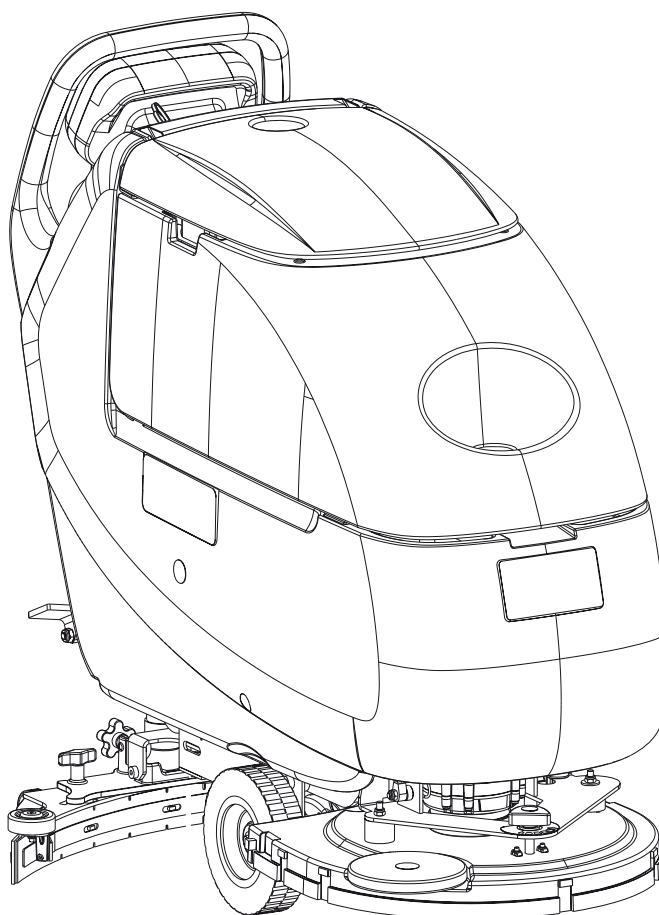


Razor™ 20 / 20T



SERVICE MANUAL

Kent model: 908 7200 020
908 7201 020

KENT

Simple. Clean.

9097065000(2) 2009-06

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GENERAL INFORMATION

GENERAL INFORMATION

CONVENTIONS

Forward, backward, front, rear, left or right are intended with reference to the operator's position, that is to say in driving position with the hands on the handlebar.

MACHINE LIFTING

**WARNING!**

Do not work under the lifted machine without supporting it with safety stands.

MACHINE TRANSPORTATION

**WARNING!**

Before transporting the machine, make sure that:

- *All covers are closed.*
- *The ignition key is removed.*
- *The machine is securely fastened to the means of transport.*

OTHER REFERENCE MANUALS

The following manuals are available at KENT Literature Service Department:

- KENT Razor™ 20 - Razor™ 20T: User Manual - Form Number 9097063000
- KENT Razor™ 20 - Razor™ 20T: Spare Parts List - Form Number 9097064000
- **Assembling Instruction** Hour meter Kit - Form Number 9096952000

- **Assembling Instruction** Extra Pressure Kit - Form Number 909 6759 000
- **Assembling Instruction** Splash Guard Kit - Form Number 909 6745 000

SAFETY

The following symbols indicate potentially dangerous situations. Always read this information carefully and take all necessary precautions to safeguard people and property.

GENERAL INFORMATION**SYMBOLS****DANGER!**

It indicates a dangerous situation with risk of death for the operator.

**WARNING!**

It indicates a potential risk of injury for people or damage to objects.

**CAUTION!**

It indicates a caution related to important or useful functions.

Pay careful attention to the paragraphs marked by this symbol.

**NOTE**

It indicates a remark related to important or useful functions.

**CONSULTATION**

It indicates the necessity to refer to the User Manual before performing any procedure.

GENERAL INSTRUCTIONS

Specific warnings and cautions to inform about potential damages to people and machine are shown below.

**DANGER!**

- *This machine must be used by properly trained operators only. Children or disabled people cannot use this machine.*
- *Do not wear jewels when working near electrical components.*
- *Do not work under the lifted machine without supporting it with safety stands.*
- *Do not operate the machine near toxic, dangerous, flammable and/or explosive powders, liquids or vapours: This machine is not suitable for collecting dangerous powders.*
- *Before performing any cleaning, maintenance, repair or replacement procedure disconnect the battery connector and remove the ignition key.*
- *Keep the battery far from sparks, flames and incandescent material. During the normal operation explosive gases are released.*
- *Battery charging produces highly explosive hydrogen gas. Keep the tanks lifted during battery charging and perform this operation in well-ventilated areas and away from naked flames.*

GENERAL INFORMATION



WARNING!

- To avoid any unauthorized use of the machine, remove the ignition key.
- Do not leave the machine unattended without being sure that it cannot move independently.
- Always protect the machine against the sun, rain and bad weather, both under operation and inactivity condition. Store the machine indoors, in a dry place: This machine must be used in dry conditions, it must not be used or kept outdoors in wet conditions.
- Before using the machine, close all doors and/or covers.
- Do not allow to be used as a toy. Close attention is necessary when used near children.
- Use only as shown in this Manual. Only Kent recommended accessories must be used.
- Take all necessary precautions to prevent hair, jewels and loose clothes from being caught by the machine moving parts.
- Do not use the machine on slopes with a gradient exceeding the specifications.
- Do not use the machine in particularly dusty areas.
- While using this machine, take care not to cause damage to people or objects.
- Do not bump into shelves or scaffoldings, especially where there is a risk of falling objects.
- Do not put any can containing fluids on the machine.
- The machine working temperature must be between +32°F and +104°F (0°C and +40°C).
- The machine storage temperature must be between +32°F and +104°F (0°C and +40°C).
- The humidity must be between 30% and 95%.
- When using floor cleaning detergents, follow the instructions on the labels of the detergent bottles.
- To handle floor cleaning detergents, wear suitable gloves and protections.
- Do not use the machine as a means of transport.
- Do not allow the brushes to operate while the machine is stationary to avoid damaging the floor.
- In case of fire, use a powder fire extinguisher, not a water one.
- Do not tamper with the machine safety guards and follow the ordinary maintenance instructions scrupulously.
- Do not allow any object to enter into the openings. Do not use the machine if the openings are clogged. Always keep the openings free from dust, hairs and any other foreign material which could reduce the air flow.
- Do not remove or modify the plates affixed to the machine.
- This machine cannot be used on roads or public streets.
- Pay attention during machine transportation when temperature is below freezing point. The water in the recovery tank or in the hoses could freeze and seriously damage the machine.
- Use brushes and pads supplied with the machine and those specified in the User Manual. Using other brushes or pads could reduce safety.
- In case of machine malfunctions, ensure that these are not due to lack of maintenance. Otherwise, request assistance from the authorised personnel or from an authorised Service Center.
- If parts must be replaced, require ORIGINAL spare parts from a Dealer or Authorised Retailer.
- To ensure machine proper and safe operation, the scheduled maintenance shown in the relevant chapter of this Manual, must be performed by the authorised personnel or by an authorised Service Center.
- Carefully read all the instructions before performing any maintenance/repair procedure.
- Do not wash the machine with direct or pressurised water jets, or with corrosive substances.
- The machine must be disposed of properly, because of the presence of toxic-harmful materials (batteries, etc.), which are subject to standards that require disposal in special centres (see the User Manual).
- Do not pull or carry the machine by the battery charger cable and never use the battery charger cable as a handle. Do not close a door on the battery charger cable, or pull the battery charger cable around sharp edges or corners. Do not run the machine on the battery charger cable.
- Keep the battery charger cable away from heated surfaces.
- Do not charge the batteries if the battery charger cable or the plug are damaged. If the machine is not working as it should, has been damaged, left outdoors or dropped into water, return it to the Service Centre.
- Before using the battery charger, ensure that frequency and voltage values, indicated on the machine serial number plate, match the electrical mains voltage.
- Do not smoke while charging the batteries.
- To reduce the risk of fire, electric shock, or injury, do not leave the machine unattended when it is plugged in. Before performing any maintenance procedure, disconnect the battery charger cable from the electrical mains.

GENERAL INFORMATION

TECHNICAL DATA

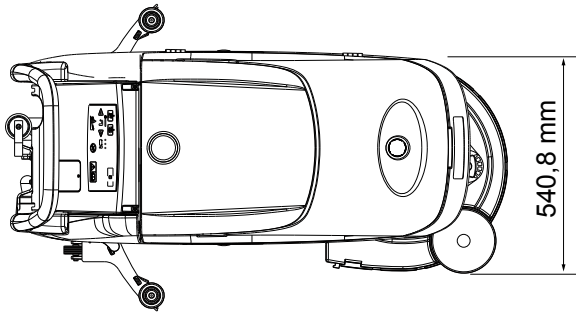
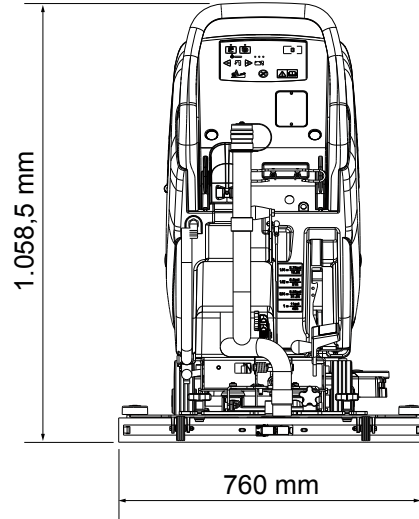
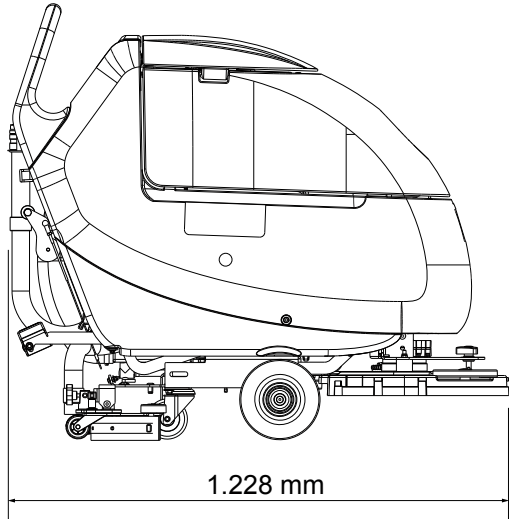
Modello	Razor™ 20 (1 brush/padholder, without drive system)	Razor™ 20T (1 brush/padholder, with drive system)
Machine height	41.7 in (1.058,5 mm)	
Solution tank capacity	11.1 USgal (42 litri)	
Recovery water tank capacity	11.1 USgal (42 litri)	
Min/max solution flow	0 ÷ 0.4 gpm (0 ÷ 1,6 lt/min)	
Solution/clean water autonomy	0,3 gpm (1,1 lt/min) ~ 36 min Media/Average	
Front wheel diameter	7,9 in (200 mm)	
Front wheel specific pressure on the floor (*)	130 psi (0.9 N/mm ²)	
Rear wheel specific pressure on the floor (*)	435.1 psi (3 N/mm ²)	
Rear wheel diameter	3.9 in (100 mm)	
Vacuum system motor power	0.44 hp (330 W)	
Drive system motor power	—	0.27 hp (200 W)
Drive speed (variable)	—	da 0 a 2.8 mph (da 0 a 4,5 km/h)
Max gradeability	—	16% - 9°
Working gradeability	2 % - 1°	
Sound pressure level (at the operator's position) (ISO 11201, ISO 4871) (LpA)	66 dB(A) ± 3dB(A)	
Sound pressure level (to the machine) (ISO 3744, ISO 4871) (LwA)	84 dB(A)	
Vibration level at the operator's arms (ISO 5349-1)	< 98,4 in/ s ² (< 2,5 m/s ²)	
Standard batteries	WET (2 x 12 V) 24V 105Ah	
Standard batteries autonomy	~ 3,2h	~ 2,6h
Battery compartment size (width x length x height)	13.8 x 13.8 x 11.8 in (350 x 350 x 300 mm)	
Vacuum system circuit capacity	41.5 in H ₂ O (1.055 mm H ₂ O)	
Cleaning width	20.9 in (530 mm)	
Squeegee width	29.9 in (760 mm)	
Machine maximum length	48.3 in (1.228 mm)	
Machine width without squeegee	21.3 in (540,8 mm)	
Brush diameter	20.9 in (530 mm)	
Deck right/left offset	3/- in (75,9/- mm)	
Brush distance from the ground (when lifted)	2,36 in (60,1 mm)	
Weight without batteries and with empty tanks	178.6 lbs (81 kg)	211.6 lbs (96 kg)
Maximum weight with batteries and full tanks	469.6 lbs (213 kg)	504.5 lbs (229 kg)
Brush motor power	0.64 hp (480 W)	
Brush speed	153 rpm	
Brush/pad-holder pressure with extra-pressure function turned off	45.2 lbs (20,5 kg)	
Brush/pad-holder pressure with extra-pressure function turned on (Optional)	-	66,1 lbs (30 kg)

(*) Machine test have been performed under the following conditions:

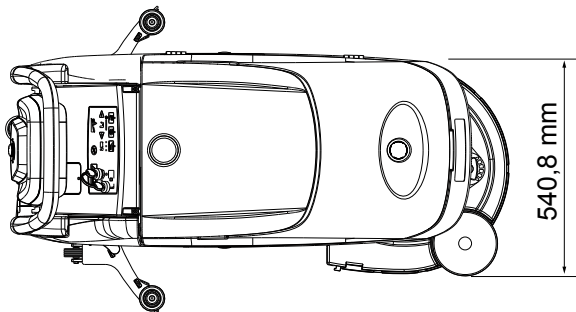
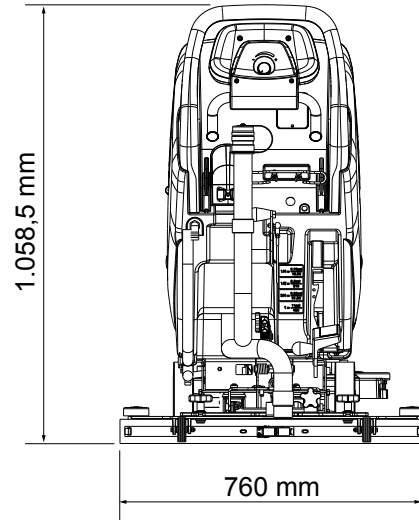
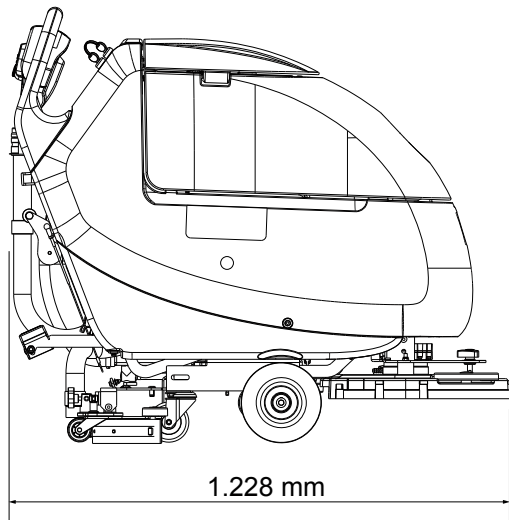
- Battery maximum size
- Brush and squeegee maximum size
- Full solution tank
- Optional equipment installed
- Wheel weight checked
- Each wheel print checked on cement
- Result expressed as maximum value for both front and rear wheels

GENERAL INFORMATION

DIMENSIONS RAZOR™ 20



DIMENSIONS RAZOR™ 20T



GENERAL INFORMATION

MAINTENANCE

The lifespan of the machine and its maximum operating safety are ensured by correct and regular maintenance

**WARNING!**

Read carefully the instructions in the Safety chapter before performing any maintenance procedure.

