↓

No → Check the mains fuse

Check whether mains and control cables are connected correctly.

Yes
↓

No → Replace mains and control cables.

Check that the spiral cable is correctly connected to X1:12 and X1:13. If wrong connected 24 vac will be faulty. Ok?

Yes
↓

↓ Replace the processor card in the operator.

2:2 24V AC between X1:7 and X1:9?

Yes No → Replace manoeuvring card in the control box.

↓

2:3 24V AC between X1:7 and X1:10?

Yes No → Check the external stop button, Column door is opened, Chain hoist switch activated, or spring brake sensor activated.

↓

2:4 24V AC between X1:7 and X1:2?

Yes No → Check the stop button in the lid and contact X4, and also contact block X2 with jumper mounted between pins 3-4. If a fault is detected replace the manoeuvring card in the control box.

↓

2:5 24V between X1:7 and X1:12?

Yes No → Replace the manoeuvring card in the control box.

↓

2:6 24V between X1:7 and X1:5?

Yes No → Check the contact X3 and the jumper mounted between pin 1-2, if a fault is detected, replace the manoeuvring card in the control box.

↓

2:7 24V AC between X1:7 and X1:1 when the Up button in the lid is activated?

Yes No → 24V AC between X1:7 and X5:1?

↓

Yes No → Replace the maneuvering card in the control box.

↓

24V AC between X1:7 and X5:2 when the Up button on the lid is activated?

↓

Yes No → Replace the lid.

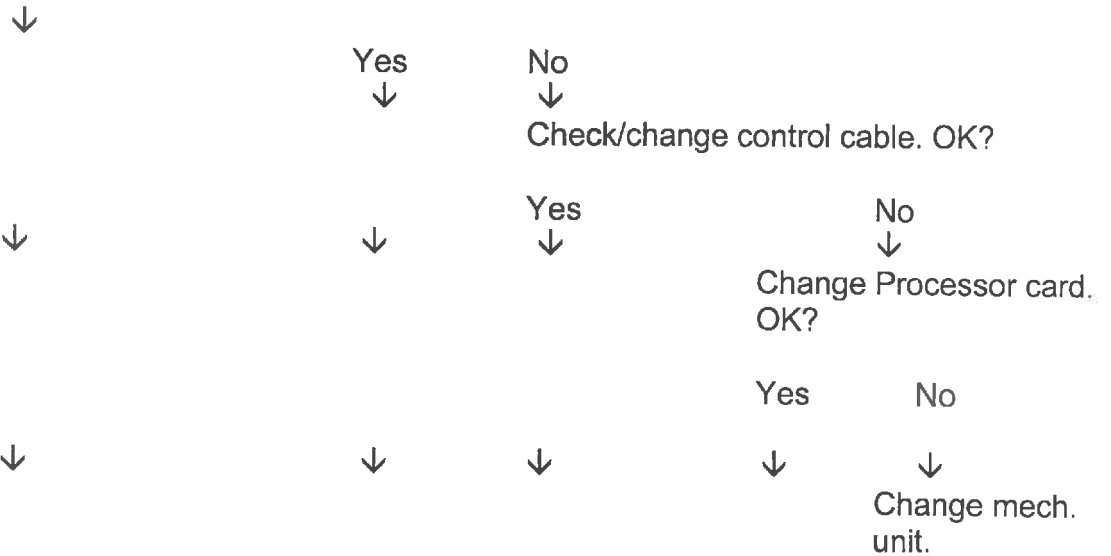
↓

Replace the maneuvering card in the control box.

2:8 Re-install the operator in accordance with the Installation&Starting document

Is it possible to operate the door upward using the Up or Down button?

Yes No → Check that the door is not disengaged. OK?



2:9 Complete the installation of the door. Is the door working OK?

Yes No → Continue to seek for the fault.
↓
Test to operate the door for a while and check all of its functions.

3. Door does not move when the Down button is activated

Make sure that the stop circuit is not broken. I.e. that the column doors are completely closed and locked, that the chain hoist is completely disengaged, and that no springs are broken causing the spring brake sensor to stop the door. All these faults in the stop circuit will give a error code. See separate document for user manual of the service tool and the Error code list in the end of this document.

3:1 Has the door been hit by an object causing the break-away function to prevent the door from closing?

No Yes → Run the door to fully open position so that the bottom bar is reconnected. OK?

↓ Yes No → Check the break away sensors in paragraph §5
↓

3:2 24V AC between X1:7 and X1:3 when the Down button on the lid is activated?

Yes No → 24V AC between X1:7 and X5:3 when the Down button on the lid is activated?

Yes No → Change lid
↓
Replace manoeuvring card in the control box.

↓

in the bottom bar are damaged or the photocells are damaged.
Open and check bottom bar and photocells.



