ADJUSTMENTS AND INSPECTIONS

READ THE USE AND MAINTENANCE HANDBOOK

PROGRAMMING WITH THE CONSOLE

Service of the console

The console allows to:

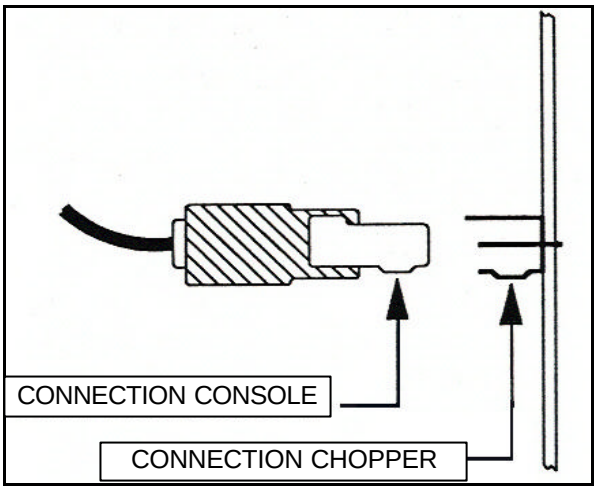
- set the chopper card for a personalised behaviour of the traction motor;
- read the type of the alarm for a correct and easy trouble shooting;
- test the different electric values and the state of the electric circuit relative to the traction.

Use of the console

The use of this instrument is very easy and comparable to the most common electronic devices (such as mobile phones).
The sequence to follow always for the connection of the console is:

1. **SWITCH OFF THE GENERAL KEY** of the machine;
2. Disconnect the from the LED alarm connection;
3. Connect the console instead of the LED alarm connection with the connection of the chopper card. If this operation results to be difficult, check if the connector is positioned in the correct direction.
4. Switch on the general key of the machine and work with the console;
5. Quit from all the programs (main menu of the ignition) and **SWITCH OFF THE GENERAL KEY** of the machine;
6. Disconnect the console and reconnect with the LED alarm connection.

THE WRONG OPERATION SEQUENCE CAN EASILY COMPROMISE THE FUNCTIONALITY OF THE CHOPPER CARD OR OF THE CONSOLE





Menu of the console

The following illustration indicates how to move inside the menu of the console and a short description of the menu (some menus provide only necessary information's for the correct functioning of the chopper and can not be modified without written authorisation from Comac).

For a detailed description, consult the chopper handbook. In the following we give you the basis information's for the debugging of the machine.

Press ENTER to get inside of the menu, in order to move inside of the different menus use the ROLL buttons, for changing the insert values use the button PARAM SET and OUT in order to quit one program.

For every modification of values in one menu the console will ask to confirm the modification when quitting the menu (ARE YOU SURE? YES=ENTER, NO=OUT).

HEADING: One reads the main characteristics of the console and of the chopper card: the name of the machine to which one is connected, voltage and maximum current of the chopper card, the working hours of the chopper card.

PARAMETER CHANGE: In this menu the parameters can be changed to personalise the machine. The adjustable parameters are: CUT BACK SPEED 1 (first speed limit of the machine) and CUT BACK SPEED 2 (second speed limit of the machine). **All the other parameters are chosen from Comac relative to the assembled traction motor and it is forbidden to change them without previous authorisation of Comac.**

TESTER: In this menu one can read the qualities of the electric characteristics (voltage traction motor, current motor, state of power switch = on/off).

SAVE: This permits, once the parameters have been changed, to enter the new setting in the memory of the console. Attention: in the console exists already AN parameter set MOD 00, which contain the correct configurations for the assembled traction wheel.

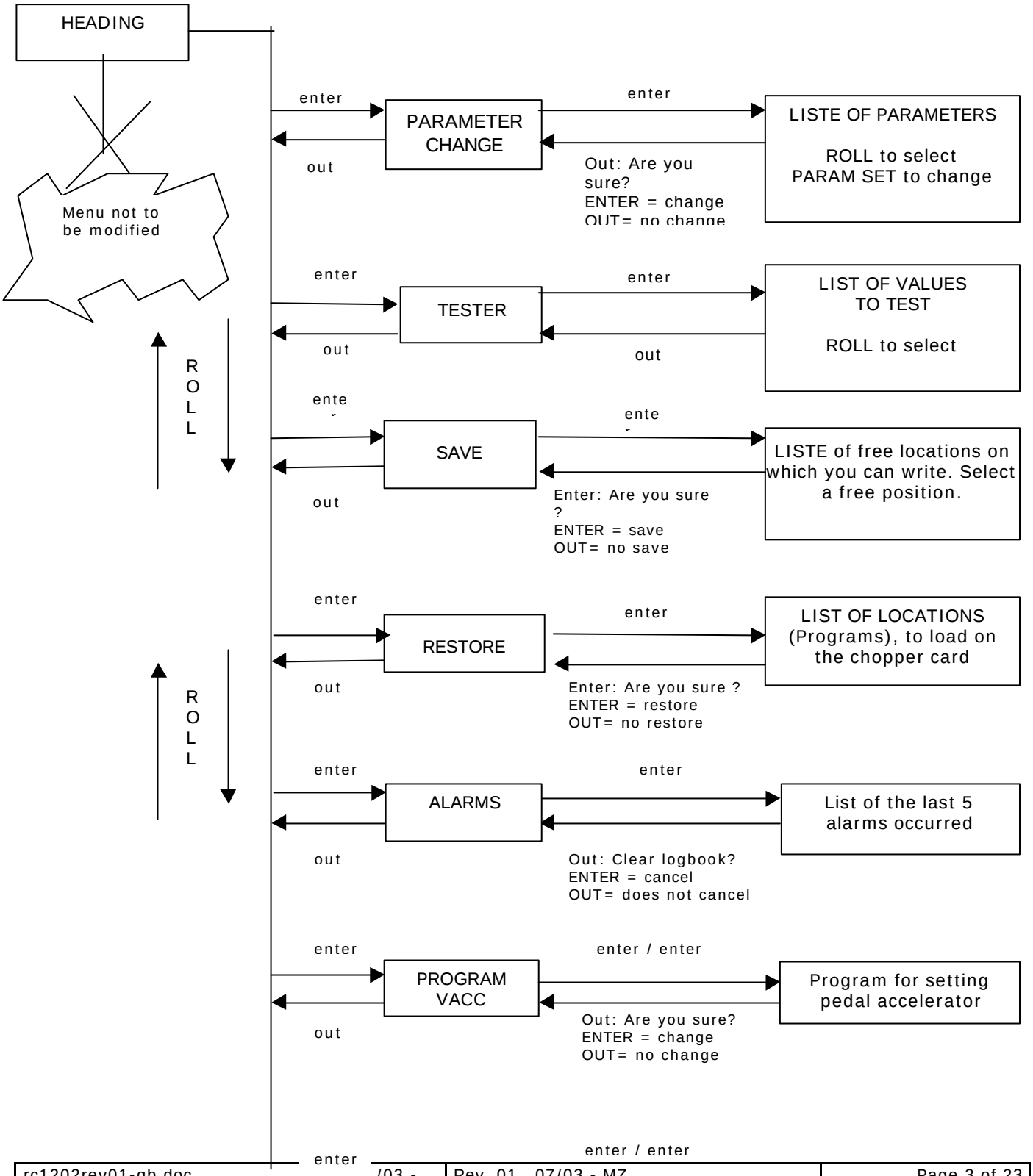
RESTORE: This permits to restore on the chopper card a parameter set, which has been entered in the console. The standard program MOD 00 refers to the standard traction wheel of the C85.

