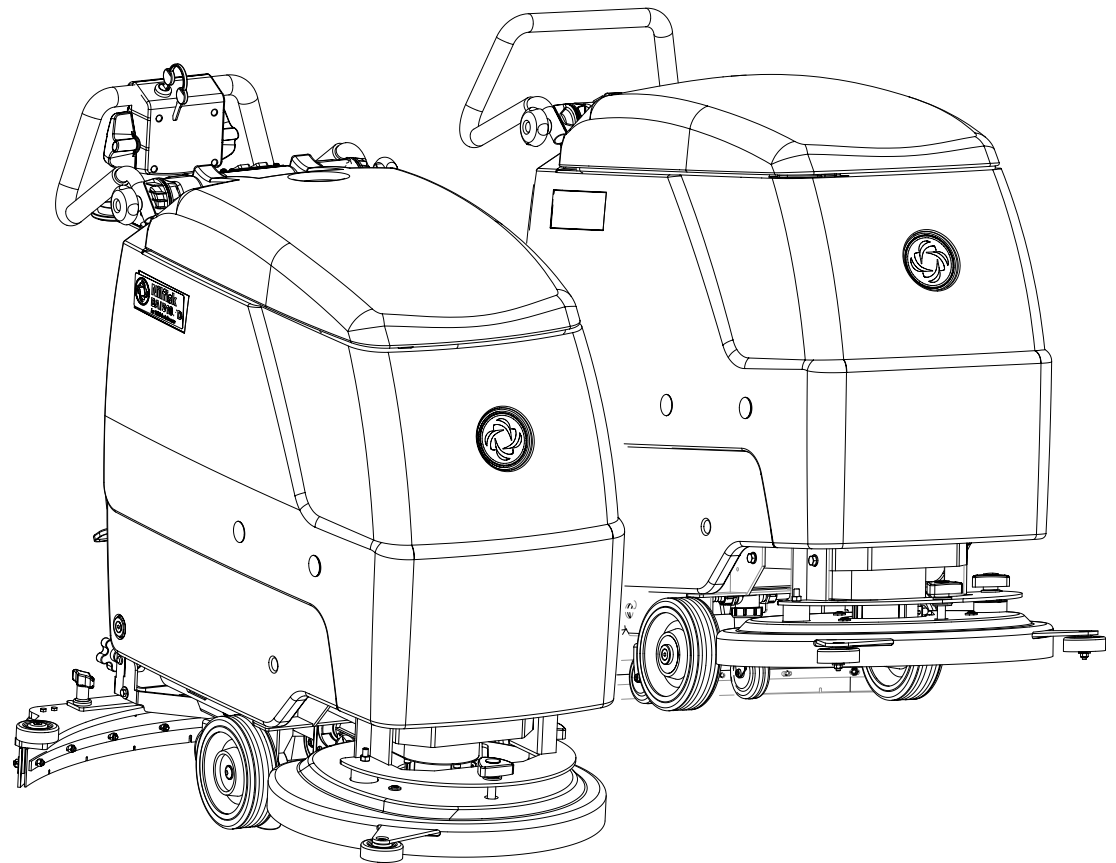


Razor 17B – 20B – 20BT



SERVICE MANUAL

KENT/Euroclean MODELS:

908 7010 020 – 908 7011 020 – 908 7025 020



KENT
Euroclean

Working For A Cleaner World

08603953(2)2003-09

INDEX

GENERAL INFORMATION	3
MACHINE LIFTING	3
MACHINE TRANSPORTATION	3
OTHER AVAILABLE MANUALS	3
SAFETY - ACCIDENT PREVENTION	3
TECHNICAL DATA	4
DIMENSIONS AND TECHNICAL DATA	4
MAINTENANCE	5
SCHEDULED MAINTENANCE	5
SCHEDULED MAINTENANCE TABLE	5
MACHINE NOMENCLATURE	6
DETERGENT SUPPLY SYSTEM	9
DETERGENT TANK AND SUPPLY SYSTEM CLEANING	9
DETERGENT FILTER CLEANING	9
SOLENOID VALVE OR DETERGENT FLOW TAP REPLACEMENT	10
DETERGENT FLOW CABLE AND ADJUSTING LEVER REPLACEMENT	12
TROUBLESHOOTING	14
SWEEPING SYSTEM	15
BRUSH MOTOR ELECTRICAL INPUT CHECK	15
BRUSH MOTOR PROTECTION ELECTRONIC SYSTEM CALIBRATION CHECK	16
BRUSH MOTOR BRUSH/CARBON BRUSH CHECK AND REPLACEMENT	18
BRUSH MOTOR REPLACEMENT	19
BRUSH REDUCTION UNIT REPLACEMENT	20
TROUBLESHOOTING	23
RECOVERY SYSTEM	24
TANK AND SUCTION GRID WITH FLOAT CLEANING	24
SUCTION MOTOR ELECTRICAL INPUT CHECK	25
SUCTION MOTOR BRUSH/CARBON BRUSH CHECK AND REPLACEMENT	26
SUCTION MOTOR REMOVAL	29
SQUEEGEE REPLACEMENT	30
SQUEEGEE CLEANING/CHECK AND POSSIBLE RUBBER REPLACEMENT	31
TROUBLESHOOTING	32
DRIVE SYSTEM	33
DRIVE MOTOR ELECTRICAL INPUT CHECK (for "20BT" version only)	33
DRIVE MOTOR BRUSH (OR CARBON BRUSH) CHECK AND REPLACEMENT (for "20BT" version only)	34
DRIVE MOTOR REPLACEMENT (for "20BT" version only)	36
DRIVE MOTOR BEARING GREASING (for "20BT" version only)	38
DRIVE WHEEL REPLACEMENT (for "20BT" version only)	39
DRIVE CONTROL MICRO-SWITCH ADJUSTMENT CHECK (for "20BT" version only)	40
TROUBLESHOOTING	41
OPEN CIRCUIT	41
THE MACHINE DOES NOT MOVE	41
THE MACHINE START IS SUDDEN, NOT PROGRESSIVE	41

ELECTRICAL SYSTEM	42
(WET OR GEL) BATTERY REMOVAL/INSTALLATION AND SETTING	42
BATTERY CHARGE	44
MAIN ELECTRONIC BOARD REPLACEMENT	46
MAIN ELECTRICTRONIC BOARD SETTING CHECK (REFERENCE TABLES)	47
DRIVE ELECTRONIC BOARD REPLACEMENT (for "20BT" version only)	49
FUSE CHECK/REPLACEMENT	50
COMPONENT LAYOUT	51
WIRING DIAGRAM	53

MACHINE LIFTING



WARNING!

Do not work under the lifted machine if it is not securely fixed.

MACHINE TRANSPORTATION



WARNING!

Before transporting the machine, ensure that:

- All doors and carters are closed
- The battery connection connector is disconnected
- The machine is fastened to the means of transportation

OTHER AVAILABLE MANUALS

The following manuals are available by Kent/ Euroclean Literature Service Department:

- Razor 17B/20B/20BT Parts List – Form Number 08812947
- Razor 17B/20B/20BT Instructions for Use - Form Number 08812946

SAFETY - ACCIDENT PREVENTION

The following symbols indicate potentially dangerous situations. Always read carefully this information and take the necessary precautions to protect people and objects.



DANGER!

Indicates the risk of being injured or the risk of death.



WARNING!

Indicates the risk of being injured.



CAUTION!

Indicates the risk of light injuries to people, machine or other objects.

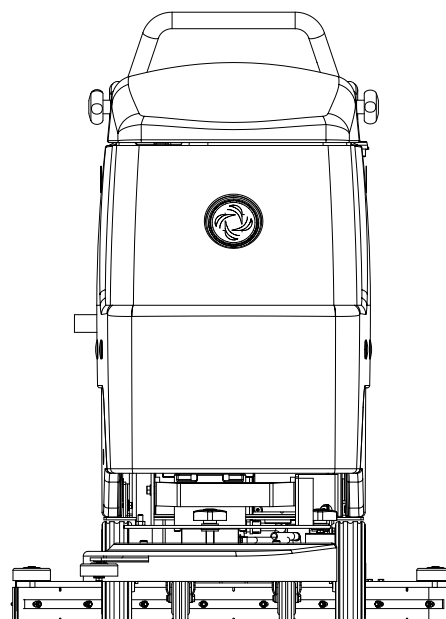
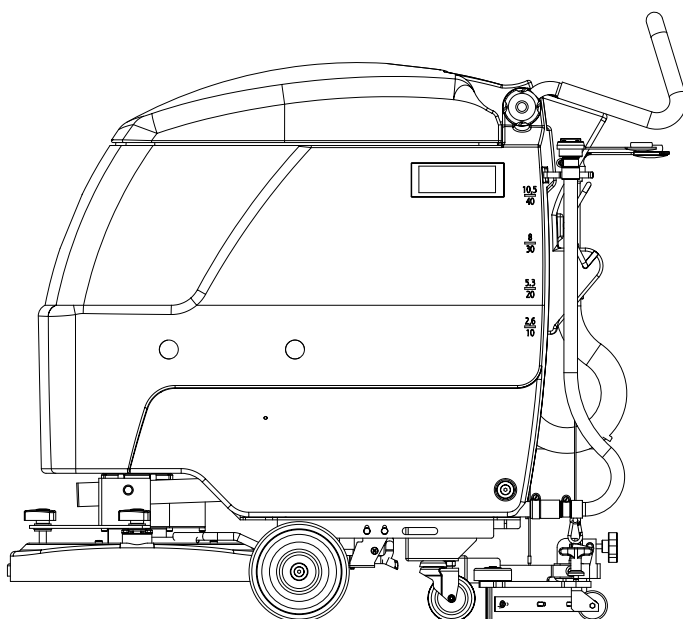
GENERAL INFORMATION

TECHNICAL DATA

DIMENSIONS AND TECHNICAL DATA

	Razor 17B	Razor 20B-20BT
Cleaning width	430 mm - 17 in	508 mm - 20 in
Machine length with extended handlebar	1158 mm - 45.6 in	1197 mm - 47.1 in
Machine length with lowered handlebar	1040 mm - 40.9 in	1180 mm - 46.5 in
Machine height with lifted handlebar	1056 mm - 41.6 in	
Machine height with lowered handlebar	943 mm - 37.1 in	
Machine width without squeegee	508 mm - 20.0 in	519 mm - 20.4 in
Brush diameter	430 mm - 17 in	508 mm - 20 in
Maximum slope	2%	
Clean water tank	40 litres - 10.6 gal	
Dirty water tank	40 litres - 10.6 gal	
Weight without batteries	255 lbs - 115,5 kg	260 lbs - 118 kg 278 lbs - 126 kg (*)
Front wheels on fixed axis	Ø 170 - 6.7 in	
Pivoting rear wheels	Ø 80 - 3.1 in	
Suction motor power	500 W	
Brush motor power	650 W	
Drive motor power (*)	130 W	
Brush/Pad Speed	180 RPM	
Acoustic pressure level	65 dBA	
Standard batteries	2x12V 139 Ah WET	
Battery voltage	24 V	
Battery compartment size	350x350x300 mm - 13.8x13.8x11.8 in	
Vacuum	1400 mm Water - 55 in Water	

(*) : For "20BT" version only



S300389

MAINTENANCE

SCHEDULED MAINTENANCE

The machine proper and safe operation is granted by a careful and constant maintenance.



See **GENERAL INFORMATION** and **SAFETY - ACCIDENT PREVENTION**

The following table sums up the scheduled maintenance. The indicated periods can be subjected to variations according to working conditions. These must be defined by the person in charge of the maintenance.
For maintenance operation instructions see the following paragraphs.

SCHEDULED MAINTENANCE TABLE

Operation	Daily, after machine use	Weekly	Every six months	Yearly
Squeegee cleaning	●			
Squeegee rubber check (and replacement)		●		
Brush cleaning	●			
Tank and suction grid with float cleaning	●			
Detergent filter cleaning		●		
Battery charge	●			
Lead battery (WET) liquid level check		●		
Nut and screw tightening check			● (1)	
Brush electric motor carbon brushes check or replacement				●
Suction electric motor carbon brush check or replacement				●
Electric drive motor brush (or carbon brush) check and replacement (*)				●
Drive shaft bearings greasing (*)				●

(1): and after the first 8 working hours

(*): for "20BT" version

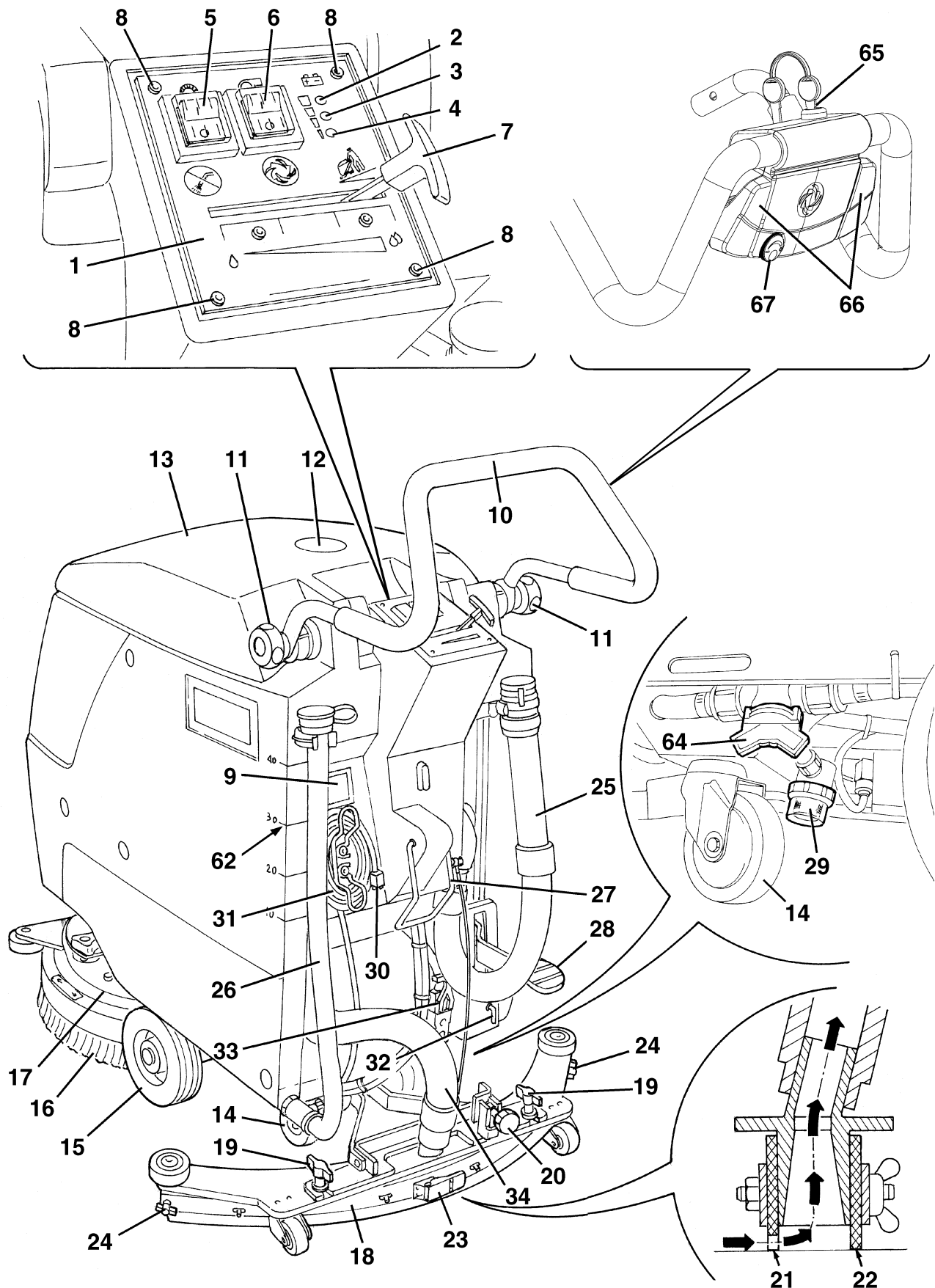
GENERAL INFORMATION**MACHINE NOMENCLATURE**

In this Manual you find numbers in brackets – example: (2). These numbers refer to the components indicated in these two nomenclature pages. Refer to these pages each time you want to find the component mentioned in the text.

- | | |
|---|--|
| 1. Control panel and commands | 36. Tank cover (open position) |
| 2. Charged battery warning light (green) | 37. Tank cover seal |
| 3. Half-discharged battery warning light (yellow) | 38. Compensation hole |
| 4. Discharged battery warning light (red) | 39. Recovery water tank |
| 5. Brush rotation switch | 40. Detergent tank |
| 6. Suction switch | 41. Recovery water suction hole |
| 7. Detergent flow control lever | 42. Suction grid with automatic closing with float |
| 8. Control panel and commands mounting screws | 43. Recovery water draining hole |
| 9. Serial number plate / technical data | 44. Suction motor |
| 10. Handlebar | 45. Brush motor |
| 11. Handlebar inclination adjusting handles | 46. Electrical component box |
| 12. Can holder | 47. Batteries |
| 13. Tank cover | 48. Battery caps |
| 14. Pivoting rear wheels | 49. Battery assembly diagram |
| 15. Front wheels on fixed axis | 50. Electronic battery charger |
| 16. Brush, or pad-holder with pad | 51. Charged battery warning light |
| 17. Brush/pad-holder plate | 52. Lead (WET) or gel (GEL) battery selector switch positioned on the electronic battery charger |
| 18. Squeegee | 53. Tank assembly |
| 19. Squeegee fastening handwheels to the machine | 54. Brush/pad-holder plate (Razor 20B version) |
| 20. Squeegee balance adjusting handwheel | 55. Brush/pad-holder plate (Razor 17B version) |
| 21. Squeegee front rubber | 56. Machine forward movement adjusting knob |
| 22. Squeegee rear rubber | 57. Machine forward movement speed adjusting knob |
| 23. Rear rubber fastening hook | 58. Brush |
| 24. Wing nuts | 59. Disk-holder |
| 25. Recovery water drain hose | 60. Pad |
| 26. Detergent drain hose | 61. Battery frame |
| 27. Squeegee lifting lever | 62. Detergent tank marks |
| 28. Brush lifting pedal | 63. Counterweight |
| 29. Detergent filter | 64. Detergent tap |
| 30. Battery charger plug | 65. Ignition key (*) |
| 31. Battery charger cable | 66. Drive control levers (*) |
| 32. Supplied key | 67. Drive speed adjuster (*) |
| 33. Battery connection connector | 68. Box with drive board and drive electrical system fuses (*) |
| 34. Squeegee suction hose | |
| 35. Tank side fastening screw | |

(*): For "20BT" version

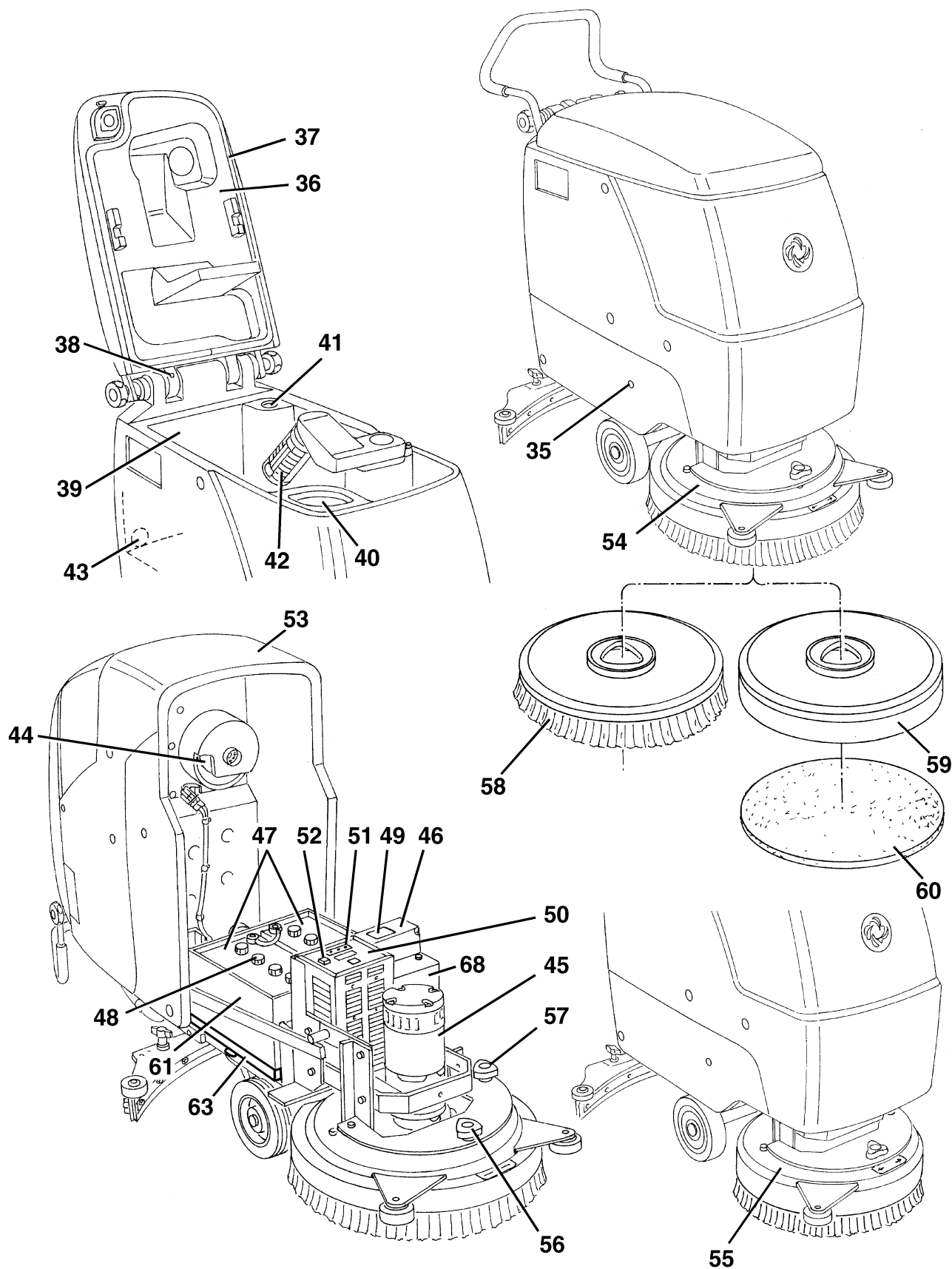
MACHINE NOMENCLATURE (CONTINUES)



S300390

GENERAL INFORMATION

MACHINE NOMENCLATURE (CONTINUES)



S300391

DETERGENT TANK AND SUPPLY SYSTEM CLEANING

1. Empty the detergent tank (40) through the hose (26).
2. Take the detergent flow control lever (7) in wide-open position, and then activate the machine until the detergent inside the machine is exhausted.
3. If necessary, rinse the tank (40) with clean water and repeat steps 1. and 2.
4. Clean out the detergent filter cleaning (see the following procedure).