The following tables provides the scheduled maintenance. The intervals shown may vary according to particular working conditions, which are to be defined by the person in charge of the maintenance.

For instructions on maintenance procedures, see the following paragraphs.

SCHEDULED MAINTENANCE TABLE

Procedure	Daily, after machine use	Weekly	Every six months	Yearly
Battery charging				
Squeegee cleaning				
Brush/pad cleaning				
Tank and vacuum grid with float cleaning, and cover gasket check				
Squeegee blade check and replacement				
Solution filter cleaning				
Battery (WET) fluid level check				
Vacuum system motor filter cleaning				
Screw and nut tightening check			(1)	
Brush/pad-holder motor carbon brush check or replacement				
Vacuum system motor carbon brush check or replacement				
Drive system motor carbon brush check or replacement (For Razor™ 20T)				

(1): And after the first 8 working hours.

GENERAL INFORMATION

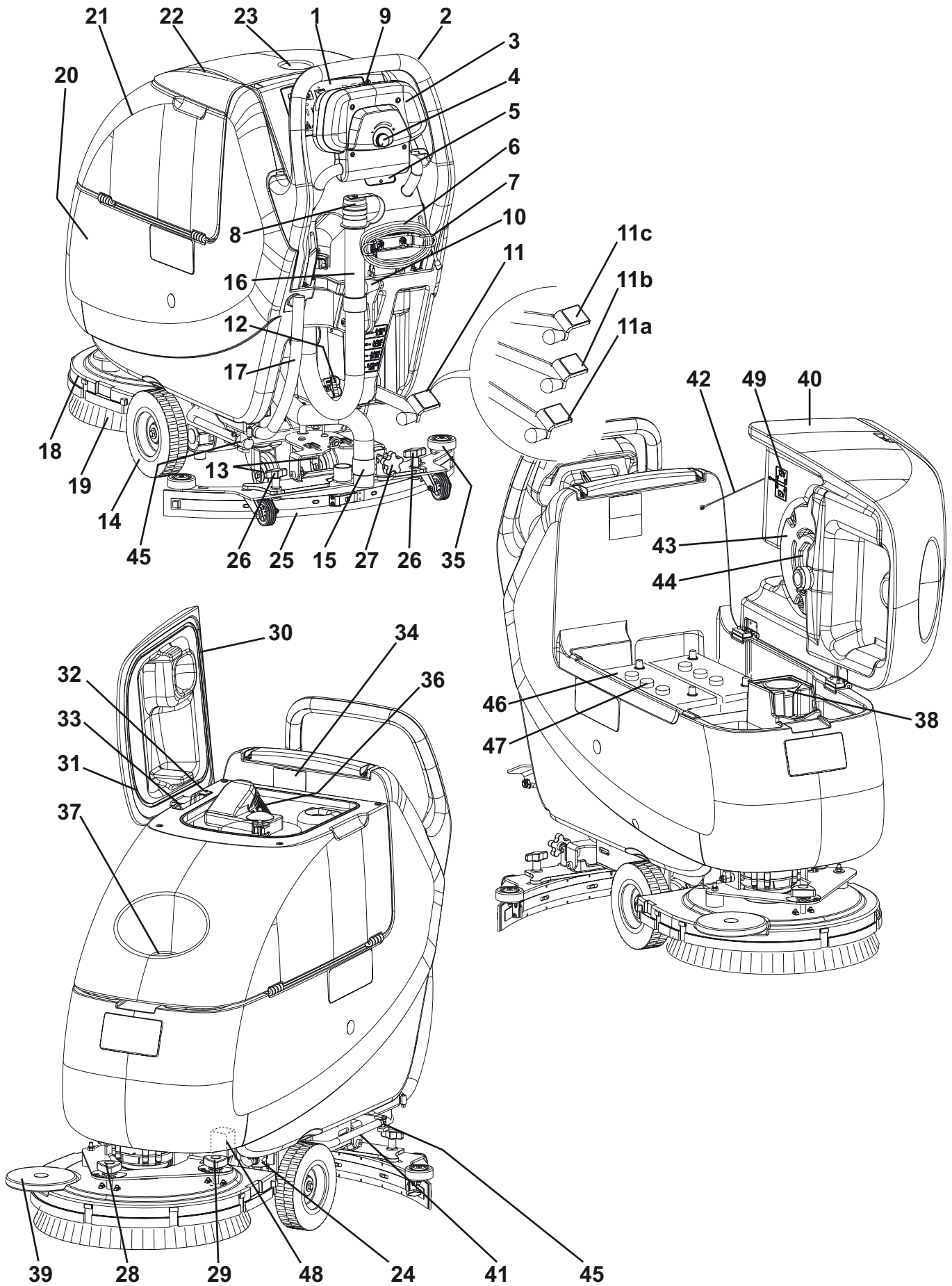
MACHINE NOMENCLATURE

Throughout this Manual you will find numbers in brackets – for example: (2). These numbers refer to the components indicated in these two nomenclature pages. Refer to these pages whenever you need to identify a component mentioned in the text..

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Control panel 2. Handlebar 3. Drive paddle (*) 4. Speed adjuster (*) 5. Battery charger data inspection window 6. Battery charger cable 7. Battery charger cable holder 8. Recovery water drain hose plug 9. Ignition key 10. Squeegee lifting/lowering lever 11. Deck lifting/lowering pedal 11a. Pedal position when deck is lifted 11b. Pedal position when deck is lowered 11c. Pedal position when the extra pressure function is on (if applicable) 12. Battery connector (red). This connector also works as EMERGENCY switch, to stop immediately all functions. 13. Rear steering wheel 14. Front wheels on fixed axle (**) Front traction wheels (*) 15. Squeegee vacuum hose 16. Recovery water drain hose 17. Solution drain and level check hose 18. Deck with one brush/pad-holder 19. Brush/pad-holder 20. Solution tank 21. Recovery water tank 22. Recovery water tank cover 23. Can holder 24. Solution filter 25. Squeegee 26. Squeegee mounting handwheels 27. Squeegee balance adjusting handwheel 28. Machine straight forward movement adjusting handwheel 29. Machine forward speed adjustment handwheel (**) 30. Recovery water tank cover (opened to be cleaned) 31. Tank cover gasket 32. Cover movable retaining plate 33. Cover fixed retaining plate (do not remove!) 34. Serial number plate/technical data 35. Squeegee bumper wheels 36. Vacuum grid with automatic shut-off float 37. Solution front filler neck 38. Filter 39. Deck bumper wheels 40. Recovery water tank (open) 41. Detergent hose 42. Lifted tank tie rod 43. Vacuum system motor cover 44. Vacuum system motor sound-deadening filter 45. Solution tap 46. Batteries 47. Battery caps 48. Solenoid valve 49. Battery connection diagram 71. Brush/pad-holder and vacuum system switch 72. Brush/pad-holder and vacuum system switch warning light 73. Vacuum system switch 74. Vacuum system switch warning light 75. Brush/pad-holder release switch 76. Brush/pad-holder release switch warning light | <ol style="list-style-type: none"> 77. Forward/reverse gear paddle (*) 78. Forward/reverse speed adjuster (*) 79. Hour counter (optional) 80. Ignition key (0 - 1) (*) 81. Battery charge indicator 81a. Charged battery warning light (green) 81b. Semi-discharged battery warning light (yellow) 81c. Discharged battery warning light (red) 82. Washing water flow control switches 82a. Flow increase switch 82b. Flow decrease switch 82c. Washing water flow indicator 90. Electronic battery charger 91. Lead (WET) or gel (GEL) battery selector 92. Green warning light (ON: the battery charger is on and batteries are charged) 93. Yellow warning light (ON: the battery charger is on and batteries are semi-discharged) 94. Red warning light (ON: the battery charger is on and it is charging the batteries) <p>(*) Only for Razor™ 20T</p> <p>(**) Only for Razor™ 20</p> |
|---|---|

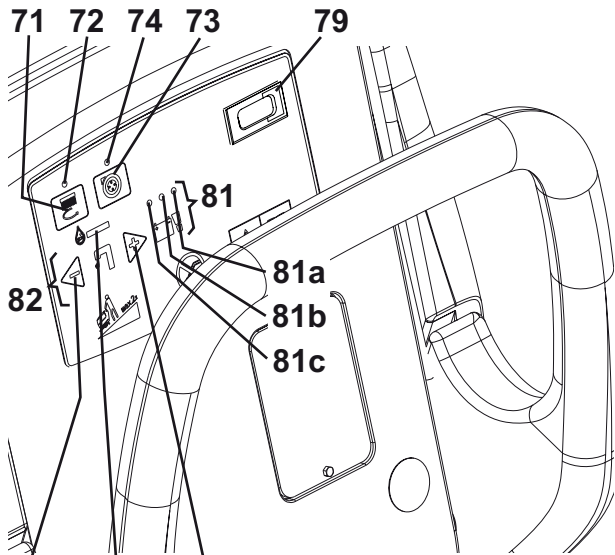
GENERAL INFORMATION

MACHINE NOMENCLATURE (Continues)

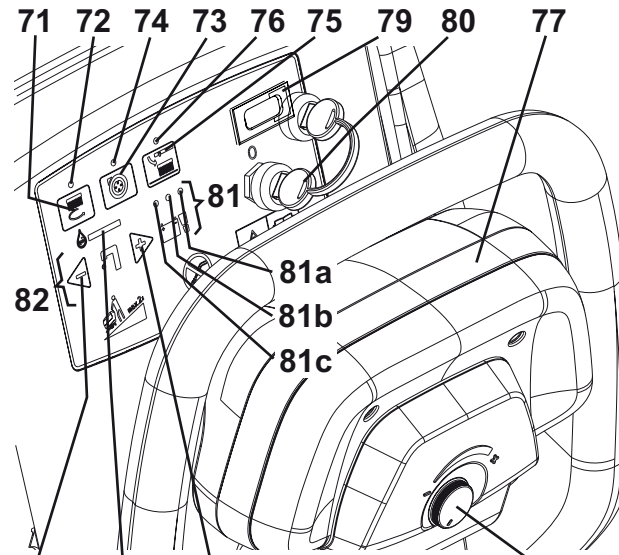


GENERAL INFORMATION

MACHINE NOMENCLATURE (Continues)



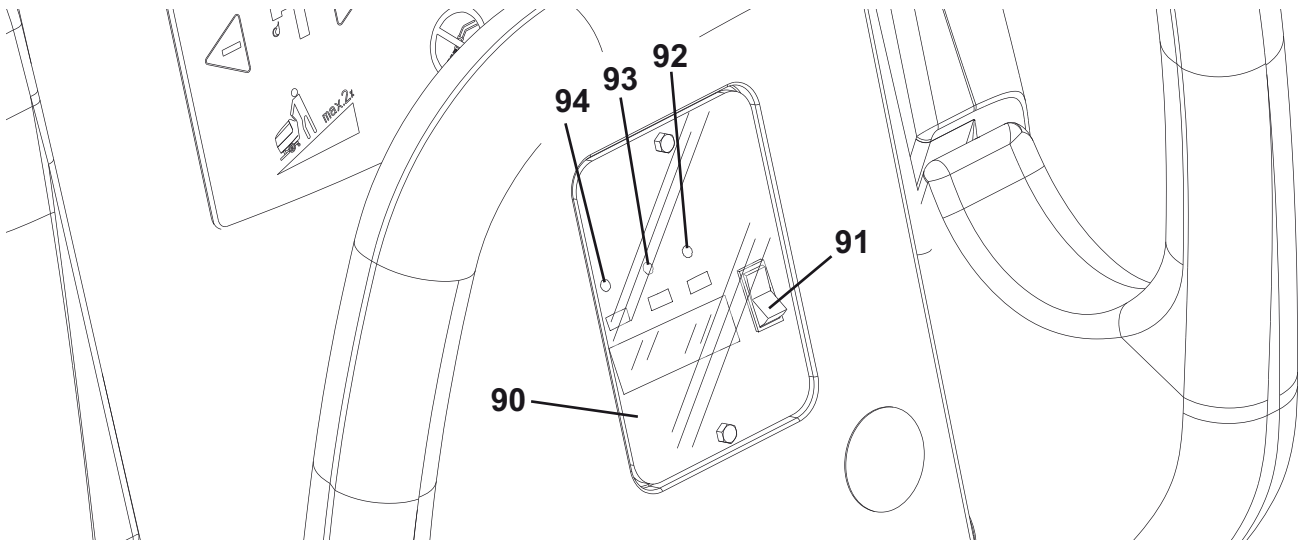
82b 82c 82a
RAZOR 20



82b 82c 82a 78
RAZOR 20T

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SOLUTION SUPPLY SYSTEM

SOLUTION SUPPLY SYSTEM

SOLUTION TANK AND SUPPLY SYSTEM CLEANING

1. Drive the machine to the appointed solution disposal area.
2.
 - (For Razor™ 20T) Turn the ignition key (80) to "0".
 - (For Razor™ 20) Turn off the switches (71) and (73).
3. Empty the solution tank (20) with the hose (17).
4. Start the machine (as shown in the User Manual) and keep it running until the solution tank is completely empty.
5.
 - (For Razor™ 20T) Turn the ignition key (80) to "0".
 - (For Razor™ 20) Turn off the switches (71) and (73).
6. Clean the tank (20) with clean water.
7. Start the machine (as shown in the User Manual) and keep it running until the solution tank is completely empty.
8. Clean the solution filter (see the following procedure).

SOLUTION FILTER CLEANING

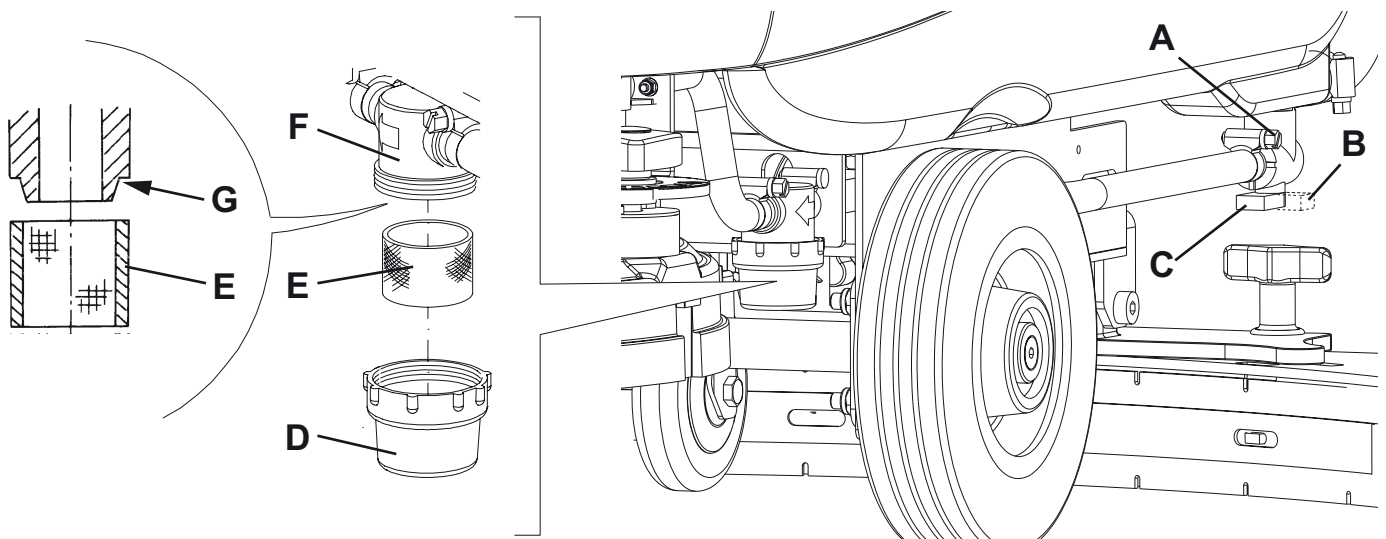
1. Drive the machine on a level floor.
2. Turn off the switches (71) and (73).
3. Close the solution tap (A) under the machine left lower side. The tap (A) is closed when it is on the position (B) and it is open when it is on the position (C).
4. Remove the transparent cover (D), then remove the filter strainer (E). Clean and install them on the support (F).