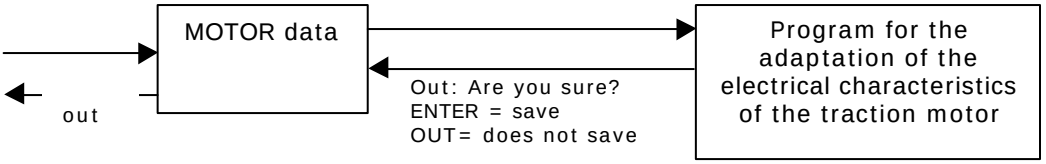
ALARMS: Indicates a list of the last five alarms occurred on the machine; according to the alarm a specific corrective action is adopted (see following paragraph).

PROGRAM VACC: This section is used to teach the chopper about the potentiometer which is assembled on the machine; **this operation must be carried out when the alarm Vacc not ok appears or when the potentiometer or the chopper card is replaced;** a wrong recognition of the potentiometer from the chopper card will block the machine.

MOTOR DATA: This section serves for the adaptation of the parameters according to the motor characteristics.

Flow chard of the console




MOTOR data
out
Out: Are you sure?
ENTER = save
OUT= does not save
Program for the adaptation of the electrical characteristics of the traction motor

Alarms and decoding

The chopper card visualises an anomaly on two information levels:

1. Through a red LED alarm (on the machine's instrument board), which blinks for a quantity of times relative to the type of anomaly;
2. Through a message on the console, that specifies more details on the nature of the anomaly.

Following table reports for each alarm the possible anomaly and how to proceed on the machine.

DIAGNOSIS LIST ALARMS
(for a better understanding of the list refer also to the electrical layout of the machine – drawing 22.51.29 and drawing 22.51.30)

Number of blinking	MESSAGE	NOTES
1	**EEPROM DATA KO**	Memory failure, which contains data of the hourmeter. Actions: - Switch on and off with the main key; if the problem persist replace the chopper card.
1	**EEPROM PAR. KO**	The chopper memory has lost the parameters. Actions: - Switch on and off with the main key. If the alarm occurs again replace the chopper. If the alarm does not occur any more, reprogram the chopper (the memorised dates were cancelled and replaced by default dates).
1	**EEPROM CONF. KO**	The chopper memory has lost special configuration dates. Actions: - Reprogram the chopper (with reference to the instructions of the console); - Switch on and off with the main key. If the alarm occur again replace the chopper card. If the alarm does not occur any more reprogram the chopper (the memorised dates were cancelled and replaced by default dates).
1	**EEPROM OFF-LINE**	The chopper-memory has lost the setting dates with reference to the hourmeter, the memorised alarms and the saved parameters. Actions: - Switch off and on with the key. If the problem persists replace the chopper.

Number of blinking	MESSAGE	NOTES
1	**WATCH-DOG**	**Test in resting or working conditions: this is an internal self-diagnosis of the chopper** Self-diagnosis of the chopper under resting or working conditions has registrated an irregularity. Possible causes: - The current sensor inside of the chopper is damaged; - The logic of the chopper card is damaged Actions: - Replace the chopper card.
2	**INCORRECT START**	Incorrect starting sequence. Possible causes: - Error in the sequence made by the operator; - The pedal microswitch and/or drive-selection microswitch are sticking; - Wiring not correct. Actions: - Check, that the starting sequence was carried out as follows: ✍Sit down on the machine and close the seat-microswitch ✍Switch on the general key ✍Select gear (forward/backward) ✍Push the acceleration pedal - Check, if the control microswitch n° 43 or the gear manipulator has not any sticking contacts and works exactly; - Check the continuity in the circuit between pedal-microswitch, chopper and gear selector; - Check the continuity in the circuit between seat-microswitch and chopper (point A3 and A8 of the choppers); - If you have not found any irregularities and the problem persists, replace the chopper card.
3	**NO FULL COND.**	The complete management is tested and results that VMN is under one third of the battery voltage. Possible causes: - Something does not work within the examined circuit; - The traction is blocked. Actions: - Check, if the negative voltage of the motor is under one third of the battery voltage; - If the failure persist replace the logic.