4:4 Compress the rubber profile. Does the yellow LED D5 stop lighting (goes black)?

Yes

No → Check wiring to control box from spiral cable. Make sure that the correct cables are connected to the correct position. See wiring diagram. Most probably there is something wrong with the break-away switches or magnets. Check the switches and make sure the magnets are in place and undamaged. Other possibilities are that the OSE-card in the bottom bar is broken or the cables in the bottom bar are damaged. Or the bottom bar is not properly connected. Open and check the parts in the bottom bar.



Everything seems OK.

5. The break-away function does not work

The break away function is based on the brake-away system in the aluminium end pieces of the bottom bar. The end pieces of the bottom bar are equipped with a magnetic sensor which in turn is connected by a cable to the OSE-card. In the side column of the door on the opposite side of the magnetic sensor, a strong magnet is placed. If the bottom bar then is released from the door, the magnet and magnet sensor is separated causing the magnet sensor to go from CLOSED to OPEN. This in turn sense that the door is hit and the operator will reduce speed and reverse if closing.

Be sure also to follow the recommended steps in the error code list for the error code **E06** in the end of this document.

5:1 Does the Control box display show error code E06?

No

Yes → Is the bottom bar connected to the door?



No Yes → Open the bottom bar and check the wiring inside. Pay attention to if the cables are damaged or worn off. Change OSE-card. If that doesn't help, exchange the brake away sensors and check the magnets. If that does not help, exchange the safety edge photocells.



5:2 Connect the bottom bar to the door. Is error code E06 still on the display?

Yes

No → Door is OK



Open the bottom bar and check the wiring inside. Pay attention to if the cables are damaged or worn off. Change OSE-card. If that doesn't help, exchange the brake away sensors and check the magnets. If that does not help, exchange the safety edge photocells.

5:3 Look at the D5 LED on the manouvering card. If the break-away switch is activated, this LED is constant on. Is the D5-LED constant on?

No Yes → Make sure nothing is activating the safety edge. Is the LED still constant lit?
 ↓
 No Yes→ Is the bottom bar completely fastened in its fastening joint?
 ↓
 Yes No→ push the bottom bar to its normal position. Ok?
 ↓
 Yes No→ Check the break-away magnet to see to that it is fastened correctly and that is has no magnetic shielding object between the magnet and magnet sensor. Is the break-away function OK?
 ↓ No Yes → Door is OK
 ↓

5:4 Open the end piece and take out the OSE-node. Make sure that the magnetic sensor is correctly mounted and locked inside the end piece and that the cables are not damaged. Ok?

Yes No → Change the break-away magnetic sensor
 ↓

5:5 Measure resistance between X4:4 and X4:6 while the end piece is at least 20cm away from the magnet in the door. If the resistance is below approx. 30 Ohms the break-away sensor is not actuated (normal operation). Is the resistance below 30Ohm?

No Yes → Change the break-away magnetic sensor with cable. If that does not help, exchange the OSE-card.
 ↓

Continue with the trouble shooting within other areas of this document

6. The door has impulse function for opening and hold-to-run for closing.

The operator is set to hold-to-run operation for closing or refuses to close if the OSE safety edge is not OK, or if the processor card in the operator does not receive a response from the OSE safety edge. (Look at the LED's D5 on maneuvering card).

6:1 24V AC between X1:7 and X1:12?

Yes No → Follow the steps in §13:1.

↓

6:2 Safety edge supervision. Is there 9-11V DC between X1:7 and X1:13 the whole way down until the door reaches the floor?

Yes No → Check the safety edge in paragraph §4 and the spiral cable..

↓

7. The operator is in hold-to-run operation, both up and down

Any fault on the encoder or in the processor card memory, is indicated by the door being put into hold-to-run operation for opening as well as closing. Any fault in the safety edge also puts the door in hold-to-run operation. See also §4 Check the Safety Edge Function.

7:1 Re-install the operator in accordance with the instructions in the installation manual. Is the door working OK?

Yes No → Replace the processor card and reinstall.



7:2 Is the safety edge and break-away OK?

Yes No → Continue with trouble shooting the safety edge and the break away system.



Run the door for a while and check all of its functions.

8. The door stops on the way up/down.

If the door is not properly balanced or moves slowly, due to high wind load, high friction or similar, the door could stop on the way up or down due to the overload protection. Refer to the applicable error code E10 and/or E09 and/or E17. Also check the safety edge, Paragraph §4.

8:1 Check, by disengaging and pulling the door manually, that the door does not run slower than normal on the way down, that the friction in the door is normal and that the balance of the door is normal. OK?

Yes No → Adjust the door.



8:2 Check that the side door switches are working properly and does not give false stop signals to the operator. Ok?

Yes No → Adjust the door switches.



8:3 Check that the spring brake sensor switches are working properly and does not give false stop signals to the operator. Ok?

