RICO Quick Troubleshooting Guide

Zapi H3D Controller

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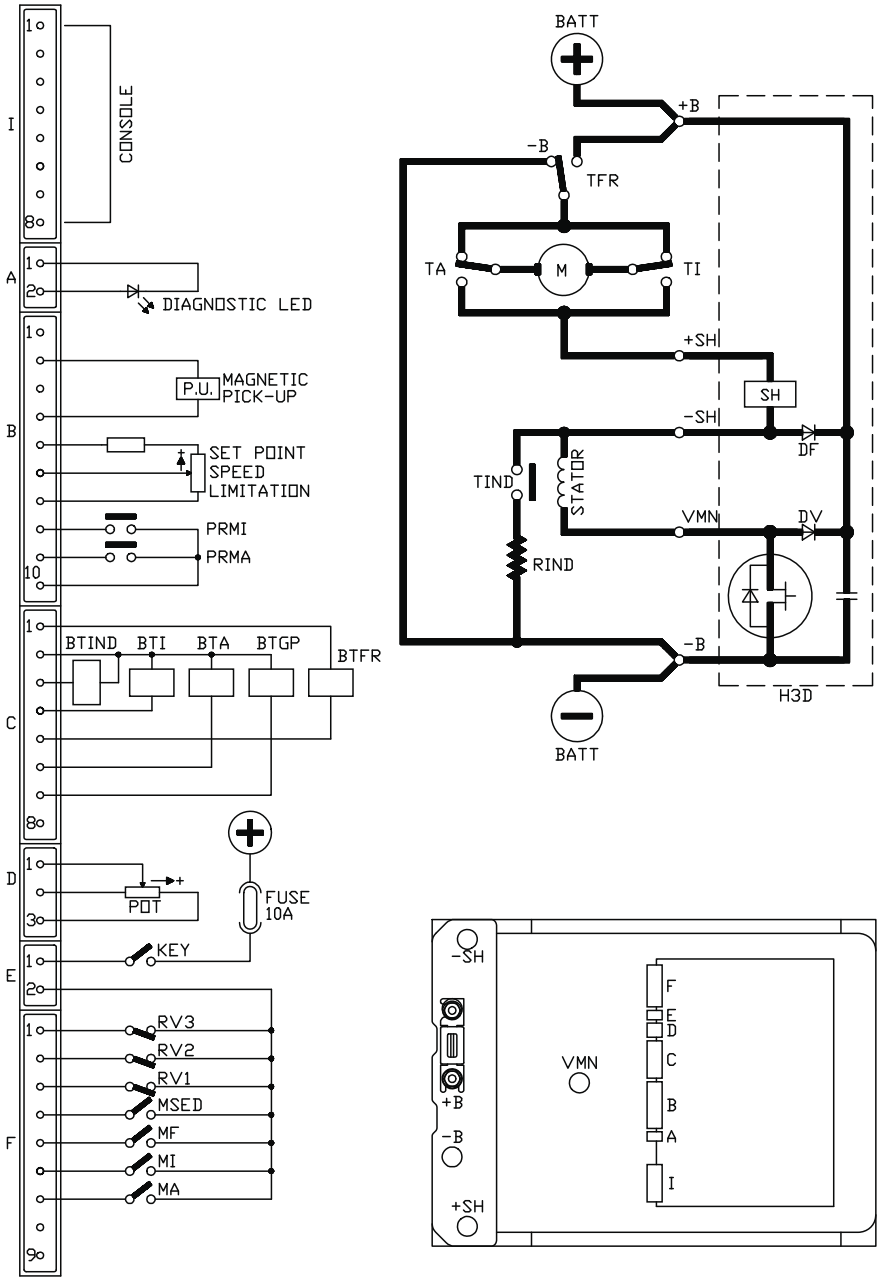
*Notes:

1) Not all parameters listed in the “Programmable Features and Descriptions” section have the ability to be changed.
2) Any parameter change should be approved by Rico

5 H3D REGENERATIVE TRACTION

- Input for 3-wire potentiometer (optional 2-wire on request)
- 3 speed reductions
- Input for handle microswitch or seat microswitch (delayed)
- Input for rapid inversion signal
- Input for brake pedal microswitch
- Weakening or bypass contactor handling
- Maximum speed control
- Backing request with associated speed and programmable timing