Number of blinking	MESSAGE	NOTES
3	**VMN LOW**	The chopper checks, if under resting conditions (with opened remote control switches) the VMN voltage correspond to the half of the battery voltage. Contrary to this, if the value is below one third, the alarm will be released. Possible causes: - Remote control switch damaged; - Metal parts, which cause an short circuit between VMN and negative battery connection; - Short circuit in the power-Mosfet; - Sticking contacts Actions: - Check the correct wiring of the cables 9-10 and the good conditions of the connections to the holdfast of the chopper of the motor section (see also following paragraph); - Check, looking for possible short circuits; - Check if the microswitches does not have sticking contacts and work correct; - If the problem persists replace the chopper.
3	**VMN HIGH**	The chopper checks under resting conditions if the voltage VMN correspond to the half of the battery voltage. Otherwise, when two third of the voltage is exceed, the alarm will be released. Possible causes: - Wrong Wiring; - Current loss or short circuit inside the motor; - Performance of the chopper damaged; - Sticking contacts of the traction-remote control switches. Actions: - Check the right wiring on the cables 9-10 and the good conditions of the connections to the holdfasts of the motor section (see also following paragraph); - Check if there are current losses or short circuit disconnecting the VMN cable. If the alarm disappears replace the motor; - Check, if the microswitches have no sticking contacts and work correct; - If the problem persist replace the chopper card.

Number of blinking	MESSAGE	NOTES
4	**VACC NOT OK**	The chopper checks if under resting conditions the voltage of the accelerator is under the memorised min. value with the function PROGRAM VACC. If the value exceeds 1 Volt the alarm will be released. Possible causes: - A cable of the potentiometer is interrupted; - The potentiometer is not connected; - The potentiometer is damaged. Actions: - Check the continuity of the connection between potentiometer, accelerator, and chopper; - Reprogram the chopper with PROGRAM VACC (see paragraph adjustments and inspections); - Check the functionality of the potentiometer (can be damaged) and if necessary replace this part (afterward reprogram the chopper).
5	**HIGH CURRENT**	The chopper tests under resting conditions with opened remote control switches, if the current signal is under 50 A. Contrary appears the alarm and the machine will be blocked. Possible causes: - The current sensor does not work; - The logic is damaged. Actions: - Replace the chopper.
5	**I=0 EVER**	The chopper checks if during the drive the current exceed a minimal value. Contrary appears this alarm and the machine will be blocked. Possible causes: - Wrong wiring between traction unit and chopper; - The motor resistance is to high, because of an failure on the motor; - Damaged current sensor. Actions: - Check the right wiring of the motor cables to the chopper (it is possible, that the rotor is connected to the holdfast +B of the chopper, instead to holdfast 1); - Replace the motor; - If the problem persists replace the chopper.

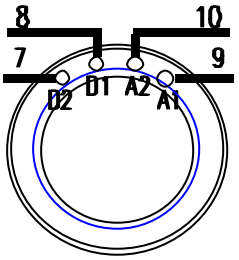
Number of blinking	MESSAGE	NOTES
6	**PEDAL WIRE KO**	The potentiometer does not receive current, because of an interruption of one of the two current supply cables. Possible causes: - Loosen red cable which must be connected to PPOT (A14); - Loosen black cable which must be connected to NPOT (A12); - Interrupted resistance of the potentiometer; - Potentiometer overloaded. Actions: - Check the connections to the chopper; - Replace the potentiometer.
7	**TEMPERATURE**	The chopper works with a temperature under 76°. If the will is exceeded, the max. current will be reduced until the value zero will be achieved at a temperature of 86°. Possible causes: - If the alarm occur at environment temperature (±20°): ✍ Malfunction of the chopper; ✍ Machine blocked through the brakes; ✍ Thermal sensor damaged or loosened; ✍ Interrupted connections; ✍ Damaged chopper; - Stressing working conditions with high environment temperature; - Insufficient heat derivation. Actions: - Check the thermal sensor inside the chopper; - Check the brakes of the machine; - Check the connections to the motor; - Let the chopper in dormant state and let it cool down; - Check if the nuts are fixed and the right installation; - If the problem persists replace the chopper.
8	**DRIVER 1 KO**	The voltage to the connection NT1 (A11) does not correspond to the scheduled value. Possible causes: - Double remote control switch damaged; - Loosened cable wiring to the connection NT1; - Short circuit MOSFET in the chopper. Actions: - Replace the double remote control switch; - Check the connections; - Replace the chopper.

Number of blinking	MESSAGE	NOTES
8	**DRIVER 1 SIC KO**	Overloaded main remote control switch connected to NT1 (A11). Possible causes: - Short circuit in the cable wiring to NT1; - Damaged remote control switch. Actions: - Check the connections; - Replace the remote control switch.
8	**DRIVER 2 KO**	The voltage to the connection NT2 (A4) does not correspond to the scheduled value. Possible causes: - Double remote control switch forward gear damaged; - Loosened cables to connection NT2; - Short circuit MOSFET inside chopper. Actions: - Replace double remote control switch; - Check the connections; - Replace the chopper.
8	**DRIVER 2 SIC KO**	Overloaded main remote control switch connected to NT2 (A4). Possible causes: - Short circuit in the cable connections to NT2; - Damaged remote control switch. Actions: - Check the connections; - Replace remote control switch.

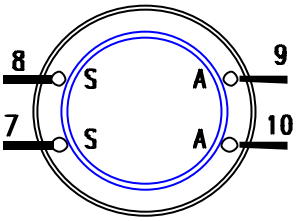
8	**CONTACTOR OPEN**	One or both remote control switches are not closed, when the traction is activated. The test verifies the VMN-signal. Possible causes: - Dirt, Dust or anything else does prevent a good connection to the remote control switch; - Motor-Isolation or interrupted contacts; - Remote control switch damaged or overloaded; - Damaged chopper. Actions: - Clean the contacts with compressed air and if necessary scrub off the dirt slightly; - Check wiring and connections to the remote control switch – positive A4 (NT2) and A11 (NT1); - Check the motor wiring and replace if necessary; - Replace the chopper.
Number of blinking	**MESSAGE**	**NOTES**
PERMANENT BLINK SIGNAL	**BATTERY**	The voltage to the chopper is fallen under 60% of the scheduled value. The machine will be blocked. Possible cause: - The battery is discharged. Actions: - Check the charge level of the batteries; - Try to restart activating the traction.
PERMANENT LIGHTED UP	**FORW BACK**	This test is carried out permanently and gives an alarm, when the two gears are activated simultaneously. Possible causes: - Wrong wiring; - Sticking gear-micro; - Wrong operation. Actions: - Check if the control-microswitch n° 43 and the manipulator do not have any sticking contacts and work correct; - Check the right wiring between traction pedal, manipulator and seat-microswitch; - If the failure is not solved replace the chopper.