DETERGENT FILTER CLEANING

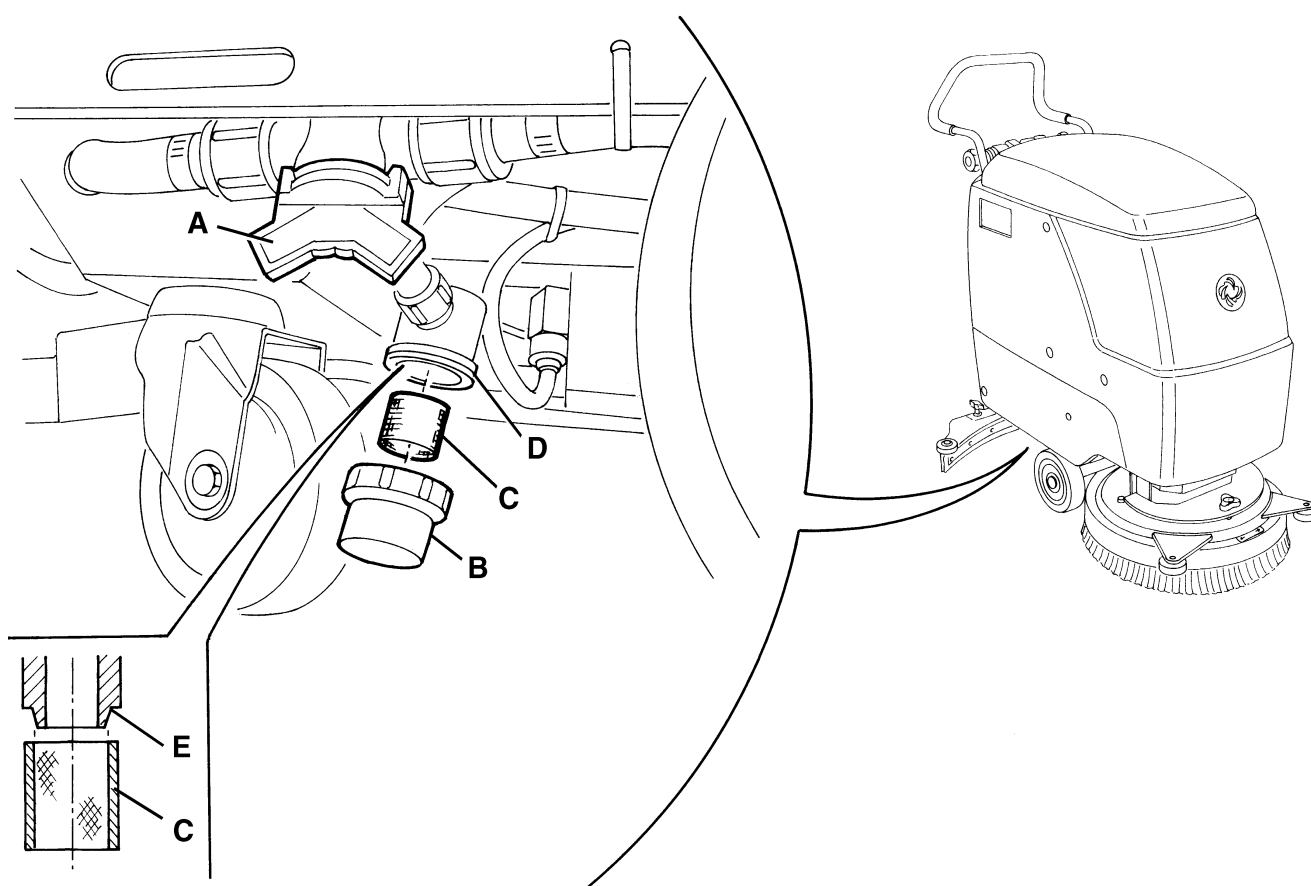
1. Close the detergent tap (A). If the machine is not equipped with the tap, it is necessary to drain the tank (40) by means of the hose (26).
2. Drive the machine on a level ground.
3. Be sure that the switches (5) and (6) are in the "0" position (off). For "20BT" version machines, turn the key (64) to "0".
4. Operating on the right lower side of the machine, remove the transparent cover (B) and the wire gauze (C), clean and install them again on the related support (D).



Note:

When installed, the wire gauze (C) must be correctly positioned on the support (D) housing (E).

Figure 1



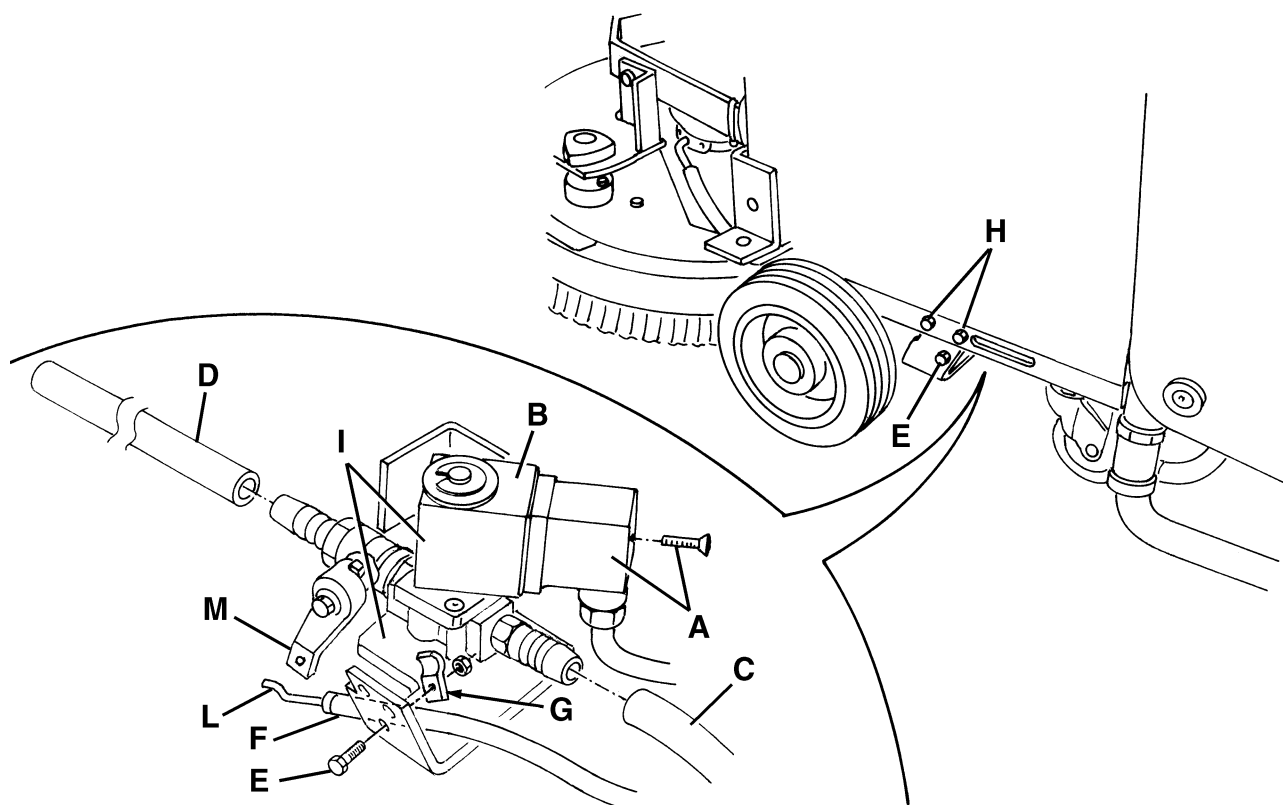
S300482

DETERGENT SUPPLY SYSTEM**SOLENOID VALVE OR DETERGENT FLOW TAP REPLACEMENT**

1. Drive the machine on a level ground.
2. Be sure the switches (5) and (6) are in 0 position (off). For "20BT" version machines, turn the key (64) to "0".
3. Disconnect the battery connector (33).
4. If there is recovery water in the tank (39), drain it through the hose(25).
5. If there is detergent in the tank (40), drain it through the hose (26).
6. Remove the supplied key (32) from its housing and unscrew the tank assembly fastening screw (35).
7. Carefully lift the tank assembly (53) by means of the handlebar (10).
8. Disconnect the solenoid valve (B) electrical connection (A).
9. Disconnect the hoses (C) and (D).
10. Loosen the screw (E) and disengage the clamp (G) from the cable (F) of the lever (7).
11. Unscrew the screws (H) and move the solenoid valve-tap-support assembly (I).
12. Disconnect the tap lever (M) cable end (L).
13. Remove the solenoid valve-tap-support assembly (I).
14. Unscrew the screws (N) and the support (O) at the cabinet bench.
15. Unscrew the hose fittings (P) and (Q).
16. Unscrew the tap (R) from the solenoid valve (B).
17. Install in the reverse order of removal, with the following change:
 - when reinstalling the solenoid valve (B), the stamping orientation (S) must be as shown in the figure; moreover, before installing the fittings (P) and (Q) and the tap (R), clean the related threads and apply LOCTITE 572 sealant.
 - if the tap (R) has been replaced, check that the new part has its lever (M) facing downward as shown (closed position), if not, position it facing downward after removing the related screw (T).
 - after the cable (L) has been installed on the lever (M), fasten the cable (F) by means of the clamp (G) and of the screw (E) in a position which meets the following conditions:
 - the lever (7) in fully closed position, the lever (M) must be vertically positioned as shown (closed tap)
 - the lever (7) in fully open position, the lever (M) must be horizontally positioned (open tap)

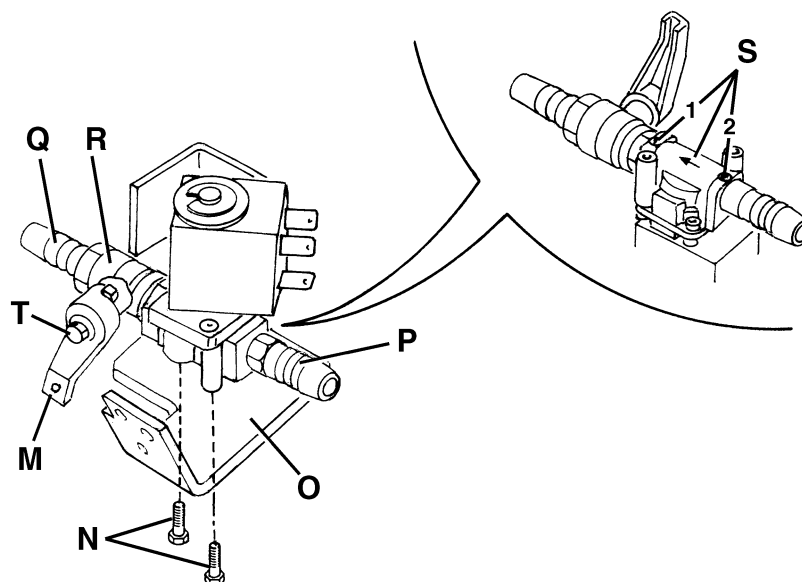
After all the components have been reinstalled, perform the lever (7) proper operation tests.

Figure 2



S300392

Figure 3



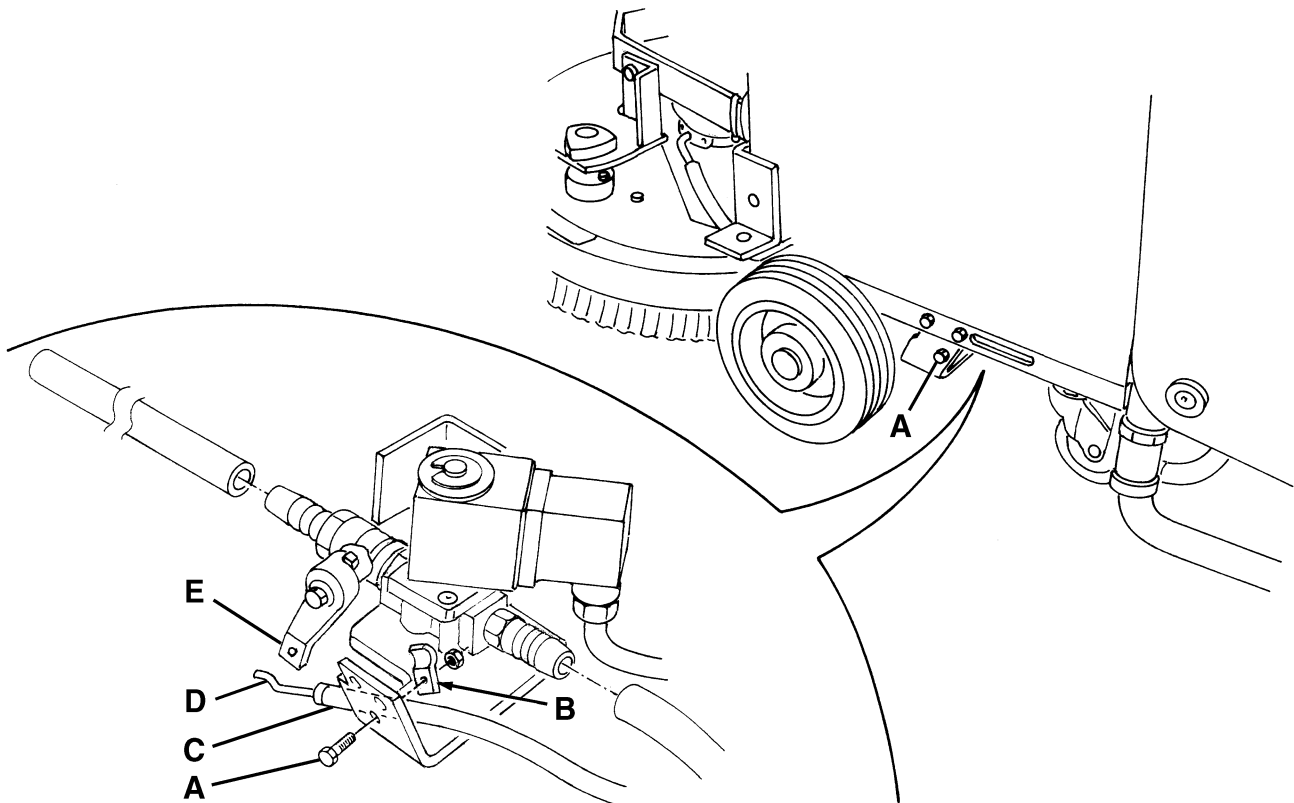
S300305

DETERGENT SUPPLY SYSTEM

DETERGENT FLOW CABLE AND ADJUSTING LEVER REPLACEMENT

1. Drive the machine on a level ground.
 2. Be sure the switches (5) and (6) are in 0 position (off). For "20BT" version machines, turn the key (64) to "0".
 3. Disconnect the battery connector (33).
 4. If there is recovery water in the tank (39), drain it through the hose (25).
 5. If there is detergent in the tank (40), drain it through the hose (26).
 6. Remove the supplied key (32) from its housing and unscrew the tank assembly fastening screw (35).
 7. Carefully lift the tank assembly (53) by means of the handlebar (10).
 8. Loosen the screw (A) and disengage the clamp (B) from the cable (C) of the lever (H).
 9. Disconnect the tap lever (E) cable end (D).
 10. Disconnect the cable (C) from the fixing clamps (F) along its run up to the lever (H).
 11. Remove the handgrip (G) from the lever (H).
 12. Unscrew the screws (I) and lightly move the panel (J).
 13. Unscrew the screws with nut (K) and the control lever with the cable (L).
 14. Install in the reverse order of removal, with the following change:
 - after the cable (D) has been installed on the lever (E), fasten the cable (C) by means of the clamp (B) and of the screw (A) in a position which meets the following conditions:
 - the lever (H) in fully closed position, the lever (E) must be vertically positioned as shown (closed tap)
 - the lever (H) in fully open position, the lever (E) must be horizontally positioned (open tap)
- After all the components have been reinstalled, perform the lever (H) proper operation tests.

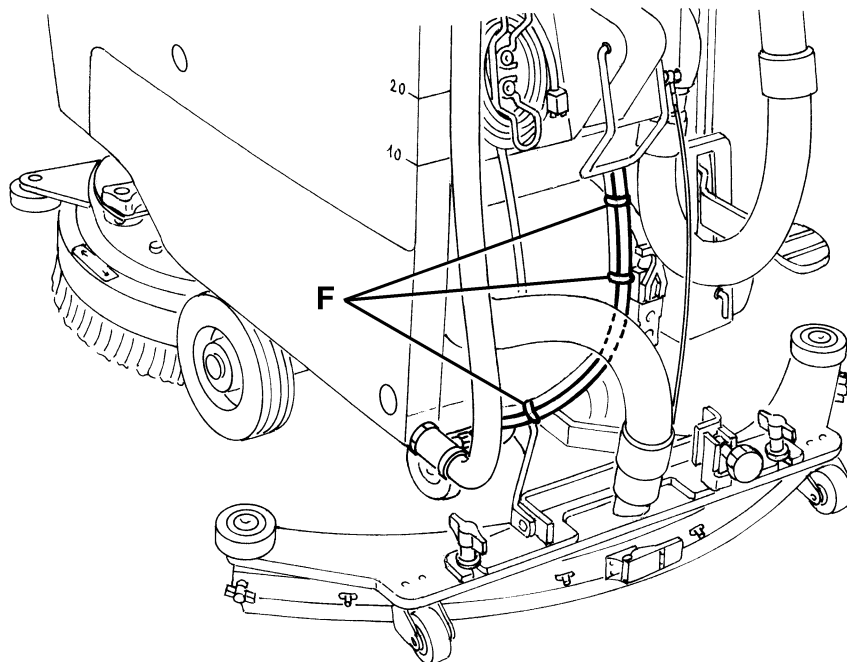
Figure 4



S300393

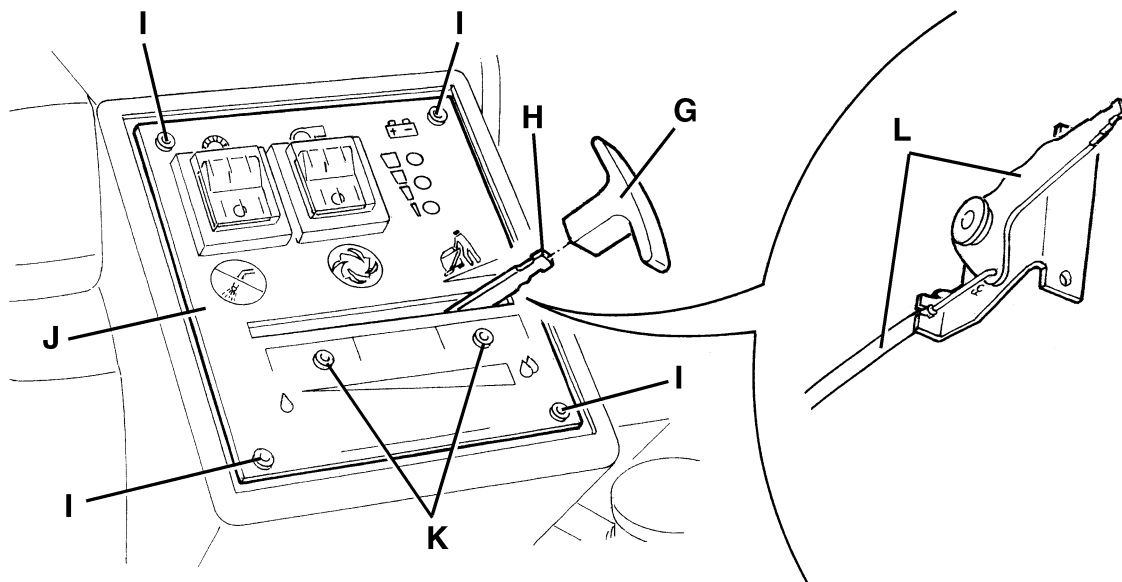
DETERGENT FLOW CABLE AND ADJUSTING LEVER REPLACEMENT
(Continues)

Figure 5



S300507

Figure 6



S300308

DETERGENT SUPPLY SYSTEM

TROUBLESHOOTING

SMALL AMOUNT OF THE DETERGENT OR NO DETERGENT REACHES THE BRUSH

Possible cause:

1. The brush switch (5) is not in ON position or it is broken (position it to ON or repair/replace it).
2. The detergent filter is obstructed/dirty (clean it).
3. The detergent flow control lever does not control the related tap anymore (check the control lever cable, from the lever to the tap).
4. The detergent tap is stuck closed (replace the tap).
5. The solenoid valve is broken or there is an open in the electrical connection (replace the solenoid valve/repair the electrical connection).
6. The electronic board is broken (replace it).
7. There is debris in the detergent tank obstructing the output hole (clean the tank).
8. There is debris in the detergent hose line obstructing the detergent flow (clean the hose line).

