



motomit IT / PC



Service and troubleshooting

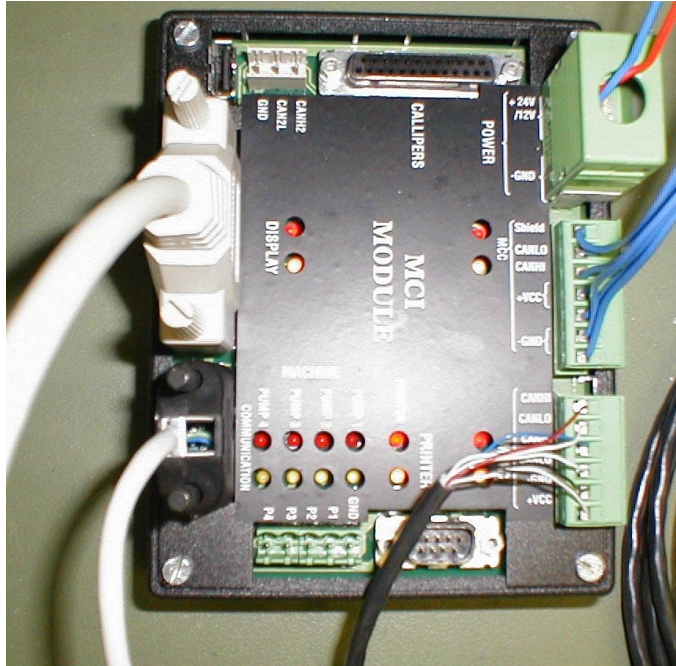
06/2004

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MCC	Harvester head module
MCKC	Keyboard control module
MCI	Interface module
MCT (MCTB)	Display (Processing module in motomit PC)

1 The system does not start

Make sure that MCI module is for **IT** model, not for **motomit 4**. MCI-IT has CALLIPERS connector.



Supply voltage:

There are three + pins and three ground pins in the POWER connector.

● ○ ● ○ ○ ○ Connect at least these two to
 └──────────┘ the power source. **motomit**

works on voltage range of 10 to 30V.

Ground at least one of the pins.

It is recommended to connect all three pins to plus and another three pins to ground.

Connect the display cable properly at both ends and check that there are no broken or bent pins.

Any led won't turn on if MCT is not connected.

As you switch the power on, leds in the MCI module should flash and turn on again after 30 - 40 seconds. There is a beep sound at the MCT and the system is running.

Leds in the MCI module:

Yellow	Function is on
Yellow and red	Function is on, less than 0.1A current
Only red	Short circuit

2 System is running but IT display is black

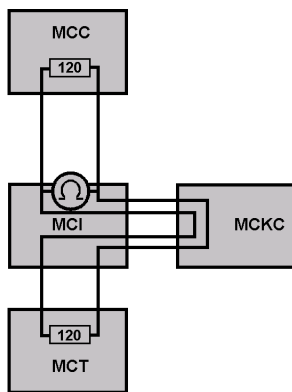
- Check the display cable.
- Heat up the cabin in wintertime before starting the system.
- **IT** is well protected against moisture but as any electrical device it will destroy if it has to be in contact with water.

3 Connection fault

Cabin module and head module send signals to each other at short intervals. If there is a longer than 1.3 s break between the signals, there'll be a message on the screen: CONNECTION FAULT / Head power is turned off. Power is cut off from the head and keyboard module. To get the connection back you have to restart the system or select Maintenance > Resets ... Turn head power ON.

Troubleshooting while the connection fault is on

Measure the resistance between CANLO and CANHI wires when the power is off. In addition to CAN wires, plus and minus wires must be in order to make CAN signal work. Resistance may vary a couple of ohms.



At both ends of the CAN bus - inside MCT and MCC modules - there is a 120-ohm terminal resistor. Measure the resistance from any connector (MCI, MCC, MCKC). Resistance should be about 60 ohms when the CAN wires are OK cause then the resistance is half of 120. Measure for example at the cabin end of the boom cable.