Adjustments and Calibration for the traction units

CIMA



METALROTA







ATTENTION: If the movement direction is wrong invert the cables 7 and 8.

CHOPPER ZAPIMOS HO 200A

PARAMETER		PROGRAM 00
ACCELERATION DELAY		**4**
BRAKING		**1**
RELEASE BRAKING		**2**
CUTBACK SPEED 1		**3**
CUTBACK SPEED 2		**6**
COMPENSATION		**9**
CREEP SPEED		**1**
TRACTION IMAX		**3**
MAX SPEED FORWARD		**9**
MAX SPEED BACKWARD		**7**
SPEED LIMIT BRAKING		**3**

Calibration with console

Connection with the console

1. Check, if all switches are switched off.
2. Lift the front wheel on a security stand.
3. Remove the connection of the LED alarm from the chopper.
4. Connect the console with the corresponding connection with **key in off-position**.
5. Turn the key and switch the machine on.
6. After switching on the machine appears the message **"HO AUTOSTOP V1.0 36V 200A 00000"** or **"*Alarm* abcdef ..."**.
7. Press onto the seat.
8. In any case Push ENTER in order to get access to the main menu.

For a more detailed description consult also the manual and the function description of the chopper Zapi.

Chopper programming	Display Console
1. Press *ENTER* to get into the main menu. 2. It appears the menu: "PARAMETER CHANGE" = CHANGE THE PARAMETERS. 3. Press ENTER and check, scrolling with ROLL the single values, if they correspond to the above mentioned values.	*** MAIN MENU *** **PARAMETER CHANGE**
4. At the end press *OUT* and confirm with *ENTER* (after the request "ARE YOU SURE?") if you changed parameters (Use the button PARAM SET on the console). **ATTENTION: THE SECURITY PARAMETERS, AS ACCELERATION, BRAKING, ETC. CAN NOT BE MODIFIED ONLY THE SPEED REDUCTIONS CAN BE MODIFIED (CUTBACK SPEED 1 AND 2).**	
5. Select with *ROLL* "RESTORE PARAM." (in case of memory losses of the chopper) = REPROGRAMMING THE CHOPPER-PARAMETER:	*** MAIN MENU *** **RESTORE PARAM.**

6. Press *ENTER*.	
7. It appears the Code of Progr. 00 :	**SELECT: Mod. 00 HO AUTOSTOP**
8. Press *ENTER* for confirmation and load the program.	
9. It appears the confirmation-request *ENTER* = YES, *OUT* = NO:	**ARE YOU SURE? YES=ENTER NO=OUT**
10. **Press** *ENTER* in order to confirm the loading process.	
11. The single parameters, which are in stage of loading, appear:	**STORING ACCELER. DELAY**
12. At the end of the process appears the description:	*** MAIN MENU * RESTORE PARAM.**

Lign up the chopper card to the movement of the acceleration pedal	**Display Console**
1. Scroll through the list with the button *ROLL UP* to "PROGRAM VACC" and select:	*** MAIN MENU * PROGRAM VACC**
2. Press *ENTER*, in order to access to the function "PROGRAM VACC"; the current max. values corresponding to the forward and reverse gear appear:	**VACC SETTING 1,7 1,7**
3. Press *ENTER*.	
4. The chopper is now prepared to record the new min. and max. values, which will be signalised from the potentiometer:	**MIN VACC MAX 0.0 - 0.0**
5. Select the forward gear and press the pedal, take care to move the pedal slowly at the beginning of this process and to move the pedal until stop:	**MIN VACC MAX 0,3 ✍ 1,7**
6. Repeat the process for the reverse gear.	**MIN VACC MAX 0,3 ? 1,7**
7. Press *OUT*.	
8. It appears the confirmation request in order to load the new values:	**ARE YOU SURE? YES = ENTER NO =OUT**
9. Press ENTERS for confirmation.	

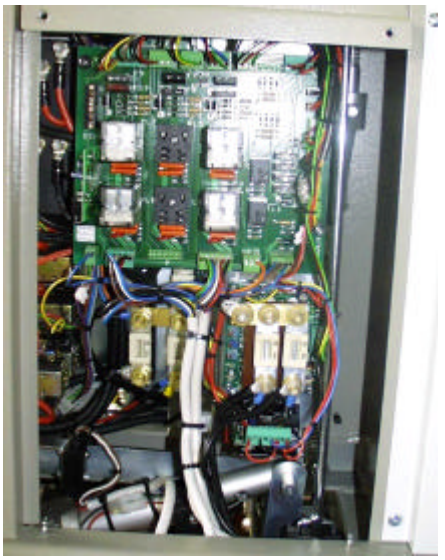
Tester	
1. **ATTENTION: make sure, that the front traction wheel is lifted with a security stand.**	
2. Select with *ROLL*:	*** MAIN MENU *** **TESTER**
3. Press *ENTER* and the different parameter-types will appear:	**VMN** **20.7 V**
4. Select with *ROLL*:	**BATTERY VOLTAGE** **36V**
5. Select with *ROLL*:	**MOTOR VOLTAGE** **VOLT = 00.0**
6. Select forward gear and gear 3 and it should appear:	**MOTOR VOLTAGE** **VOLT = 36**
7. Select the 2. Gear and let turn the wheel at max. speed, it appears:	**MOTOR VOLTAGE** **VOLT = 25 - 27** (or similar values)
8. Select the first gear and let turn the wheel at max. speed, it should appear:	**MOTOR VOLTAGE** **VOLT = 13 – 14** (or similar values)
9. If the speed limits are inverted, check the position of the blue and brown cables on the alteration switch: the blue cable should be behind the brown cable.	
10. Insert the reverse gear, press the pedal until stop and it appears:	**MOTOR VOLTAGE** **VOLT = 26 – 30** (or similar values)
11. Press *OUT.*	
10. If necessary select with *ROLL*:	*** MAIN MENU *** **PARAMETER CHANGE**
12. Take off the general key and take of the console connection from the chopper.	
13. Remove the security stand.	