Yes No → Adjust the springs or the spring brake switches.

8:4 Check that the chain hoist switch (optional) are working properly and does not give false stop signals to the operator. Ok?

Yes No → Adjust the chain host switch.



8:5 Ensure that the brake resistor is connected. Ok?

Yes No → Connect the brake resistor.



8:6 Check that the chain on the tension roll is not too tight. Ok?

Yes

No → Adjust the chain for more slack.



9. The door goes slowly while opening

The Crawford 855 door will run slowly upwards in some conditions.

9:1 Is the door running on UPS power (i.e. no external power to the door)?

Yes →

This is a normal behaviour while the door is running on UPS power in order to save UPS batteries.

No



9:2 Is the installation switch ON?

Yes →

This is a normal behaviour while the door is in Installation mode

No



9:3 Is the door in Break-away mode (i.e. bottom bar is separated from side columns)?

Yes →

This is a normal behaviour if the break-away function is active. Operation gets back to normal operation when the door has repaired in the fully open position

No



9:4 Is the door overheated (see error code list)? Is there a error code E07?

Yes →

This is a normal behaviour if the temperature is above a certain limit. The door will then run slower in order for the operator to cool down.

No



9:5 33V DC between X1:7 and X1:13 the whole way up until the door reaches the top position?

Yes

No → Check the brake away magnetic sensor and magnet. Also check the OSE system in paragraph §4 and/or §Fel! Hittar inte referenskölla.



Replace the processor card and reinstall.

Test to operate the door for a while and check all of its functions.

10. The door tries to close but reverses on the way down

Check that the safety edge or break away is not activated. See paragraph §4 and/or §Fell Hittar inte referenskölla.

11. The door tries to close but reverses against the floor

11:1 Check that there are no objects in the door opening and that the operator is installed with the correct 50mm installation tool .

Clear from objects (cables, stones etc.)? Not clear? → Clear up



11:2 Has the door leaf been deformed because of temperature changes/collisions, causing activation of the pinch guard to take place earlier?

No Yes → Adjust the door, re-install.



Reinstall the door

12. No additional functions are working on the C-card

Check that the basic ECS 940 functions are working. This is done by unplugging X6 on the manoeuvring card (break the supply voltage, unplug X6 and switch on again) and then test-run the door. Be aware of the fact that photocell and radio are a part of the basic function, if installed.

12:1 Are the basic functions working?

Yes No → Proceed with the trouble-shooting guide



Plug in X6 on the manoeuvring card (break the supply voltage first).

12:2 Are the red LED's on the C-card flashing?

Yes No → Check that the ribbon cable between J1 and X6 is properly plugged in, if so replace the C-card, if this is not enough finally replace the manoeuvring card.



12:3 Check that the communication with the processor card is working. The red LED's, D5 and D6, should flash almost simultaneously with approx. 1 second's frequency.

Yes



No → Check that the wires to X1:14-15 are connected correct (wire 8 to X1:14 and wire 9 to X1:15). If so, replace the C-card or the Processor card in the operator and if this is not enough, finally the manoeuvring card/ribbon cable/manoeuvring cable.

12:4 Activate automatic closing according to the manual.

Turn S1:1-8 and S2:1-6 on the C-card to off and T1 and T2 to min.

The Door should be fully open. Is the Door closing automatically after approx. 5 seconds?

Yes

No → Replace the C-card or the Processor card in the operator.



Check (see manual) that the switches S1:1-8 and S2:1-6 are set to the requested function(s).

13.

No function on service counter display on the control box lid.

The display should normally show the accumulated number of door cycles /1000, status of automatic closing and fault/error codes.

13:1 Check if the display is black and does not show any information. Is it black?

No

Yes → Check of the spiral cable is connected correct to X1:12-13. If the two wires are in the wrong place the display will be black. Wait 5 minutes for the automatic fuse to cool down



Yes → Check that the ribbon cable between the manoeuvring card and the C-card is connected correctly and not damaged

Yes → Check that there is 24 vac between X1:6 and X1:7. Can you measure 24 vac?

Yes



No → Check that the processor card in the motor is connected correctly to the transformer card. Remove the motor lid and reconnect.

No → Check all wiring between the operator and the control box and check the power supply.

No → Exchange the transformer card in the operator

Exchange the C-card

Additional

14. Optional Photocell

Any fault occurring in the optional photocell is indicated by the operator stopping gently and then going into reverse until it is fully open.

It may also refuse to close.

There must always be 24V AC between X1:7 and X1:5 until the beam of the photocells has been broken.