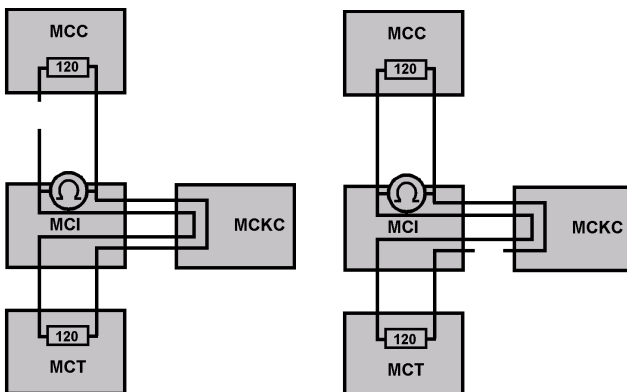
60 Ω = wire OK

120 Ω = break

0 Ω = CAN wires touch together. Damaged cable.

infinite = no connection towards cabin or head

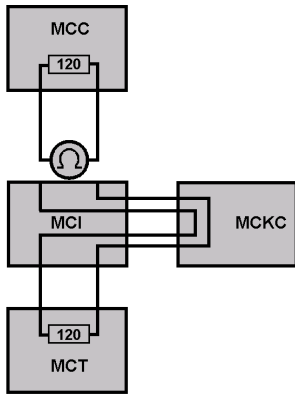
Resistance 120 Ω



Resistance is 120 ohms if the CAN wire is broken.

Break is often in the boom cable, but it can be in the cabin in MCKC or MCT cables as well. You can test the boom cable easily by replacing it with a short cable, that surely is OK. If the connection doesn't work with it, the reason is elsewhere.

Measuring the boom cable

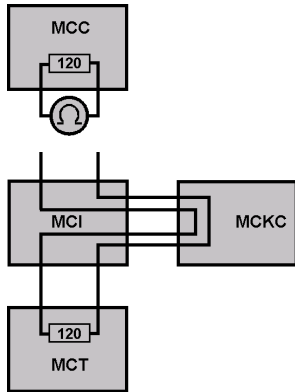


Disconnect the boom cable connector from MCI and measure the resistance from the cable.

120 Ω = wire OK

0 Ω = CAN wires touch together. Damaged cable.

infinite = broken wire or terminal resistor



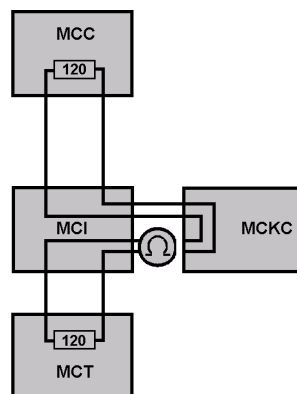
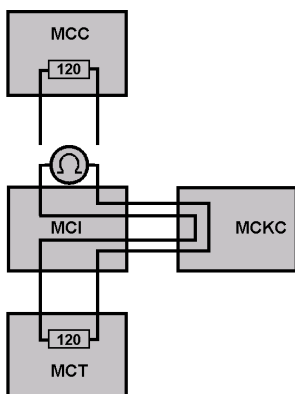
Terminal resistor can be damaged if the CAN connector has received over voltage. Then you have to replace the module and send it to service.

Measure directly from the connector.

120 Ω = terminal resistor OK

infinite = connector or terminal resistor broken

Measuring the cable in the cabin



Make sure that there are no bent cables. Small wire can break inside the insulation. Be careful with the wire ends. CAN bus go through the display cable. Check it for broken or bent connector pins.

120 Ω = wire OK

0 Ω = CAN wires touch together. Damaged cable.

infinite = broken wire or terminal resistor

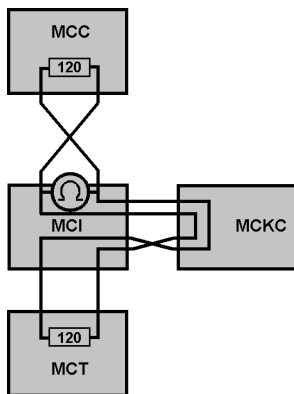
Resistance 60 Ω

Start the system. If you can see the head module program version in the menu Settings > Machine, but you still get the connection fault:

- Check power wires at the keyboard module cable.
- Short circuit in any sensor or valve cuts the power off and therefore breaks also the CAN signal. Disconnect all the other connectors from the head module except the boom cable. If you can't get the connection, try another head module and/or another keyboard module. There doesn't have to be the same program version in the other head module when testing the connection. Take a look at the leds on the modules. Smell of smoke or cracks on the surface of the module indicate that the module is damaged.