THE DETERGENT REACHES THE BRUSH ALSO WHEN THE MACHINE IS OFF

Possible cause:

1. The solenoid valve is broken (replace it).
2. The electronic board is broken (replace it).

BRUSH MOTOR ELECTRICAL INPUT CHECK

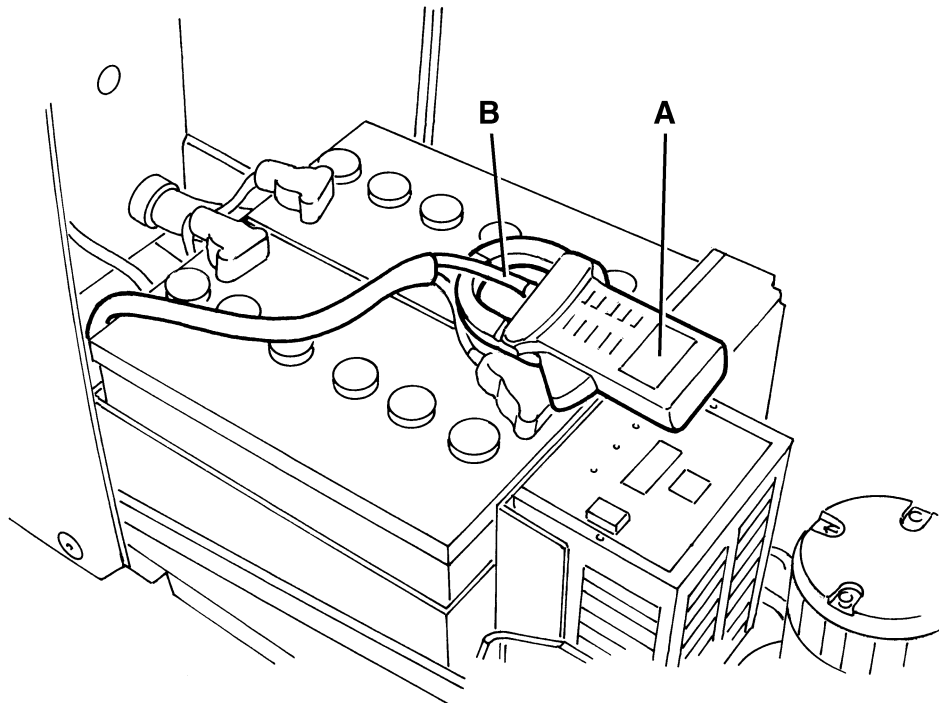


WARNING!

This procedure must be performed by qualified personnel only.

1. Drive the machine on a level ground.
 2. Be sure the switches (5) and (6) are in the 0 position (off). For "20BT" version machines, turn the key (64) to "0".
 3. Remove the brush (16).
 4. If there is recovery water in the tank (39), drain it through the hose (25).
 5. If there is detergent in the tank (40), drain it through the hose (26).
 6. Remove the supplied key (32) from its housing and unscrew the tank assembly fastening screw (35).
 7. Carefully lift the tank assembly (53) by means of the handlebar (10).
 8. Set an ammeter (A) on the battery supply positive cable (B).
 9. For "20BT" version machines, turn the key (64) to "I". Position the brush switch (5) to I and check that the brush motor input is 5 A max. If the input is higher, perform the following steps in order to find and eliminate the cause of the abnormal input:
 - remove from the brush rotation shaft/flange possible amounts of dirt or wrapped-round materials (ropes, clothes, etc.), which prevent or slow down its rotation.
 - if necessary, carry out the motor brush check (see the procedure on the following page).
 - if necessary, disassemble the motor (see the procedure on the following pages), clean it and check its moving parts.
- If the above-mentioned procedures do not lead to a correct electrical input, it is necessary to replace the motor (see the procedure on the following pages).
10. Carry out steps from 1. to 9. in the reverse order.

Figure 1



S300309

SWEEPING SYSTEM

BRUSH MOTOR PROTECTION ELECTRONIC SYSTEM CALIBRATION CHECK



Warning!

This procedure must be performed by qualified personnel only.



Note:

The check must be carried out with the batteries charged [check that the indicator light turns on (2)].

1. Drive the machine on a rough ground (roadbed or similar). Be careful because during the test, the machine can leave permanent scratches on the ground.
2. Close the detergent flow by means of the lever (7).
3. Lower the brush (E) on the ground by means of the pedal (F).
4. Set an ammeter (A) on the battery supply cable (B).
5. For "20BT" version machines, turn the key (64) to "I". Activate the brush (E) by means of the switch (5) and check that the brush motor protection system turns on with an electrical input between 30 and 45A.
The activation of the brush motor protection system is indicated by the indicator lights (3 and 4) flashing.



Note:

If the roughness of the surface is not enough to activate the motor protection system, add a supplementary pressure on the brush plate (G) with the foot, until the indicator lights (3 e 4) flash.



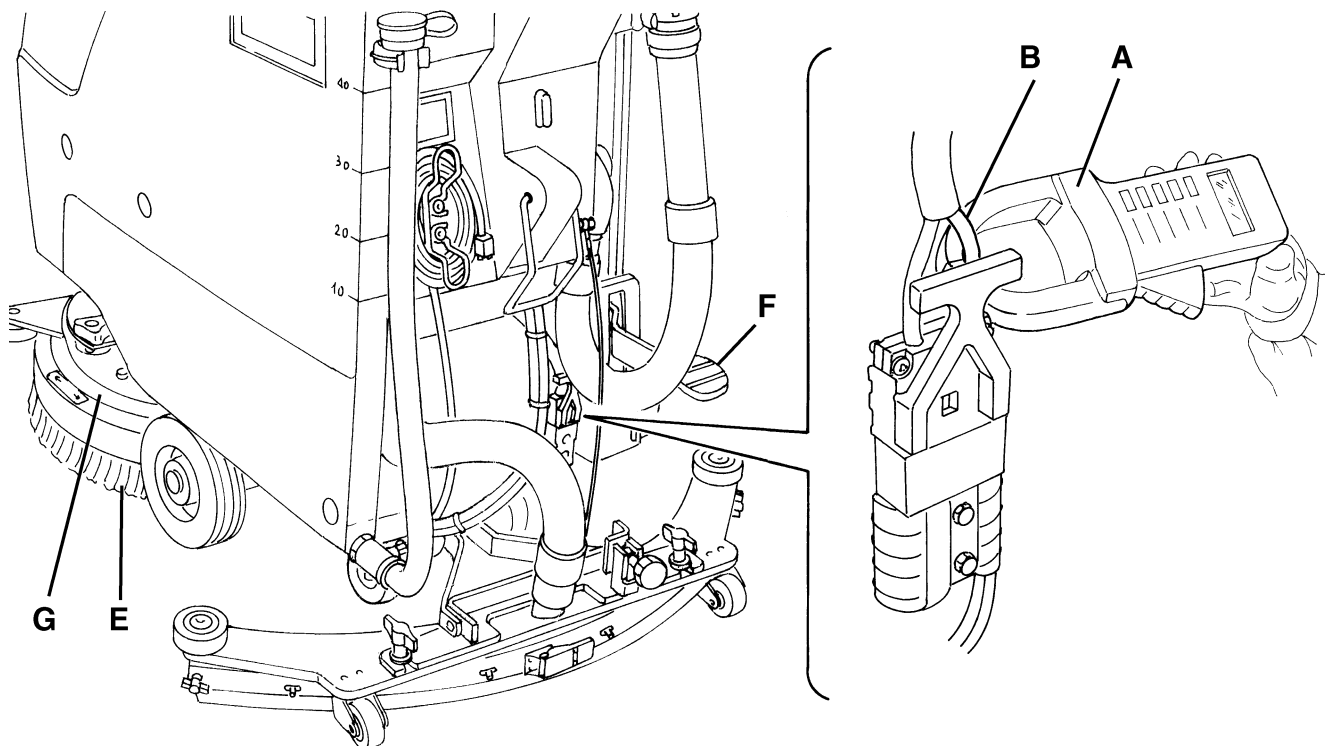
Warning:

In case of system malfunction do not persist in doing the test to avoid damaging the brush motor or burning the safety fuse (C); proceed as indicated in the following steps.

6. If the protection system activates with inputs lower than 30A, possible causes and related interventions are the following:
 - Fuse screws (C) non correctly tightened (tighten them)
 - Damaged or inadequate value fuse (C) (replace it with a 50A fuse, Nilfisk original spare parts).
 - Damaged fuse harness (C) (repair it).
 - Damaged electronic board (replace it)
7. If the protection system activates with inputs higher than 50A or does not activate, possible causes and related interventions are the following:
 - Inadequate value fuse (C) (replace it with a 50A fuse, Nilfisk original spare parts).
 - Damaged electronic board (replace it)
 - Short circuit in the fuse harness (C) (repair it).
8. At the end of these operations, perform the test again (see steps from 1. to 6.).
9. Reset the machine by performing these operations in the reverse order.

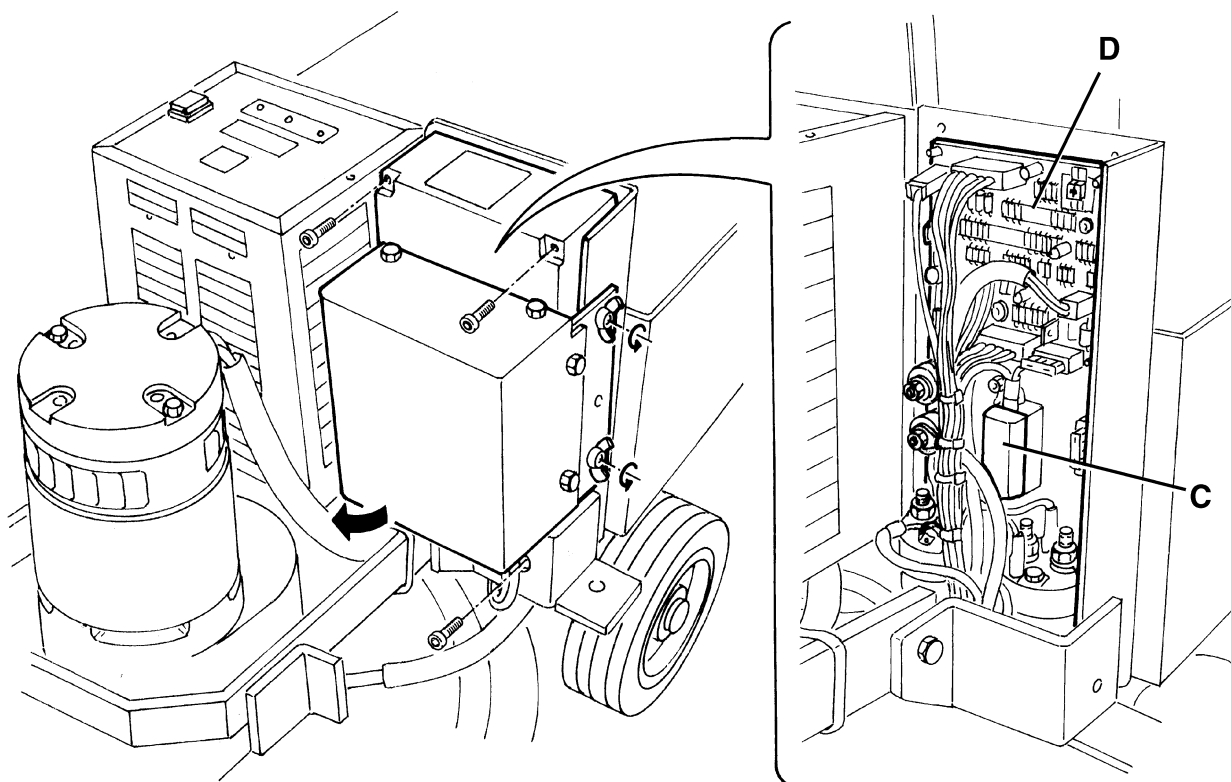
BRUSH MOTOR PROTECTION ELECTRONIC SYSTEM CALIBRATION CHECK (Continues)

Figure 2



S300508

Figure 3



S300484

SWEEPING SYSTEM

BRUSH MOTOR BRUSH/CARBON BRUSH CHECK AND REPLACEMENT

1. Drive the machine on a level ground.
2. Be sure the switches (5) and (6) are in the 0 position (off). For "20BT" version machines, turn the key (64) to "0".
3. Disconnect the battery connector (33).
4. If there is recovery water in the tank (39), drain it through the hose(25).
5. If there is detergent in the tank (40), drain it through the hose (26).
6. Remove the supplied key (32) from its housing and unscrew the tank assembly fastening screw (35).
7. Carefully lift the tank assembly (53) by means of the handlebar (10).
8. Remove dust and dirt from the brush motor exterior; then disengage and remove the clamp (A).
9. For each of the four brushes, lift the retaining spring (B) and remove the brushes (C).
10. Check if the four brushes are worn. The brushes are worn when there is not sufficient contact with the motor armature, because of their use, of the contact surface which is not integral or because the thrust spring is broken, etc. Check the brush length: new brush = 18 mm, worn brush = 4-5 mm.
11. If necessary, remove the brushes to replace them, by unscrewing the nuts (D) and disengaging the lead-in wires (E).

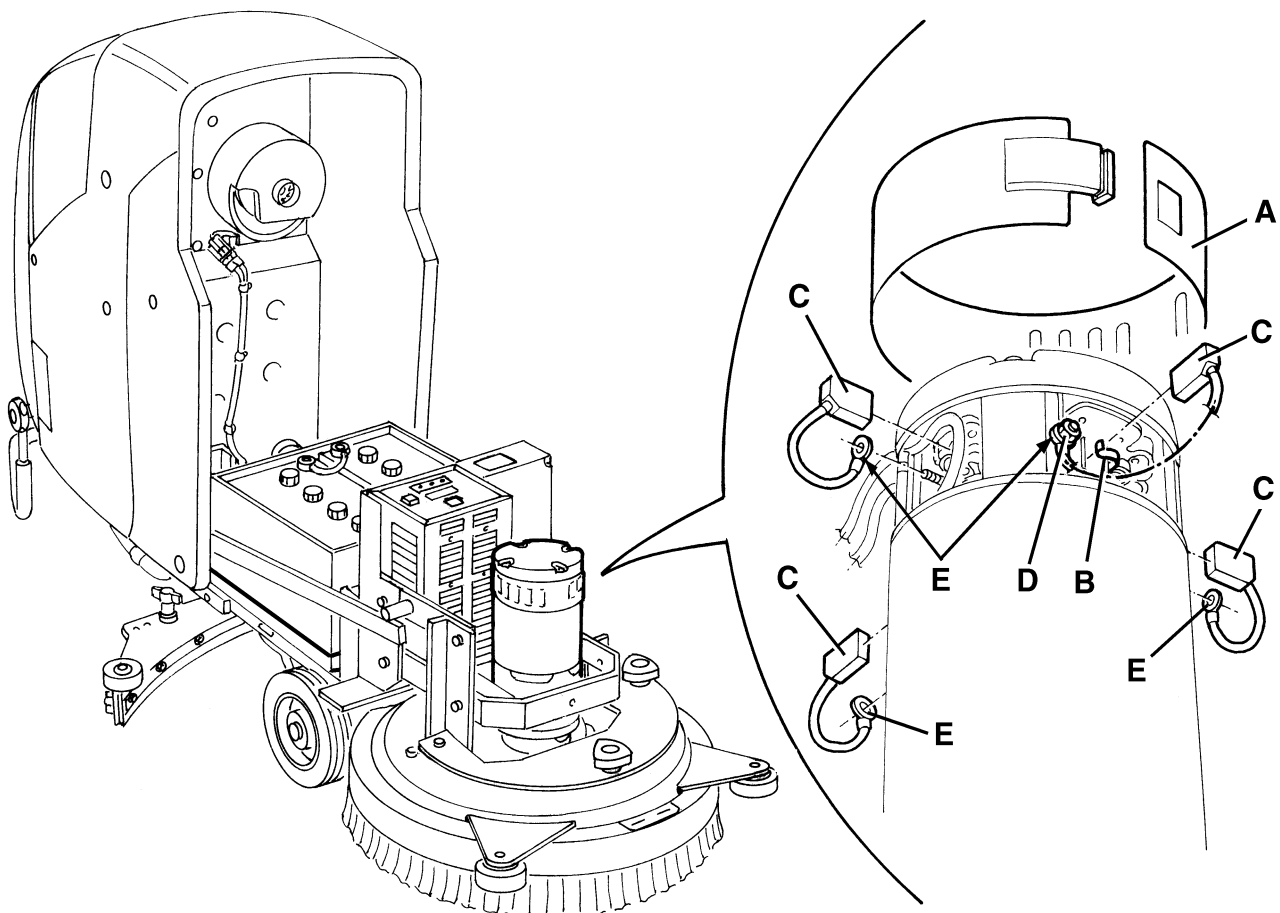


NOTE:

It is advisable to replace all four brushes at the same time, even if they are not all worn in the same way.

12. Install in the reverse order of removal, with the following caution:
 - when connecting the terminals (E), take care of their insulation from the surrounding parts of the frame.

Figure 4



S300395

BRUSH MOTOR REPLACEMENT

1. Drive the machine on a level ground.
2. Be sure the switches (5) and (6) are in the 0 position (off). For "20BT" version machines, turn the key (64) to "0".
3. Disconnect the battery connector (33).
4. If there is recovery water in the tank (39), drain it through the hose (25).
5. If there is detergent in the tank (40), drain it through the hose (26).
6. Remove the supplied key (32) from its housing and unscrew the tank assembly fastening screw (35).
7. Carefully lift the tank assembly (53) by means of the handlebar (10).
8. (For "20BT" version only) Loosen the wing nuts (A) and move aside the drive electronic board (B).
9. Remove the screws (C) and carefully remove the electric component box cover (D) making it slide upwards.
10. Disconnect the brush motor electrical cables (E) and (F) from the connections (G) (electromagnetic switch) and (H) (insulator).
11. Cut the clamps (I) and disengage the motor cable (J).
12. Remove the nuts (D).
13. Carefully lift and remove the brush motor (L) with its pinion and bearing.

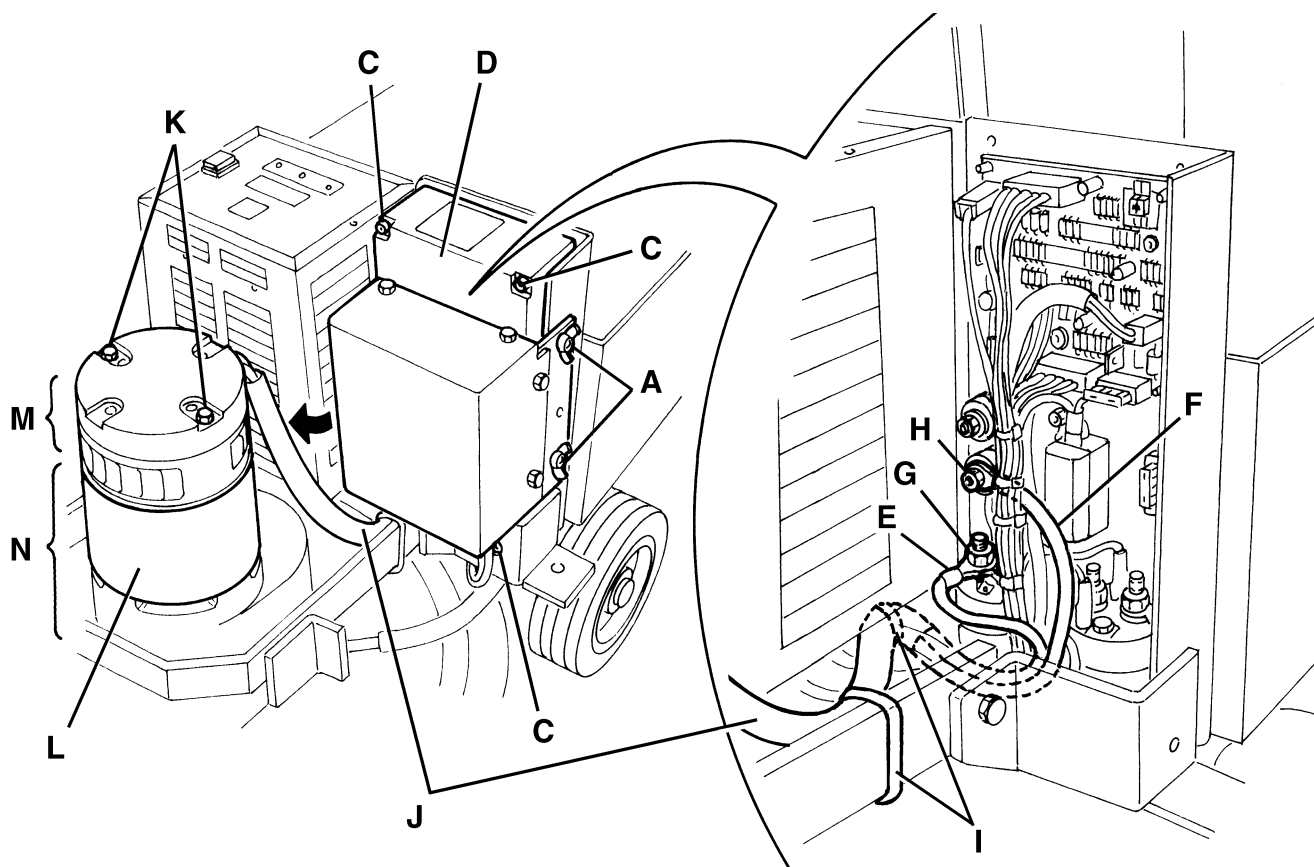


CAUTION!

To prevent part (M) and part (N) from separating during the motor disassembly/reassembly, it is advisable to apply adhesive tape temporarily to keep the two parts together.

14. Install in the reverse order of removal, with the following change:
 - If applied at step 13, remember to remove the adhesive tape.