5.1 INPUT CONNECTORS DESCRIPTION

pin	function	description
F1	RV3/QUICK1	Input for 3rd speed reduction request. The request is active when the pin is disconnected. To disconnect link to +CH or adjust to level 9 the corresponding speed. This pin can be programmed as input for rapid inversion signal, the safety is active when pin is opened.
F2	RV2/BACKING	Input for 2nd speed reduction request. The request is active when the pin is opened (low level) and disactivated if the pin is positive (high level) or the speed is programmed to level 9. If programmed as reverse request (backing), the pin must be free, because the logic drives automatically when you use the inputs B8 and B9, the running is setted with the parameter CUTBACK 2 and for a time programmable with the parameter BACKING TIME, when you require this function it is not necessary to active the pin F4 (seat microswitch).
F3	RV1	Input for 1st speed reduction request which is active when pin is opened. The activation of this reduction is combined with an intensity braking and programmable length (CURVE BRAKING) and (CURVE TIME). It is possible to eliminate the braking in curve programming curve time as 0.
F4	MSED / HANDLE	Input for seat microswitch signal (delayed 2 sec.) if the pin is taken to a high potential the running is active, the delay isn't executed if the pin is programmed as tiller-handle.
F5	MF	Input for brake pedal microswitch when the pin is taken high (+VB) during a release braking phase the braking current is the one programmed at the parameter "PEDAL BRAKING" plus a value that is proportional to the accelerator signal and to the parameter "BRAKING MODUL". If the brake is pressed during the usual running the current is reduced by 50% and the speed No. 2 reduction is activated.
F6	MI	Input for backward request signal. The request is active when the signal is high (+VB)
F7	MA	Input for forward request signal. The request is active when the signal is high (+VB)
E8		Same as pin F4 but active when signal is low
F9		Same as F8
I6	REF*	Input for speed set-point signal with external potentiometer, on this pin it is set up the voltage relative to the maximum speed, the range is 0V - 5V. Open the jumper JP5 for rendering operative this input.

* = The functions relative to the maximum speed check are activated only if you have programmed the Option “SPEED” at “CHECK” mode.

5.2 PROGRAMMABLE FUNCTIONS DESCRIPTION (OPTIONS)

function/pin	option	description
1) PIN G3	**by-pass**	The contactor connected to connector G3 is handled as a bypass, with activation current = 80%Imax., output current = 90%Imax., activation delay=800 msec.
	weak	The contactor connected to connector G3 is handled as weakening, with activation current = 50% of Imax. The disabling current is programmable from 10% to 100% of Imax. (WEAK DROP OUT). Activation delay=800 msec.
2) SPEED	**free**	Speed check not active. The mini-console can be used with this option.
	check	Speed check active. By the trimmer R22 and or the signal to pin B6 it is set up the maximum speed. When the speed exceeds this value the controller reduces the motor voltage or brakes if the difference persists. The braking goes on until the speed is less than the maximum value set. Sampling is made every 60 sec. Please note that when the speed check option is activated the miniconsole can not be used.
3) BATTERY	**free**	No low battery charge alarm
	check	Activates the check that reads the battery voltage in standby. When the residual charge is less than 10%, the maximum current is halved and the LED blinks continuously.
4) ARB	**free**	No anti roll back
	check	Anti-roll back
5) RELEASE	**free**	No regenerative braking at release
	check	Braking active at the moment of pedal release with increment of the braking current by means of the brake pedal.
6) HOURS	**free**	Hour meter only active when running
	check	Hour meter active when the key is on
7) PIN F1	**cut b.#3**	It associates the function of n° 3 speed reduction request to the F1 connector
	quick I	It associates the function for rapid inversion to the connector F1 with the following characteristics: plugging braking with 1.2 x Imax, restart in forward direction with 0.5 x Imax, slower acceleration (to avoid wheel slip). Also the machine will stop if the safety button is released and a forward or backward request is present. The rapid inversion request is accepted only when it is present with the forward request. The function is active when the pin is free or connected to battery negative.

8) PIN F4	**seat**	The input of running enable by the seat microswitch is associated to connector F4: A microswitch temporal sequence is requested. Delay of 2 seconds on deactivation. The function is active if the pin is connected to the positive
	handle	Like the “seat” option but without delay
9) PIN F2	**cut b.#2**	It associates the speed reduction n° 2 to the pin F2.
	backing	It associates the backing request F2 connector. In this selection please leave the pin free because the connections are inside the logic board.