Head module program version shows only lines, so there hasn't been connection when the system has started.

- If the program update has interrupted for some reason and therefore failed, upload the program again.



- CANL -> CANL and CANH -> CANH. Signal wires should not be in cross.

Voltage when the cables are connected and the power is on:

- **CONNECTION FAULT / Head power is turned off:** CANHI and CANLO 1.3 V. Plus and minus wires 0 V.
- **Connection OK:** CANHI and CANLO 2.5 V. Plus and minus wires have the system voltage fed to MCI (24 V).
Note that voltage loss is not big in a proper boom cable.

Troubleshooting while the connection fault is not on

Short circuit in a saw home sensor can make a permanent connection fault. Faulty pulse sensor can make a break a couple of times a day.

Damaged cable can cut the connection in a certain position of the crane or head.

Too big **power consumption** at the MCI module cuts off the connection. Head module outputs are for 2.5 A max current each.

Take Error code printout:

- 801 Voltage to head module has been cut off.
- 802 Connection break in CAN bus. Code is registered if there is longer than 1.3 s break.
- 8XX Other codes that indicate CAN problems. For program developers' use.

4 Problems in measuring

MAKE USE OF THE TEST DISPLAY!

Almost 100% of the measuring problems come from bad censoring, grounding and wiring and from poor quality CAN cable. To prevent measuring and other problems use only shielded boom cable sold by Mitron, which is intended for systems under heavy interference. Connect each sensor's plus and ground only to their own pins. Keep the censoring wires separated from the wires controlling the valves. Use diodes in the valves to prevent voltage peaks.

It is better to use pulse encoders that give less than 600 pulses / rotation. **motomit** is able to read high frequencies but some encoders may give distorted output. Test display shows the number of pulse edges.

Take calibration printout before and after making major changes to the curve. Keep a logbook from the calibrations and store the latest printouts in a safe place.

Diameter does not set in basic calibration

- If there are negative pulse values as you open the head, connect the pulse channels A and B other way round to MCC. Do the basic calibration again.
- Try another sensor. Some new sensors have been broken as well.

Head close value is not correct

- E.g. head close is 90 mm when it should be 50. Lower down the calibration points or the whole curve by 40 mm.

There are sudden changes in measuring

- Check wiring and mechanics and all diodes in the valves.
- Take error code printout. Have there been short breaks in the CAN connection?
- Adjust pressure to measuring wheel.
- Use wider measuring wheel if it seems to get deep into the soft bark.

Diameter doesn't increase when you open the head after felling a tree

- If > Calibration > Basic diam. ... Filtering is 8, only decreasing diameters are accepted.

Diameter doesn't change when you close the head after felling a tree

- Diameter can not change if the length does not change!
- If the length changes, check the sensor input on the test display.

Sensor does not give any pulses

- Connect the sensor to another input, for example diameter pulse encoder to length encoder's connector. If the sensor gives pulses to test screen, MCC input is broken. If not, sensor or its wiring is broken.
- Check > Settings > Head ... Diam sensor type.

DIAM.DROPPED >2cm message on the screen

- Tells you that diameter has dropped more than 2 cm within 10 cm length. May be true if there has been a big knot or such. Otherwise problems in sensor. Check the shape of the calibration curve.

5 Printers

Thermal printer feeds only blank paper or prints strange letters

- Check > Maintenance > Start-Up ... Printer. Scriptos = Kyosha. Start **motomit** and printer again.
- There are 8 dip jumpers at the side of Kyosha printer's paper cover. Nro 6 has to be in position ON, the others OFF.

Printed text is light grey or almost invisible

- Try another roll of dry paper.
- Open the printer and clean it carefully.
- Send the printer to Mitron for service.

Printed does not feed paper well

- Printer works best in horizontal position. If you have to install it vertically, paper side must be downwards. A4 printer must always be placed horizontally.

A4 printer does not work

- Install the drivers to PC if this is the first attempt to make it work.
- Input voltage to the printer must be at least 13.5V.
- Read troubleshooting section from printer's manual.

A4 printer feeds only blank paper

- Change the ink cartridge.
- Do not install the printer close to the heating valves of the cabin. Hot air may dry the ink nozzles.