Figure 5



S300311

SWEEPING SYSTEM**BRUSH REDUCTION UNIT REPLACEMENT**

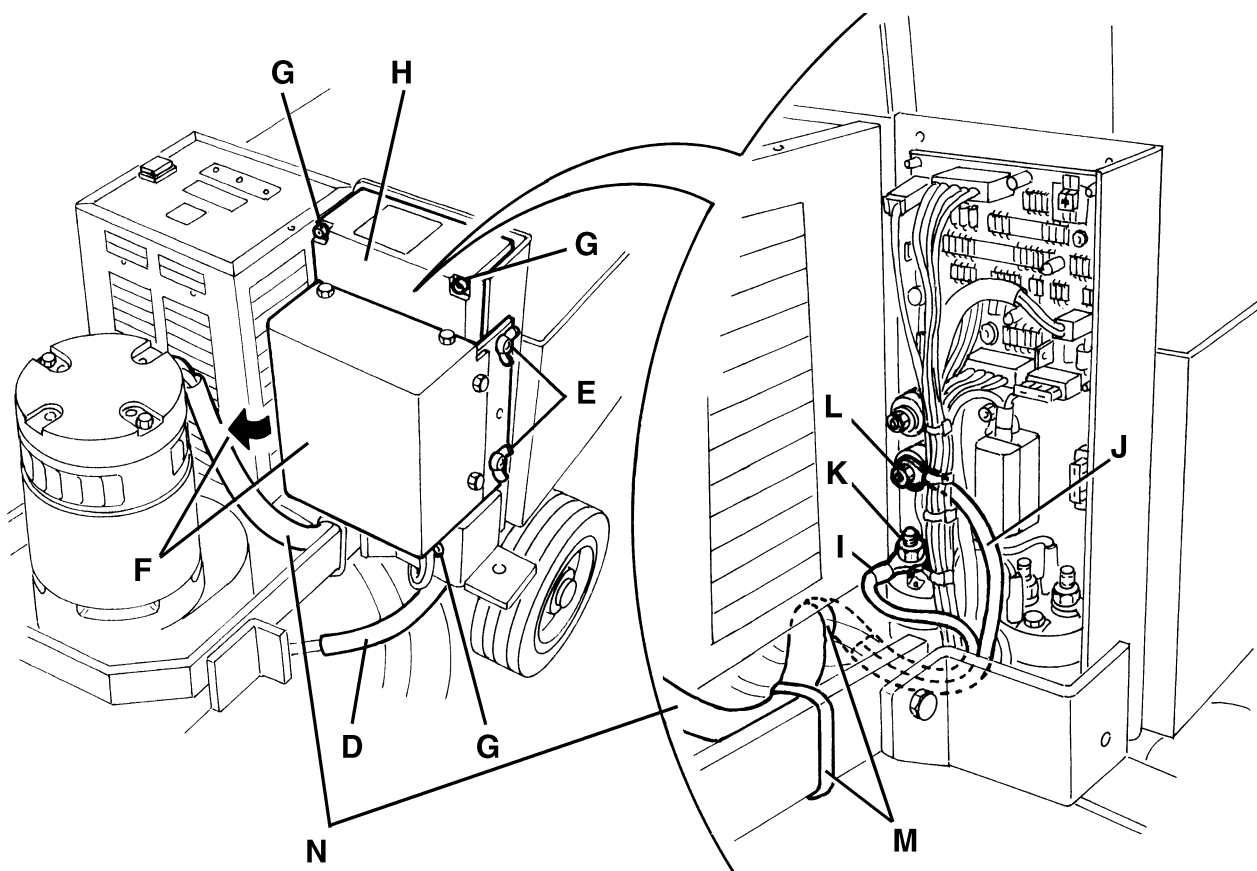
1. Remove the brush (16).
2. Be sure the switches (5) and (6) are in the 0 position (off). For "20BT" version machines, turn the key (64) to "0".
3. Disconnect the battery connector (33).
4. Lift the machine by means of a lifting system, if available, in order to work under the brush-holder (54/55); if the lifting system is not available, lay down the machine on one side and perform the following procedure:
 - Remove the suction squeegee (see the related paragraph).
 - If there is recovery water in the tank (39), drain it through the hose (25).
 - If there is detergent in the tank (40), drain it through the hose (26).
 - Remove the supplied key (32) from its housing and unscrew the tank assembly fastening screw (35).
 - Carefully lift the tank assembly (53) by means of the handlebar (10).
 - Disconnect the battery (47) negative cable (-).
 - Disconnect the other cables of the batteries.
 - Remove the batteries (47).
 - Remove the battery frame (61).
 - Perform the following steps from 5. to 8. before laying down the machine.
 - Carefully lower the tank assembly (53) by means of the handlebar (10).
 - Lay down the machine on one side and set it down carefully on proper guards (A).
 - Open the tank assembly (C) completely by means of the handlebar (B).
5. Disconnect the detergent hose (D).
6. (For "20BT" version only) Loosen the wing nuts (E) and move aside the drive electric box (F).
7. Remove the screws (G) and carefully remove the electric component box cover (H) making it slide upwards.
8. Disconnect the brush motor electrical cables (I) and (J) from the connections (K) (electromagnetic switch) and (L) (insulator).
9. Cut the clamps (M) and disengage the motor cable (N).
10. Operating on the brush installation area, remove the screw (O), remove the flange assembly (P) and recover the key (Q).
11. Remove the screws (R) and the reduction unit with the motor (S).
12. Remove the detergent hose (T).
13. Remove the motor mounting nuts (U) to the reduction unit.
14. Carefully lift and remove the brush motor (V) with its pinion and bearing.

**CAUTION!**

To prevent part (T) and part (U) from separating during the motor disassembly/reassembly, it is advisable to apply adhesive tape temporarily to keep the two parts together.

15. Recover the reduction unit with oil (Y).
16. Install in the reverse order of removal, with the following change:
 - Before installing the new reduction unit, fill in with oil of the type and quantity indicated by the reduction unit data plate (SAE W 80 - 90 oil). The oil in the tank must cover the gear (Z).
 - If applied at step 14, remember to remove the adhesive tape.

Figure 6

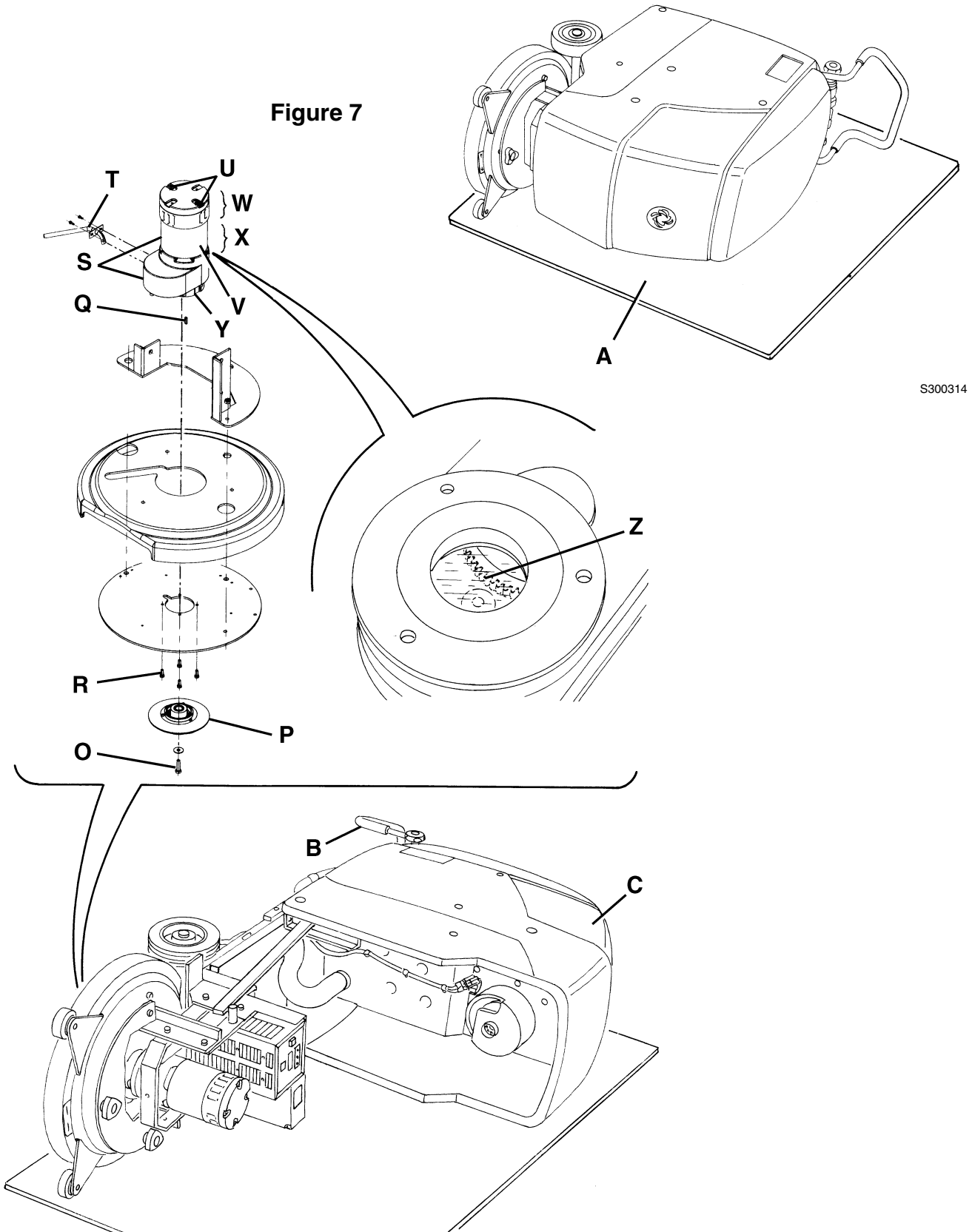


S300486

BRUSH REDUCTION UNIT REPLACEMENT (Continues)

Figure 8

Figure 7



TROUBLESHOOTING

OPEN CIRCUIT

The brush motor fuse determines the open circuit. This system allows to prevent the brush motor circuits from being damaged in case of short circuit.

If there is an open in the electrical circuit, the possible causes are the following:

1. Short circuit: check all cable and connection insulation integrity.
2. Engine locked: check that debris or other objects do not prevent the engine rotation.

THE BRUSH DOES NOT ROTATE

Possible cause:

1. The battery voltage is too low (check the battery charge indicator on the control panel).
2. The electrical motor brushes are worn (replace the electrical motor brushes).
3. Malfunction in the electrical motor (repair or replace the electrical motor).
4. Brush motor burned fuse (remove the cause and replace the fuse).
5. The brush ON/OFF switch (5) is broken (replace it).
6. Malfunction in the reduction unit (repair or replace it).
7. The wiring harness is damaged (repair it).
8. The electromagnetic switch is damaged (replace it).

BRUSH MOTOR ELECTRONIC PROTECTION INTERVENTION (See Use and Maintenance Manual)

Possible causes:

1. Insufficient water on the floor (increase water amount).
2. The floor is too rough for the brush you are using.
3. There are bulky waste materials or cords around the brush or between the brush and its flange (disassemble the brush and remove the waste materials or cords).
4. The brush motor electrical input is too high (check the electrical input).
5. The brush motor protection system does not work properly (see the specified paragraph for the system calibration).

RECOVERY SYSTEM

TANK AND SUCTION GRID WITH FLOAT CLEANING

1. Push the machine to the appointed disposal area.
2. Be sure the switches (5) and (6) are in the 0 position (off). For "20BT" version machines, turn the key (64) to "0".
3. Lift the cover (A), clean and wash with clean water the cover (A), the tanks (B) and (C) and the screen (D) of the suction automatic closing.
Drain the water from the tanks by means of the hoses (25 and 26).
4. If necessary, release the retainers (E) and open the screen (D); recover the float (F), clean all the components and then reinstall them.
5. Check the integrity of the tank cover gasket (G).

**Remark:**

The gasket (G) creates vacuum in the tank that is necessary for the suction of recovery water.

If necessary replace the gasket (G) after removing it from its housing (H). When assembling the new gasket, install its joint (I) in the (central) area as shown in the figure.

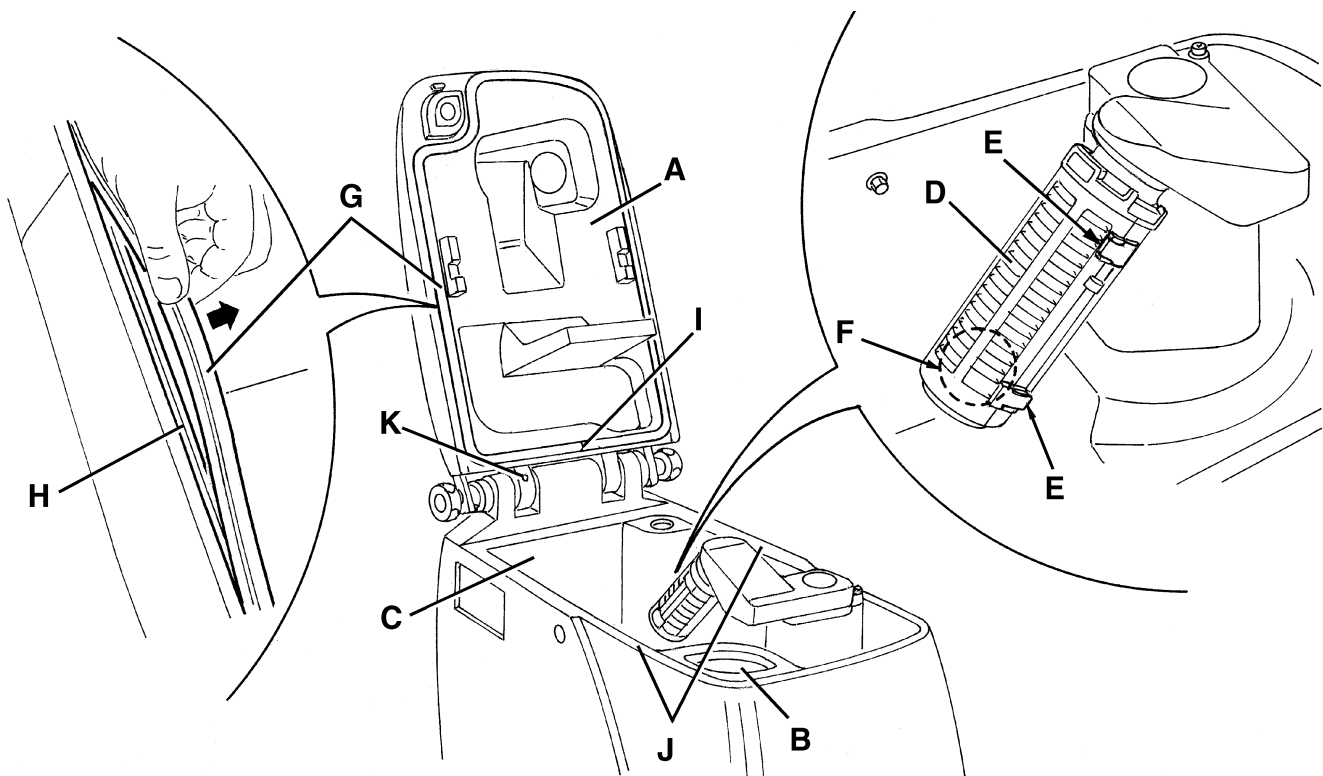
6. Be sure that the gasket (G) bearing surface (J) is integral and adequate for the gasket.
7. Be sure that the compensation hole (K) is not obstructed.

**Remark:**

The hole (K), allowing to compensate the air in the cover interspaces, contributes to create vacuum in the tank.

8. Close the cover (A).

Figure 1



S300397

SUCTION MOTOR ELECTRICAL INPUT CHECK



WARNING!

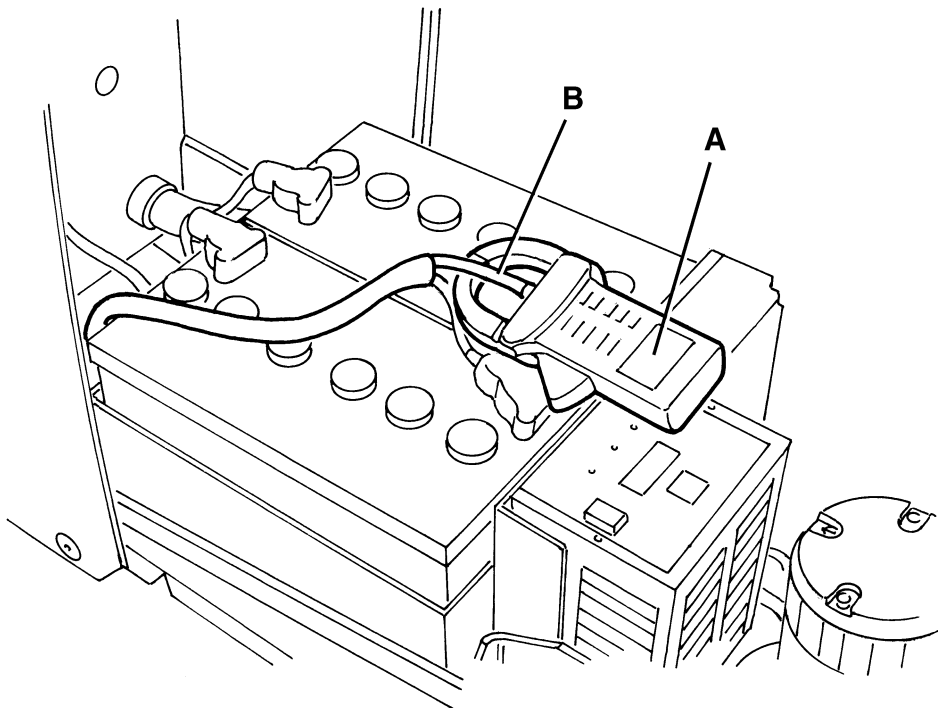
This procedure must be performed by qualified personnel only.

1. Drive the machine on a level ground.
2. Be sure the switches (5) and (6) are in the 0 position (off). For "20BT" version machines, turn the key (64) to "0".
3. If there is recovery water in the tank (39), drain it through the hose (25).
4. If there is detergent in the tank (40), drain it through the hose (26).
5. Remove the supplied key (32) from its housing and unscrew the tank assembly fastening screw (35).
6. Carefully lift the tank assembly (53) by means of the handlebar (10).
7. Set an ammeter (A) on the battery supply positive cable (B).
8. For "20BT" version machines, turn the key (64) to "I". Position the suction switch (6) to I and check that the suction motor input is 22 A max. If the input is higher, perform the following steps in order to find and eliminate the cause of the abnormal input:
 - carry out the motor brush check (see the procedure on the following page).
 - if necessary, disassemble the motor (see the procedure on the following pages), clean it and check its moving parts.

If the above-mentioned procedures do not lead to a correct electrical input, it is necessary to replace the motor (see the procedure on the following pages).

9. Carry out steps from 1. to 8. in the reverse order.

Figure 2



S300316

RECOVERY SYSTEM

SUCTION MOTOR BRUSH/CARBON BRUSH CHECK AND REPLACEMENT

**NOTE:**

The motor installed on the machine can either be a FISE or a AMETEK.

The following procedure refers to the FISE motor only.

1. Drive the machine on a level ground.
2. Be sure the switches (5) and (6) are in the 0 position (off). For "20BT" version machines, turn the key (64) to "0".
3. Disconnect the battery connector (33).
4. If there is recovery water in the tank (39), drain it through the hose (25).
5. If there is detergent in the tank (40), drain it through the hose (26).
6. Remove the supplied key (32) from its housing and unscrew the tank assembly fastening screw (35).
7. To operate on the suction motor (44) carefully lift the tank assembly (53) by means of the handlebar (10).
8. Disconnect the suction motor electrical connector (A).
9. Unscrew the screws (B) and remove the deadening guard (C).
10. Remove the cover (D) (that is pressurized) from the suction motor (E).
11. Remove the brushes (F).
12. Check if the brushes are worn. The brushes are worn when there is not sufficient contact with the motor armature, because of their use, of the contact surface which is not integral or because the thrust spring is broken, etc.
13. If necessary, remove the brushes to replace them, by disengaging the lead-in wires (G).
14. Install in the reverse order of removal.

Figure 3

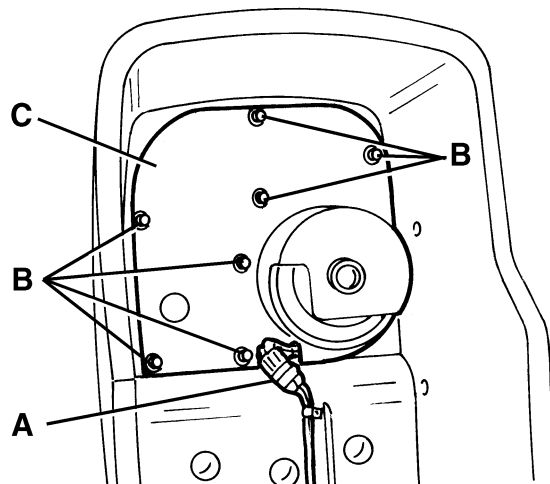
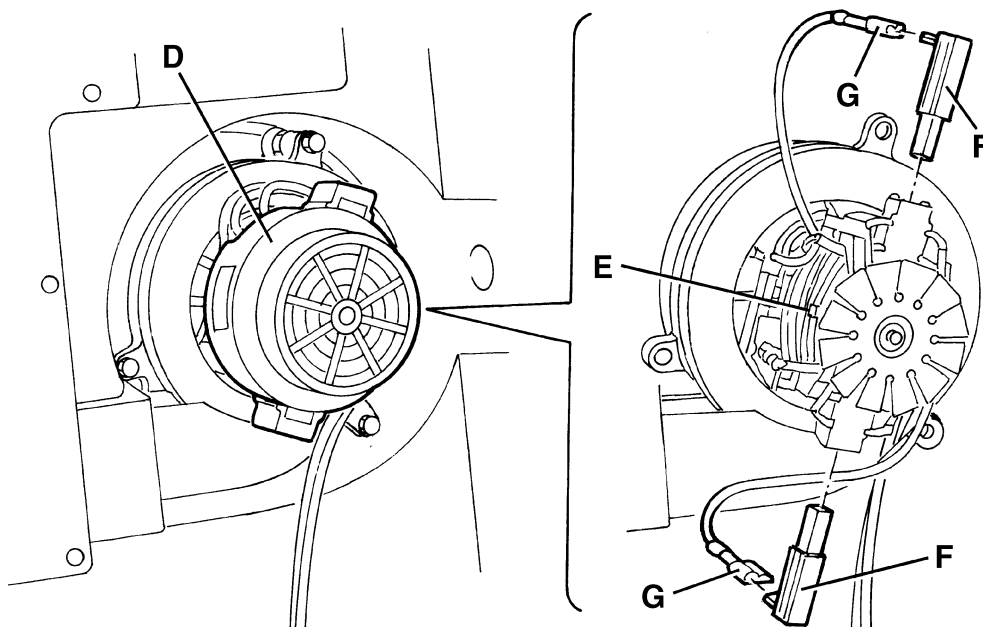


Figure 4



S300317

SUCTION MOTOR BRUSH/CARBON BRUSH CHECK AND REPLACEMENT

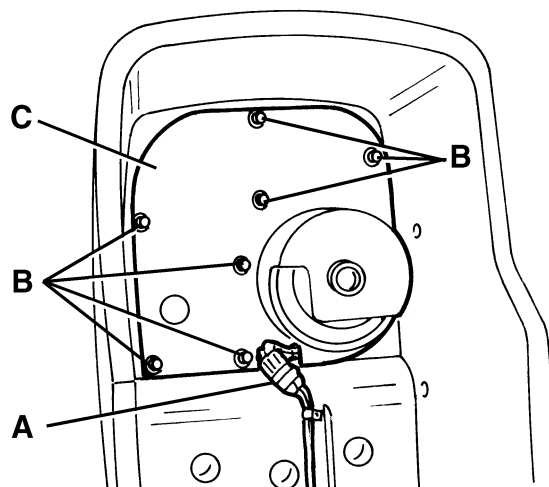


NOTE:

The motor installed on the machine can either be a FISE or a AMETEK.
The following procedure refers to the AMETEK motor only.