14:1 Door reverses on the way down without any objects blocking the photocell

The operator automatically turns off the external options photocells when the lowest part of the door is less than 550mm from the ground. The reason for this is that otherwise the bottom bar itself will block the photocells and cause a reverse of the door. Therefore the predrilled holes for the photocells are drilled at 500mm from the floor. If though the installer have drilled new holes above 500mm from the ground the door will have a high risk of reversing. So it is important to ensure that no photocells are placed in the door opening higher than 500 mm from the ground. If the customer wants to have the photocells higher than 500mm, it is a must to place the photocells out of the way from the bottom bar.

14:2 Is the LED on the photocell amplifier on?

Yes	No → 24V AC between X3:3 and X3:5?
	↓ ↓
	Yes No → Replace the manoeuvring card in the control box.
	↓
	Check that the cable connections for the photoelectric cell amplifier and optics are OK?
	↓ ↓
	Yes No → Take action to rectify the fault.
	↓
	Replace the photocell amplifier or optics.

↓

14:3 Does the LED on the photocell amplifier go out when the photocell beam is broken?

Yes	No → Check that the cable connections for the photocell amplifier and optics are OK?
	↓ ↓
	Yes No → Take action to rectify the fault.
	↓
	Replace the photocell amplifier or optics.

↓

↓

14:4 Is there 24V AC between X1:7 and X1:5 when the photocell beam is broken?

Yes	No → Check Paragraphs §4 and §5.
-----	----------------------------------

↓

14:5 Check cable connections for the photocell amplifier - OK?

Yes No → Take action to rectify the fault.

↓

Check that switch S1 on the photocell amplifier is in position 1.

↓

Yes No → Change S1 on the photocell amplifier to position 1.

↓

Replace the photocell amplifier.

15. No function on X8 input terminal(s).

Open, One button function, Additional safety, interlocking Door,
Open inside, Open outside, Reduced opening.

The input terminals are working with 24 VAC from the transformer card in the operator.
Between X8: 2,4,6,8,10,12,14 and X8.15 shall it always be 24 VAC, if not the manoeuvring
card or the transformer card in the operator is defect. Check that the switch for each function
has a momentarily closing function.

15:1 The Open function doesn't work.

Shall open the Door from all positions and reverse a closing Door. 24VAC
between X8:15 and X8:1 when a switch is activated?

Yes No → Check wiring to outside switch.

↓

Check that the ribbon cable between J1 and X6 is properly plugged in, if so
replace the C-card, if this is not enough finally replace the manoeuvring card.

15:2 The One-button function doesn't work.

Shall open the Door from all positions, reverse a closing Door and close a fully
open Door. 24VAC between X8:15 and X8:3 when a switch is activated?

Yes No → Check wiring to outside switch.

↓

Check that the ribbon cable between J1 and X6 is properly plugged in, if so
replace the C-card, if this is not enough finally replace the manoeuvring card.

15:3 Additional safety doesn't work.

Shall reverse closing Door from all positions. 24VAC between X8:15 and X8:5
when a switch is activated?

Yes No → Check wiring to outside switch.

↓

Check that the ribbon cable between J1 and X6 is properly plugged in, if so
replace the C-card, if this is not enough finally replace the manoeuvring card.

15:4 Interlocking Door doesn't work.

Closed Door shall not open if X8:7-8 has a closing. 24VAC between X8:15 and X8:7 when a switch is activated?

Yes No → Check wiring to opposite Door.

↓

Check that the ribbon cable between J1 and X6 is properly plugged in, if so replace the C-card, if this is not enough finally replace the manoeuvring card.

15:5 The Open inside function doesn't work.

Shall open the Door from all positions and reverse a closing Door. 24VAC between X8:15 and X8:9 when a switch is activated?

Yes No → Check wiring to outside switch.

↓

Check that the ribbon cable between J1 and X6 is properly plugged in, if so replace the C-card, if this is not enough finally replace the manoeuvring card.

15:6 The Open outside function doesn't work.

Shall open the Door from all positions and reverse a closing Door. 24VAC between X8:15 and X8:11 when a switch is activated?

Yes No → Check wiring to outside switch.

↓

Check that the ribbon cable between J1 and X6 is properly plugged in, if so replace the C-card, if this is not enough finally replace the manoeuvring card.

16. Warning/Traffic lights don't work.

Check the fuse F1 on HR-relay-card (also fuse F10 at FR).

Check for 230VAC at X11:L1-N and that the light bulbs not are broken.

Check the adjustments of S1:1-8 with the manual (to assure that the right functions are chosen).

16:1 Check of red warning light: Door in middle position, S1:3 on. (Flashing red light between end positions).

Is the LED D8 on HR-relay-card flashing?

Yes No → Check that the ribbon cable to J4 on C-card is properly plugged in, if so, replace the HR-relay-card, and finally if this is not enough replace C-card.

↓

Pulsating 230VAC between X11:N and X12:1 ?

Yes No → Replace the HR-relay-card.