5.3 ADJUSTMENT PARAMETER DESCRIPTION (MENU PROGRAM)

The parameters can be modified with the controller both in standby and in running.
For storing the modifications in the nonvolatile memory, you must go out from the menu program and confirm the “ENTER” request.
Regenerative traction parameters:

1) **ACCELER DELAY** = acceleration time, i.e. the minimum time during which the motor voltage varies from 0V to the maximum.
2) **INVERS BRAKING** = basic braking current in direction inversion. A value is added to this value based on the accelerator plus a fixed increment every second.
3) **RELEASE BRAKING** = release braking current.
4) **PEDAL BRAKING** = release braking current with brake pedal pressed.
5) **CUTBACK SP.1** = reduction of speed n° 1 associated to the input F3. The accelerator is reduced.
6) **CUTBACK SP.2** = reduction of speed n° 2 associated to the input F2 and to the input F5 if activated on running. It defines the speed to be set up in the BACKING mode.
7) **CUTBACK SP.3** = reduction speed n° 3 associated to the input F1.
8) **AUXILIARY TIME** = auxiliary contactor activating time connecting to the C7 (NTGP) output.
9) **COMPENSATION** = compensation of the speed (motor voltage) on the basis of the current when the speed reductions are active. It is activated only with the pedal pressed over 80%.
10) **BRAKING MODULATION** = defines the maximum current in inversion braking with the accelerator pedal pressed. When the accelerator is pressed all the way down in inversion, braking becomes more severe the higher the value of the parameter.
11) **IMAX** = defines the maximum current of the chopper both when running and in braking. All the current adjustments are expressed as a percentage of this value.
The adjustment interval is from 75% (level 0) to 100% (level 9).
12) **MAX SPEED FORW** = Max speed with forward direction on. This speed reduction goes under adjustable compensation with the COMPENSATION parameter.
13) **MAX SPEED BACK =** Max speed with backward direction on. This speed reduction goes under adjustable compensation with the COMPENSATION parameter.

14) CREEP SPEED = defines the minimum voltage applied to the motor with the running request activated. Provides a more immediate response in starting off.

15) WEAK DROPOUT = threshold of current for opening the weakening contactor (if programmed as such and not as bypass, in which case the output threshold is fixed and not programmable).

16) CURVE BRAKING = current for curve braking, activated with RV1 request, if the PWM is greater than 80% and the motor current less than 40%Imax.
This braking level is used also for the speed check.

17) CURVE TIME = curve braking time associated to RV1. If 0, braking is not carried out.

18) BACKING TIME = backing request activating time delay. If programmed at level 9 there is no time delay and the on status is present if a request is present.

5.4 ADJUSTMENT CHART

PARAMETERS	UNIT	PROGRAMMED LEVEL									
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
ACCELERATION DELAY	Sec.	0.41	0.82	1.2	1.6	2	2.4	2.9	3.3	3.7	4.1
INVERS BRAKING	% IMax.	19	23	28	32	37	41	46	50	55	59
RELEASE BRAKING	% IMax.	15	19	23	27	31	34	38	42	46	50
PEDAL BRAKING	% IMax.	25	31	37	43	49	56	62	68	74	80
CUTBACK SP. (1-2-3)	% VBatt.	10	22	33	45	53	61	69	78	88	100
COMPENSATION	K (I)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
BRAKING MODUL	% IMax.	0	3	5	8	11	14	17	20	22	25
I MAX. (VERSION 800A)	Amp.	600	622	644	667	689	711	733	755	778	800
I MAX. (VERSION 1000A)	Amp.	750	778	806	833	861	889	916	944	972	1000
MAX. SPEED FORW-BACK	% VBatt.	10	22	33	45	53	61	69	78	88	100
CREEP SPEED	% VBatt.	0	1.9	3.9	5.9	7.8	9.8	11.7	13.7	16.6	17.6
WEAK DROPOUT	% IMax.	10	20	30	40	50	60	70	80	90	100%
CURVE BRAKING	% IMax.	15	19	23	27	31	34	38	42	46	50
CURVE TIME	sec.	0	0.2	0.3	0.4	0.6	0.8	1	1.2	1.6	2
AUXILIARY TIME	sec.	0.1	0.5	2	4	7	9	12	14	17	20
BACKING TIME	sec.	0.05	0.2	0.35	0.5	0.75	1.0	1.5	2.0	2.5	cont.

7 TRACTION ADJUSTMENT AND DIAGNOSIS

7.1 SEQUENCE OF SETTINGS FOR REGENERATIVE/STANDARD TRACTION

- With the machine switched off, connect the programming console and then switch on. If no wiring errors or component defects are found, the display shows the manufacturer's name, programme release, configuration, and hour-meter value. If the module has already been configured, the procedure passes directly to step four. Otherwise, proceed in order as follows.