1. Drive the machine on a level ground.
2. Be sure that the switches (5) and (6) are in the "0" position (off). For "20BT" version machines, turn the key (64) to "0".
3. Disconnect the battery connector (33).
4. If there is recovery water in the tank (39), drain it through the hose (25).
5. If there is detergent in the tank (40), drain it through the hose (26).
6. Remove the supplied key (32) from its housing and remove the tank assembly fastening screw (35).
7. To operate on the suction motor (44) carefully lift the tank assembly (53) by means of the handlebar (10).
8. Disconnect the suction motor electrical connector (A).
9. Remove the screws (B) and remove the deadening guard (C).
10. Disengage the retainers (D) and (E) and then remove the cover (F) from the suction motor (G).
11. Loosen the screws (H) and remove the retainers (I).
12. Disconnect the electrical connections (J) and remove the brushes (K).
13. Check if the brushes are worn. The brushes are worn when there is not sufficient contact with the motor armature, because of their use, of the contact surface which is not integral or because the thrust spring is broken, etc.
14. If necessary, replace the brushes. It is advisable to replace all the brushes at the same time.
15. Install in the reverse order of removal.

Figure 5

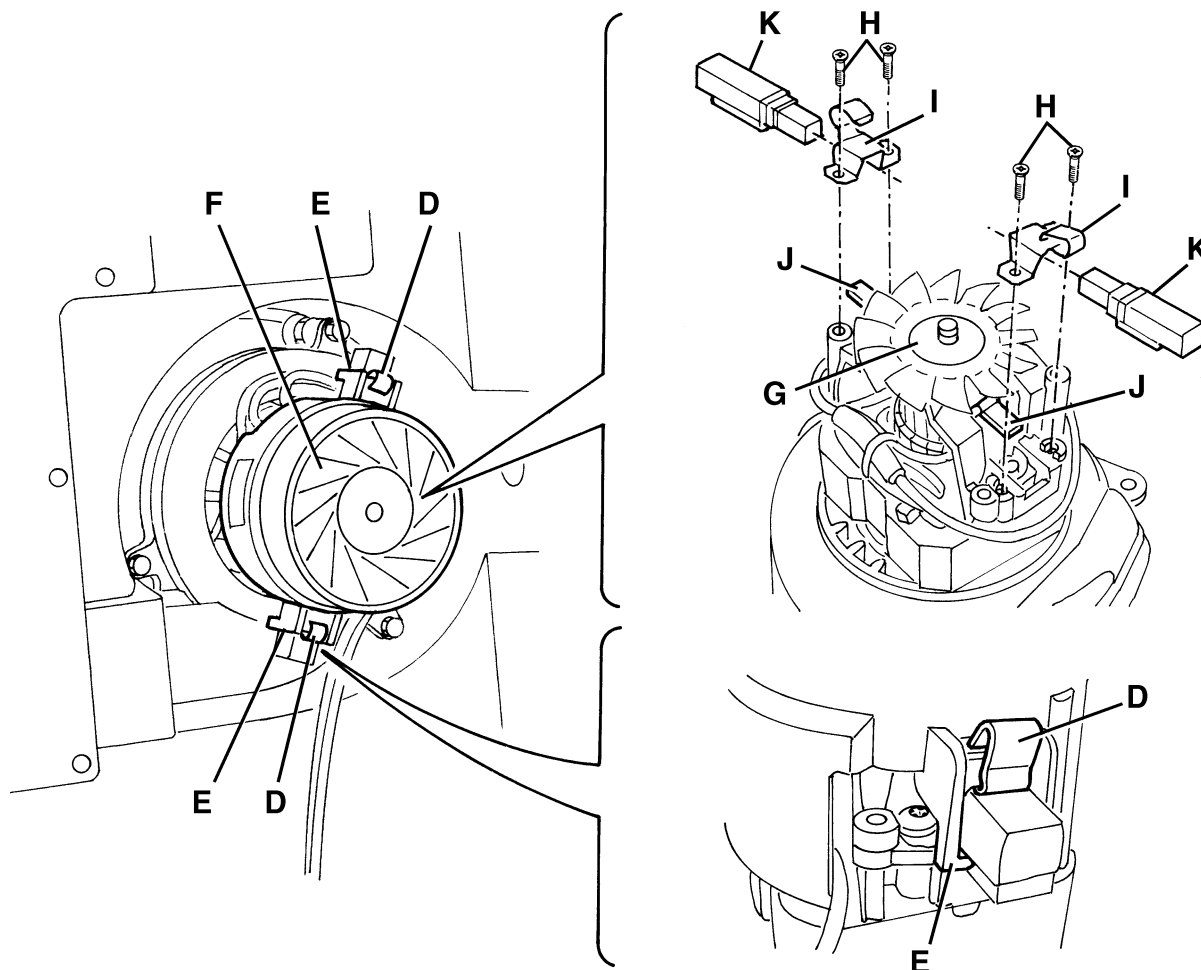


S300317

RECOVERY SYSTEM

SUCTION MOTOR BRUSH/CARBON BRUSH CHECK AND REPLACEMENT (continues)

Figure 6



S300487

SUCTION MOTOR REMOVAL



NOTE:

The motor installed on the machine can either be a FISE or a AMETEK. The following procedure refers to both types of motors.

1. Drive the machine on a level ground.
2. Be sure the switches (5) and (6) are in the 0 position (off). For "20BT" version machines, turn the key (64) to "0".
3. Disconnect the battery connector (33).
4. If there is recovery water in the tank (39), drain it through the hose (25).
5. If there is detergent in the tank (40), drain it through the hose (26).
6. Remove the supplied key (32) from its housing and unscrew the tank assembly fastening screw (35).
7. To operate on the suction motor (44) carefully lift the tank assembly (53) by means of the handlebar (10).
8. Disconnect the suction motor electrical connector (A).
9. Unscrew the screws (B) and remove the deadening guard (C).
10. Unscrew the motor fastening screws (D).
11. Remove the suction motor (E) and the joint (F).
12. Recover the gasket (G) that is between the motor and the structure.
13. Install in the reverse order of removal.

Figure 7

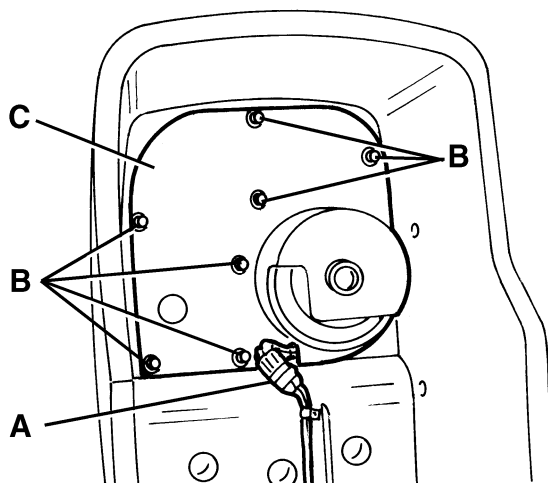
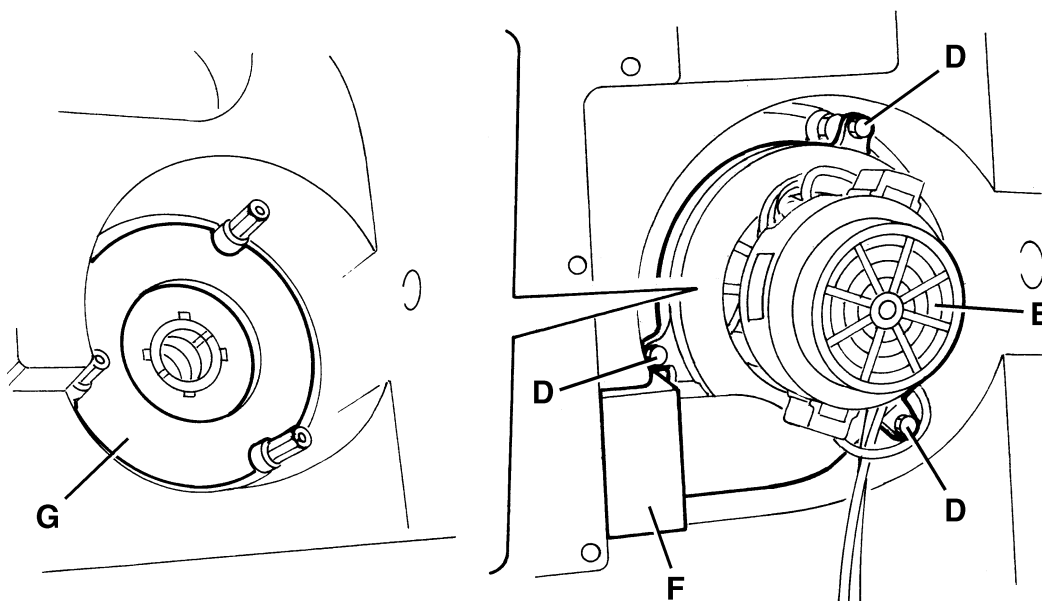


Figure 8



S300317

S300319

RECOVERY SYSTEM

SQUEEGEE REPLACEMENT

1. Drive the machine on a level ground.
2. Be sure the switches (5) and (6) are in the 0 position (off). For “20BT” version machines, turn the key (64) to “0”.
3. Lower the squeegee (18) by means of the lever (27).
4. Disconnect the suction hose (34) from the squeegee.
5. Loosen the handwheels (19) and remove the squeegee (18).
6. Install in the reverse order of removal.
7. If necessary, adjust the balancing handwheel (20) of the squeegee.

SQUEEGEE CLEANING/CHECK AND POSSIBLE RUBBER REPLACEMENT



CAUTION!

It is advisable to use protective gloves when cleaning the squeegee because there can be cutting debris.

Squeegee cleaning

1. Remove the squeegee as described on the previous page.
2. Wash and clean the squeegee; in particular, clean the compartments (A) and the hole (B) from dirt and debris. Check that the front rubber (C) and the rear rubber (D) are integral and free from cuts and lacerations; otherwise replace them (see following steps).
3. Install in the reverse order of removal.

Squeegee rubber check

4. Clean the squeegee (as described in the previous steps).
5. Check that the front rubber edge (E) and the rear rubber edge (F) lay down on the same level, along their length; otherwise adjust their height as described below:
 - disengage the retainer (G) and loosen the wing nuts (H) to adjust the rear rubber (D); then tighten the wing nuts and engage the retainer.
 - loosen the nuts (I) to adjust the front rubber (C); then tighten the nuts.
6. Check that the front rubber (C) and the rear rubber (D) are integral and free from cuts and lacerations; otherwise replace them as described below.
Check that the front corner (J) of the rear rubber is not worn; otherwise, overturn the rubber to replace the worn corner with an integral one. If the other corners are worn too, replace the rubber; proceed as described below.

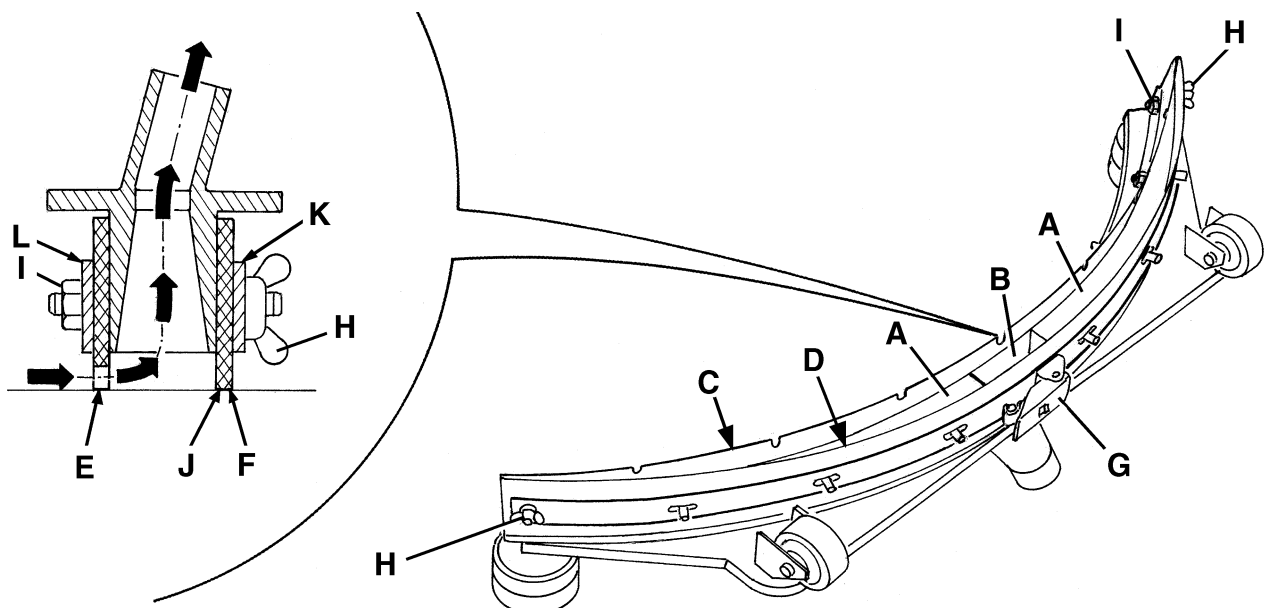
Squeegee rubber replacement (or overturning)

7. To replace (or overturn) the rear rubber (D) disengage the retainer (G), unscrew the wing nuts (H) and the retaining strip (K). Install in the reverse order of removal.
To replace the front rubber (C) unscrew the nuts (I) and remove the retaining strip (L). Install in the reverse order of removal.

After the rubber replacement (or overturning), adjust their height as described at step 5.

8. Reinstall the squeegee as described on the previous page.
9. If necessary, adjust the balancing handwheel (20) of the squeegee.

Figure 9



S300320

RECOVERY SYSTEM**TROUBLESHOOTING****OPEN CIRCUIT**

The suction motor fuse determines the open circuit. This system allows to prevent the suction motor and its circuits from being damaged in case of short circuit.

If there is an open in the electrical circuit, the possible causes are the following:

1. The motor is damaged (check the motor brushes/motor electrical input).
2. Damaged cable (check all cable and connection insulation integrity).

DIRTY WATER SUCTION IS INSUFFICIENT OR THERE IS NO SUCTION**Possible cause:**

1. The float automatic closing (42) is activated because the water recovery tank (39) is too full (empty the water recovery tank).
2. Dirty float shield (42) (clean it).
3. The tank cover (36) is not correctly positioned (place it correctly).
4. The tank cover gasket is not efficient or the compensating hole (38) is obstructed (remove the causes).
5. The squeegee or the suction hose is obstructed or damaged (clean or repair/replace them)
6. The electrical motor brushes are worn (replace the electrical motor brushes).
7. Malfunction in the electrical suction motor (repair or replace the electrical motor).
8. Burned fuse (remove the cause and replace the fuse)
9. The suction ON/OFF switch (6) is broken (replace it).
10. The wiring harness is damaged (repair it).
11. The suction motor electromagnetic switch is broken (replace it).

THE SQUEEGEE LEAVES LINING OR DOES NOT COLLECT WATER**Possible cause:**

1. There is debris under the squeegee lip (remove them).
2. The squeegee rubber lips are torn or worn (replace them)
3. The squeegee is unbalanced [balance it by means of the handwheel (20)].

DRIVE MOTOR ELECTRICAL INPUT CHECK (for "20BT" version only)

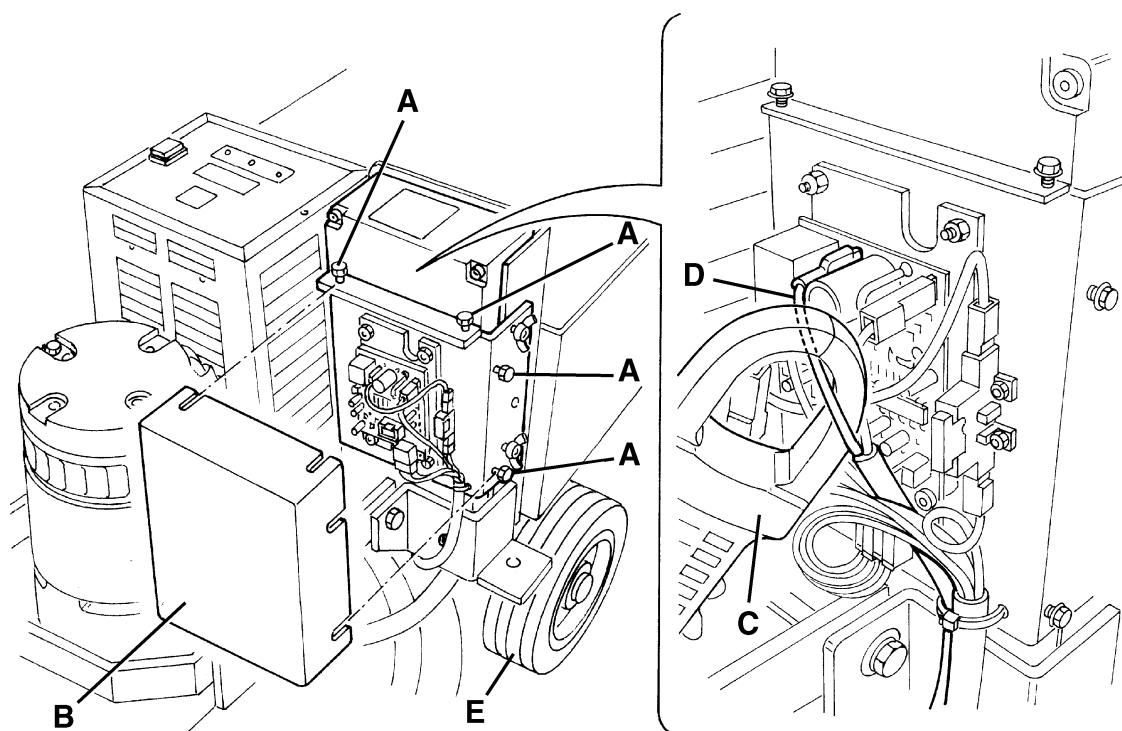


Warning:

This procedure must be performed by qualified personnel only.

1. Drive the machine on a level ground.
 2. Turn the key (64) to "0".
 3. If there is recovery water in the tank (39), drain it through the hose (25).
 4. If there is detergent in the tank (40), drain it through the hose (26).
 5. Remove the supplied key (32) from its housing and remove the tank assembly fastening screw (35).
 6. Carefully lift the tank assembly (53) by means of the handlebar (10).
 7. Loosen the screws (A) and remove the drive electronic board cover (B).
 8. Set an ammeter (C) on the drive motor cable (D).
 9. Turn the ignition key (64) to "I" position.
 10. Set the drive speed adjuster (66) at the maximum speed.
 11. Lift the drive wheels (E) from the ground and keeping them well lifted, activate the drive control levers (65) and check that the drive motor input is max 2,5A at 24V.
Release the levers (65) and when the wheels (E) stop, lower them on the ground; turn the key (64) to "0".
- If the electrical input is higher, perform the following operations to detect and correct the causes:
- Remove from the drive wheels shaft all the possible amounts of dirt or wrapped-round materials (ropes, clothes, etc.), which prevent or slow down its rotation.
 - If necessary, carry out the motor brush check (see the procedure on the following page).
 - If necessary, disassemble the motor (see the procedure on the following pages), clean it and check its moving parts.
- If the above-mentioned procedures do not lead to a correct electrical input, it is necessary to replace the motor (see the procedure on the following pages).
12. Carry out steps from 1. to 10. in the reverse order.

Figure 1



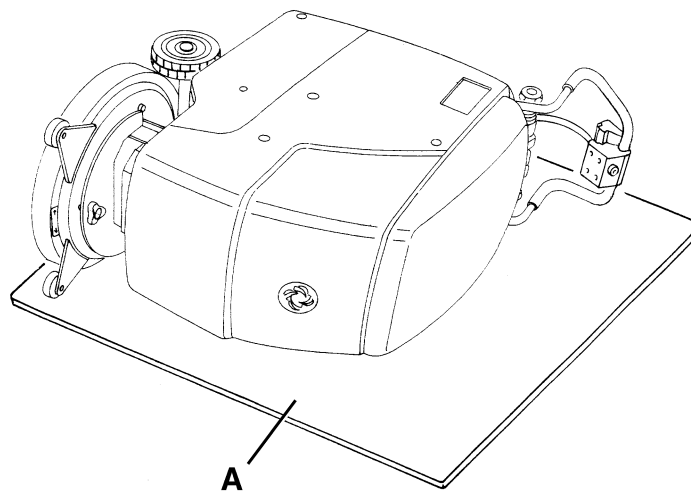
S300488

DRIVE SYSTEM

DRIVE MOTOR BRUSH (OR CARBON BRUSH) CHECK AND REPLACEMENT (for "20BT" version only)

1. Remove the brush (16).
2. Turn the key (64) to "0".
3. Disconnect the battery connector (33).
4. Lay down the machine on one side, operating as described below:
 - Remove the suction cap (see the related paragraph).
 - If there is recovery water in the tank (39), drain it through the hose (25).
 - If there is detergent in the tank (40), drain it through the hose (26).
 - Remove the supplied key (32) from its housing and remove the tank assembly fastening screw (35).
 - Carefully lift the tank assembly (53) by means of the handlebar (10).
 - Disconnect the battery (47) negative cable (-).
 - Disconnect the other cables of the batteries.
 - Remove the batteries (47).
 - Remove the battery frame (61).
 - Carefully lower the tank assembly (53) by means of the handlebar (10).
 - Lay down the machine on one side and set it down carefully on proper guards (A).
 - Open the tank assembly (C) completely by means of the handlebar (B).
5. Remove the upper drive motor fastening screws (D).
6. Remove the wheel axle screws (E) and loosen the screws (O).
7. Turn the drive motor (F) slightly on the wheel axle.
8. Clean the exterior part of the drive motor (F) from dirty and dust, then mark the reciprocal position (G) between the cover (H) and the motor body (I).
9. Carefully remove the screws (L) and the cover (H).
10. Check if the two brushes (M) are worn. The brushes are worn when there is not sufficient contact with the motor armature, because of their use, of the contact surface which is not integral or because the thrust spring is broken, etc.
11. If necessary, remove the brushes to replace them, by disengaging the lead-in wires (N).
12. It is advisable to replace all the brushes at the same time.
13. Install in the reverse order of removal.