↓

Check cables, light bulbs and connections to the warning lights.
Change the C-card

16:2 Check of green warning light:

Door in fully open position. (Steady green light at open position).

Is the LED D5 on HR-relay-card lit?

Yes

No → Check that the ribbon cable to J4 on C-card is properly plugged in, if so, replace the HR- relay-Card, and finally if this is not enough, replace the C-card.

↓

230VAC between X11:N and X12:2 ?

Yes

No → Replace the HR-relay-Card.

↓

Check cables, light bulbs and connections to the warning lights.
Change the C-card

16:3 Check of inside traffic light, red:

Switch S1:7 on. Open with Open inside button (X8:9-10). Stop the Door in middle position. (Flashing red light on the inside, steady red light on the outside). Is LED D8 flashing and LED D7 lit on the HR-relay-card?

Yes

No → Check that the ribbon cable to J4 on C-card is properly plugged in, if so, replace the HR- relay-card, if this is not enough, finally replace C-card.

↓

↓

Pulsating 230VAC between X11:N and X12:1 ?
230VAC between X11:N and X12:4 ?

Yes

No → Replace the HR-relay-card.

↓

Check cables, light bulbs and connections to the warning lights
Change the C-card

16:4 Check of inside traffic light, green:

Open with Open inside button (X8:9-10). Run the Door to fully open position.

(Steady green light at open position). Is the LED D5 on HR-relay-card lit?

Yes

No → Check that the ribbon cable to J4 on C-card is properly plugged in, if so, replace the HR- relay-card, and finally if this is not enough, replace the C-card.

↓

230VAC between X11:N and X12:2 ?

Yes

No → Replace the HR-relay-card.

↓

Check cables, light bulbs and connections to the warning lights
Change the C-card

16:5 Check of outside traffic light, red:

Switch S1:7 on. Open with Open outside button (X8:11-12). Stop the Door in middle position. (Flashing red light on the outside, steady red light on the inside). Is LED D7 flashing and LED D8 lit on the HR-relay-card?

Yes

No → Check that the ribbon cable to J4 on C-card is properly plugged in, if so, replace the HR- relay-card, and finally if this is not enough replace the C-card.

↓

Pulsating 230VAC between X11:N and X12:4 ?
230VAC between X11:N and X12:1 ?

Yes

No → Replace the HR-relay-card.

↓

Check cables, light bulbs and connections to the warning lights.
Change the C-card

16:6 Check of outside traffic light, green: Open with Open outside button (X8:11- 12). Run the Door to fully open position. (Steady green light at open position). Is the LED D6 on HR-relay-card lit?

Yes

No → Check that the ribbon cable to J4 on C-card is properly plugged in, if so, replace the HR- relay-card, and finally if this is not enough replace the C-card.

↓

230VAC between X11:N and X12:3 ?

Yes

No → Replace the HR-relay-card.

↓

Check cables, light bulbs and connections to the warning lights.
Change the C-card

17. No function on relay kit.

17:1 Door in closed position:

Is LED D10 on the HR-relay-card lit ?

Yes

No → Check that the ribbon cable to J4 on C-card is properly plugged in, if so, replace the HR- relay-card, and finally if this is not enough replace the C-card.

↓

Connection between X13:4 and X13:6 ?

Yes No → Replace HR-relay-card.



Check cable and connections to outside function.

17:2 Door in open position:

Is LED D9 on the HR-relay-card lit?

Yes No → Check that the ribbon cable to J4 on C-card is properly plugged in, if so, replace the HR- relay-card, and finally if this is not enough replace the C-card.



Connection between X13:1 and X13:3 ?

Yes No → Replace HR-relay-card.



Check cable and connections to outside function

18. No function on interlocking relay.

18:1 Door in closed position:

Is LED D11 on the HR-relay-card NOT lit?

Yes No → Check that the ribbon cable to J4 on C-card is properly plugged in, if so, replace the HR- relay-card, and finally if this is not enough replace the C-card.



Connection between X13:7 and X13:8 ?

Yes No → Ok



Replace HR-relay-card.

18:2 Door in open or middle position:

Is LED D11 on the HR-relay-card lit?

Yes No → Check that the ribbon cable to J4 on C-card is properly plugged in, if so, replace the HR- relay-card, and finally if this is not enough replace the C-card.



Connection between X13:7 and X13:8 ?

Yes No → Replace HR-relay-card.

Check cable and connections to outside function.

19. No 24VAC output on X14:1-2.

Check X14:1-2 for 24VAC without any consumer connected.
(To check for errors in a magnetic loop amplifier, for instance.) If so, replace the consumer in question. (Check that F10 is ok, FR only)

19:1 230VAC between X11:L1-N?

Yes No → Check supply voltage.



Replace HR-relay-card.