Consult the console manual for further procedure details.

1) Configure the chopper model (page 16-17).

2) Select the desired options (page 16-17).

3) Select and set battery voltage (page 16-17).

4) Check the operation of all the wired inputs, including the potentiometer, by means of the tester functions on the console.

5) Carry out accelerator signal acquisition on the "PROGRAM VACC" menu.

6) Set the maximum current by selecting the level corresponding to the desired value shown on the table of modifications (page 22).

7) Set accleration by moving the machine forward and backward.

8) Set the CREEP speed starting from level 0. With the machine stopped, press the pedal lightly in order to close the running microswitch, leaving the potentiometer at the minimum value, and then raise the level of the CREEP until the machine begins to move.

9) To set the speed reductions, activate the desired reduction request microswitch, take the compensation level to 0, set the speed (CUTBACK SP.I, etc.) with machine in standby on a flat surface and the accelerator pedal pressed all the way down. Apply a load on the machine or put it in a slope keeping completely pressed the acceleraror pedal, and in these conditions set the compensation level until you reach the desired speed.

10) RELEASE BRAKING is set by running the machine and then completely releasing the accelerator pedal without pressing other pedals.

11) For INVERSION BRAKING, first set the MODUL BRAKING level at 0, run the machine and invert the direction with the pedal pressed down, then regulate the braking level.

12) MODUL BRAKING with accelerator. A parameter that increases the inversion braking according to the level of the accelerator signal; set it by inverting the direction with the pedal pressed all the way down. It is operating also with pedal braking equipped with a potentiometer.

13) Release braking with brake pressed (PEDAL BRAKING). Set by pressing the brake pedal lightly during release.

7.2 H3D TRACTION DIAGNOSIS

Description of the alarms signalled by the diagnostic LED.
The alarm code is shown in parentheses. A detailed description is given in the section "DECODING THE ALARMS DISPLAYED ON CONSOLE" on page 36.

1 FLASH = Logic anomaly (EEPROM DATA KO, EEPROM PAR. KO, EEPROM CONF. KO, EEPROM OFF-LINE, CHOPPER NO CONF, WATCH-DOG).

2 FLASHES = Running request on startup or error in handle/speeds sequence (INCORRECT START).

3 FLASHES = Error on VMN test (NO FULL CONDUCTION, VMN LOW).

4 FLASHES = Accelerator high in standby or failures in its connection: this error inhib-its the operation (VACC NOT OK).

5 FLASHES = Error in reading current - this error inhibits operation (I HIGH AT STAND, I=0 EVER).

6 FLASHES = Malfunction of the contactor driver circuit (DRIVER SHORTED, COIL SHORTED).

7 FLASHES = Excessive temperature, greater than 80°C (TH. PROTECTION).

8 FLASHES = Contactors do not open or VMN high in standby (BRAKE CONT. OPEN, DIR CONT. OPEN, VMN HIGH).

9 FLASHES = Contactor closed (BRAKE CON CLOSED) only for regenerative; (DIR. CON CLOSED) only standard traction.

CONTINUOUS BLINKING (32 BLINKS) = Low battery charge, battery with <10% of residual charge (BATTERY).

LED REMAINS ON = Double running request (FORW BACK).

7.3 DECODING CONSOLE DISPLAYED ALARMS

1) BRAKE CONT. CLOSED (only regenerative version)

Test carried out in the passage from running to initial regenerative braking.
If, on running contactor closure, the VMN is > 2/3 VBATT, an alarm is issued.
Possible causes:

a) The normally open contact of the braking contactor is closed. Free the contact and clean it; if it is damaged replace the contactor.

b) The braking contactor remains excited for a defect in the logic board or because the NTFR wire is in short circuit toward negative.
To understand if the defect is produced by one of these causes, select the running and press the pedal without giving the seat or tiller request, if the activation only of the braking contactor is in synchrony with the pedal (or selector) command verify what follows: disconnect the wire from the NTFR connector and repeat the test above, if the contactor remains disactivated replace the logic, otherwise if the contactor moves check that there is not a wire shorted to a metallic part.