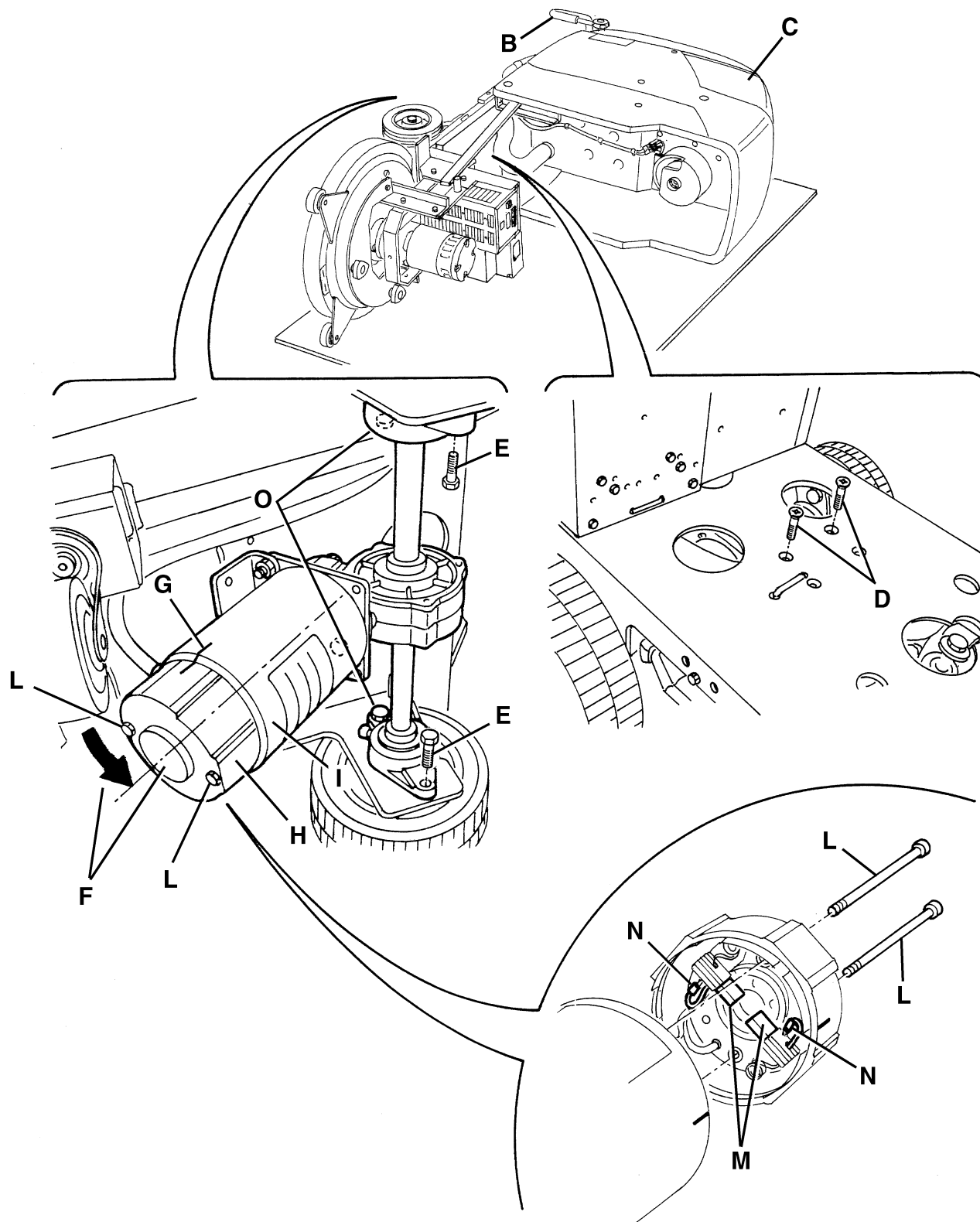
Figure 2



S300489

DRIVE MOTOR BRUSH (OR CARBON BRUSH) CHECK AND REPLACEMENT (for "20BT" version only) (Continues)

Figure 3



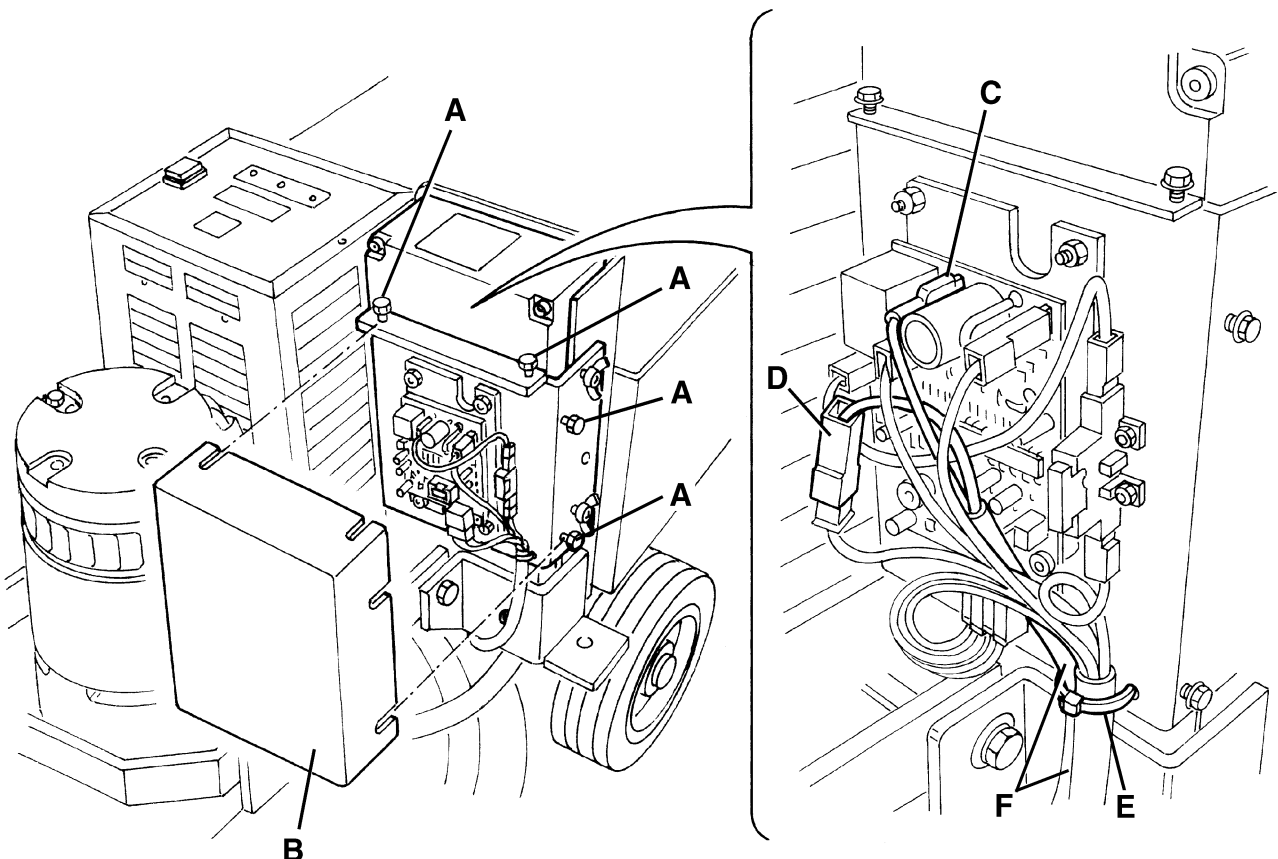
S300490

DRIVE SYSTEM

DRIVE MOTOR REPLACEMENT (for "20BT" version only)

1. Remove the brush (16).
2. Turn the key (64) to "0".
3. Disconnect the battery connector (33).
4. Loosen the screws (A) and remove the drive electronic board cover (B).
5. Disconnect the electrical connections (C) and (D) from the drive motor.
6. Cut the clamp (E) and remove the drive motor harness (F).
7. Lay down the machine on one side, operating as described below:
 - Remove the suction cap (see the related paragraph).
 - If there is recovery water in the tank (39), drain it through the hose (25).
 - If there is detergent in the tank (40), drain it through the hose (26).
 - Remove the supplied key (32) from its housing and remove the tank assembly fastening screw (35).
 - Carefully lift the tank assembly (53) by means of the handlebar (10).
 - Disconnect the battery (47) negative cable (-).
 - Disconnect the other cables of the batteries.
 - Remove the batteries (47).
 - Remove the battery frame (61).
 - Carefully lower the tank assembly (53) by means of the handlebar (10).
 - Lay down the machine on one side and set it down carefully on proper guards (G).
 - Open the tank assembly (I) completely by means of the handlebar (H).
8. Remove the upper drive motor fastening screws (J).
9. Remove the wheel axle screws (K) and loosen the screws (O).
10. Turn the drive motor (L) slightly on the wheel axle.
11. Remove the screws (M) and carefully remove the drive motor by disengaging the reduction unit (N) connecting worm screw.
12. Install in the reverse order of removal.

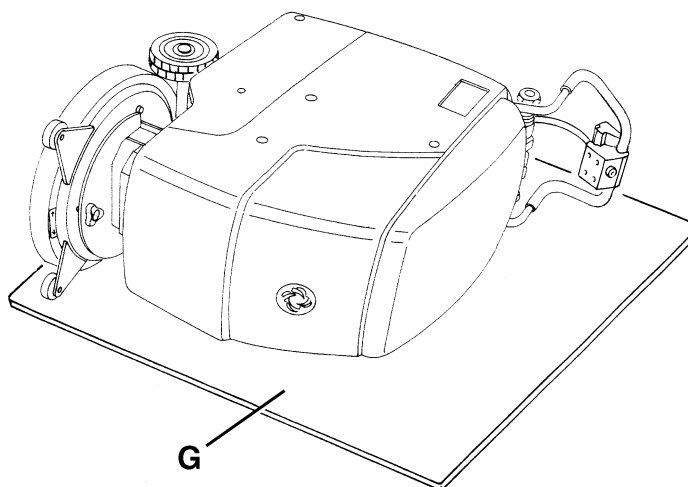
Figure 4



S000491

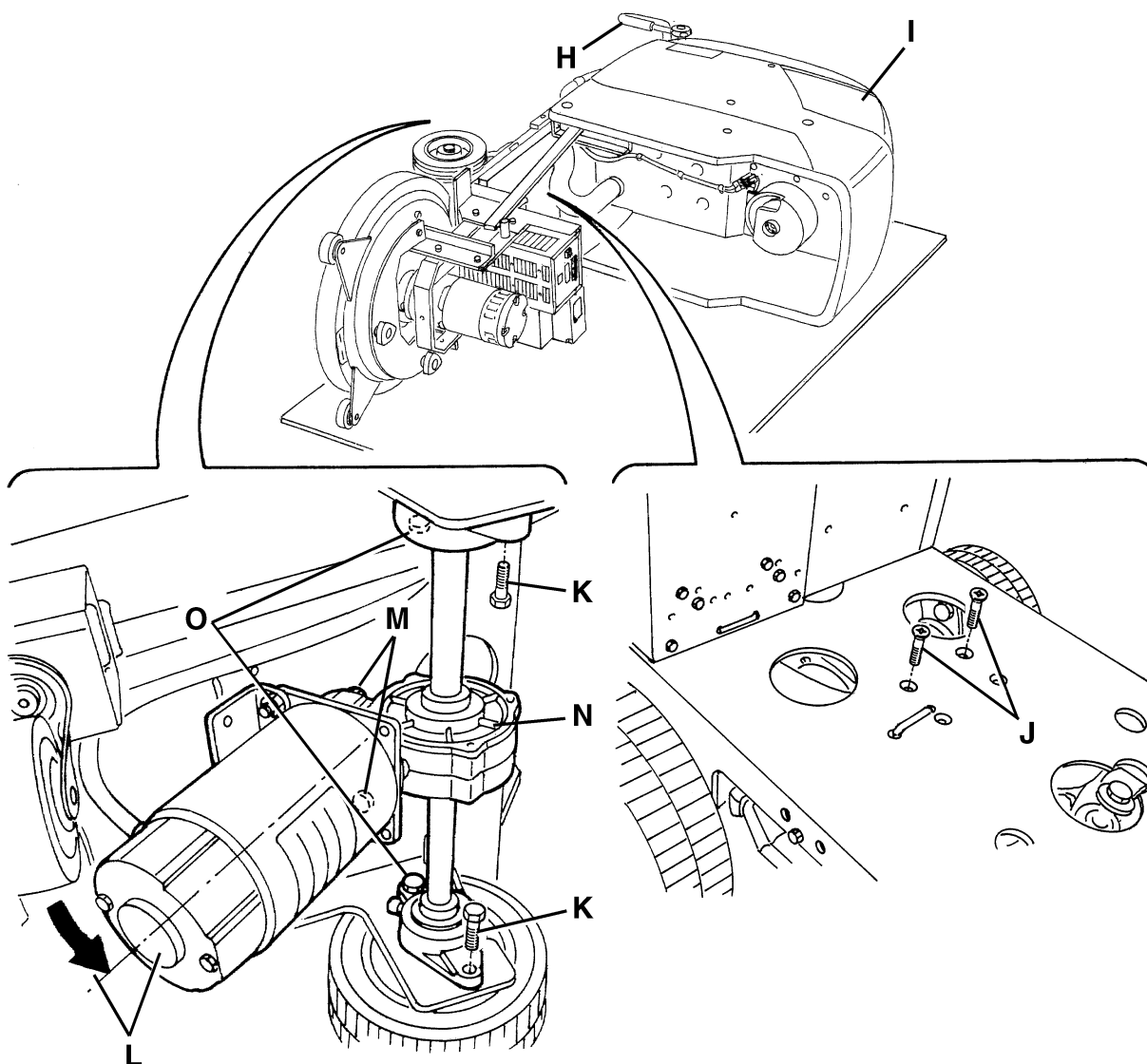
DRIVE MOTOR REPLACEMENT (for "20BT" version only) (continues)

Figure 5



S300492

Figure 6

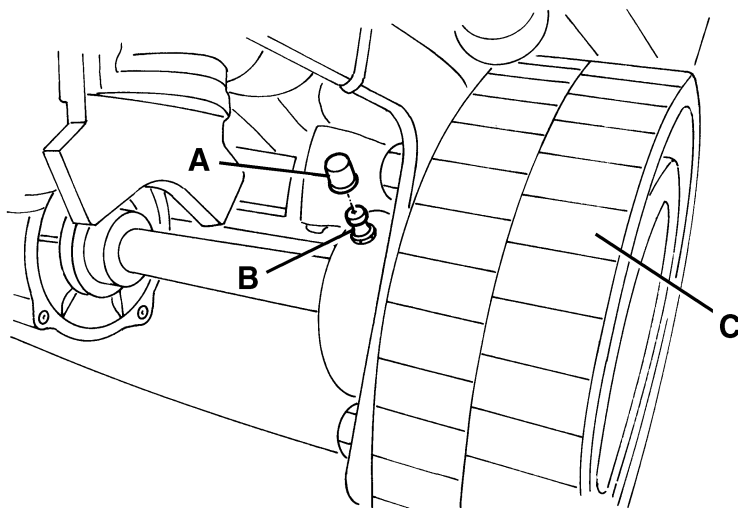


S300493

DRIVE MOTOR BEARING GREASING (for "20BT" version only)

1. Turn the key (64) to "0".
2. Remove the protection caps (A) from the lubricators (B) of each drive wheel (C).
3. By means of a lubricator apply AIVAVIA GREASE 3 or a "Li soap" mineral grease.
4. Clean the lubricators (B) and install the protection caps (A) again.

Figure 7

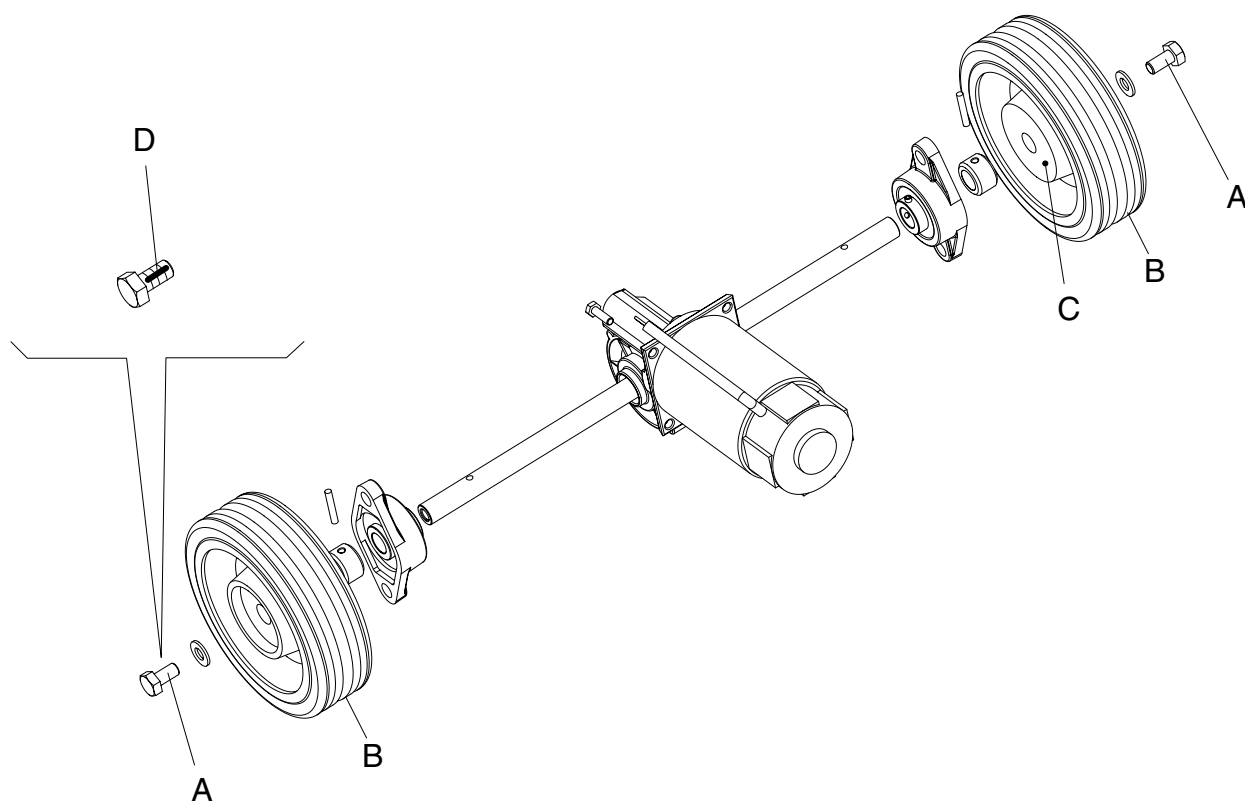


S300494

DRIVE WHEEL REPLACEMENT (for "20BT" version only)

1. Turn the key (64) to "0".
2. Slightly lift the machine drive wheels.
3. Remove the screws (A).
4. Remove the wheels (B).
5. Install the new wheels (B), consider that the right wheel is different from the left wheel; the right wheel has a blue label (C).
6. Apply a strip (D) of Loctite 243 at half of the length of the screws (A), then loosen the screws (A) at 50 Nm tightening torque.
7. Lower the machine drive wheels.

Figure 8



S300495

DRIVE CONTROL MICRO-SWITCH ADJUSTMENT CHECK (for "20BT" version only)



Note:

Perform this check when there is not a machine progressive start at the activation of the drive control levers (65), but there is a sudden start.

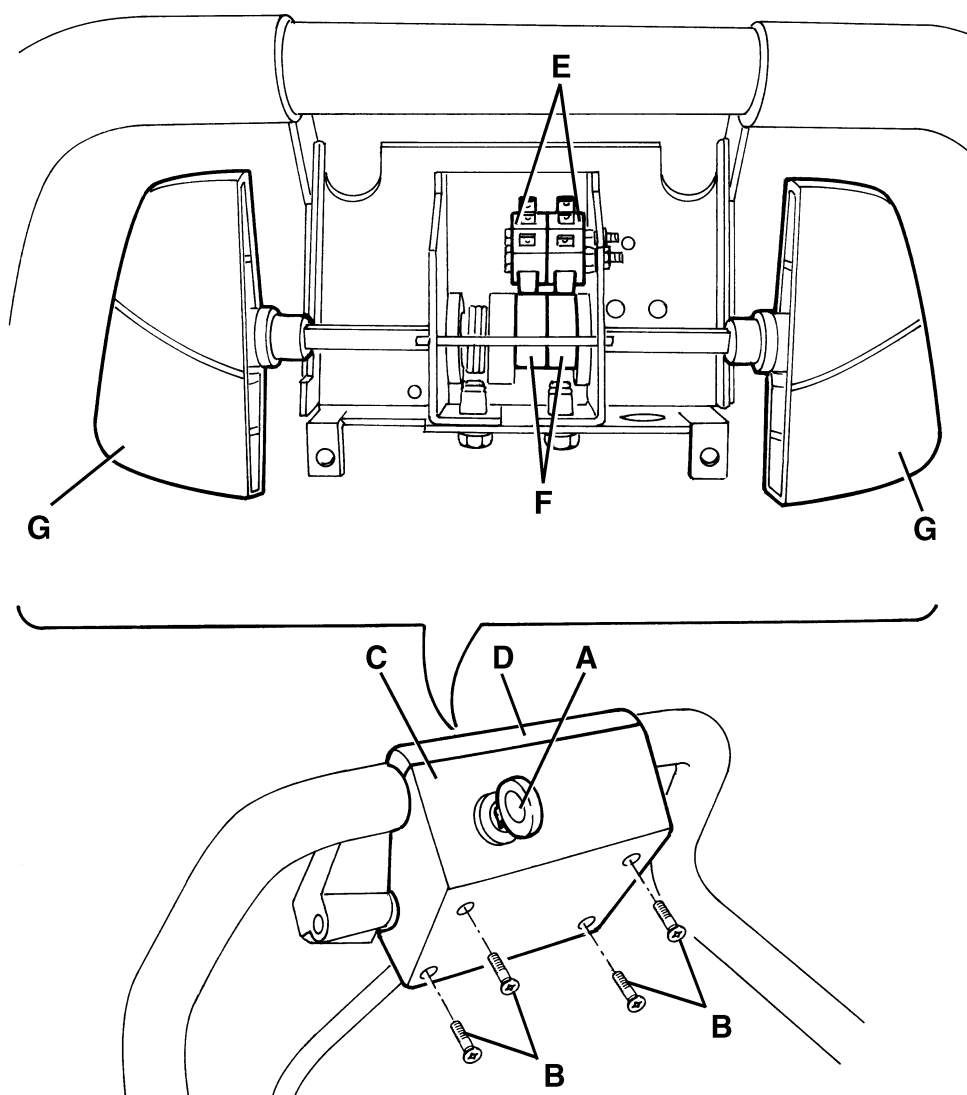
1. Turn the ignition key (A) to "0" position.
2. Remove the half bearing fastening screws (B).
3. Slightly move the half bearings (C) and (D).
4. Disconnect the electrical connections from the micro-switches (E) and recover the half bearings (C) and (D).
5. Activate the drive control levers (G) forward and backward and check that the micro-switch (E) related to black cam, between the two cams (I), (connected to white cables) is activated first.