Motor Data	Display Console
1. Move through the list with the button *ROLL UP* or *ROLL DOWN* from " PROGRAM VACC " to " MOTOR DATA ":	*** MAIN MENU *** **MOTOR DATA**

2. Press *ENTER* to get access to the function “MOTOR DATA” = LOADING THE DATES OF THE TRACTION MOTOR. If the value „50“ appears it is correct, otherwise carry out a reprogramming in order to get closer to the value „50“ by pushing the brake more or less on request of the chopper.	**MOTOR DATA VALUE 50**
3. Press *ENTER* to prepare the calibration process.	
4. It appears a message to execute following process:	**BLOCK MOTOR AND INSERT FWR DIR.**
5. Block the motor and push the brake.	
6. Push the traction pedal and select the third speed.	
7. Select the **reverse gear**.	
8. Push the button *ENTER and wait for a message on the display*:	**READING MOTOR**
9. When this message appear the chopper start to carry out the calibration process (2 seconds) and the machines tends to move in the reverse direction.	
10. Check, if the value gets closer to the "50" and repeat it if necessary:	**MOTOR DATA VALUE 50**
11. Stop the process and press OUT and you will come back to the menu:	**MAIN MENU MOTOR DATA**
12. Press *OUT* in order to conclude the programming.	
13. Remove the general key.	
14. Remove the console connection from the chopper.	

Inspection of the electrical equipment	

1. Remove the battery connection.
2. Check the cleanness and the attachment of battery cable connections.
3. Check the connection and the attachment of the cables: **remote control switches, fuses, motors** etc.
4. Restore the battery connection.
5. Switch the machine on with the key and check, if the red control light blinks 5 times.
6. Check of the control lights and switches:
   - Check the green control light in order to switch on the machine;
   - Check the function of the hourmeter;
   - Check the function of the horn;
   - Check the lifting – lowering function of the brush base;
   - Check the function of the manipulator forward-/reverse gear;
   - Check the function of the battery control display;
   - Check the control switch and the function of the winking light;
   - Check the function of the front and back head lights;
   - Check the right control light for the activated brake and the indicator for the oil level;
   - Check the reserve light – float solution tank;
   - Check the light for the completely lowered squeegee;
   - Check the light for the lifted brush base;
   - Check the AUT-MAN function with reference to the squeegee operation and the suction motor;
   - Check the switch and the function of the suction motor (with insert forward gear);
   - Check the switch and the function of the solenoid valve (with machine in working conditions and working brush motor);
   - Check the switch and the function of the brush motor (with machine in working conditions);
   - Check the display switch and the function of the squeegee movement;
   - Check the float of the recovery tank and that the suction motor switches off accordingly;
   - Check the function of the seat-microswitch;
   - Check forward-, reverse gear, speed reduction, acceleration and brakes;



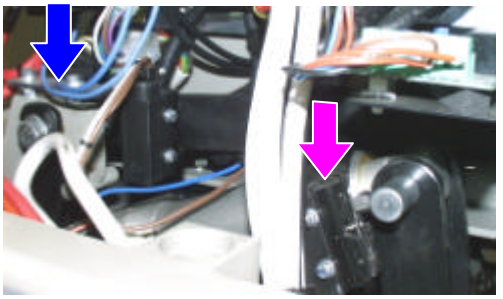


Adjustment of the microswitch of the basement with cylindrical brushes

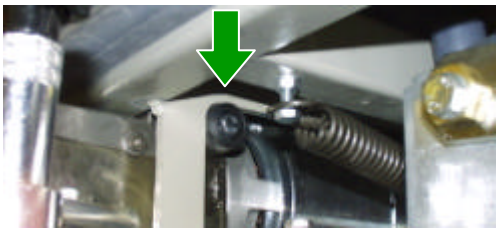
1. Remove the front and lateral panel.
2. Place both microswitches, so that there remains a play of 1 mm between the casing and the level with the wheel, when the cam is pushes on the lever.
3. Check, if with max. brush pressure (is achieved, when the handwheel is pressed completely to +), the completely extended **spring** measures **255-260 mm** from one to the other Screw centre and if necessary, adjust the microswitch for the lowering of the brush base by adapting the **microswitch support rod**. Carry out another test of the movement and check the measurements.



4. Adjustment of the **support lifting microswitch** of the basement, so that the **guide wheels right and left** rest lightly pressed on the frame and the basement does not oscillate during displacement of the basement.

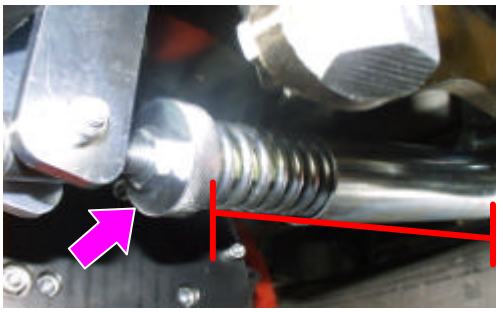


5. Check, if the lifted brush unit, moves freeley to the left after bumps.

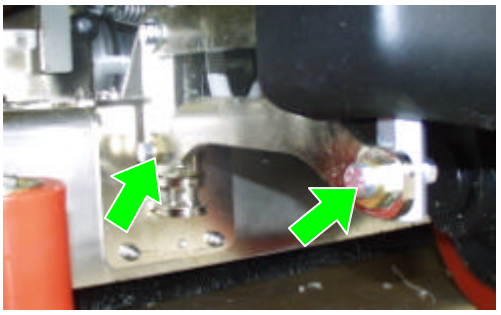


Adjustments and checks of the cylindrical brush base

1. Pressure adjustment for the cylindrical brushes: let down the cylindrical brush unit adjust the **ring nut** to a **spring length** between **215** mm (min. kg) and **220** mm (max. kg).
2. Fix the ring nut.