Additional D-kits

20. No function on D1.

Warning light red, see §16:1
Relay kit, see §17.
Interlocking, see §18
24VAC for external consumer, see §19.

21. No function on D2.

24VAC for external consumer, see §19
Check connections to/replace loop amplifier
Loop amplifier connections, see §15:1, §15:3
Relay kit, see §17
Interlocking, see §18

22. No function on D3.

Relay kit, see §17.
Interlocking, see §18
24VAC for external consumer, see §19.

23. No function on D4.

Warning light red, see §16:1.
24VAC for external consumer, see §19
Check connections to/replace loop amplifier
Loop amplifier connections, see §15:1, §15:3
Relay kit, see §17
Interlocking, see §18

24. No function on D5.

Traffic lights, see §16:3-§16:6
Relay kit, see §17.
Interlocking, see §18
24VAC for external consumer, see §19.

25. No function on D6.

Traffic lights; see §16:3-§16:6
24VAC for external consumer, see §19.
Check connections to/replace loop amplifier
Loop amplifier connections; see §15:1, §15:3
Relay kit, see §17
Interlocking, see §18

26. No function on D7.

Warning lights, see §16:1.
Relay kit, see §17
Interlocking, see §18
24VAC for external consumer, see §19.

27. No function on green warning light.

Green warning light, see §16:2

Test run the door for a while and check that all functions are OK.

28. Trouble shooting via LED-display on Control Box

- It is possible to see which errors that are active at the moment.
- As default, the number of accumulated door cycles is always shown on the display in the control box and on the display on the service tool
- If a fault occurs that trigs a error code, the display stops showing the number of cycles and instead shows the current error code. If more than one fault occurs, the display only shows the error code with the lowest number (for example if both E04 and E08 is active, only E04 will be shown). In order to see the other error codes, a service tool is needed.

29. Trouble shooting via Service tool

- As a tool for certified Crawford service and installation staff, a Service Tool can be connected to the circuit card in the lid ("C-card"). The service tool has two buttons.
- If a fault occurs that trigs a error code, the display stops showing the number of cycles and instead shows the current error code. If more than one fault occurs the display only shows the error code with the lowest number. In order to see the other error codes the service tool can be used to scroll trough all the active fault codes..
- One is able to see the 15:th latest errors/events in the logger (C-card) in historical order (latest code first)
- As default, the number of accumulated door cycles is always shown on the display in the control box and on the display on the service tool

For trouble shooting via the service tool, please see separate document K046804 for user manual of the Service tool.

30. Error codes list

OBSERVE the following:

1. Find the error code that you have seen in the control box display in the ERROR CODE table to the left
2. Follow the recommended User Solution in the right column. Start with recommendation #1 and then test if the error code disappears in the control box display.
3. If the error code still is shown in the control box display, continue with recommendation #2 and so on until the error code disappears in the display.

Error Code	Headline	Cause	System Action	Service Solution	Condition for clear	See also chapter
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Error Code	Headline	Cause	System Action	Service Solution	Condition for clear	See also chapter
E01	RAM-error, C-card	Error while checking RAM in C-card	Display: E01 Operator: Operator in hold to run mode until cleared	1. Power Off/On 2. Exchange C-card	Power OFF/ON	§12
E02	E ² Memory error, C-card	Error While verifying E ² PROM-memory in C-card	Display: E02 Operator: Operator in hold to run mode until cleared	1. Power Off/On 2. Exchange C-card	Power OFF/ON	§12
E03	Communications error	Communications error between PROCESSOR CARD and C-CARD	Display: E03 Operator: Operator in hold to run mode until cleared	1. Power Off/On 2. Run installation mode 3. Check cabling 4. Change C-card 5. Exchange processor card	Error is cleared when communication is back to normal	§12
E04	Safety Edge error	Safety Edge error detected	Display: E04 for 5 seconds or until cleared Operator: Operator in hold to run mode down (normal speed); impulse mode up (0.6m/s) until cleared	1. Power Off/On 2. Run installation mode 3. Check spiral cable for damages 4. Check spiral cable connection in the control box. 5. Check cabling in bottom bar for damages 6. Change OSE-card in bottom bar 7. Check and replace if needed the safety edge photocells 8. Check and replace if needed the break-away sensors 9. Exchange processor card	Error is cleared if safety edge is back to normal operation AND down button is pressed	§4, §5, E06
E05	Installation mode	The door is in installation mode and installation switch (SW1) is ON	Display: E05 Operator: Installation mode	1. Finish the installation and then turn the installation switch (SW1) back to normal 2. Turn power OFF/ON	Installation switch is set to OFF AND door is properly installed	§1