Check both micro-switches operation (E) by means of a tester.

If the test is negative, it is necessary to replace the cams and micro-switches assembly.

6. Carry out steps from 2. to 4. in the reverse order.

Figure 9



S300496

TROUBLESHOOTING

OPEN CIRCUIT

The drive motor fuse determines the open circuit. This system allows to prevent the drive motor circuits from being damaged under overload conditions.

If there is an open in the electrical circuit, the possible causes are the following.

Drive motor; the fuse burns and opens the electrical circuit. Possible causes:

1. There are debris or cords under the machine or around the drive wheels (remove debris or cords).
2. The motor is damaged (check the motor brushes/motor electrical input).
3. The slope is excessive (do not use the drive system to pass over slopes higher than 2%)

THE MACHINE DOES NOT MOVE

Possible causes:

1. The battery voltage is too low (charge the battery).
2. The electronic board fuse is burned (replace it).
3. The drive electronic board has a malfunction (replace it).
4. The drive control lever micro-switches are broken (replace them).
5. The harness is damaged (repair it).

THE MACHINE START IS SUDDEN, NOT PROGRESSIVE

Possible causes:

The drive control micro-switches with cams assembly does not work (replace it).

(WET OR GEL) BATTERY REMOVAL/INSTALLATION AND SETTING

Removal

1. Drive the machine on a level ground.
2. Be sure the switches (5) and (6) are in the 0 position (off). For "20BT" version machines, turn the key (64) to "0".
3. Disconnect the battery connector (33).
4. If there is recovery water in the tank (39), drain it through the hose (25).
5. If there is detergent in the tank (40), drain it through the hose (26).
6. Remove the supplied key (32) from its housing and unscrew the tank assembly fastening screw (35).
7. Carefully lift the tank assembly (53) by means of the handlebar (10).
8. Disconnect the battery cables (47).
9. Remove the batteries (47).
10. If necessary, remove the battery frame (61).

Setting (WET or GEL)

11. If the type of battery chosen to be installed is different from the removed one (not Wet but Gel, or vice versa), before installing the batteries on the machine and connect the new batteries, the machine electronic board and battery charger setting must be performed, proceeding in the following way.

Machine setting

12. Ensure that the battery connector (33) is completely disconnected.
13. (For "20BT" version only) Loosen the wing nuts (A) and move aside the drive electronic board (B).
14. Remove the screws (C) and carefully remove the electric component box cover (D) making it slide upwards.
15. On the electronic board place the micro-switch (F) to the Wet (Pb) or Gel position according to the type of battery that is to be installed.



WARNING:

Do not move the adjacent switch (E), which is related to the battery charger.

16. Reinstall the electric component box cover (D) and install the screws (C).
17. Reinstall the drive electric board (B) and the wing nuts (A).

Battery charger setting

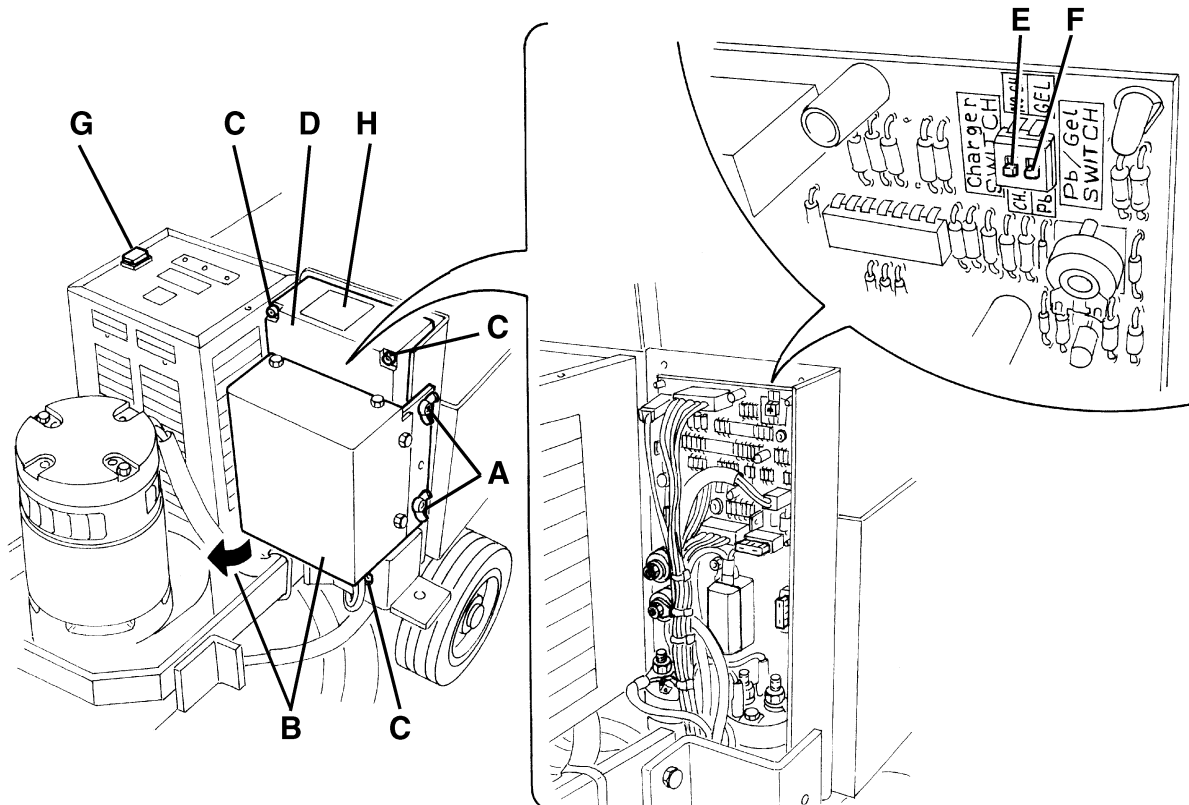
18. Place the selector (G) to the Wet (Pb) or Gel position according to the type of battery that is to be installed.

Battery installation and charge

19. Install the batteries on the machine according to the diagram (H) and carry out steps 8., 9. and 10. in the reverse order.
20. If necessary, charge the batteries (see the procedure in the Use and Maintenance Manual).
21. Carry out steps from 1. to 7. in the reverse order.

(WET OR GEL) BATTERY REMOVAL/INSTALLATION AND SETTING
(Continues)

Figure 1



S300497

ELECTRICAL SYSTEM

BATTERY CHARGE



CAUTION!

Charge the batteries when the warning light (3 or 4) turns on and at the end of every cleaning. Keeping the batteries charged make their life last longer.



CAUTION!

When the batteries are discharged, recharge them as soon as possible, as that condition makes their life shorter.

Check for battery charge at least once a week.



WARNING!

Battery charging produces explosive hydrogen gas. Charge the batteries only in well-ventilated areas and far from naked flames.

Do not smoke during battery charging.

Keep the tank assembly open while recharging the battery.



WARNING!

Pay attention during battery recharging because there can be battery liquid leakages. The battery liquid is corrosive. If it comes in contact with the skin or eyes, rinse thoroughly with water and consult a physician.

1. Drive the machine on a level ground.
2. Remove the supplied key (32) from its housing and remove the tank assembly fastening screw (35).
3. Carefully lift the tank assembly (53) by means of the maneuver handle (10).
4. For lead batteries only:
 - Check for correct level of electrolyte inside the battery; if necessary, top up through the caps (48).
 - Leave the caps (48) open for next recharging.
 - Clean (if necessary) the upper surface of the battery.
5. Proceed with recharging the battery according to one of the following ways, depending on the presence of the electronic battery charger (50).

BATTERY CHARGE (Continues)

Battery charging with (optional) electronic battery charger installed on the machine

1. For lead batteries only:
 - Check for correct level of electrolyte inside the battery; if necessary, top up through the caps (48).
 - When the correct level is reached, close the caps (48) and clean (if necessary) the upper surface of the battery.
2. Connect the battery charger electrical connector (30) to the electrical system (the system voltage and frequency must be compatible with the battery charger values: see the battery charger OPERATING MANUAL).



Note:

When the battery charger is connected to the electrical system, all machine functions are automatically cut off.

When the red warning light (4) on the control panel turns on (only with optional battery charger installed on the machine), it shows that the battery charger is charging the batteries.

3. When the red warning light (4) turns off, the battery charging is completed.
4. Once the battery charging is completed, disconnect the battery charger electric connector (30) from the electric system and hook it to its housing on the machine.
5. Carefully lower the tank assembly (53) by means of the maneuver handle (10).
6. Remove the supplied key (32) from its housing and install the tank assembly fastening screw (35).
7. Now the machine is ready to be used.



Note:

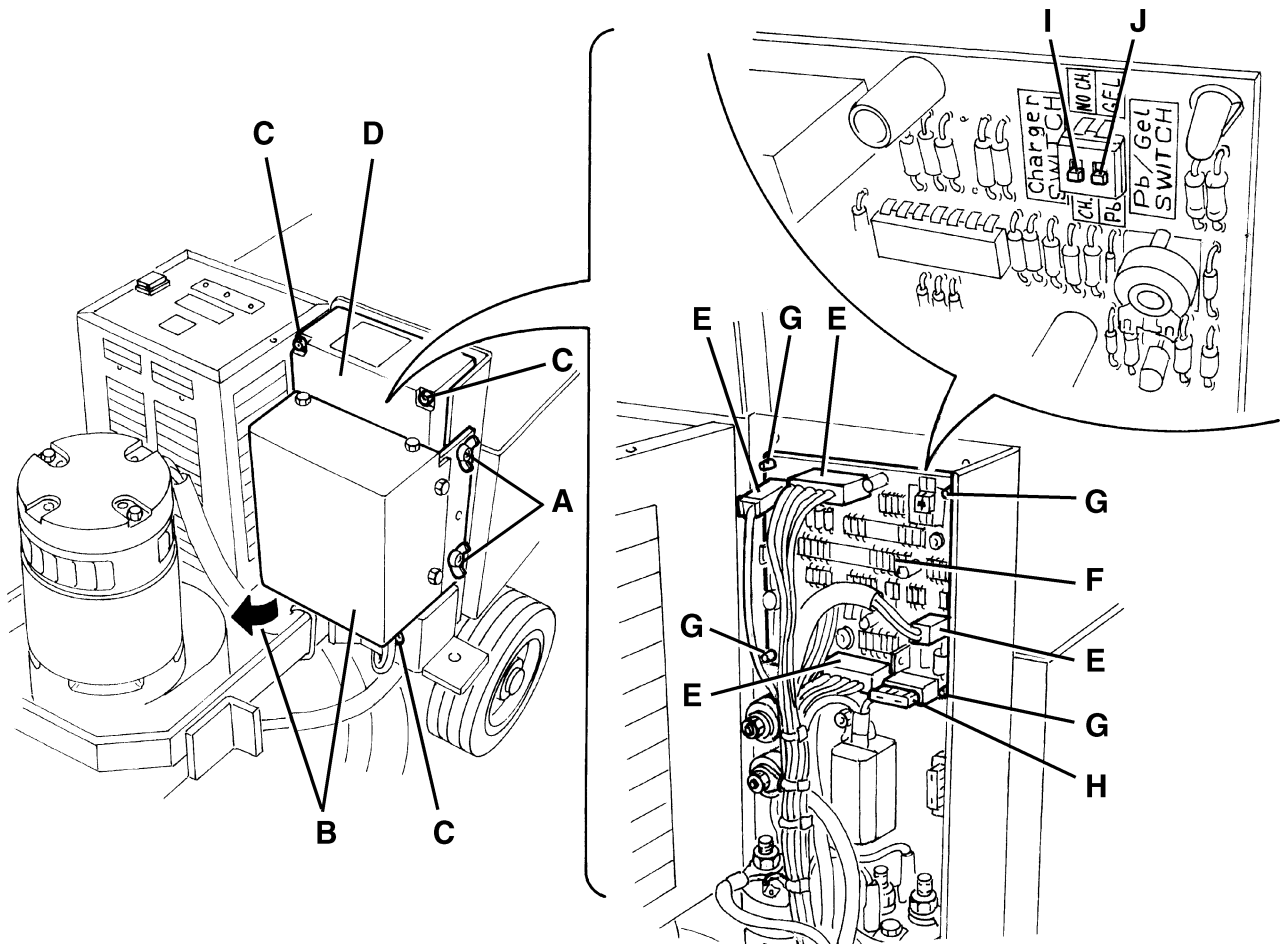
For further information about the battery charger operation (50), see the related Manual.

ELECTRICAL SYSTEM

MAIN ELECTRONIC BOARD REPLACEMENT

1. Drive the machine on a level ground.
2. Check that the switches (5) and (6) are in the "0" position (off). For "20BT" version machines, turn the key (64) to "I".
3. Disconnect the battery connector (33).
4. If there is recovery water in the tank (39), drain it through the hose (25).
5. If there is detergent in the tank (40), drain it through the hose (26).
6. Remove the supplied key (32) from its housing and remove the tank assembly fastening screw (35).
7. Carefully lift the tank assembly (53) by means of the handlebar (10).
8. (For "20BT" version only) Loosen the wing nuts (A) and move aside the drive electronic board (B).
9. Remove the screws (C) and carefully remove the electric component box cover (D) making it slide upwards.
10. Disconnect all the electronic board (F) electric connections (E).
11. Disengage the retainers (G) and remove the electronic board (F).
12. Install in the reverse order of removal, with the following change:
 - Be sure that the board/solenoid valve fuse (H) is installed.
 - Position the switch (J) related to the type of battery (Wet or Gel) and the switch (I) related to the battery charger (50) in the same position as the replaced board.

Figure 2



S300498

MAIN ELECTRICTRONIC BOARD SETTING CHECK (REFERENCE TABLES)

a) Pb/gel micro-selector

1	Pb	Lead/acid batteries
0	Gel	Gel batteries

V tol.: $\pm 0,1V$		
	Pb	Gel
Green -> yellow	20.0	21.4
Yellow -> red (flashing)	18.6	19.8

b) Battery charger micro-selector

0	Ch	For machines with SPE battery charger on board
---	----	--



WARNING:

The SPE battery charger must be connected to the battery + cable and to the CH faston of the electronic board to power the electronic board with +24V: if the battery charger is to be removed from the machine for service, set the selector to "NO Ch" to work with the machine when the battery charger is not installed.

c) Voltage references:

Working conditions:

A: All turned off

B: Brush on, vacuum motor off

C: Brush off, vacuum motor on

Upper 8-Way Connector MODU1 Type					
PIN		Description	Working conditions		
			A	B	C
1	CS	Switches	24V	24V	24V
2	BS	Brush switch	Indef.	24V	Indef.
3	VS	Aspirator switch	Indef.	Indef.	24V
4	LR	Red LED ($\Leftrightarrow$ EB2 PIN 2)	Indef.	depending on battery condition	
5	LG	Yellow LED ($\Leftrightarrow$ EB2 PIN 3)	Indef.	depending on battery condition	
6	LV	Green LED ($\Leftrightarrow$ EB2 PIN 4)	Indef.	depending on battery condition	
7	LC	LED common ($\Leftrightarrow$ EB2 PIN 1)	24V	24V	24V
8	V-	Aux 0V	0V	0V	0V

ELECTRICAL SYSTEM

2-Way Connector MODU1 Type						
PIN		Description	Working conditions			
			A	B	C	
1	W+	Solenoid valve +	24V	24V	24V	
2	W-	Solenoid valve -	Indef.	0V	Indef.	

Lower 8-Way Connector MODU1 Type						
PIN		Description	Working conditions			
			A	B	C	
1	CT	Electromagnetic switches	24V	24V	24V	
2	BT	Brush electromagnetic switch	Indef.	0V	Indef.	
3	VT	Aspirator electromagnetic switch	Indef.	Indef.	0V	
4	S-	- shunt	0V	0V	0V	
5	S+	+ shunt	0V	<40mV	0V	
6	V-	Power -	0V	0V	0V	
7	V+	Power +	24V	24V	24V	
8	BL	Battery charger output (for red LED)	Indef. (*)	Indef.	Indef.	

(*) depends on the connection of the battery charger to the mains: only the battery charger connected to the mains (ON) => 0V (high resistance) for the red LED cathode.

Fastons						
PIN		Description	Working conditions			
			A	B	C	
1	6,3	SPE battery charger power supply	24V (*)	24V (*)	24V (*)	
2	4,8	SPE battery charger red LED power supply	Indef. (**)	Indef.	Indef.	

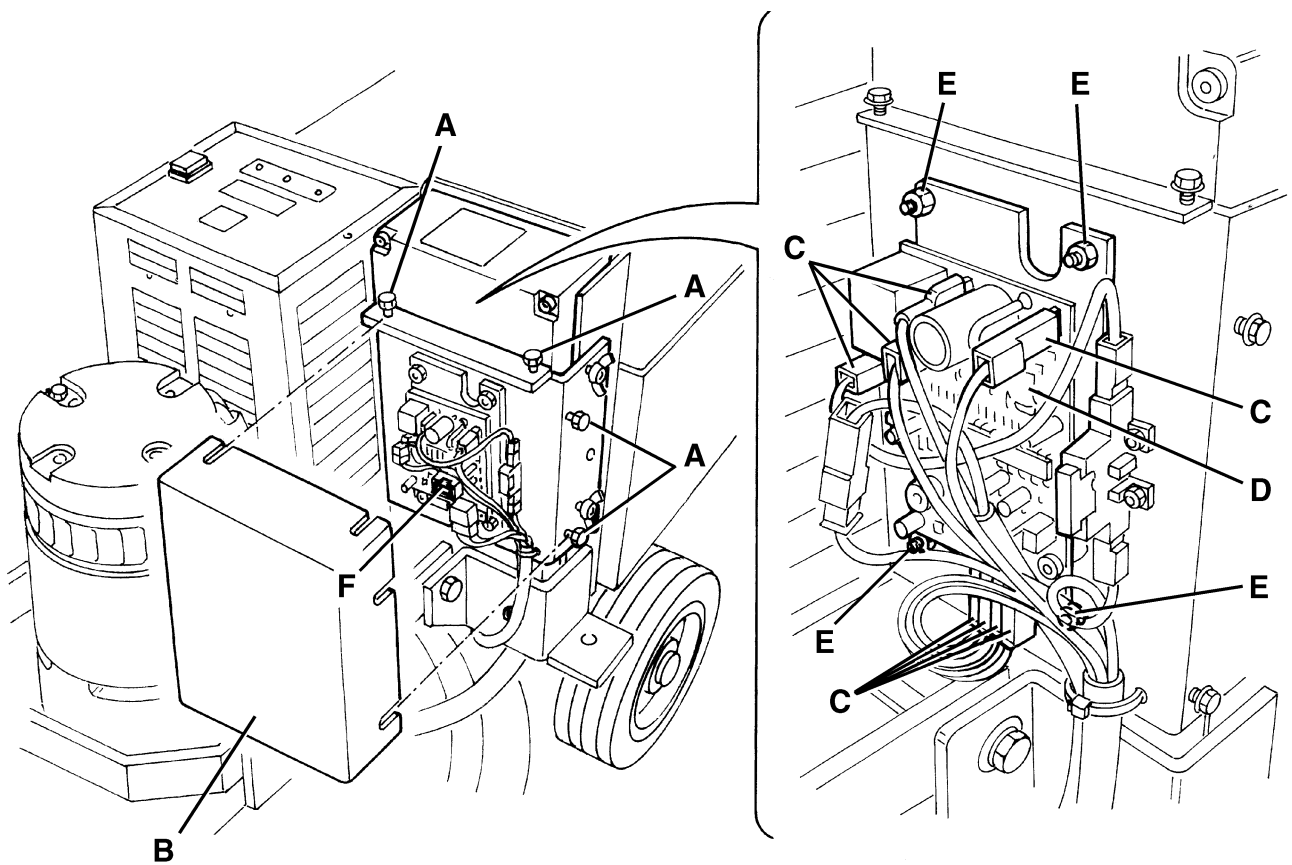
(*) depends on the connection of the battery charger to the mains: only with the battery charger connected to the mains (OFF) => 24V

(**) depends on the connection of the battery charger to the mains: only the battery charger connected to the mains (ON) => 0V (high resistance) for the red LED cathode.

DRIVE ELECTRONIC BOARD REPLACEMENT (for "20BT" version only)

1. Drive the machine on a level ground.
2. Turn the key (64) to "0".
3. Disconnect the battery connector (33).
4. If there is recovery water in the tank (39), drain it through the hose (25).
5. If there is detergent in the tank (40), drain it through the hose (26).
6. Remove the supplied key (32) from its housing and remove the tank assembly fastening screw (35).
7. Carefully lift the tank assembly (53) by means of the handlebar (10).
8. Loosen the screws (A) and remove the cover (B).
9. Disconnect all the drive electronic board (D) electric connections (C).
10. Remove the nuts (E) and remove the drive electronic board (D).
11. Install in the reverse order of removal, with the following change:
 - Be sure that the electronic board protection fuse (F) is installed.