3. Inclination adjustment of the cylindrical brush base: if necessary (current consumptio of the motors or unequal brush consumption) adjust through the **excentrical Bushings** on the lower left and right arms:
   - ✍unscrew the adjuster nut;
   - ✍loosen the screws;
   - ✍turn the bushings until the evenness adjustemnt of the basement;
   - ✍fix the screws and the adjuster nuts.

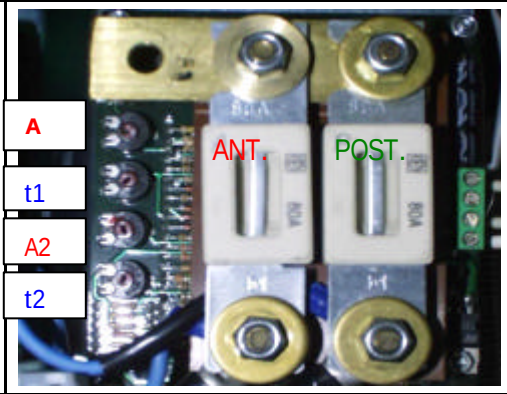


Calibration of the amperemeter card brush motor

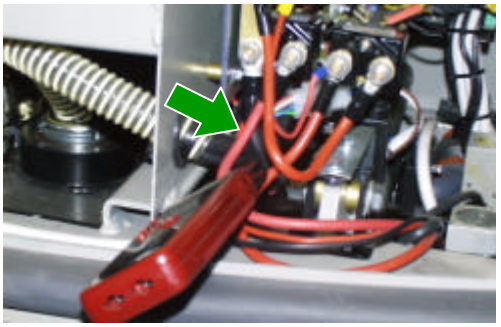
1. Insert the **amperemeter pincers** on the current supply cable (cable n° 4A) of the front brush motor.
2. Let down the basement gradually, with max. pressure, on rough floor.
3. Push the brush switch, so that the brushes rotate.



4. When you achieve **38-40 A**, both control light should start to blink; if the calibration is different adjust **Trimmer A1 (ampere)** and keep the current consumption of the motor constant according the indicated values.
5. Increase the pressure until the pincer indicates **44-46 A** and check if the card intervene after 14-18 blinking signals (the left lamp remains switched on permanently) and switches off the motor; in case of differences, switch of the general key and repeat the process after the adjustment of **Trimmer t1 (time)** on the card, so that the right intervention time is achieved.

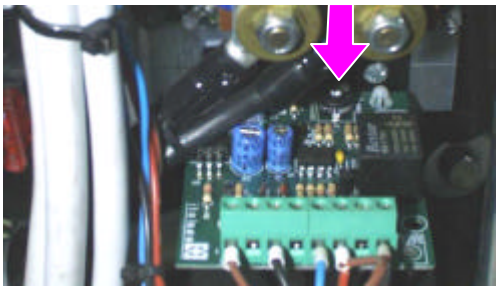


6. Repeat the process on the **back motor cable** (cable N° 4): **Trimmer A2** and **Trimmer t2** (after the intervention of the card, the right lamp remains switched on).
7. Block the trimmers with anti loosening seal.
8. Check under working conditions if both motors have a similar current consumption with a max. tolerance difference of 2-4 ampere. If you get substantial differences change the inclination of the brush base (see point 3 of the adjustments and checks of the brush base unit).



Calibration of the automatic power shutoff brush motor

1. Check that, after releasing the pedal, the brush rotation is stopped within 2-3 seconds; if necessary calibrate the delay time through adjustment of the **Trimmers**.
2. Fix the trimmer with anti loosening seal.



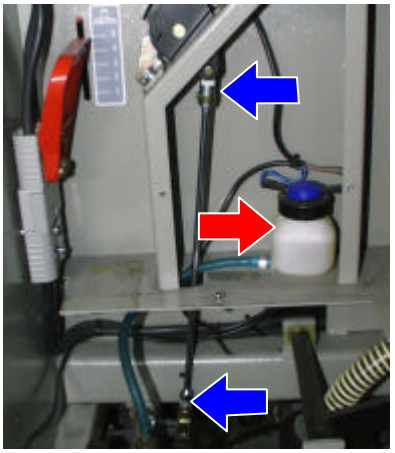
Calibration of the float control card for the suction motor

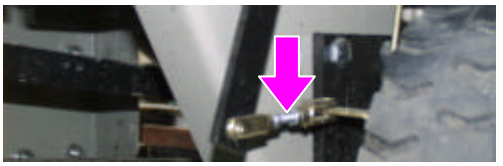
1. Switch on the suction motor and check that the motor stops after 4 seconds (? 1 second) when you lift the float manually; if necessary adjust the **Trimmer** of the card.
2. Block the Trimmer with anti-loosening-seal.



Check and Inspection of the brakes

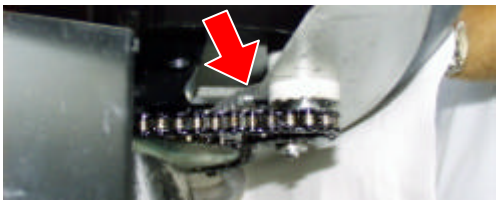
1. Restore the right execution of the hand, parking and emergency brakes through the adjustment of the tie rod: unscrew the nut and screw the rod into the corresponding **fork**, until 2 or 3 snaps are obtained. Fix the nut.
2. Check and restore the oil level of the **brakes**.
3. Check, if the wheels do not remain blocked and brake simultaneously, if necessary adjust the **tie rods**. Fix the nuts.
4. Check, if the machine after release with max. speed, with full tank, on release of the acceleration pedal, will stop within 125-130 cm.