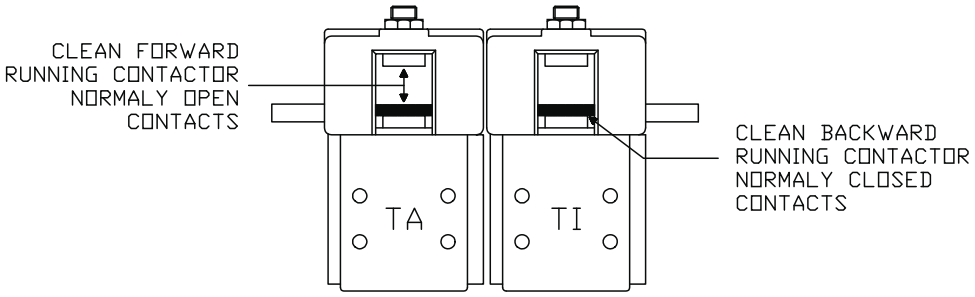
2) DIR. CONT. OPEN

Test carried out at running request: running contactor closure is verified by checking that the VMN signal is consistent. Possible causes:

a) For finding out the causes follows the diagnosis procedure is as follows:

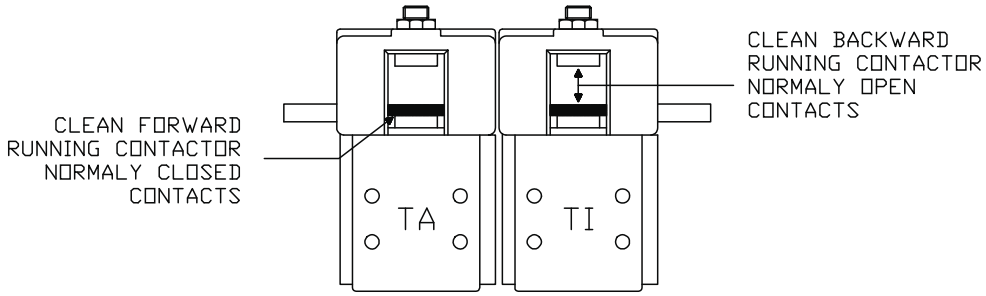
<table>
<tr><th>CONDITION UNDER WHICH FAULT IS DETECTED</th><th>TEST</th><th>RESULT</th><th>TEST</th><th>RESULT</th><th>FAULT DESCRIPTION AT POINT:</th></tr>
<tr><td rowspan="3">ONLY AT FORWARD RUNNING REQUEST</td><td rowspan="3">YOU SEE FORWARD CONTACTOR (TA) CLOSING FOR 0.3sec. THEN OPENING?</td><td>YES</td><td>→</td><td>→</td><td>A1</td></tr>
<tr><td rowspan="2">NO</td><td rowspan="2">WHEN REQUESTING FORWARD RUNNING YOU FIND ANY VOLTAGE AT COIL CONTACTS FOR 0.3 sec.?</td><td>YES</td><td>B1</td></tr>
<tr><td>NO</td><td>C1</td></tr>
<tr><td rowspan="3">ONLY AT BACKWARD RUNNING REQUEST</td><td rowspan="3">YOU SEE BACKWARD CONTACTOR (TI) CLOSING FOR 0.3sec. THEN OPENING?</td><td>YES</td><td>→</td><td>→</td><td>A2</td></tr>
<tr><td rowspan="2">NO</td><td rowspan="2">WHEN REQUESTING BACKWARD RUNNING YOU FIND ANY VOLTAGE AT COIL CONTACTS FOR 0.3sec.?</td><td>YES</td><td>B2</td></tr>
<tr><td>NO</td><td>C2</td></tr>
<tr><td rowspan="3">AT BOTH RUNNING REQUEST</td><td rowspan="3">YOU SEE FORWARD OR BACKWARD CONTACTOR (TA OR TI) CLOSING FOR 0.3sec. THEN OPENING</td><td>YES</td><td>→</td><td>→</td><td>A3</td></tr>
<tr><td>NO</td><td>WHEN REQUESTING FORWARD RUNNING YOU FIND ANY VOLTAGE AT TA COIL'S CONTACTS (OR AT BACKWARD CONTACTOR COIL'S CONTACTS (BTI)) FOR 0.3sec.?</td><td>YES</td><td>B3</td></tr>
<tr><td></td><td></td><td>NO</td><td>C3</td></tr>
</table>

A1) There is not a good contact either on TA (=forward contactor) NA (normally open) or on TI (=backward contactor) NC (normally closed), due to dust, dirt or any particles which prevent a good contact.
Clean contacts by means of compressed air; if necessary remove dirt applying a soft abrasive movement.