Error Code	Headline	Cause	System Action	Service Solution	Condition for clear	See also chapter
E06	Break-away mode	Operator and door is in break-away mode. Bottom bar is separated from its fastening joint. Or break-away sensor/magnet is broken. Or OSE-card is damaged	Display: E06 Operator: Hold to run down OR impulse up with reduced speed.	<ol style="list-style-type: none"> 1. Power OFF/ON 2. Run installation Mode 3. Run door to fully open position 4. Check spiral cable for damages 5. Check spiral cable connection in the control box 6. Check magnets in t-cast 7. Check breakaway switches in bottom bar with a magnet on both sides of the bottom bar 8. Check cabling in the bottom bar for damages 9. Change OSE-card in bottom bar 10. Change break-away sensors 11. Change Safety edge photocells 12. Exchange processor card 	Breakaway system does not indicate break-way any longer AND door has reached fully open position	§4, §5, E04
E07	Over temperature	Operator is overheated and automatically reduces speed or temporarily turns off the motor	<p>E07-1 Display: E07 until cleared Operator: Go into slow speed mode 0,6m/s</p> <p>E07-2 Display: E07 until cleared Operator: Stopped until cleared</p> <p>E07-3 Display: E07 in at least 5s and then until cleared Operator: E07 for 5s OR until cleared, AND release PWM</p>	<p>Let the operator cool down a few minutes or change the time for automatic closing so that the door stays open for a longer period of time before closing</p>	<p>E07-1 Operator <70°C E07-2 and E07-3 Operator <80°C</p>	

Error Code	Headline	Cause	System Action	Service Solution	Condition for clear	See also chapter
E08	Stop button pressed/Chain hoist engaged	Stop circuit is open >2 seconds Stop button is pressed, Column door is opened, Chain hoist switch activated, or spring brake sensor activated	Display: Show E08 Operator: Stopped until cleared	<ol style="list-style-type: none"> 1. Check all switches (stop button, door switches, tension spring switches, balancing spring switches, chain hoist) junction boxes 2. Check cabling in junction boxes 	Stop circuit is closed	§8
E09	Power fail	Net Voltage (230VAC) is below 195VAC >100ms The supply voltage frequency is outside normal range	Display: E09 Operator: Stopped until cleared	<ol style="list-style-type: none"> 1. Make sure that the door has correct power 230VAC, 16A, 50/60Hz 2. Check the Transformer card in the operator and exchange if needed 	Supply voltage is normal during 5 continuous seconds?	§1.4, E10, E17
E10	Overload, voltage	DC-bus < 200Vdc OR DC-bus > 378Vdc	Display: E10 for 5s OR until cleared	<ol style="list-style-type: none"> 1. Make sure that the break resistor is connected and not damaged 2. Decrease the friction of the door 3. If the operator is hot, let it cool down some time 4. Make sure that the door has correct power 220/230VAC, 16A, 50/60Hz 5. Exchange the processor card 	Load is normal during 5 continuous seconds.	§8, §1.4, E17, E09
E11	Operator Disengaged	The disengagement disc has been turned and the operator is disengaged	Display: E11 Operator: Stopped until cleared	<ol style="list-style-type: none"> 1. Reconnect the operator by pulling the red knob 2. Jerk the bottom bar up and down to let the clutch engage 3. Fully open the door 	Operator is engaged AND door is fully opened	§0

Error Code	Headline	Cause	System Action	Service Solution	Condition for clear	See also chapter
E12	General error	Current sensed from Power module is >36A and gives input to A-MPU (logic signal)	Display: E12 for 5s or until cleared	<ol style="list-style-type: none"> 1. Decrease the friction of the door 2. If the operator is hot, let it cool down some time 3. Make sure that the door has correct power 220/230VAC, 16A, 50/60Hz 4. Exchange the processor card 	Current sensed is below limit for 5 continuous seconds	§8, §1.4
E13	Opto coupler error	Internal error in opto couplers or push button (UP/DOWN/STOP) circuitry	Display: E13 Operator: Operator stopped until cleared	<ol style="list-style-type: none"> 1. Power OFF/ON 2. Check the control box for the connection of the push buttons 3. Exchange the processor-card 	Cleared when operation is back to normal AND power OFF/ON	
E14	A-<->B processor disagreement	Internal error in the Processor card	Display: E14 Operator: Operator stopped until cleared	<ol style="list-style-type: none"> 1. Power OFF/ON 2. Exchange the processor-card 	Cleared when operation is back to normal AND power OFF/ON	
E15	Processor card selftest error	The measured current in the motor is outside normal values	Display: E15	<ol style="list-style-type: none"> 1. Power OFF/ON 2. Exchange the processor card 	Power OFF/ON	
E16	Direction error	Motor cables are switched to PROCESSOR card without operator re-installation	Display: E16 Operator: Operator in hold to run mode up and down until cleared	<ol style="list-style-type: none"> 1. Power Off/On 2. Run installation mode 	Operator is reprogrammed. OR motor cables are switched back to normal positions AND door starts to run in the correct direction	§1