Steering adjustment

1. Restore the correct chain tension through the chain tightener:
   - ? Unscrew the nut;
   - ? Screw on sufficiently the **Screw M8**, (try afterwards to turn the steer completely to the right or to the left, check if there are no interference's because of excessive chain tension);
   - ? Fix the nut.
2. Check the play of the steering axle and when necessary screw on the **ring nut**. Take into consideration, that the

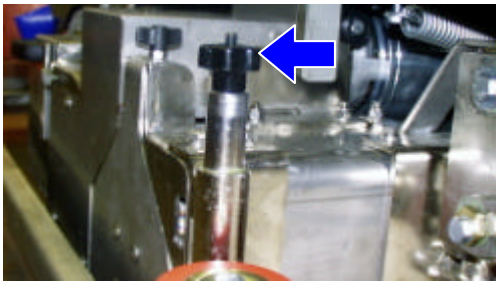


lower bearing with conic rolls can be blocked, if you screw on to much. Retry the play and the complete turn of the steer.



Adjustment of the lateral bars

1. Adjust the front part of the lateral bars: Adjustment of the **knobs** until the rubber touches slightly the floor.

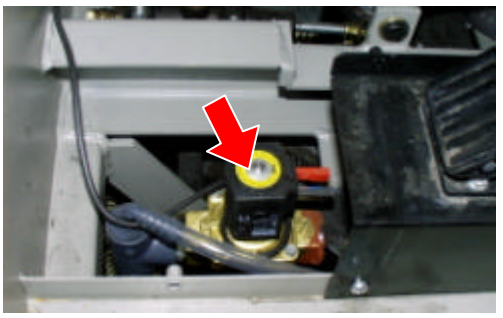


2. Adjustment of the back part of the lateral bars: Adjust the **lock nut**, so that the rubber is slightly bended; block it with the clip.



Inspection of the water system

1. Check the cleanness and the positioning of the solution tank filter.
2. Fill the tank completely with water and check the gaskets.
3. Check the tightness of the tubes, **solenoid valve** and the adjustment of the water cock.
4. Check, that the solution with opened cock flows continuously and regularly on both brushes.
5. Fill the recovery tank and check the gaskets.
6. Check the tightness of the exhaust pipe and plug.



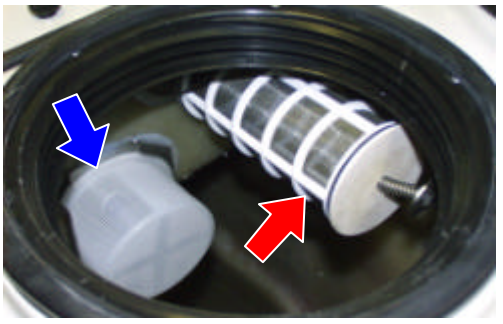
Suction inspection

1. Check the cleanness and functionality of the **gaskets** between suction motor and suction box.
2. Check the connections and the tightness of the suction tubes and the squeegee tube.
3. Check, if the **hole** under the suction box for the water run out is not constipated.

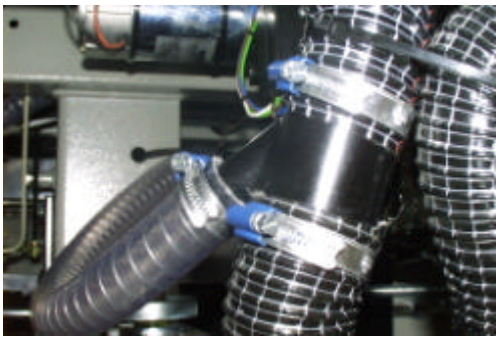




4. Clean the **filter** for the protection of the suction motor and the **filter** for the float protection inside the recovery tank.

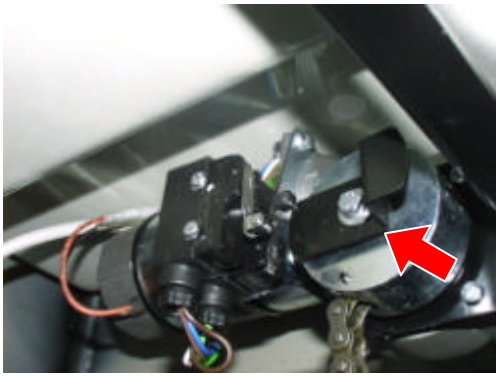


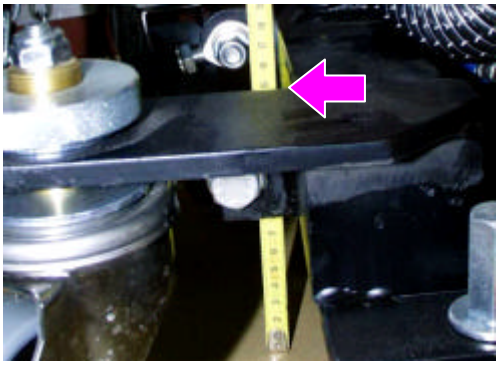
5. Check the connections, the cleanness and the tightness of the suction hoses and the squeegee hose.