6 Other

Some tips for troubleshooting:

- Check the program version dates in the window > Settings > Machine.
 - MCD - cabin module program date and version.
 - MCC - head module program date and version.
 - Dates should be the same so that programs will work properly together.
- EEPROM COPY FAULT message on the screen
 - MCT has failed in sending data to MCC. Check program dates. There should be the same program dates in the cabin module and in the head module. If a certain module causes this, the module should be replaced.
- After updating a new program you should always reset all memories (> Maintenance > Resets ... All). This Resets the production data and initialises tree species and preset tables. All memory reset doesn't change any hydraulic settings, calibrations or preset keys.
- Take one Error code printout before and after the malfunction has occurred.
- Save MAS file. Take Settings and Presets printout. Load MAS to your simulator and run the same program.
- Try to identify and locate the source of malfunction and the situation how it happens as clearly as possible.
- What were the latest changes in settings, presets, wiring?

7 Greasing

Connection grease is used in connectors of **motomit** modules. Greasing of the male connectors is necessary because electrolysis causes corrosion especially for the head module pins in the long run. Greasing of the connectors increases operating life of the module. Connectors should be greased every time when female connectors are lifted up due to a service action. Recommendable grease is like the one used in the power current mountings. Greasing is already done by Mitron Oy for every head module delivered.

8 Memory card

Compact Flash memory card is used with **motomit IT** for data transfer and program update purposes. Compact Flash cards are widely used in a variety of personal digital devices including digital cameras, digital music players and handheld PCs. There's no battery inside. Data is not lost when power is turned off. Cards sold by Mitron are made for heavy industrial use. Flash cards have high storage capacities, but 16 MB is enough for **motomit** use.



Flash card and adapter for standard PCMCIA slot.

Win 98 and newer operating systems have support for Flash card. You can handle the files like if it was a floppy disk.

9 Cables

MCT - MCI

Standard data cable D25M - D25F

MCI - MCC

Shield	-----	Shield	Connect the shield only at MCI end
CANLO	-----	CANLO	
CANHI	-----	CANHI	
VCC	-----	VCC	} VCC and GND are doubled to secure the continuous power supply
VCC	-----	VCC	
GND	-----	GND	} VCC and GND are doubled to secure the continuous power supply
GND	-----	GND	

MCI - MCKC

CANHI	-----	CANHI
CANLO	-----	CANLO
CANHI	-----	CANHI
CANLO	-----	CANLO
GND	-----	GND
VCC	-----	VCC

Calliper

D25M		D9M
2	-----	3
3	-----	2
7	-----	5

MCI - PC COM **motomit PC communication**

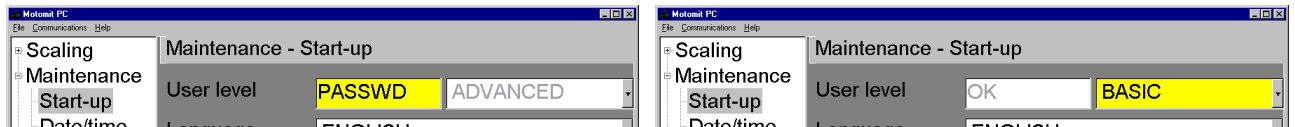
D9F		D9F
2	-----	2
3	-----	3
5	-----	5

10 User levels

SW versions starting from 06 / 2003

BASIC, STANDARD, ADVANCED, SPECIAL, SERVICE

- Light grey text means that setting is disabled on the current user level.
- Operator can always browse through all windows and see what settings are on.
- SERVICE level is reserved for SW developers' use only.
- No affect on program updates.



User level can be changed in the window > Maintenance > Start-up. Type the correct password and change the user level in the listbox.

Ask your password from Mitron.

	BASIC	STANDARD	ADVANCED	SPECIAL
Scaling	all disabled	can change only preset length, min diam, key programming, ID, contract, misc,	can change all except price lists, bucking condition, price type, distr diff start qual, control meas interval	all enabled
Maintenance	can change time and date can reset cutting area	can change all except vol calc method	can change all except vol calc method	all enabled
Settings	can change base machine number	can change all except DRF monitoring	all enabled	all enabled
Reports	all enabled	all enabled	all enabled	all enabled
Calibrations	all disabled	all enabled except auto calibration	all enabled	all enabled
Communications	all disabled	all disabled	all enabled	all enabled