Error Code	Headline	Cause	System Action	Service Solution	Condition for clear	See also chapter
E17	Overload, current	Current sensing device senses a current above upper limit (depends on temperature and frequency).	Display: E17 for 5s OR until cleared	<ol style="list-style-type: none"> 1. Decrease the friction of the door 2. If the operator is hot, let it cool down some time 3. Make sure that the door has correct power 220/230VAC, 16A, 50/60Hz 4. Exchange the processor card 		E10, E09
E18	Break resistor fault	When door tried to run, it detected that the Break-resistor is not connected or is damaged.	Display: E18 until cleared Operator: Stopped until cleared	<ol style="list-style-type: none"> 1. Open the operator lid and attach the brake resistor connector or replace brake resistor if damaged. If brake resistor is damaged also exchange the processor card 	Brake resistor connected correctly AND Power Off/On	
E19	Not Used	Not Used	Not Used			
E20	Current sense error	Current sensed is below lower limit when motor is running	Display: E20 Operator: Operator stopped until cleared	<ol style="list-style-type: none"> 1. Run installation mode 2. Open operator and check wiring 3. Exchange processor-card 	Cleared when operation is back to normal	§1
E21	Position sensor error	Operator is trying to run but motor is not rotating, or sensor does not detect the rotation during 3000 ms.	Display: E21 Operator: Operator in hold to run mode until cleared	<ol style="list-style-type: none"> 1. Run installation mode 2. Open operator and check encoder wheel (black plastic cogwheel) 3. Exchange processor-card 	Cleared when operation is back to normal AND power OFF/ON	§1
E22	Installation error	Wrong checksum in internal memory of installation data	Display: E22 Operator: Operator stopped until cleared	<ol style="list-style-type: none"> 1. Run installation mode 2. Exchange processor-card 	Operator reprogrammed	§1
E23	Door range error	Door is outside normal range	Display: E23 Operator: Operator hold to run mode until cleared	<ol style="list-style-type: none"> 1. Run installation mode 2. Open operator and check encoder wheel (black plastic cogwheel) 3. Exchange processor-card 	Operator reprogrammed	§1

Error Code	Headline	Cause	System Action	Service Solution	Condition for clear	See also chapter
E24	Power failure	Operator disengaged/engaged OR Power OFF/ON	Display: E24 Operator: Only impulse up	<ol style="list-style-type: none"> 1. Fully open the door 2. Run installation mode 3. Check upper limit switch 4. Exchange processor-card 	Roof detected	§1

31. Additional help and instructions when measuring/checking the safety/break-away system

When measuring the voltage a nominal value of $\pm 10\%$ applies.

NOTE! DC-voltage!

Normally the one should get the following readings when measuring in the ECS 940A:

Status	Measuring between:	Measured value
Safety device not activated	X1:13 and X1:7	17VDC.
Safety device activated	X1:13 and X1:7	0VDC.
Break-away activated	X1:13 and X1:7	30VDC.

If all this is ok, then the spiral cable and bottom bar is OK.

If not, one has to proceed with the bottom bar.

The magnetic sensors are just a contact that is closed when it is in front of the magnet.

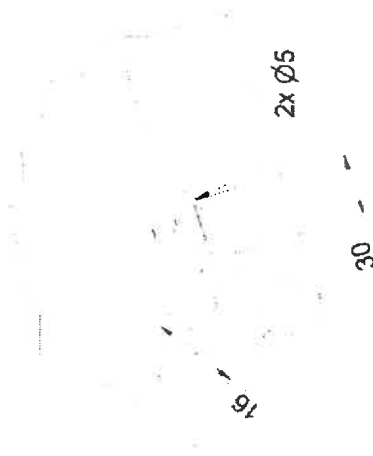
Can be checked by disconnecting the cables from X1:4-5-6 on the OSE-pcb and measure them individually when they are in front of the magnet, the contact shall then be closed and open when one move the bottom bar away from the magnet.

Can be disconnected with loops between X1:4-5 and 5-6.

	Measured value	Measured value	Measured value
Measuring on OSE-pcb between:	Safety device not activated / Break-away on both sides OK. (magnets in front of sensor)	Safety device activated / Break-away on both sides OK. (magnets in front of sensor)	Safety device not activated / Break-away activated. (At least 1 magnet not in front of sensor)
X1:2-3	2 VDC	0 VDC	0 VDC
X1:1-3	12 VDC	12 VDC	3,5 VDC
X1:1-2	10 VDC	12 VDC	4,5 VDC

When working on an 855 one shall always make sure that the bottom rubber is cut properly in both ends and that the optics cable is mounted in the cuts!

See picture:



The door shall also be adjusted so that the bottom rubber/rubber tube (and optics) don't hit the floor!