Adjustment of the squeegee microswitch

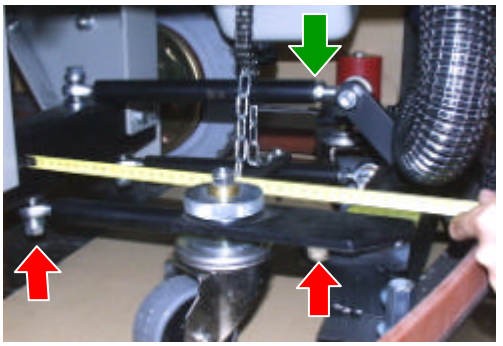
1. Place both microswitches, so that remains 1 mm play between casing and lever with wheel, when the cam presses this.
2. Adjustment of the squeegee lifting (with lifted brush base) through the **cam** of the actuator. Unscrew the central screw, turn the cam until the **lifting microswitch** snaps (external micro) until a distance of **170/180 mm** between the upper support part and floor is achieved.
3. Screw on the central screw in order to fix the cam.
4. Attention!! Check with completely lifted squeegee, that the upper nut of the right castor wheel does not touch the tank when the squeegee oscillates lateral.
5. The downward movement is controlled automatically through the cam.
6. Check again the upward and downward movement.



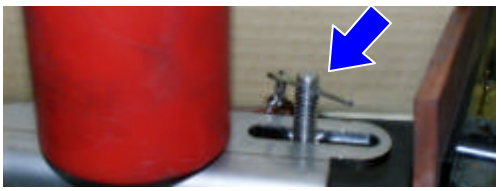


Squeegee adjustment

1. Unscrew the blocked ring nuts.
2. Lift the wheels by screwing on to the support, so that the rubber is not pressed too much onto the floor but has an inclination of about 30°.
3. Adjust the inclination of the squeegee, turning the **upper arm**, so that the rubber has a regular inclination at the side and the centre. At the end block the adjuster nut.

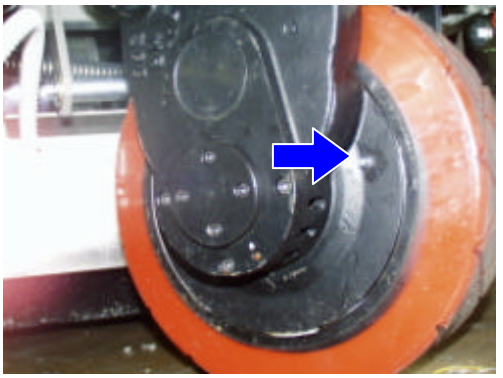


4. Adjustment of the lower regulation rod of the squeegee to a measurement of **318-320 mm** between the central holes of the **joint heads**, so that the **thread pins** of the squeegee are approximately at the centre of slot on the lateral splash guard bars, on the left and on the right; Fix the adjuster nuts.



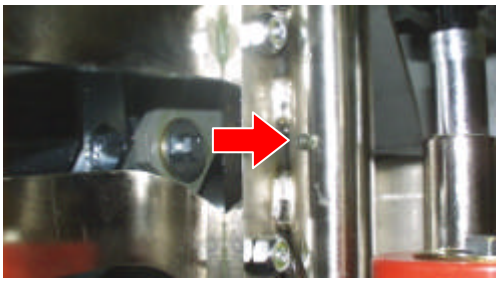
Points to grease and maintenance

1. Grease the traction unit through the **grease nipples**.

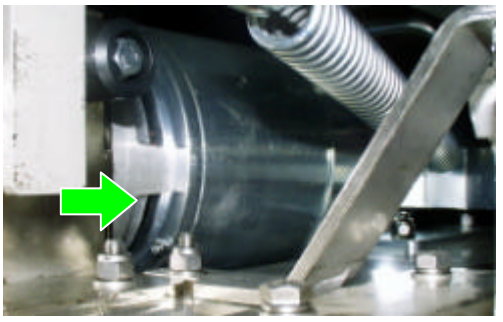


2. Grease the **support pins** basement arms.

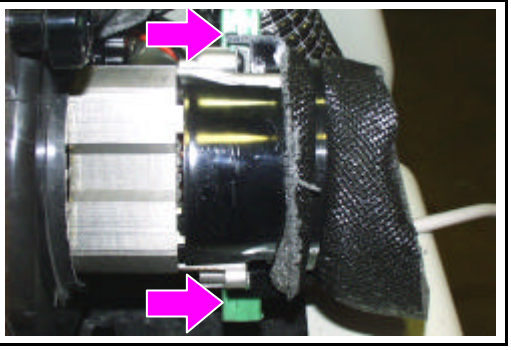




1. Check the cleanness and the functionality of the air-openings for the cooling of the **brush motor**.
2. Check the wear and the sliding of the carbon brushes.



6. Check the wear and sliding of the **carbon brushes** of the suction motor.



Function inspection of the machine

1. Check the functions of the switches and the control-lights;
2. Check the function of the seat microswitch;
3. Check the function of the acceleration pedal;
4. Check the function of the cylindrical brush unit;
5. Check the functionality of the brush motors;
6. Check the function of the solenoid valve;
7. Check the squeegee function operating it manually or automatically;
8. Check the squeegee function;
9. Check the function of the emergency and parking brake;
10. Check the function of the steer;
11. Check the conditions of the batteries, the holdfasts and the cables;
12. Check the functionality of the horn;
13. Check the functionality of the headlight and the winking light.

Test the functions of the machine

1. Fill the tanks with water and check if there are any leakages.
2. Check the tightness of the water supply and the regularly water flow on both brushes.
3. Adjust the inclination and the wheels of the squeegee and carry out a test.
4. Adjust the brush pressure and the inclination of the basement and carry out a test.
5. Check the marks of the cylindrical brushes on the floor, adjust them and carry out a test.
6. Adjustment of the lateral bars with the knobs and carry out a test.
7. Check the automatic function.
8. Check the function of the seat-microswitch.
9. Check the function of the adjustment lever of the seat position.
10. Check the function of the selection switch for the water outlet.
11. Check the function of the manipulator for the pressure adjustment of the brushes.
12. Check the efficiency of the parking and emergency brake: brake with max. speed and check, if the wheels are blocked simultaneously.
13. Check, that the machine, outgoing from max. speed, with full tank, after releasing the acceleration pedal, is stopped within 125-130 cm. Otherwise check again the parameter in the console again, especially “Release Braking”.
14. Check the forward-, reverse gear, acceleration and brakes.

Final inspection

Check all functions: Scrubbing, suction, forward-, reverse gear and brakes.