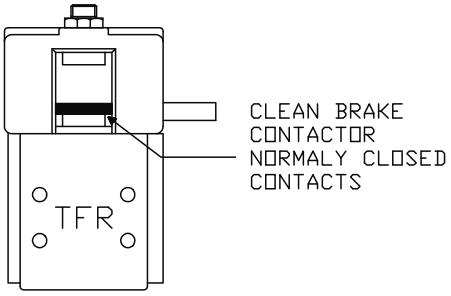
It could be necessary to change both contactors.

A2) There is not a good contact either on TI NA or on TA NC, due to dust, dirt or any particles which prevent a valid contact.
Clean contacts by means of compressed air; if necessary remove dirt applying a soft abrasive movement.



It could be neccessary to change both contactors.

A3) The most likely reason is that the normally closed contact of the braking contactor doesn't make a good contact towards the battery negative for dust, dirt or because the contact doesn't locate completely for a mechanical defect of the contactor.



It could be necessary to replace the contactor.

It may be due to 1 of following causes of motor connecting interruption:

a) brushes open from the armature (fig.1).
b) brush cable burn up (fig.2).
c) Missing the braking contactor negative cable (fig. 3)
d) Interruption either on motor winding or on motor cables.

Fig. 1

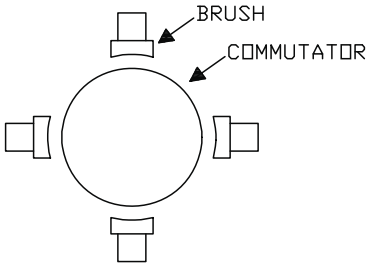


Fig. 2

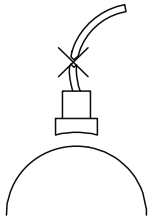
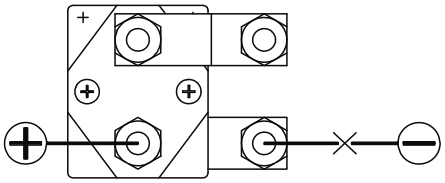


Fig. 3



B1) Forward contactor (TA) is supplied with a correct voltage but does not close. Possible causes:

1) Contactor coil is open circuit, verify its resistance using an ohmmeter.
2) Contact can't move due to some mechanical restriction.
3) Nominal working coil voltage is greater than the battery voltage.

B2) Reverse contactor (TI) is supplied with a correct voltage but it doesn't close; everything said at point B1 for TA is valid here.

B3) Reverse and forward contactors are supplied with correct voltage but they don't close; see point B1.

C1) Supply is not present at TA. Check cables and connections from TA coil to connectors C2 (PT) and C6 (NTA).

C2) Supply is not present at TI. Check cables and connections from TI coil to connectors C2 (PT) and C4 (NTI).

C3) Supply is not present at TA and TI. Check cables and connections from the coils to connectors C2 (PT), C6 (NTA) and C4 (NTI).

- For points C1, C2, C3 replacing controller may be necessary.

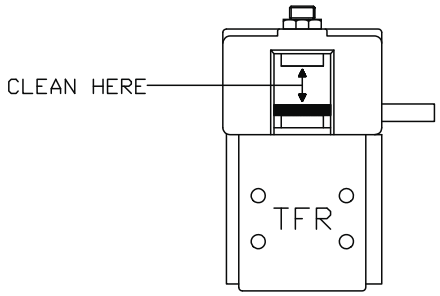
For H3D standard configuration the solutions at point A1-A2-A3-B1-B2-B3-C1-C2-C3 are valid; for the last two points please respect the different connections rather than the regenerative configuration.

3) BRAKE CONT. OPEN (regenerative only)

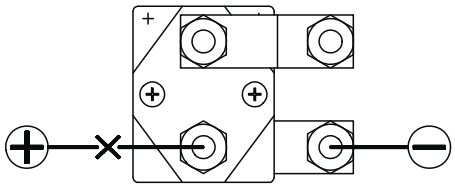
Test carried out during the passage to running. After closing one of the direction contactors, the braking contactor closes, verifying that the VMN goes from < 1/3 to > 2/3. If this does not occur, an alarm is shown.
For finding the causes follow the diagnosis procedure as follows:

TEST	RESULT	2° TEST	ESITO	3° TEST	RESULT	FAULT DESCRIPTION AT POINT
AT RUNNING REQUEST THE TFR CLOSES FOR 0.3sec?	YES	→	→	→	→	A4
						A5
	NO	WHEN THERE'S THE RUNNING REQUEST, IS THERE A VOLTAGE AT PIN BTFR FOR A TIME OF 0.3sec?	YES	CHECK WITH AN OHMMETER IF THE TFR COIL IS INTERRUPTED	YES	B4
					NO	B5
						B6
			NO	→	→	C4

A4) There is not a good contact on the NA of TFR, clean the contact, if it is damaged, replace the contactor.