NOTE

The filter strainer (E) must be correctly positioned on the housing (G) of the support (F).

5. Open the tap (A).



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SOLUTION SUPPLY SYSTEM

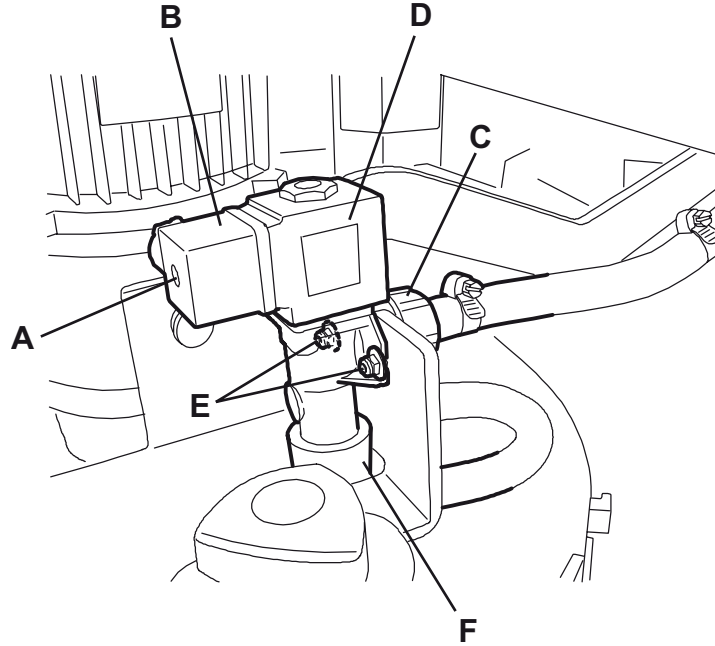
SOLENOID VALVE DISASSEMBLY/ASSEMBLY

Disassembly

1. Remove the brush.
2. Lower the deck by pressing the pedal (11).
3. Remove the screw (A), disconnect the connector (B) and recover the gasket.
4. Disconnect the union (C) from the solenoid valve (D) and recover the gasket.
5. Remove the screws (E).
6. Slightly lift the solenoid valve (D), disconnect the union (F) and recover the gasket.
7. Recover the solenoid valve (D).

Assembly

8. Assemble the components in the reverse order of disassembly.



S301522

TROUBLESHOOTING

Small amount of solution or no solution reaches the brush

Possible causes:

1. The solution filter is clogged/dirty (clean).
2. The solution tap is stuck closed (replace).
3. The solenoid valve is broken or there is an open in the electrical connection (replace the solenoid valve/repair the electrical connection).
4. There is debris in the solution tank clogging the output hole (clean the tank).
5. There are debris in the solution hoses clogging the flow (clean the hoses).

The solution reaches the brush also when the machine is off

Possible causes:

1. There is dirt or calcium deposit on the solenoid valve gasket (clean).
2. The solenoid valve is broken (replace).

BRUSHING SYSTEM

BRUSH/PAD CLEANING

**CAUTION!**

It is advisable to wear protective gloves when cleaning the brushes/pads because there may be sharp debris.

1. Remove the brushes/pads, as shown in the User Manual.
2. Clean and wash the brushes/pads with water and detergent.
3. Check that the brush/pads are integral and not excessively worn; otherwise replace them.

BRUSH/PAD-HOLDER BRUSH DECK DISASSEMBLY/ASSEMBLY

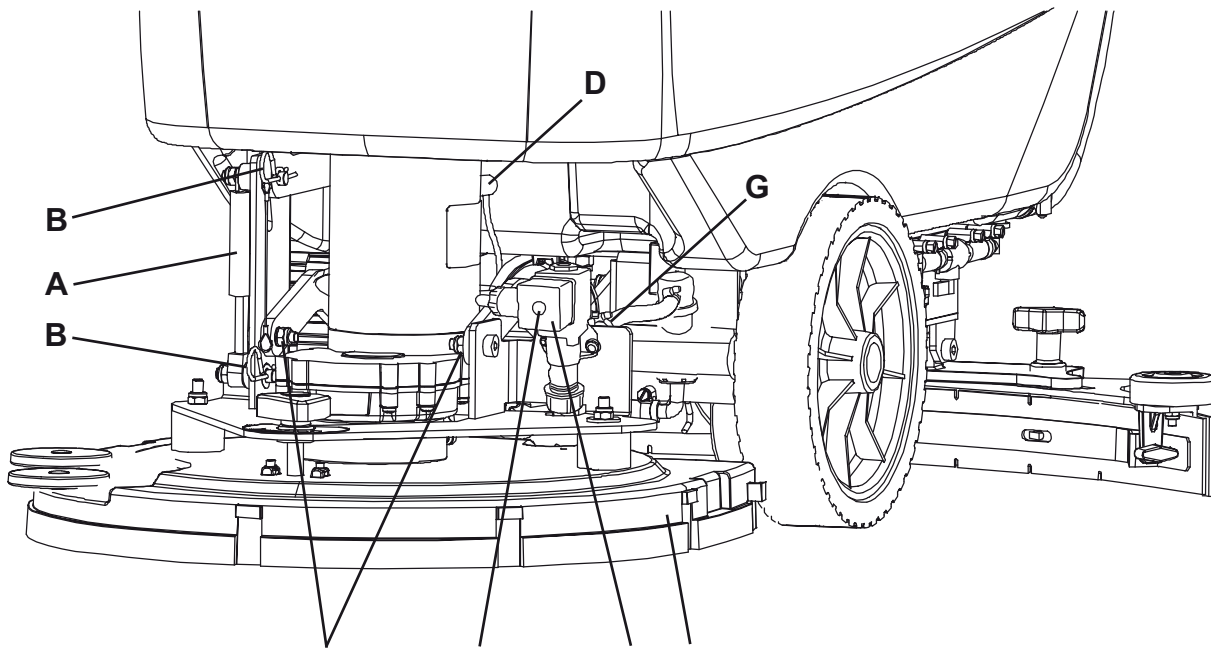
The machine can be equipped with either the brush/pad-holder deck or the cylindrical brush deck.

Disassembly

1. Drive the machine on a level floor.
2. Remove the brushes/pad-holders, as shown in the User Manual.
3. Lower the brush/pad-holder deck by pressing the pedal (11).
4. Disconnect the brush/pad-holder motor electrical connection (A).
5. Remove the screw (B) and disconnect the electrical connection (C).
6. Disconnect the solution hose connection (D).
7. Remove the screws (F), then remove the brush/pad-holder deck (E).

Assembly

8. Assemble the components in the reverse order of disassembly.



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BRUSHING SYSTEM

BRUSH MOTOR ELECTRICAL INPUT CHECK


WARNING!

This procedure must be performed by qualified personnel only.

Check

1. If the tank (21) contains recovery water:
 - Drive the machine to the appointed recovery water disposal area.
 - (For Razor™ 20T) Turn the ignition key (80) to "0".
 - (For Razor™ 20) Turn off the switches (71) and (73).
 - Empty the recovery water tank (21) with the hose (16).
2. Drive the machine on a level floor.
3. Remove the brush/pad-holder.
4. Lower the deck by pressing the pedal (11).
5. Turn off the switches (71) and (73).
6. Grasp the handle (41) and carefully lift the tank (40).
7. Apply the amperometric pliers (A) on one cable (B) of the brush motor (C).
8. (For Razor™ 20T). Turn the speed adjuster (84) to idle and turn the ignition key (80) to "1".
9. Turn on the brush/pad-holder by pressing the switch (71) and check that the motor electrical input is 3 - 4 A at 24 V. Turn off the brush/pad-holder by pressing the switch (71).

Remove the amperometric pliers (A).

If the electrical input is higher, perform the following procedures to detect and correct the abnormal input:


NOTE

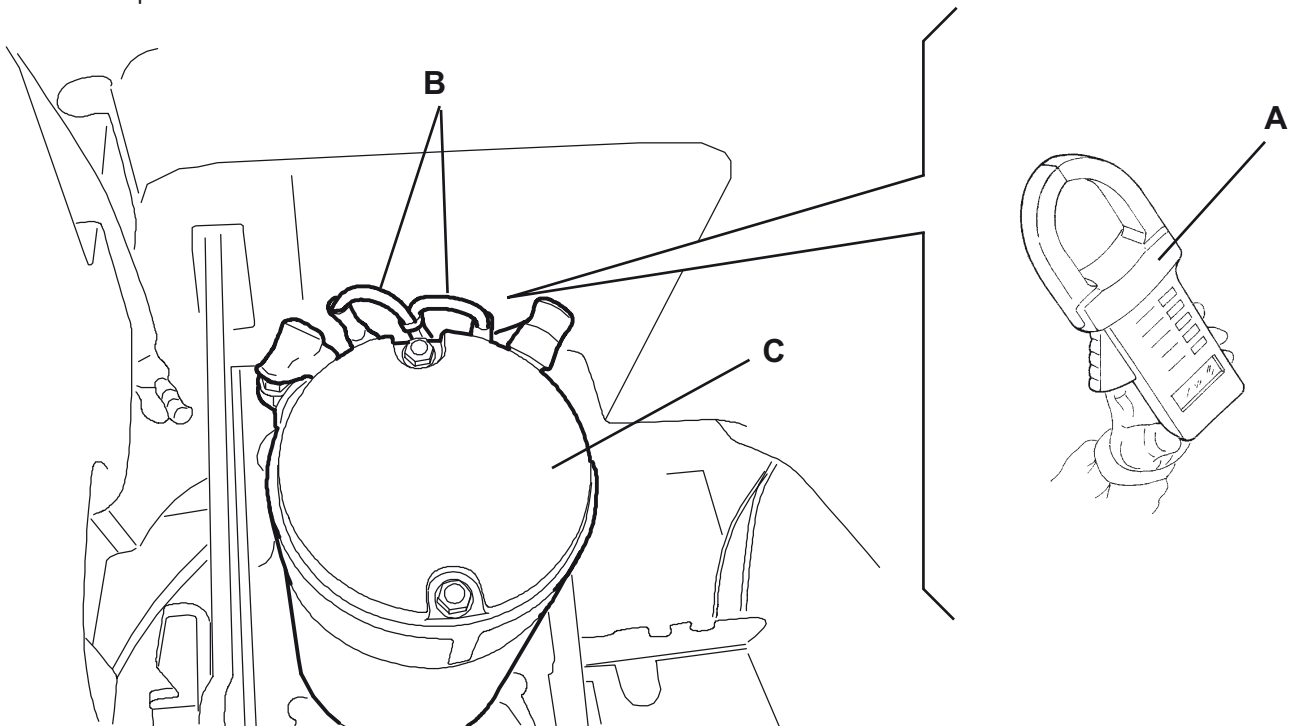
If the electrical input is higher than the maximum allowed value, the 3 battery warning lights (81) flash simultaneously.

- Check the tightening of F1 fuse screw (see the procedure in Fuse Check/Replacement paragraph).
- Check if there is dust or dirt (ropes, cables, etc.) on the brush/pad-holder hub.
- Check the motor carbon brushes (see the procedure in the relevant paragraph).
- Disassemble the motor (see the procedure in the relevant paragraph), and check the condition of all its components.

If the above-mentioned procedures do not lead to a correct electrical input, the motor must be replaced (see the procedure in the relevant paragraph).

Reset

10. Perform steps 3 to 7 in the reverse order.



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BRUSHING SYSTEM

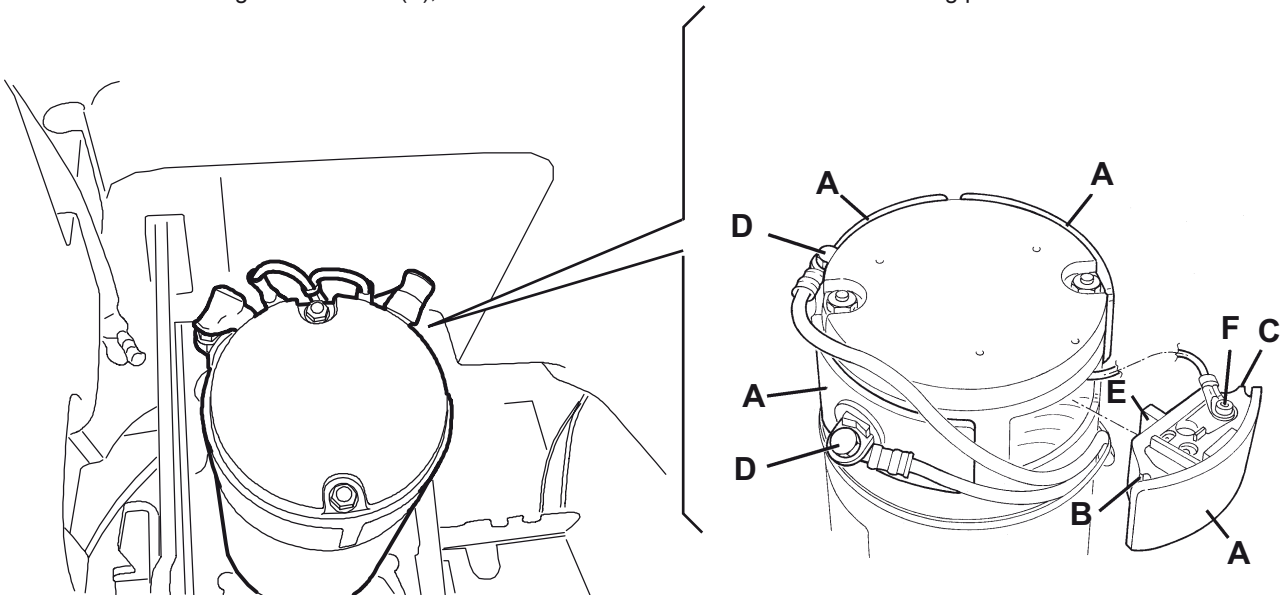
BRUSH MOTOR CARBON BRUSH CHECK/REPLACEMENT

Check

1. If the tank (21) contains recovery water:
 - Drive the machine to the appointed recovery water disposal area.
 - (For Razor™ 20T) Turn the ignition key (80) to "0".
 - (For Razor™ 20) Turn off the switches (71) and (73)
 - Empty the recovery water tank (21) with the hose (16).
2. Drive the machine on a level floor.
3. Remove the brush/pad-holder.
4. Lower the deck by pressing the pedal (11).
5. Turn off the switches (71) and (73).
6. Grasp the handle (41) and carefully lift the tank (40).
7. Disconnect the battery connector (12).
8. Remove dust and dirt from the motor carbon brush support area (A).
9. Disengage the fasteners (B) and (C) and remove four carbon brush supports (A). If necessary, disconnect the electrical connections (D).
10. Check if the carbon brushes (E) are worn. Replace the carbon brushes when: the contact with the motor armature is insufficient, the carbon brushes are worn, the carbon brush contact surface is not integral, the thrust spring is broken, etc.
11. If necessary, disconnect the connections (F) and remove the carbon brushes with their supports (A) to replace them. Replace the carbon brushes as an assembly.