Figure 3



S300500

ELECTRICAL SYSTEM

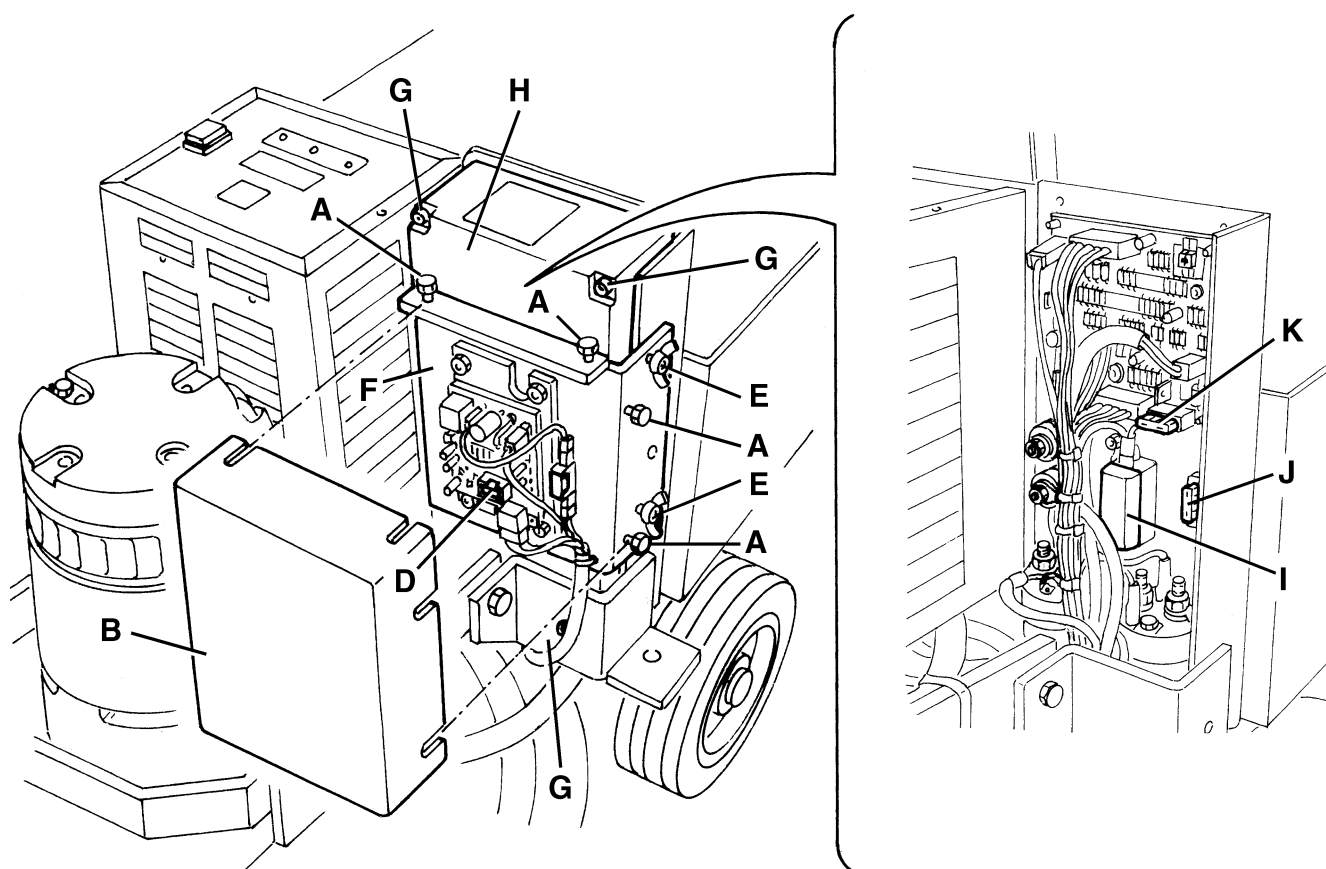
FUSE CHECK/REPLACEMENT

1. Disconnect the battery connector (33).
2. Drain the water from the tanks (39 and 40) by means of the hoses (25 and 26).
3. Remove the supplied key (32) from its housing and remove the tank assembly fastening screw (35).
4. Carefully lift the tank assembly (53) by means of the handle (10).
5. (for "20BT" version only) Loosen the screws (A) and remove the cover (B).
6. (for "20BT" version only) Check/replace the fuses:
 - Drive fuse (30A) (C)
 - Electronic board protection fuse (2A) (D)
7. (For "20BT" version only) Loosen the wing nuts (E) and move aside the drive electronic board support (F).
8. Remove the screws (G) and carefully remove the electric component box cover (H) making it slide upwards.
9. Check/replace the fuses:
 - Brush safety fuse (50A) (I)
 - Vacuum motor fuse (40A) (J)
 - Solenoid valve fuse (5A) (K)
10. Install in the reverse order of removal.

**NOTE:**

Be careful when assembling the fuses, especially those for the brush safety; if not assembled correctly, the electronic system for the protection of the brush motor overload can be affected. After fuse replacement, perform the brush motor overload protection electronic system operation check (see the related paragraph).

Figure 4



S300501

COMPONENT LAYOUT

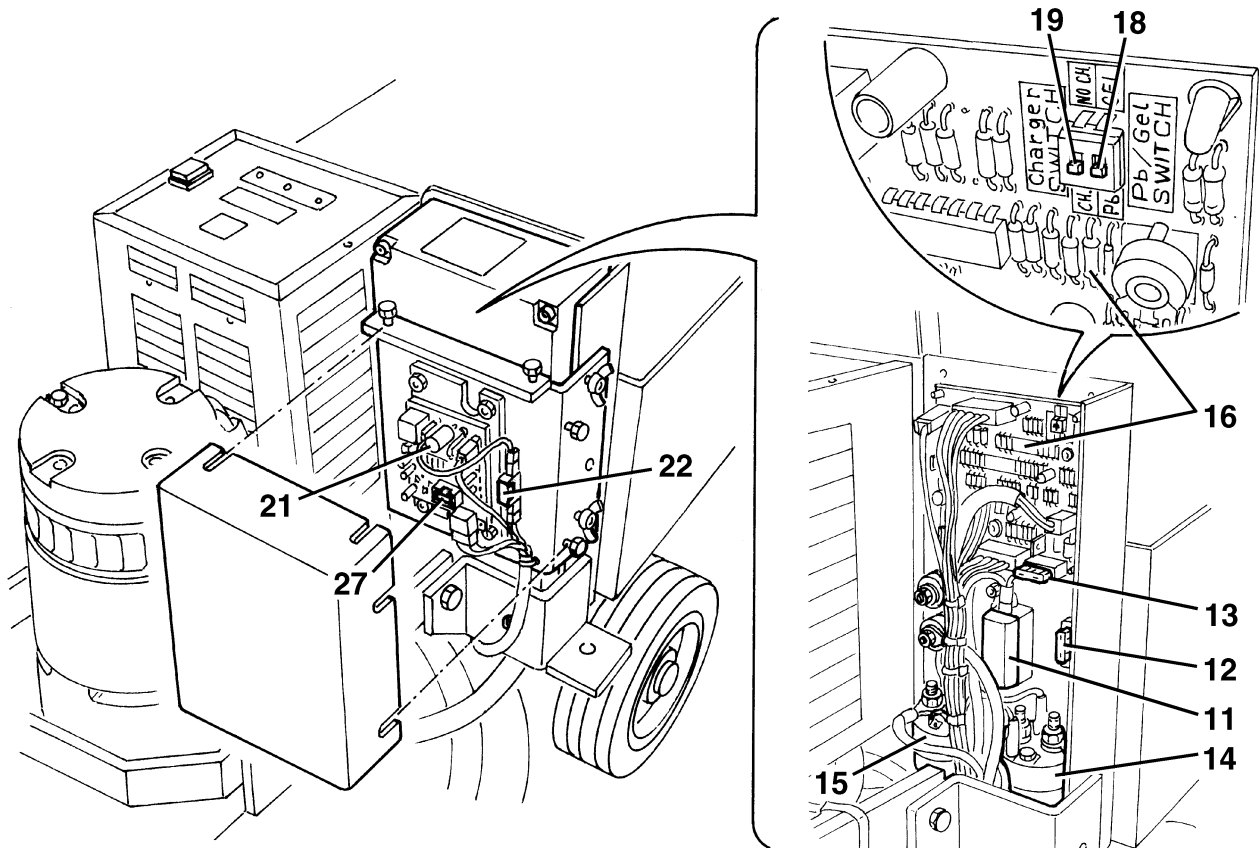


Note:

The symbol in brackets (..) after the name of the component refers to the wiring diagram (see the following pages).

- | | |
|---|--|
| 1. Charged battery warning light (green) | 17. Lead (WET) or gel (GEL) battery selector switch (positioned on the electronic battery charger) |
| 2. Half-discharged battery warning light (yellow) | 18. Battery charger presence/absence selector (positioned on the electronic board) |
| 3. Discharged battery warning light (red) | 19. Lead (WET) or gel (GEL) battery selector switch (positioned on the electronic board) |
| 4. Brush motor switch (SW1) | 20. Detergent supply solenoid valve (EV1) |
| 5. Suction motor switch (SW2) | 21. (*) Drive electronic board (EB3) |
| 6. Suction motor (M1) | 22. (*) Drive fuse (F4) |
| 7. Brush motor (M2) | 23. (*) Key switch (K1) |
| 8. Battery connection connector (C1) | 24. (*) Drive motor (M3) |
| 9. Batteries | 25. (*) Drive control levers |
| 10. Battery charger (CH1) | 26. (*) Drive speed adjuster |
| 11. Brush fuse (F1) | 27. (*) Drive electronic board fuse |
| 12. Aspirator fuse (F2) | 28. (*) Drive control lever micro-switches |
| 13. Board/solenoid valve fuse (F3) | |
| 14. Electromagnetic switch | |
| 15. Electromagnetic switch | |
| 16. Main electronic board (EB1) | |

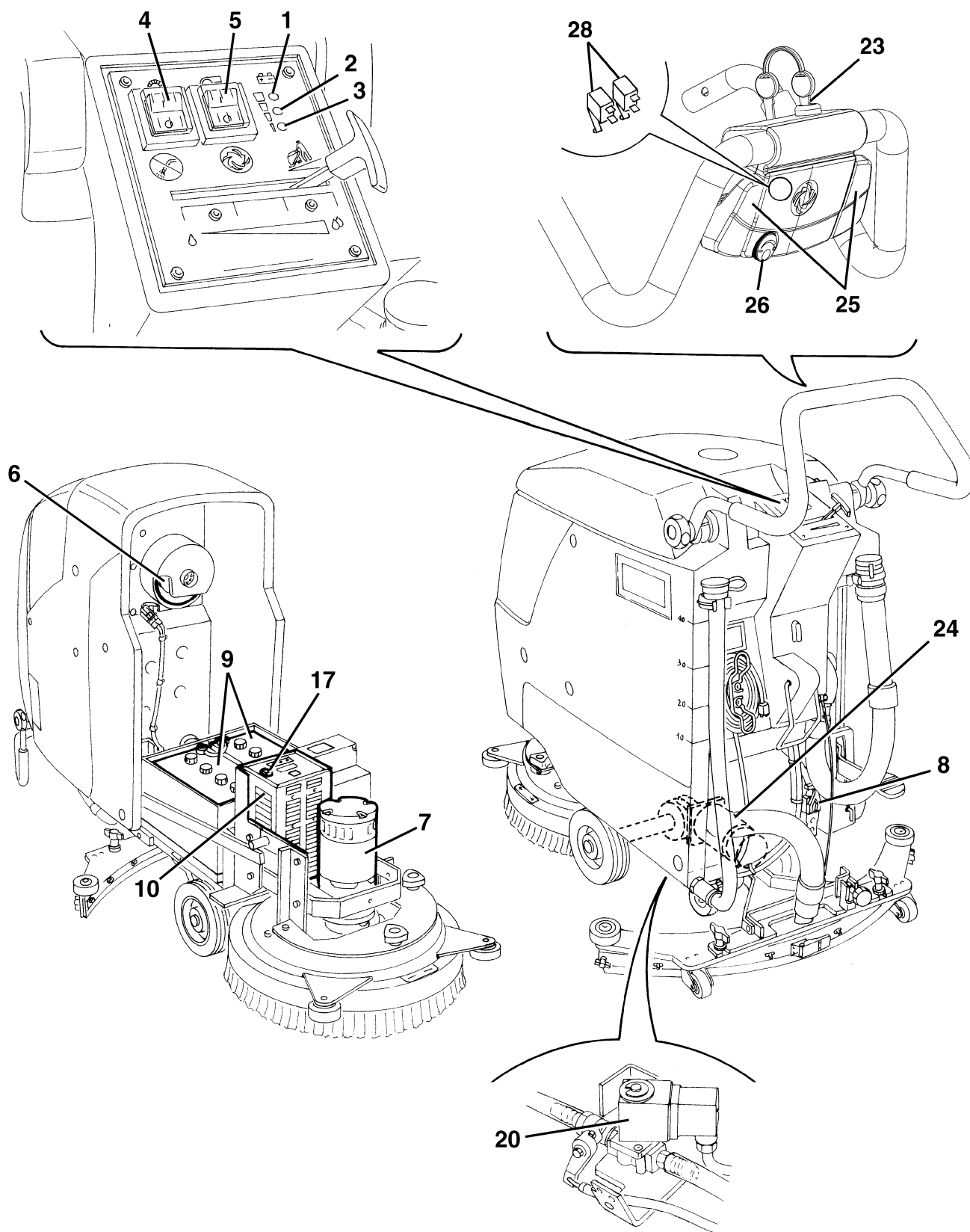
(*): for "20BT" version



S300502

SERVICE MANUAL

ELECTRICAL SYSTEM



S300509

WIRING DIAGRAM

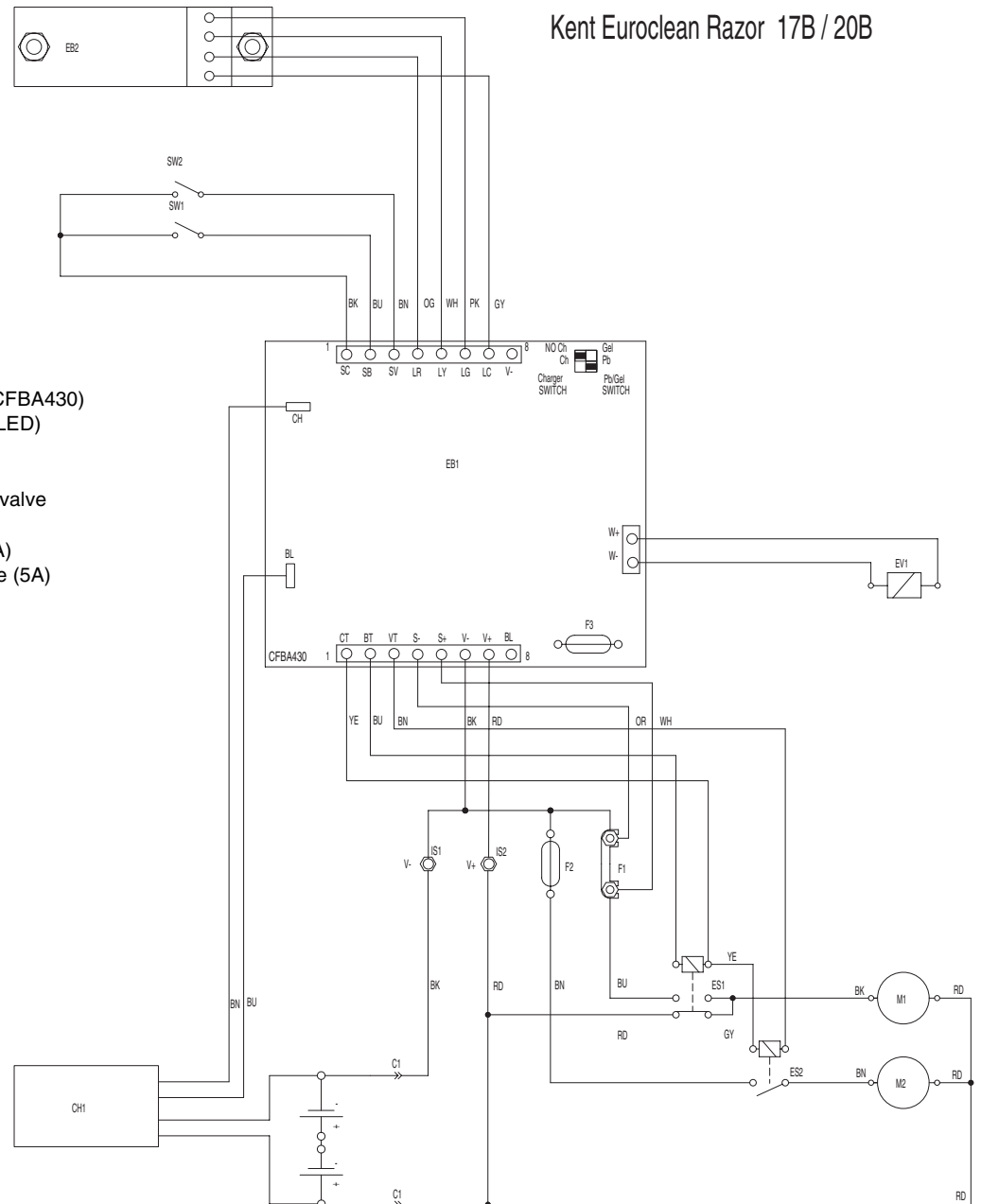
Kent Euroclean Razor 17B / 20B

Legend

CH1	Battery charger
C1	Battery connector
EB1	Electronic board (CFBA430)
EB2	LED board (CFBALED)
ES1	Brush switch
ES2	Aspirator switch
EV1	Aspirator solenoid valve
F1	Brush fuse (50A)
F2	Aspirator fuse (40A)
F3	Solenoid valve fuse (5A)
IS1	Negative insulator
IS2	Positive insulator
M1	Brush motor
M2	Aspirator motor
SW1	Brush switch
SW2	Aspirator switch

Colour code

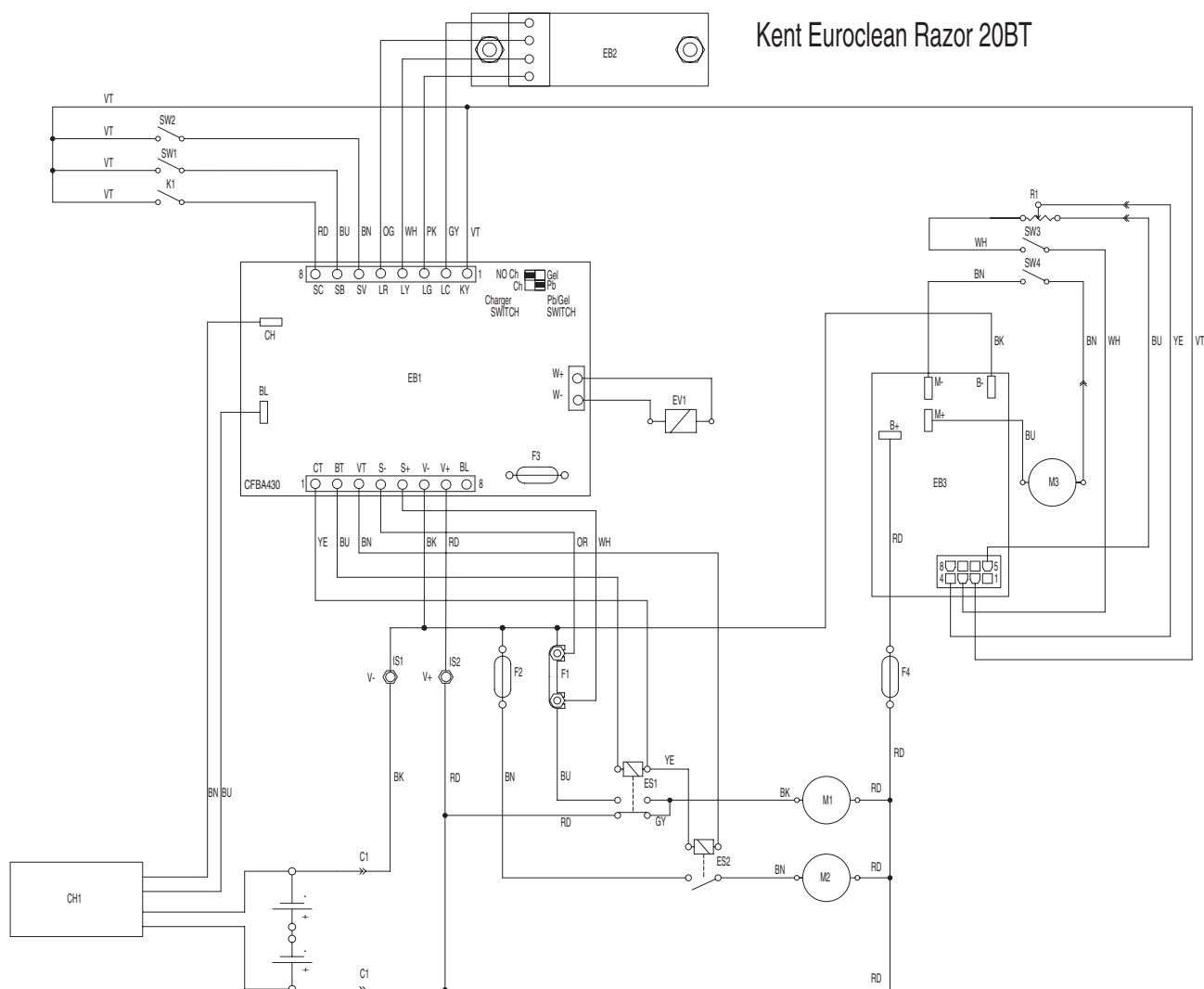
BK	Black
BU	Blue
BN	Brown
GN	Green
GY	Grey
OG	Orange
PK	Pink
RD	Red
VT	Violet
WH	White
YE	Yellow



S300510

SERVICE MANUAL

ELECTRICAL SYSTEM



S300511

Legend

CH1	Battery charger
C1	Battery connector
EB1	Electronic board (CFBA430)
EB2	LED board (CFBALED)
EB3	Traction electronic board
ES1	Brush switch
ES2	Aspirator switch
EV1	Aspirator solenoid valve
F1	Brush fuse (50A)
F2	Aspirator fuse (40A)
F3	Solenoid valve fuse (5A)
F4	Traction fuse (30A)
IS1	Negative insulator
IS2	Positive insulator
K1	Key switch
M1	Brush motor
M2	Aspirator motor
M3	Drive motor
R1	Drive speed governor
SW1	Brush switch
SW2	Aspirator switch
SW3	Traction control micro-switch
SW4	Drive motor micro-switch

Colour code

BK	Black
BU	Blue
BN	Brown
GN	Green
GY	Grey
OG	Orange
PK	Pink
RD	Red
VT	Violet
WH	White
YE	Yellow



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