A5) The positive cable on the braking contactor is missing.



B4) Replace the contactor coil or the complete contactor.

B5) Contactor mechanically locked, unlock it or replace it.

B6) Contactor has a working nominal voltage higher than the supply.

C4) Supply does not appear at the contactor coil, please check the cables and the connections from the coil to the connector C1(PTFR) and C5(NTFR).

4) DIR.CON.CLOSED

Test carried out during the passage to standby or braking.
Checks that the running contactor opens by comparing the consistent status of the VMN potential. Possible causes:

a) Running contactor welded or slow to open.

b) Logic failure.

5) VMN LOW

The test is carried out at standby and in running up to 80% of PWM. If the VMN voltage is lower than 1/3 of the battery voltage, an alarm is shown.
For finding out the causes follow the diagnosis procedure has follows:

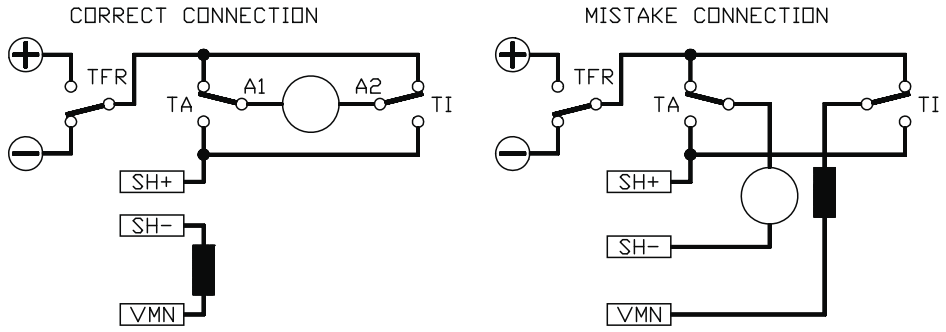
CONDITIONS UNDER WHICH FAULTS IS DETECTED	1° TEST	RESULT	2° TEST	RESULT	3° TEST	RESULT	FAULT DESCRIPTIO POINT:
AT THE KEY ON	DISCONNECT THE MOTOR CABLE CONNECTED TO THE BATTERY AND THEN VERIFY IF THE ALARM STILL PRESENT	YES	→	→	→	→	C5
		NO	A RUNNING CONTACTOR IS LOCKED IN WORKING POSITION	YES	THE STUCK CONTACTOR COIL IS SUPPLIED?	YES	B7
						NO	B8
				NO			D1 D2 D3
RUNNING WITH CONTACTORS ON RUNNING POSITIONS	→	→	→	→	→	→	C5
AS SOON AS THE ACCELERATOR PEDAL IS COMPLETLY RELEASED FOR DOING A RELEASE BRAKING	IS IT PRESENT THE BYPASS OR THE WEAKENING CONTACTOR?	YES	→	→	→	→	E1
		NO	→	→	→	→	C5

B7) If the running contactor remains closed, you can verify:

1) if the wire going from NTA to NTI is shorted to a metallic part connected to the battery negative;
2) disconnecting the contactor wire always excited from board connector if the contactor is no longer excited, replace the logic board.

B8) A running contactor remains in the working position, free the contact, it may be necessary to replace the contactor.

D1) Wrong connections of the motor cables. The stator and the armature are crossed.



D2) There is current leakage in the motor between the stator winding and the armature. Otherwise there are some electric parts of these windings that makes a contact inside the motor.

D3) Check that there are no metallic parts inside the contactor board that cause a short towards the negative in the points connected to SH- and SH+.

C5) The most probably reason is that the failure is inside the controller, replace it.

E1) If a bypass contactor is present check that it is not welded or it is too slow opening.
To verify this possibility, disconnect the bypass and check if the failure disappears: if this happens, replace the logic.

ATTENTION: the contactors connected to the controller must not have arc suppression on the contactor coils. Suppression exists inside the controller. Any external suppresion will modify the contactor opening times.

6) VMN HIGH

Test carried out in standby. If the VMN voltage is greater than 2/3 VBATT, an alarm is shown. Possible causes:

a) Contactor welded (only standard traction).

b) Short circuit between +BATT and VMN, check if there are any metallic parts causing short circuit in the contactor board.

c) Logic failure, probably the braking diode has failed, replace the power board.