Reset

12. Assemble the components in the reverse order of disassembly, and note the following:
 - When connecting the terminals (F), take care of their insulation from the surrounding parts of the frame.



S301539A

BRUSHING SYSTEM

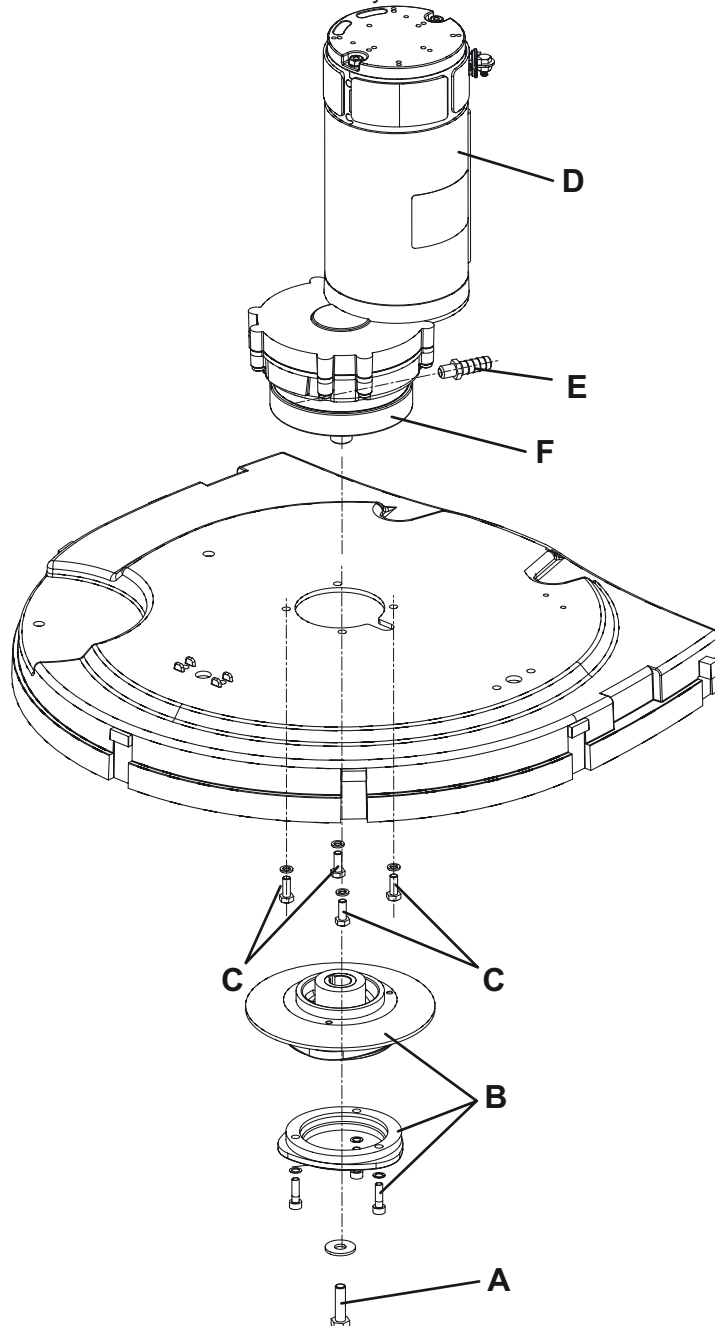
BRUSH MOTOR DISASSEMBLY/ASSEMBLY

Disassembly

1. Remove the deck (see the procedure in the relevant paragraph).
2. At the workbench, remove the screw (A) from the deck.
3. Remove the hub assembly (B) with a puller.
4. Remove the screws (C).
5. Remove the reduction unit (D).
6. If necessary, remove the water distribution union (E) and flange (F) from the reduction unit.

Assembly

7. Assemble the components in the reverse order of disassembly.



S301544

BRUSHING SYSTEM

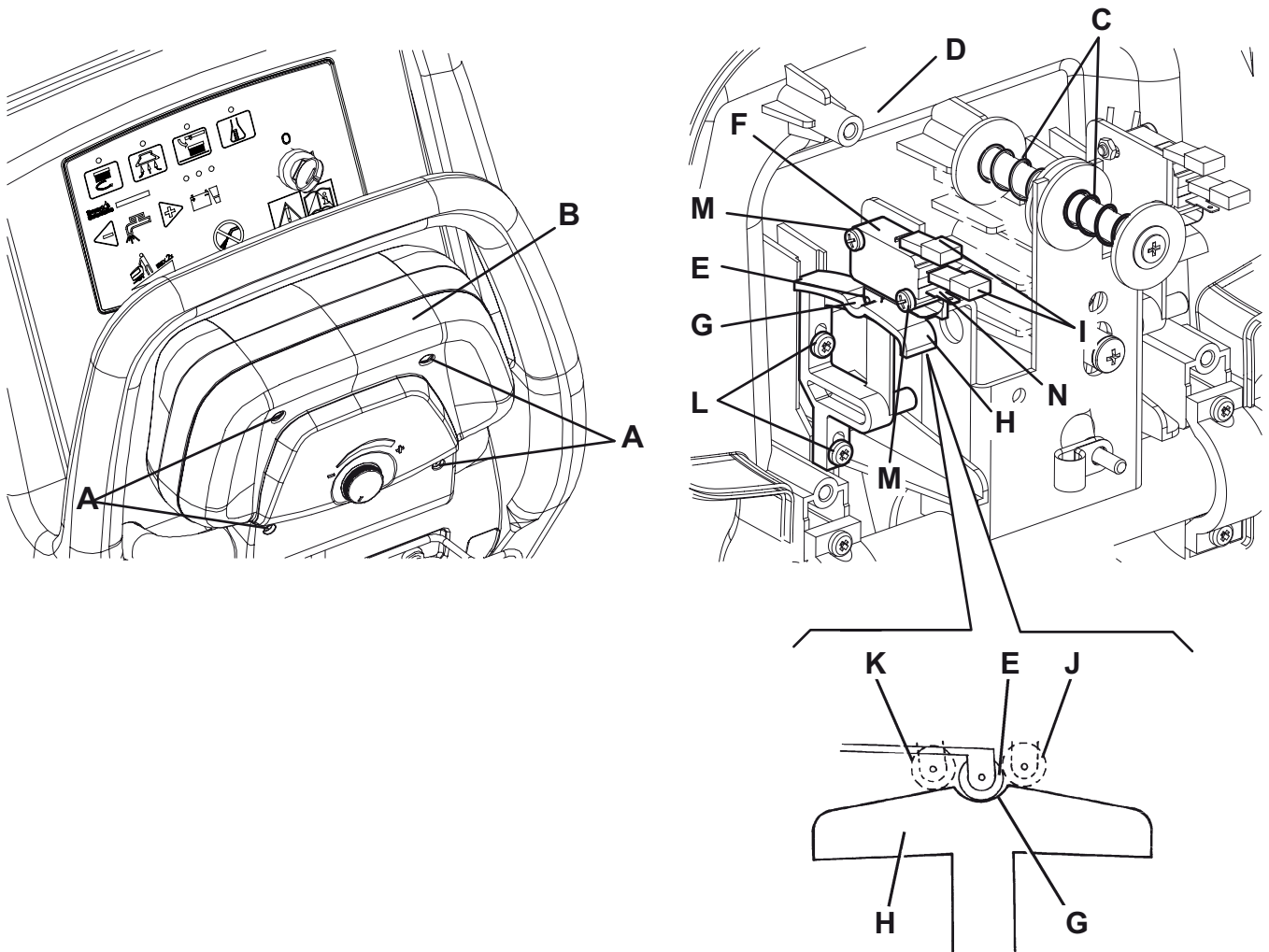
BRUSH ENABLING MICROSWITCH ADJUSTMENT/REPLACEMENT (For Razor™ 20T)

1. Drive the machine on a level floor.
2. Turn the ignition key (80) to "0".
3. Disconnect the battery connector (12).
4. Remove the screws (A) and move the drive paddle cover (B).
5. Check that the springs (C) operate correctly when releasing the drive paddle (D).
6. If necessary, replace the microswitch (F) according to the following procedure:
 - Mark the position of the connectors (I) and disconnect them from the microswitch.
 - Remove the screws (M).
 - Remove the microswitch (F).
 - Install the new microswitch and fasten it with the screws, then connect the connectors (I).
7. Check that the actuator (E) of the microswitch (F) is in the housing (G) of the cam (H) when the drive paddle is released (D). Also check that the cable contacts (I) are all open (use a tester).
8. Press the drive paddle (D) and check that the actuator (E), in the positions (J) and (K) activates the microswitch (F) (a clicking sound must be heard). Also check that the cable contacts (I) are all closed (use a tester).
If necessary, to reach the above-mentioned condition, loosen the screws (L) and adjusting the position of the cam (H), and/or by loosening the screws (M) and adjusting the position of the microswitch (F). Retighten the screws.

**CAUTION!**

If the microswitch connections (I) are disconnected, pay attention to reconnect them on the same terminals and to leave the terminal (N) free.

9. Assemble the components by performing steps 3 and 4 in the reverse order.
10. Test the brush operation.



S301549A

BRUSHING SYSTEM

TROUBLESHOOTING

ALL BRUSHES DO NOT ROTATE

Possible causes

1. The brush enabling microswitch is misadjusted or broken (adjust or replace).
2. The wiring harness between microswitch and function electronic board is damaged (repair).
3. The brush motor electromagnetic switch wiring harness is damaged (repair).
4. The function electronic board is damaged (replace).
5. The wiring harness between function electronic board and brush motor electromagnetic switch is damaged (repair).
6. The brush motor electromagnetic switch is damaged (replace).
7. The brush motor fuse is open (replace).

RECOVERY WATER SYSTEM

RECOVERY WATER SYSTEM

RECOVERY WATER TANK AND VACUUM GRID CLEANING, AND COVER GASKET CHECK

1. Drive the machine to the appointed recovery water disposal area.
2.
 - (For Razor™ 20T) Turn the ignition key (80) to "0".
 - (For Razor) Turn off the switches (71) and (73).
3. Lift the cover (A) to washing position (L).
4. Wash with clean water the cover (A), the tank (B) and the vacuum grid with automatic shut-off float (D). Drain the water in the tank through the hose (16).
5. If necessary, release the fasteners (E) and open the grid (D), recover the float (F), clean all the components and then reinstall them.
6. Check the tank cover gasket (G) for integrity.



NOTE

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

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

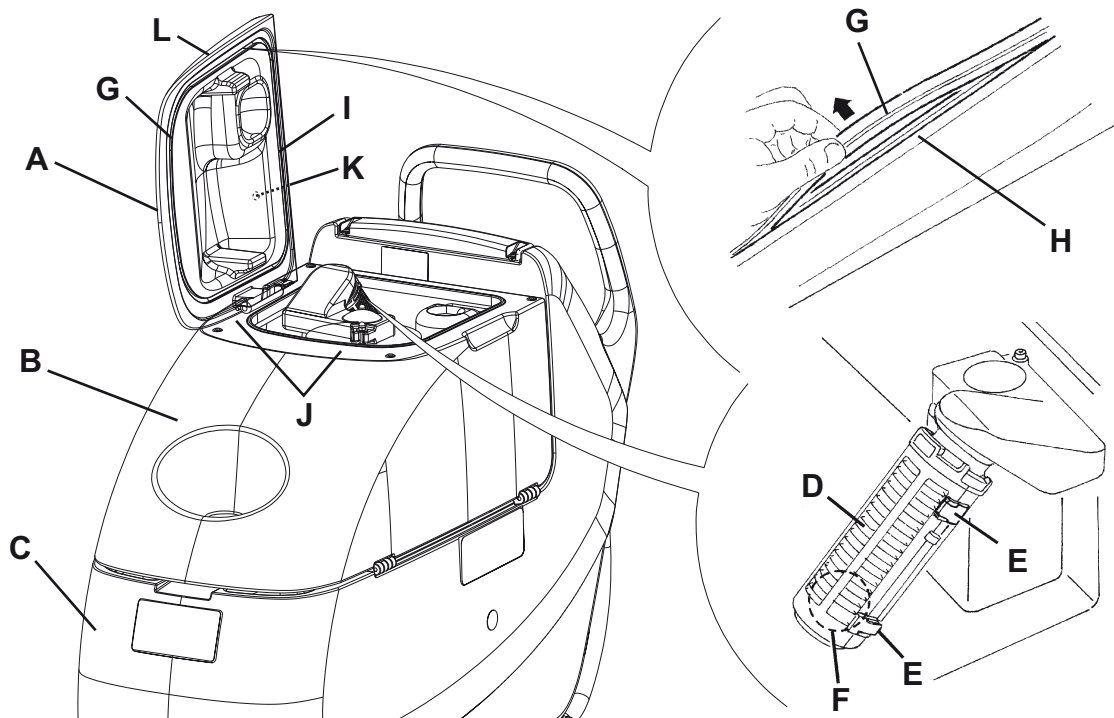
7. Check that the bearing surface (J) of the gasket (G) is integral and adequate for the gasket itself.
8. Check the compensation hole (K) for clogging, and clean it if necessary.



NOTE

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

9. Close the cover (A).



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RECOVERY WATER SYSTEM

SQUEEGEE CLEANING/CHECK/REPLACEMENT AND SQUEEGEE BLADE REPLACEMENT


CAUTION!

It is advisable to wear protective gloves when cleaning the squeegee because there may be sharp debris.

Disassembly and cleaning

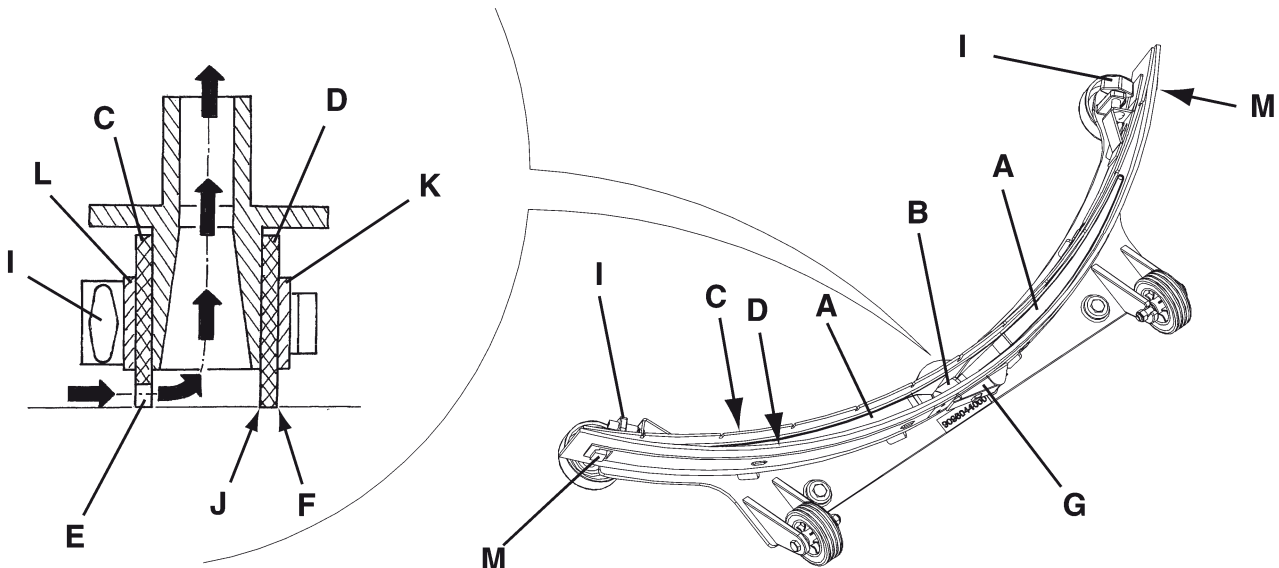
1. Drive the machine on a level floor.
 - (For Razor™ 20T) Turn the ignition key (80) to "0".
 - (For Razor™ 20) Turn off the switches (71) and (73).
3. Lower the squeegee (25) with the lever (10).
4. Loosen the handwheels (26) and remove the squeegee (25).
5. Disconnect the vacuum hose (15) from the squeegee.
6. Clean the squeegee. Clean the compartments (A) and the hole (B) especially. Check the front blade (C) and the rear blade (D) for integrity, cuts and tears; otherwise replace them (see the procedure in the following paragraph).
7. Install the squeegee in the reverse order of removal.

Check and replacement

1. Clean the squeegee, according to the procedure shown in the previous paragraph.
2. Check that the edges (E) of the front blade (C) and the edges (F) of the rear blade (D) lay down on the same level, along their length; otherwise adjust their height according to the following procedure:
 - Release the tie rod (G), disengage the fasteners (M) and adjust the rear blade (D), then tighten the wing nuts, or engage the fasteners, and then engage the tie rod.
 - Loosen the handwheels (I) and adjust the front blade (C); then tighten the handwheels.
3. Check the front blade (C) and rear blade (D) for integrity, cuts and tears; if necessary replace them according to the following procedure. Check that the front corner (J) of the rear blade is not worn; otherwise, overturn the blade to replace the worn corner with an integral one. If the other corners are worn too, replace the blade according to the following procedure:
 - Release the tie rod (G), remove the wing nuts (H) or disengage the fasteners (M), remove the retaining strip (K), then replace/overturn the rear blade (D). Then install the blade in the reverse order of removal.
 - Unscrew the handwheels (I) and remove the retaining strip (L), then replace the front blade (C). Install the blade in the reverse order of removal.

After the blade replacement (or overturning), adjust the height as shown in the previous step.

4. Connect the vacuum hose (15) to the squeegee.
5. Install the squeegee (25) and screw down the handwheels (26).
6. If necessary, adjust the squeegee balance adjusting handwheel (27).



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RECOVERY WATER SYSTEM

VACUUM SYSTEM MOTOR FILTER CLEANING

Disassembly and cleaning

1. If the tank (21) contains recovery water:
 - Drive the machine to the appointed recovery water disposal area.
 - (For Razor™ 20T) Turn the ignition key (80) to "0".
 - (For Razor™ 20) Turn off the switches (71) and (73).
 - Empty the recovery water tank (21) with the hose (16).
2. Drive the machine on a level floor.
3.
 - (For Razor™ 20T) Turn the ignition key (80) to "0".
 - (For Razor™ 20) Turn off the switches (71) and (73).
4. Grasp the handle (41) and carefully lift the tank (40).
5. Remove the vacuum system motor filter (44) and clean it with water and compressed air.
6. Install the filter (44).

Assembly

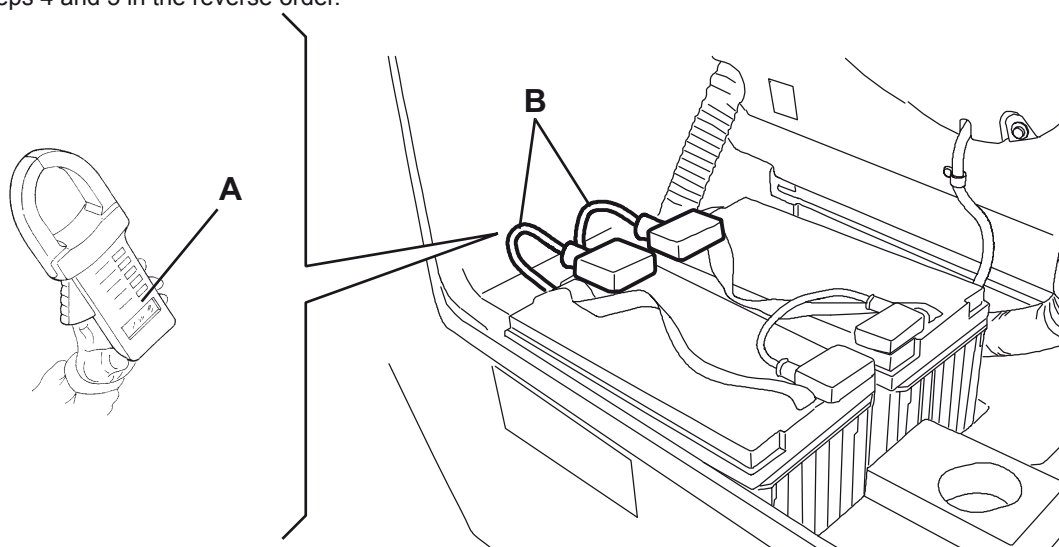
7. Assemble the components in the reverse order of disassembly.

VACUUM SYSTEM MOTOR ELECTRICAL INPUT CHECK

**WARNING!**

This procedure must be performed by qualified personnel only.

1. If the tank (21) contains recovery water:
 - Drive the machine to the appointed recovery water disposal area.
 - (For Razor™ 20T) Turn the ignition key (80) to "0".
 - (For Razor™ 20) Turn off the switches (71) and (73).
 - Empty the recovery water tank (21) with the hose (16).
2. Drive the machine on a level floor.
3.
 - (For Razor™ 20T) Turn the ignition key (80) to "0".
 - (For) Turn off the switches (71) and (73).
4. Disconnect the battery connector (12).
5. Grasp the handle (41) and carefully lift the tank (40).
6. Apply the amperometric pliers (A) on one cable (B) of the batteries.
7.
 - (For Razor™ 20T) Turn the ignition key (80) to "I".
8.
 - Turn on the vacuum system by pressing the switch (73) and check that the motor electrical input is 16 - 19 A at 24 V.
 - Turn off the vacuum system by pressing the switch (73).
 - Remove the amperometric pliers (B).
 - If the electrical input exceeds the specifications, check the motor carbon brushes (see the procedure in the relevant paragraph).
 - If necessary, disassemble the vacuum system motor (see the procedure in the relevant paragraph), and check the condition of all its components.
 - If the above-mentioned procedures do not lead to a correct electrical input, the motor must be replaced (see the procedure in the relevant paragraph).
9. Perform steps 4 and 5 in the reverse order.

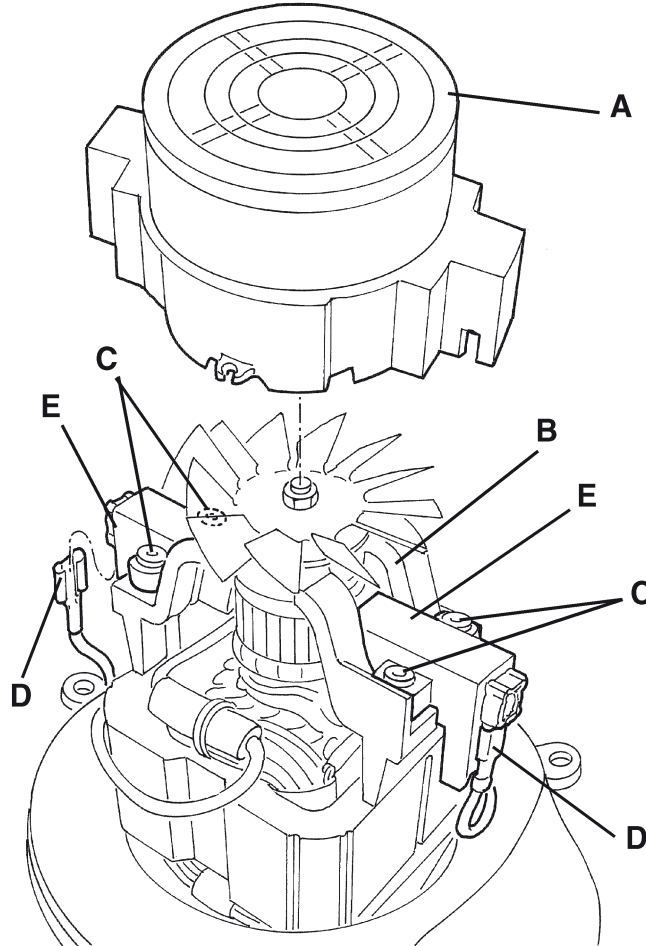


S301553

RECOVERY WATER SYSTEM

VACUUM SYSTEM MOTOR CARBON BRUSH CHECK/REPLACEMENT

1. Remove the vacuum system motor (see the procedure in the relevant paragraph).
2. At the workbench, remove the cover (A) (press-fitted) from the vacuum system motor (B).
3. Remove the screws (C).
4. Disconnect the electrical connections (D).
5. Remove the carbon brushes (E).
6. Check the carbon brushes for wear. Replace the carbon brushes when: the contact with the motor armature is insufficient, the carbon brushes are worn, the carbon brush contact surface is not integral, the thrust spring is broken, etc.
7. If necessary, replace the carbon brushes. Replace the carbon brushes as an assembly.
8. Assemble the components in the reverse order of disassembly.



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RECOVERY WATER SYSTEM

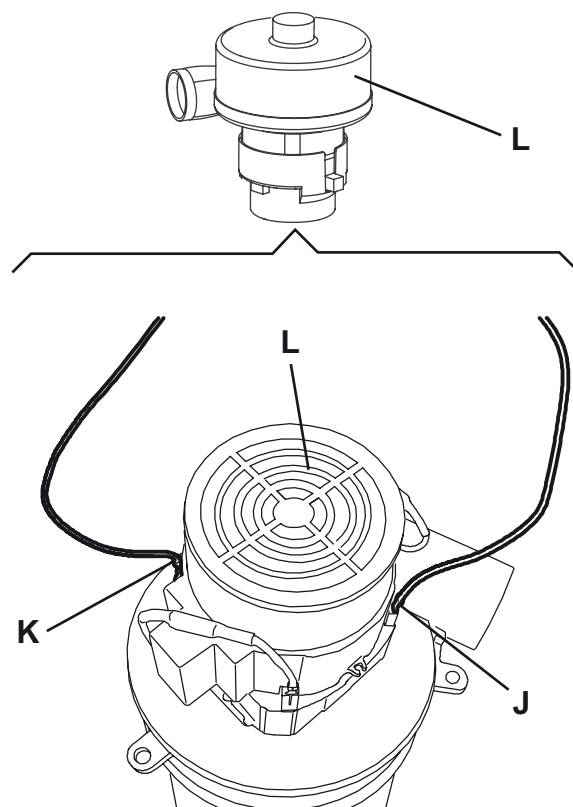
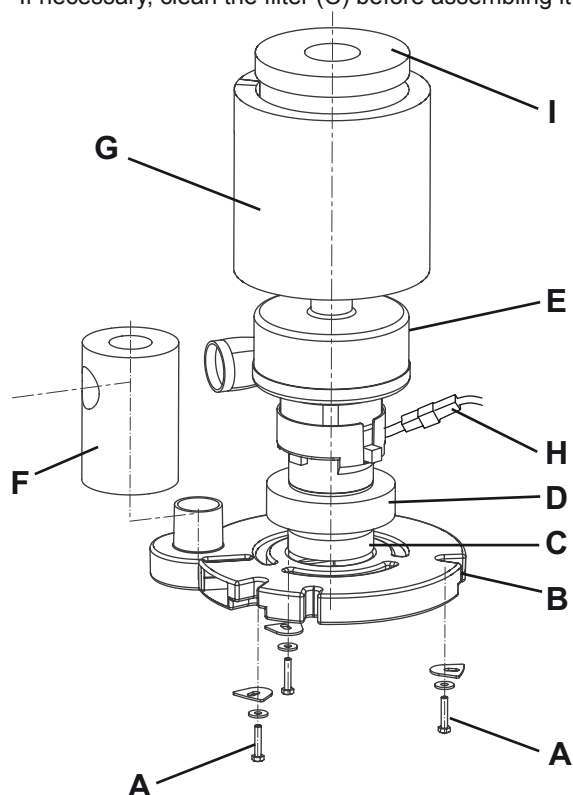
VACUUM SYSTEM MOTOR DISASSEMBLY/ASSEMBLY

Disassembly

1. If the tank (21) contains recovery water:
 - Drive the machine to the appointed recovery water disposal area.
 - (For Razor™ 20T) Turn the ignition key (80) to "0".
 - (For Razor™ 20) Turn off the switches (71) and (73).
 - Empty the recovery water tank (21) with the hose (16).
2. Drive the machine on a level floor.
3.
 - (For Razor™ 20T) Turn the ignition key (80) to "0".
 - (For Razor) Turn off the switches (71) and (73).
4. Disconnect the battery connector (12).
5. Grasp the handle (41) and carefully lift the tank (40).
6. Remove the screws (A) and recover the washers.
7. Remove the motor cover (B).
8. Remove the filter (C) and the gasket (D).
9. Remove the motor (E), the sound-deadening pipe (F) and the sound-deadening panel (G).
10. Disconnect the electrical connector (H) of the motor (E).
11. Check the efficiency of the gasket (I) and, if necessary, replace it.

Assembly

12. Assemble the components in the reverse order of disassembly, and note the following:
 - If necessary, clean the filter (C) before assembling it (see the procedure in the relevant paragraph).



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RECOVERY WATER SYSTEM

SQUEEGEE SPRING CHECK/REPLACEMENT (All models, with aluminium squeegee)

Check

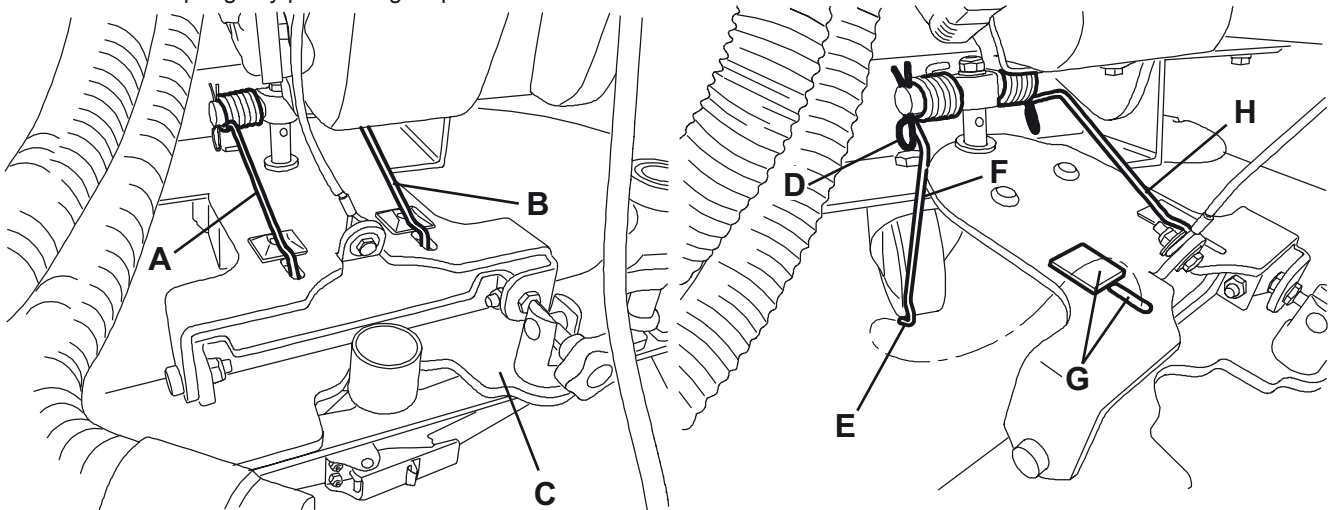
1. Drive the machine on a level floor.
2. • (For Razor™ 20T) Turn the ignition key (80) to "0".
• (For Razor™ 20) Turn off the switches (71) and (73).
3. Check that the springs (A) and (B) push the squeegee (C) on the floor correctly.
4. If necessary, disassemble and replace the springs according to the following procedure.