7) NO FULL COND.

The test is carried out in full conduction. In this condition, if the VMN is found to be greater than 1/3 VBATT, the diagnostic circuit is faulty, causing a safety risk, and thus machine operation is inhibited. If the defect persists, replace the logic.

8) THERMAL PROTECTION

An indication that the controller temperature has exceeded 80° C.
The maximum current is gradually reduced, reaching 0 at a temperature of 85° C.

a) If the alarms occurs while cold, the most probably reason is failure of the thermal diagnosis circuit on the power or on the logic board, replace one of the two parts or replace the complete controller.

b) If the alarm occurs frequently the machine has worked for a short time, it is probably due to inadequate heat sinking. Check the fixing nuts are tight and the installation is correct .

9) BATTERY

The battery charge is low.
The alarm is signalled only if the “battery check” option has been selected from the serial console (default). When this alarm occurs, the maximum current is reduced to 50%.

10) INCORRECT START

An incorrect starting sequence.
The machine only starts if the sequence is followed: key-handle (or seat) - running.
Possible causes:

a) Running microswitch or handle microswitch closed.

b) Error in sequence made by the operator, pedal pressed at the key on.

c) Incorrect wiring if there are not any defects externally it is necessary to replace the logic..

11) FORW - BACK

The test is carried out continuously. An alarm is signalled when two requests for running are made simultaneously. Possible causes:

a) Defective wiring.

b) Running microswitch closed.

c) Incorrect manoeuvre.

d) If there are no external defects, replace the logic.

12) VACC NOT OK

The test is made in standby.
The alarm indicates that the accelerator voltage is greater than 1V with respect to the minimum value stored. Possible causes:

a) A potentiometer wire is open circuit or the potentiometer negative has not been connected to the PIN D2 of the logic board. In this case an alarm is generated because the logic does not find the load on pin D2.

b) The potentiometer is not correctly calibrated.

c) The potentiometer is defective (interrupted).

13) I HIGH AT STAND

Test carried out in standby. Checks that the current is zero.
If this is not verified, an alarm is signalled. This alarm inhibits machine operation.
Possible causes:

a) Current sensor broken or logic failure.
First replace the logic. If the defect persists, replace the power unit.

14) I=0 EVER

Test carried out in running.
Checks that the current during running is greater than a minimum value. If not, an alarm is signalled and the machine is shut down. Possible causes:

a) The current sensor is faulty. Replace the power unit.

b) Incorrect connection of the motor cables to the power bars SH- and SH+.

15) EEPROM PAR.KO

Fault in the area of memory in which the adjustment parameters are stored. This alarm inhibits machine operation. If the defect persists when the key is switched off and on again, replace the logic. If the alarm disappears, remember that the parameters stored previously have been cancelled and replaced by the default values.

16) EEPROM CONF.KO

Fault in the area of memory in which the special chopper configuration data is stored. If the defect persists when the key is switched off and on again, replace the logic. Otherwise, remember that the chopper configuration has been reset to the default values (regeneration version, etc.); thus it must be reprogrammed.
Consult the console manual.

17) EEPROM DATA KO

The data in the area of memory for the hour-meter is incorrect. This alarm does not shut down the machine. If the alarm disappears when the key is switched off and on again, remember that the hour-meter data has been reset to zero.

18) EEPROM OFF LINE

Fault in the nonvolatile memory that contains data relative to the area for the hour-meter, the alarms stored and the programming parameters.
If the alarm persists when the key is switched off and on again, replace the logic.

19) CHOP NO CONF.

An alarm similar to no. 16, except that here, even though the data is correct, it does not correspond to a hardware configuration recognised by the H2B. The considerations are the same as for alarm 16 “EEPROM CONF.KO”.

20) WATCHDOG

The test is made in both running and standby.
It is a self-diagnosis test within the logic. If an alarm should occur, replace the logic.

21) SHORTED COIL

An overload or a short circuit toward +BATT on the contactor negative driver outputs.
Possible causes:

a) The contactor coils are short circuit or draw more than 6 A continuous.

b) Short circuit with +BATT of the wiring that comes from the contactor connector. The alarm indicates the occurrence of an overload, not the breakdown of a chopper component. Once the external cause is removed, the chopper can be restarted.

22) DRIVER SHORTED

The test is carried out in standby, and checks that the voltage of the drivers that control the contactors is consistent with the preset value.
Possible causes:

a) Logic failure.

b) Driver breakdown caused by overvoltage in the contactor negative wiring. Replace the logic after having removed the cause.