Disassembly

5. Remove the squeegee (see the procedure in the relevant paragraph).
6. Lift the deck by pressing the pedal (11).
7. Grasp the handlebar (2) and lower the front part of the machine.
8. Remove the cotter pin (D).
9. Disengage the end (E) of the left spring (F) from the housing (G).
10. Remove the left spring (F).
11. Repeat steps 8, 9 and 10 for the right spring (H).

Assembly

12. Assemble the springs by performing steps 5 to 11 in the reverse order.



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RECOVERY WATER SYSTEM**TROUBLESHOOTING****The vacuum system motor does not turn on**

1. The wiring harness between the function electronic board and the vacuum system relay is damaged or short-circuited (check and repair).
2. The vacuum system relay is damaged (replace).
3. The wiring harness between relay and motor is damaged (repair).
4. The vacuum system fuse is open (replace).
5. The vacuum system motor carbon brushes are worn (replace).
6. The vacuum system motor is faulty (check the electrical input).
7. The function electronic board is damaged (replace).

Dirty water vacuuming is insufficient or there is no vacuuming

Possible causes:

1. The vacuum grid with automatic shut-off float is activated because the recovery water tank is full (empty the recovery water tank).
2. The vacuum grid with automatic shut-off float is dirty, or the vacuum pre-filter is dirty (clean).
3. The tank cover is not correctly positioned (adjust).
4. The tank cover gasket is not efficient, or the compensating hole is clogged (repair/clean).
5. The vacuum system motor filter is dirty (clean).
6. The squeegee or the vacuum hose is clogged or damaged (clean or repair/replace).
7. The vacuum gaskets are damaged or do not match perfectly (repair or replace).

The squeegee leaves lining on the floor or does not collect water

Possible causes:

1. There is debris under the blade (remove).
2. The squeegee blade edges are torn or worn (replace).
3. The squeegee is not balanced (adjust it with the relevant handwheel).
4. (For aluminium squeegee) The squeegee springs are not efficient (check/replace)

DRIVE SYSTEM

DRIVE SYSTEM

TRACTION ENABLING MICROSWITCH ADJUSTMENT/REPLACEMENT (For Razor™ 20T)

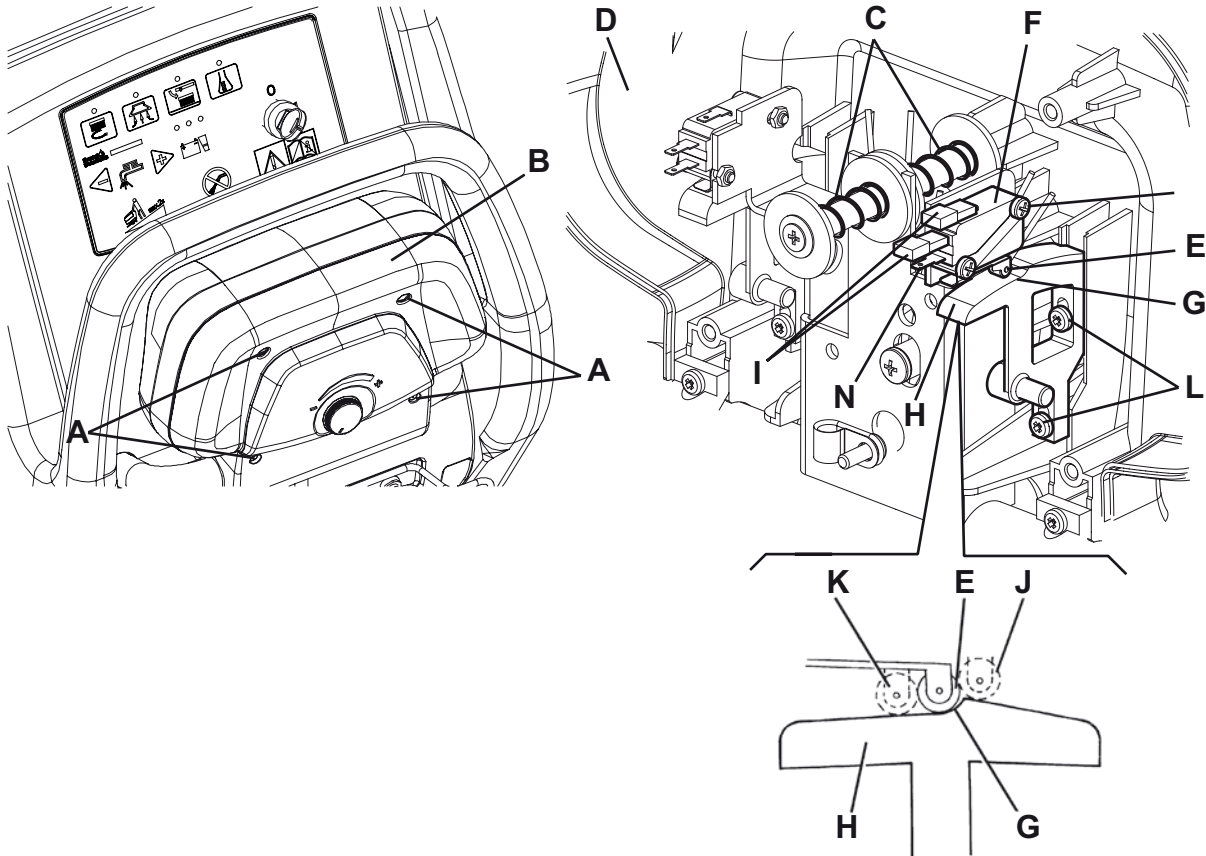
1. Drive the machine on a level floor.
2. Turn the ignition key (80) to "0".
3. Disconnect the battery connector (12).
4. Remove the screws (A) and move the drive paddle cover (B).
5. Check that the springs (C) operate correctly when releasing the drive paddle (D).
6. If necessary, replace the microswitch (F) according to the following procedure:
 - Mark the position of the connectors (I) and disconnect them from the microswitch.
 - Remove the screws (M).
 - Remove the microswitch (F).
 - Install the new microswitch and fasten it with the screws, then connect the connectors (I).
7. Check that the actuator (E) of the microswitch (F) is in the position (G) of the cam (H) when the drive paddle is released (D).
8. Press the drive paddle (D) and check that the actuator (E), in the position (K) doesn't activate the microswitch (F). Also check that the cable contacts (I) are all open (use a tester).
9. Press the drive paddle (D) and check that the actuator (E), in the position (J) activates the microswitch (F) (a clicking sound must be heard). Also check that the cable contacts (I) are all closed (use a tester).
If necessary, to reach the above-mentioned condition, loosen the screws (L) and adjusting the position of the cam (H), and/or by loosening the screws (M) and adjusting the position of the microswitch (F). Retighten the screws.



CAUTION!

If the microswitch connections (I) are disconnected, pay attention to reconnect them on the same terminals and to leave the terminal (N) free.

10. Assemble the components by performing steps 3 and 4 in the reverse order.
11. Test the traction operation.



S301559A

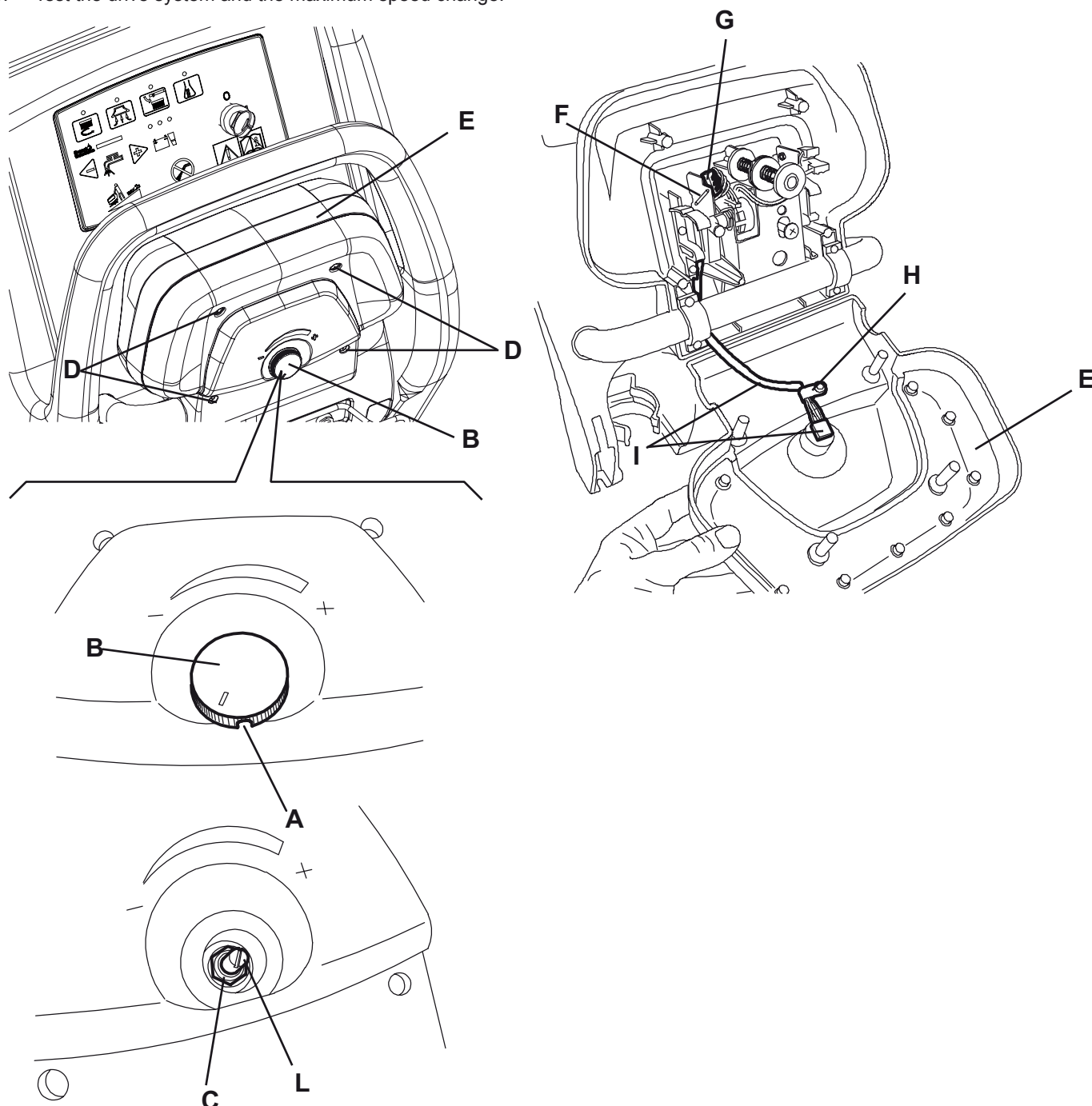
MAXIMUM SPEED POTENTIOMETER DISASSEMBLY/ASSEMBLY (For Razor™ 20T)

Disassembly

1. Disconnect the battery connector (12).
2. Operating inside the hole (A), loosen the threaded dowel and remove the maximum speed adjuster knob (B).
3. Unscrew the potentiometer mounting nut (C).
4. Remove the screws (D) and move the cover (E).
5. Cut the fastening clamp (F) and disconnect the potentiometer connector (G).
6. Open the clamp (H).
7. Remove the potentiometer with the relevant wiring harness (I). Check and replacement

Assembly

8. Assemble the components in the reverse order of disassembly, and note the following:
 - Fasten the knob (B) with the potentiometer shaft (L) completely turned to the left and the hole (A) in the lower centre part of the panel as shown in the figure.
9. Test the drive system and the maximum speed change.



S301559A

DRIVE SYSTEM

DRIVE SYSTEM MOTOR ELECTRICAL INPUT CHECK (For Razor™ 20T)


WARNING!

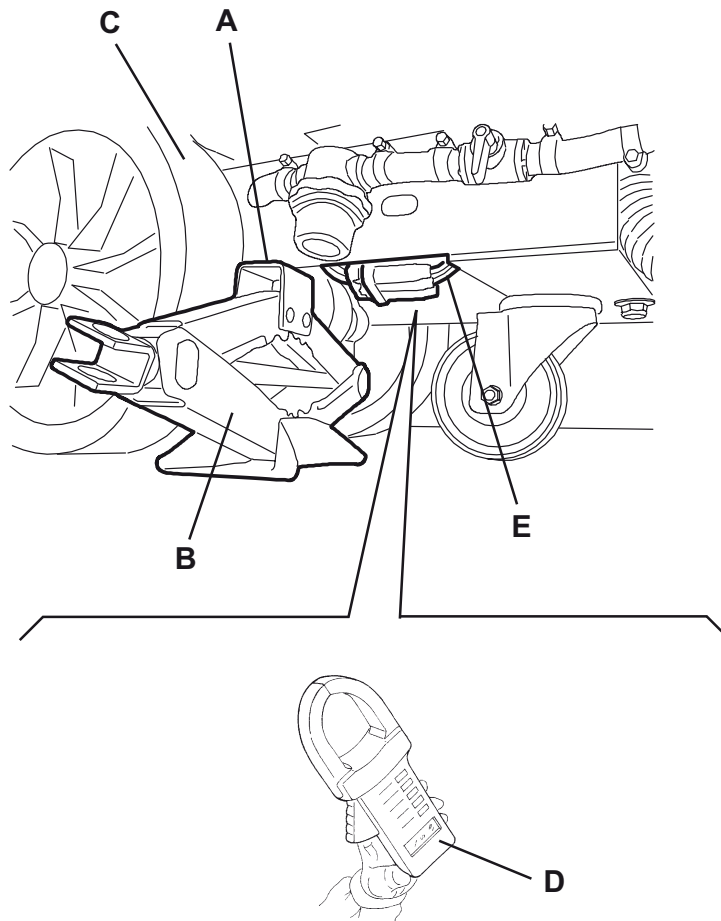
This procedure must be performed by qualified personnel only and with the help of an assistant.

1. Check that the batteries are completely charged, otherwise charge them as shown in the User Manual.
2. If the tank (21) contains recovery water:
 - Drive the machine to the appointed recovery water disposal area.
 - Turn the ignition key (80) to "0".
 - Empty the recovery water tank (21) with the hose (16).
3. Drive the machine on a level floor.
4. Lower the deck by pressing the pedal (11).
5. Under the left side the machine, install a suitable jack (C) in the position (A), and slightly lift the machine so that the left wheel (C) can turn freely, without touching the floor or the jack.


WARNING!

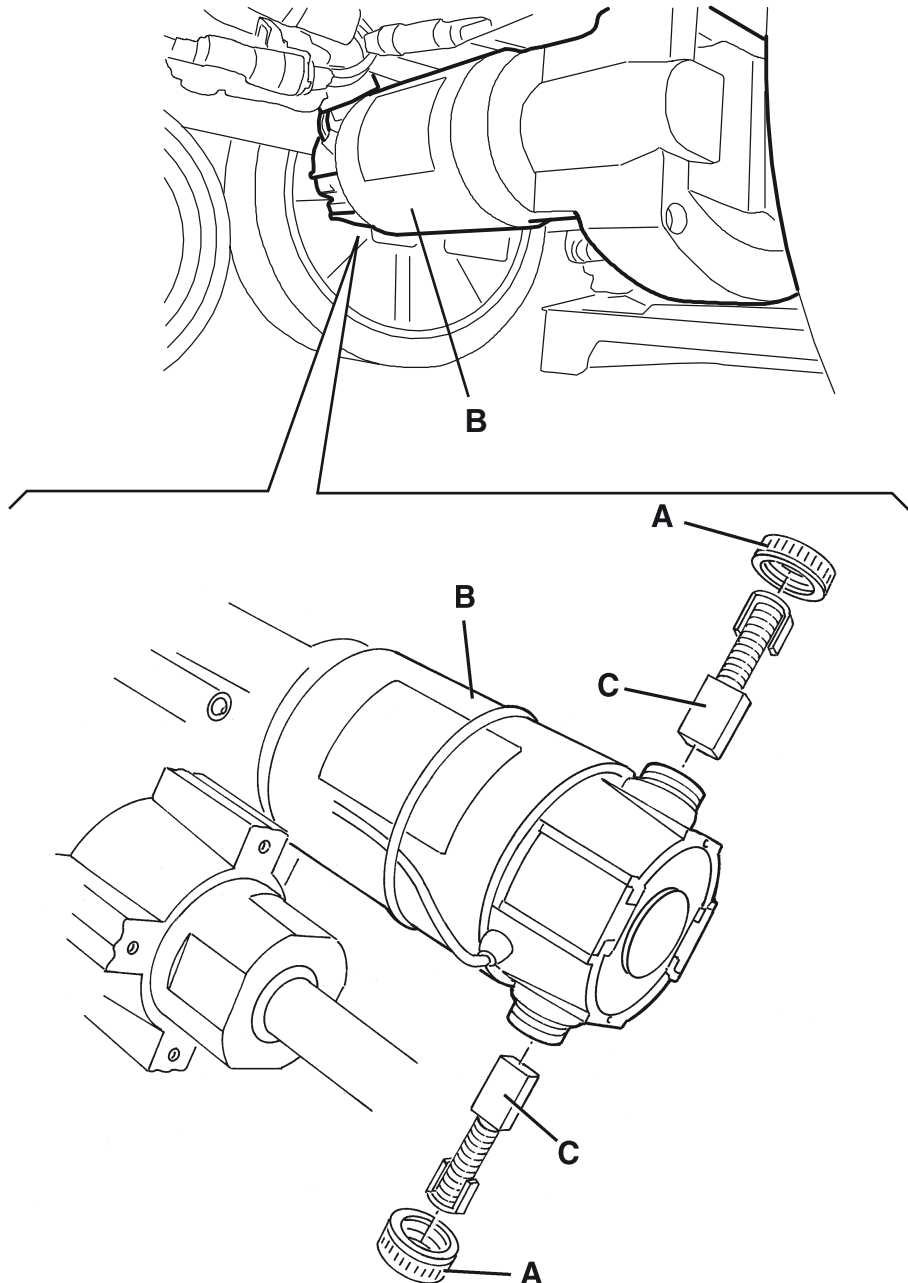
While performing this procedure, pay attention to the rotation of the driving wheel (C).

6. Apply the amperometric pliers (D) on one cable (E) of the drive system motor.
7. Turn the ignition key (80) to "I".
8. Turn the speed adjuster (84) to the maximum speed.
9. With the help of an assistant who firmly keeps the machine by the handlebar, push the drive paddle (3) completely forward and check that the electrical input is 1.5 - 2.5 A at 24 V. Release the drive paddle (3). Turn the ignition key (80) to "0" and remove the amperometric pliers (D).
If the electrical input is higher, perform the following procedures to detect and correct the abnormal input:
 - Check if there is dust or debris preventing the component rotation. The lifted wheel (C) must turn freely with a slight resistance of the differential.
 - If necessary, disassemble the motor-differential (see the procedure in the relevant paragraph) then check for hub correct alignment and bearing smooth running.
 If the above-mentioned procedures do not lead to a correct electrical input, the motor must be replaced (see the procedure in the relevant paragraph).
10. Perform steps 4 and 5 in the reverse order.



DRIVE SYSTEM**DRIVE SYSTEM MOTOR CARBON BRUSH CHECK AND REPLACEMENT (For Razor™ 20T)**

1. Drive the machine to the appointed disposal area, and empty the recovery water tank (21) with the hose (16).
2. Place the machine on a hoisting system (if available).
Otherwise, drive the machine on a level floor.
3. Turn the ignition key (80) to "0".
4. Disconnect the battery connector (12).
5. Operating on the left side of the machine, clean the drive system motor (B) in the area of the covers (A).
6. Unscrew the covers (A) and remove the carbon brushes (C).
7. Check if the carbon brushes (C) are worn. Replace the carbon brushes when: the contact with the motor armature is insufficient, the carbon brushes are worn, the carbon brush contact surface is not integral, the thrust spring is broken, etc.
If necessary, replace the carbon brushes. Replace the carbon brushes as an assembly.
8. Assemble the components in the reverse order of disassembly.



S301563A

DRIVE SYSTEM

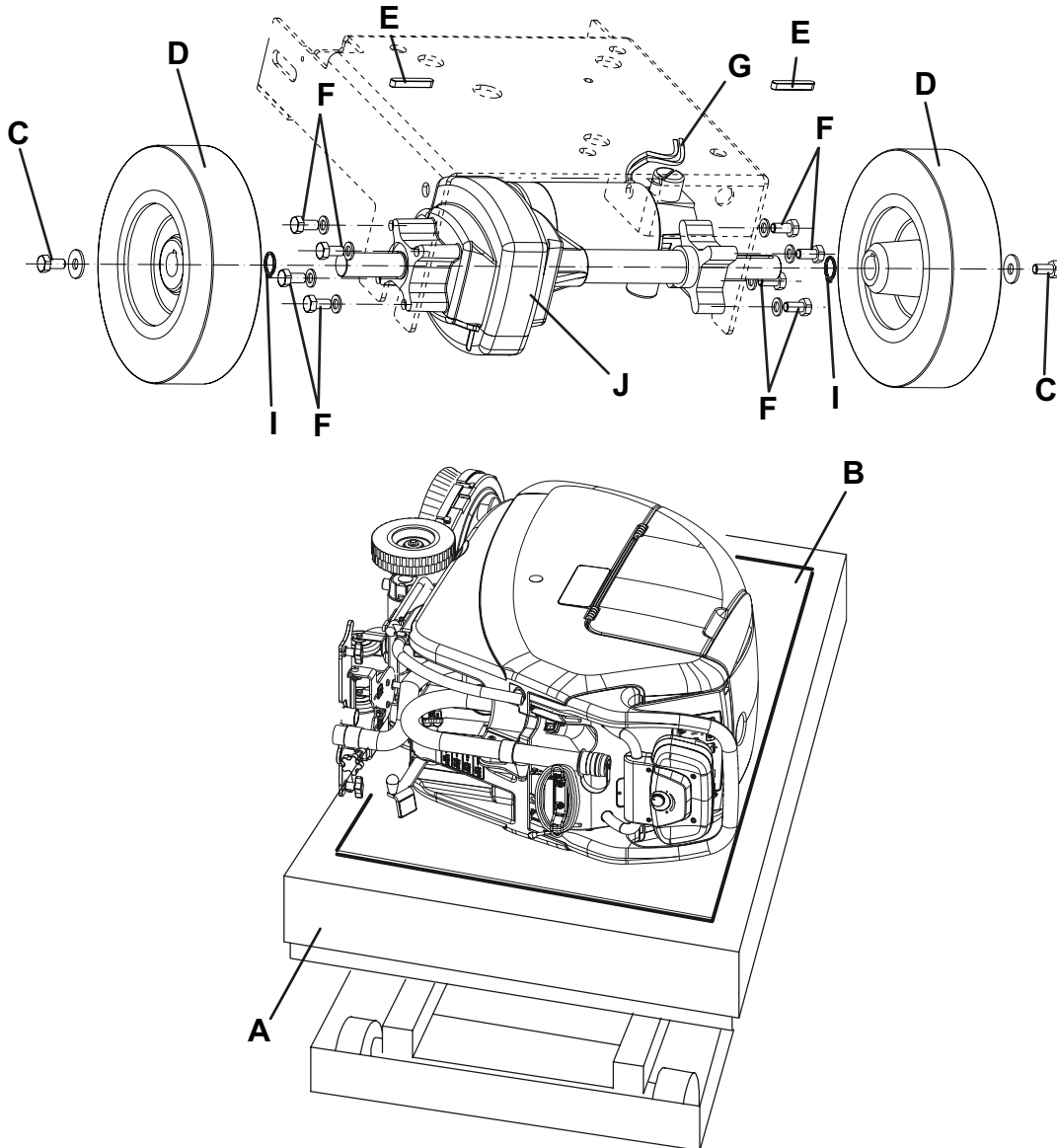
DRIVE SYSTEM MOTOR-DIFFERENTIAL DISASSEMBLY/ASSEMBLY (For Razor™ 20T)

Disassembly

1. If the tank (21) and/or (20) contains recovery water:
 - Drive the machine to the appointed disposal area.
 - Turn the ignition key (80) to "0".
 - Empty the recovery water tank (21) with the hose (16).
 - Empty the solution tank (20) with the hose (17).
2. Remove the squeegee (see the procedure in the relevant paragraph).
3. Remove the batteries (see the procedure in the relevant paragraph).
4. Prepare an hoisting system (A) on which the machine is to be laid on one side. Place a panel (B) on the hoisting system to avoid damaging the machine.
5. With the help of an assistant, tilt the machine on one side and lay it on the panel (B).
6. Remove the screws (C), then remove the wheels (D) and recover the keys (E).
7. Remove the screws (F) on both sides.
8. Disconnect the connectors (G) of the drive system motor.
9. If necessary, remove the spacers (I) and the retaining rings.
10. Remove the motor-differential (J).

Assembly

11. Assemble the components in the reverse order of disassembly.



P100155K

TROUBLESHOOTING (For Razor™ 20T)**Open circuit**

Possible causes:

1. There are bulky debris or cords under the machine or around the driving wheels (remove the debris).
2. The motor is damaged (check the motor electrical input).
3. The floor gradient is excessive (do not use the drive system on slopes with a gradient exceeding the specifications).
4. There is a short circuit in the drive system electronic board harness (repair).
5. The drive system electronic board is faulty (replace).

The machine does not move

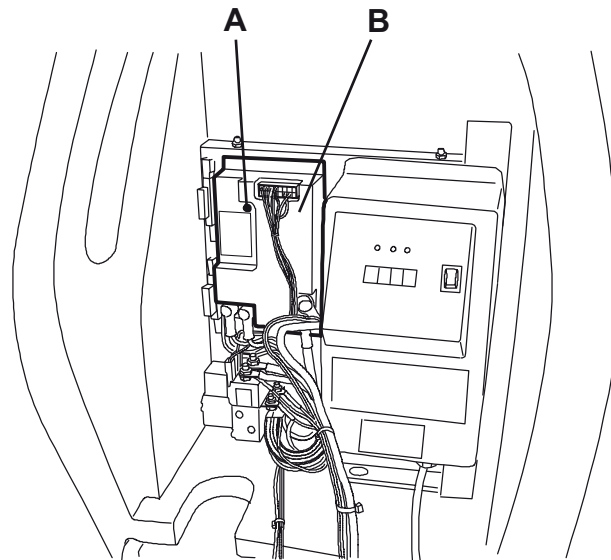
Possible causes:

1. The battery voltage is too low (charge the batteries).
2. The drive paddle potentiometer is misadjusted or broken (adjust or replace).
3. The speed adjuster is broken (replace).
4. The drive system enabling microswitch is misadjusted or broken (adjust or replace).
5. The drive system electronic board is faulty (replace).
6. There is an open in the fuse (repair).
7. The wiring harness is damaged (repair).
8. The drive system motor carbon brushes are worn (replace).
9. The drive system motor is faulty (replace).

DRIVE SYSTEM**TROUBLESHOOTING (For Razor™ 20T) (Continues)****DRIVE SYSTEM ELECTRONIC BOARD DIAGNOSTIC TABLE**

No. of flashes (*)	Meaning	Action
1	Drive system/brush enabling microswitch closed when starting the machine	Check the microswitch adjustment
2	Faulty speed potentiometer	Check both speed potentiometers
3	Faulty speed potentiometer	Check both speed potentiometers
4	Speed potentiometer off neutral when starting the machine	Check the speed potentiometer adjustment
5	Thermal protection	Check the drive system motor electrical input
6	Faulty drive system electronic board	Replace the drive system electronic board
7	Overcurrent output	Check the drive system motor electrical input; if the electrical input is normal, replace the drive system electronic board
8	Missing power connection	Check the drive system fuse and the drive system electronic board wiring harness; if the fuse and the wiring harness are normal, replace the drive system electronic board
9	Low battery voltage	Charge the batteries
10	High battery voltage	Check the batteries
11	Overload output	Check the drive system motor electrical input
12	(Not applicable)	--
13	Ignition key wrong sequence	Check for false contacts in the ignition key – function electronic board – drive system electronic board circuit (orange cables)
14	Software error	Replace the drive system electronic board (B)

(*) Flashing of led (A) of the drive system electronic board (B)



S301565

OTHER SYSTEMS**SCREW AND NUT TIGHTENING CHECK**

1. Drive the machine to the appointed disposal area, and empty the recovery water tank (21) with the hose (16).
2. Place the machine on a hoisting system (if available).
Otherwise, drive the machine on a level floor.
3.
 - (For Razor™ 20T) Turn the ignition key (80) to "0".
 - (For Razor™ 20) Turn off the switches (71) and (73).
4. Grasp the handle (41) and carefully lift the tank (40).
5. Check:
 - Tightening of mounting screws and nuts;
 - Correct position of fasteners;
 - Visible faults in the components;
 - Leaks of fluids.
6. Carefully lower the tank (40).
7. Remove the machine from the hoisting system.

ELECTRICAL SYSTEM

ELECTRICAL SYSTEM

MACHINE WORKING HOUR CHECK (optional)

1. (For Razor™ 20T) Turn the ignition key (80) to "1".
2. Press the vacuum system switch (73) and read on the hour counter (79) the total number of working hours (scrubbing/drying) performed by the machine.
3. Turn off the vacuum system by pressing the switch (73).
4. (For Razor™ 20T) Turn the ignition key (80) to "0".

BATTERY CHARGE AND MAINTENANCE

See the User Manual.

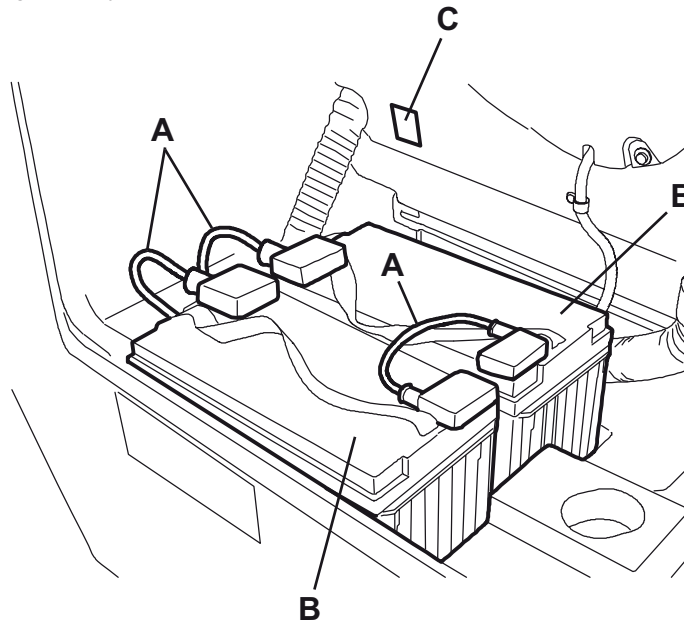
BATTERY DISASSEMBLY/ASSEMBLY

Disassembly

1. If the tank (21) contains recovery water:
 - Drive the machine to the appointed recovery water disposal area.
 - (For Razor™ 20T) Turn the ignition key (80) to "0".
 - (For Razor) Turn off the switches (71) and (73).
 - Empty the recovery water tank (21) with the hose (16).
2. Drive the machine on a level floor.
3.
 - (For Razor™ 20T) Turn the ignition key (80) to "0".
 - (For Razor™ 20) Turn off the switches (71) and (73).
4. Disconnect the battery connector (12).
5. Grasp the handle (41) and carefully lift the tank (40).
6. Disconnect the cables (A) from the battery terminals.
7. Remove the battery shims, if present.
8. Carefully remove the batteries (B).

Assembly

9. Assemble the batteries in the reverse order of disassembly, referring to the installation diagram (C), and note the following:
 - Set the machine according to the type of batteries installed (WET or GEL) as shown in the relevant paragraph.



S301566

ELECTRICAL SYSTEM**BATTERY TYPE SETTING (WET OR GEL) (For Razor™ 20)**

Set the electronic board of the machine and of the battery charger according to the type of batteries installed (WET or GEL) as shown below:

Machine setting

- Press the switch (71) or (73) and pay attention to the following in the very first seconds of machine operation:
 - If the green warning light (81a) is flashing, the machine is set to GEL.
 - If the red warning light (81c) is flashing, the machine is set to WET.
- If the setting is to be changed, perform the following procedure.
- Make sure that the switches (71) and (73) are turned off.
- Press and hold the switches (71) and (73) at the same time.
- Release the switches (71) and (73) at least 8 seconds after starting the machine.
- Within three seconds, press the switch (73) again for a few seconds and check that the warning light for the required setting is flashing (as shown in step 1).

Battery charger setting

- Remove the battery charger data inspection window screws (A).
- Remove the window (B).
- Turn the battery charger selector (C) to WET position for lead batteries, or to GEL position for gel batteries.
- Install the window (B) and tighten the screws (A).

BATTERY TYPE SETTING (WET OR GEL) (For Razor™ 20T)

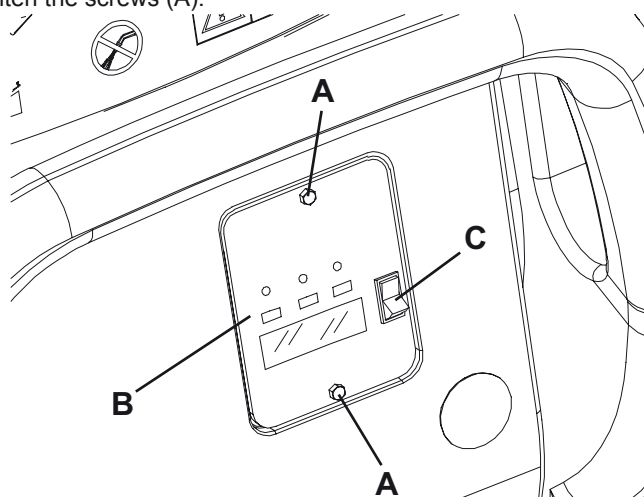
Set the electronic board of the machine and of the battery charger according to the type of batteries installed (WET or GEL) as shown below:

Machine setting

- Turn the ignition key (80) to "I" position and pay attention to the following in the very first seconds of machine operation:
 - If the green warning light (81a) is flashing, the machine is set to GEL.
 - If the red warning light (81c) is flashing, the machine is set to WET.
- If the setting is to be changed, perform the following procedure.
- Turn off the machine by turning the ignition key (80) to "0".
- Press and hold the switches (71) and (73) at the same time, then turn the ignition key (80) to "I".
- Release the switches (71) and (73) at least 8 seconds after starting the machine.
- Within three seconds, press the switch (73) again for a few seconds and check that the warning light for the required setting is flashing (as shown in step 1).

Battery charger setting

- Remove the battery charger data inspection window screws (A).
- Remove the window (B).
- Turn the battery charger selector (C) to WET position for lead batteries, or to GEL position for gel batteries.
- Install the window (B) and tighten the screws (A).



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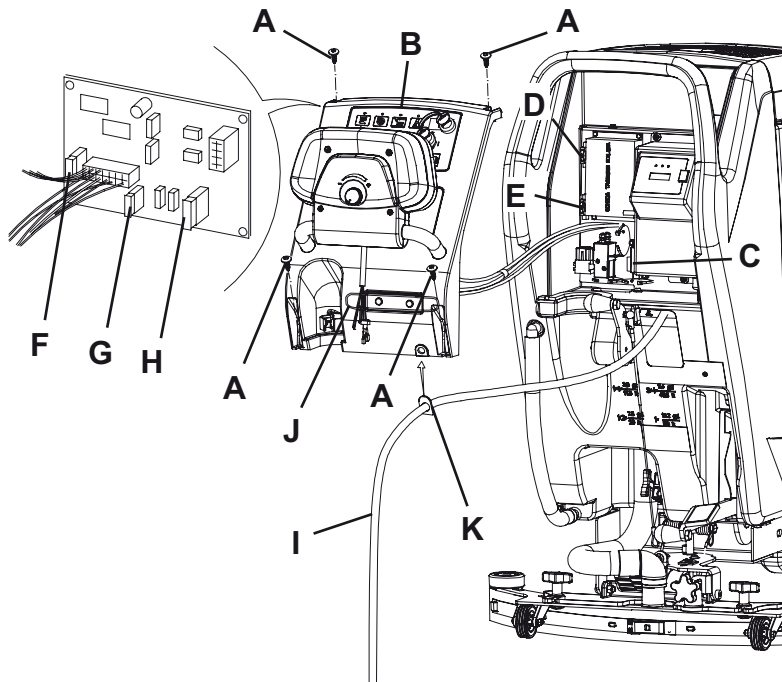
ELECTRICAL SYSTEM

FUSE CHECK/REPLACEMENT

1. Disconnect the battery connector (12).
2. Move aside the recovery water drain hose (16).
3. Remove the battery charger cable (I) from the cable holder (J).
4. Remove the screws (A) and carefully move aside the panel (B) by disengaging the grommet (K) from its housing on the panel (B).
5. Check/replace the following fuses:
 - (C) - F1 fuse, deck: (40 A)
 - (D) - F2 fuse, vacuum system: (30 A)
 - (E) - F3 fuse, drive system: (30 A) (*)
 - (F) - F4 fuse, signal circuits: (3 A)
 - (G) - F5 fuse, brush/pad-holder release: (20 A) (*)
 - (H) - F6 fuse, pumps: (3 A) (*)

(*) Only for Razor™ 20T

6. Perform steps 1 to 4 in the reverse order.



S301569K

ELECTRICAL SYSTEM

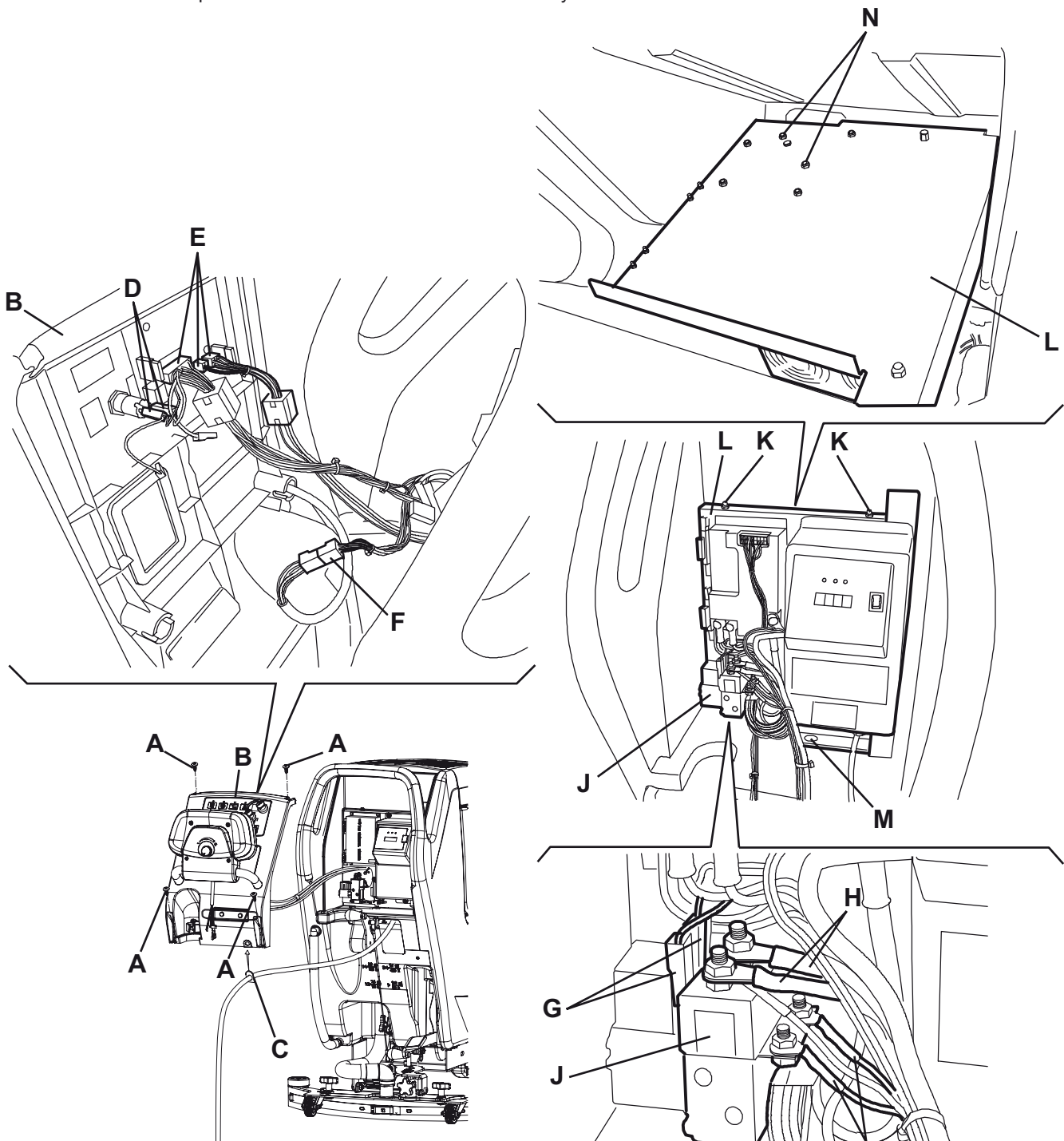
BRUSH MOTOR ELECTROMAGNETIC SWITCH DISASSEMBLY/ASSEMBLY

Disassembly

1. Disconnect the battery connector (12).
2. Move aside the recovery water drain hose (16).
3. Remove the battery charger cable (6) from the cable holder (7).
4. Remove the screws (A) and carefully move aside the panel (B) by disengaging the cable grommet (C) from its housing on the panel (B).
5. Disconnect the connectors (D), (E), (F), and remove the panel (B).
6. Disconnect the terminals (G) and (H) from the electromagnetic switch (J). Disconnect also the terminals (I), which are present only on the models with drive system.
7. Remove the screws (K) and move the electrical panel (L) by disengaging it from the lower fastener (M).
8. Remove the screws (N) on the rear side of the electrical panel (L), then remove the electromagnetic switch (J).

Assembly

9. Assemble the components in the reverse order of disassembly.



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S301572

ELECTRICAL SYSTEM

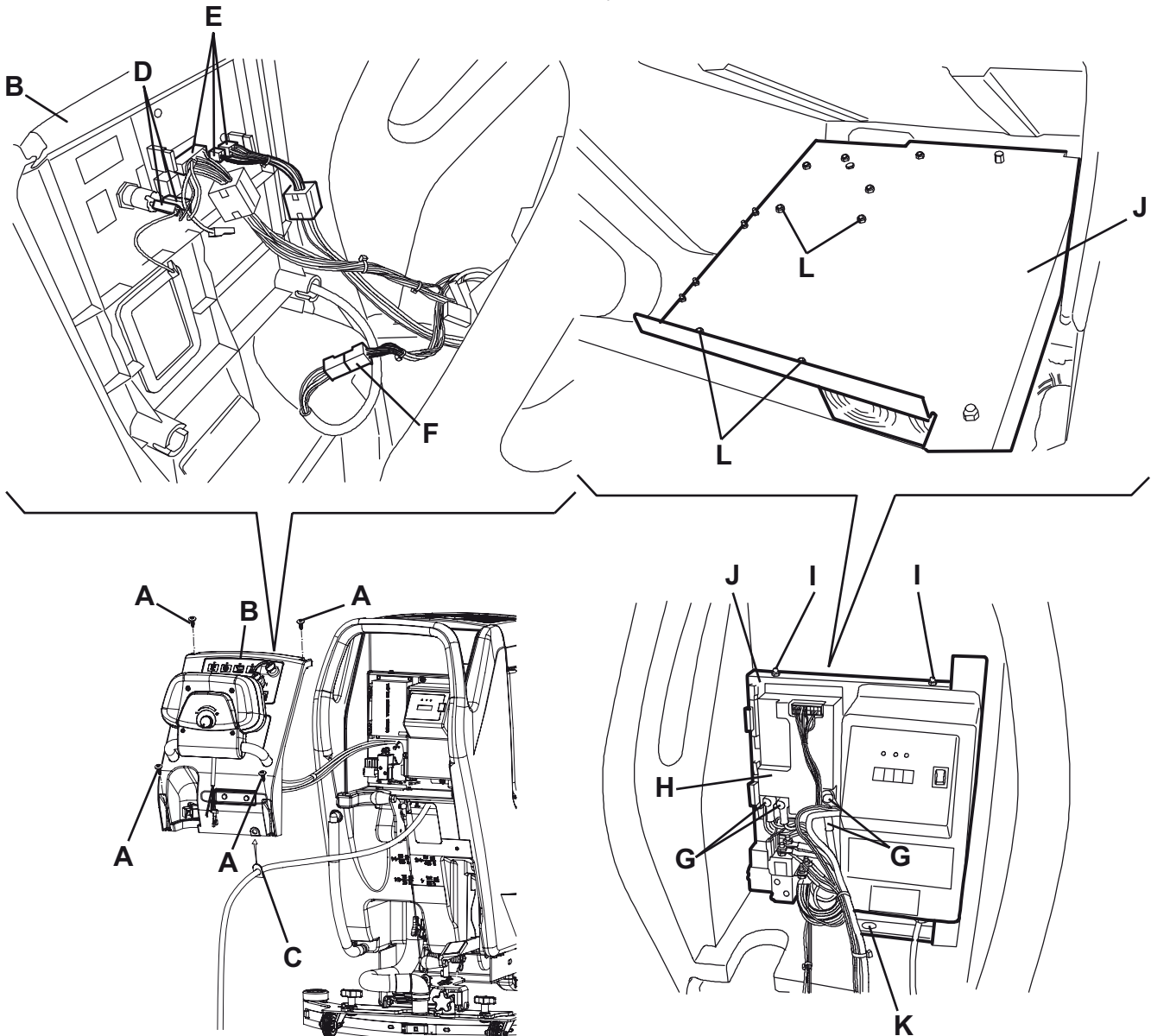
DRIVE SYSTEM ELECTRONIC BOARD DISASSEMBLY/ASSEMBLY (For Razor™ 20T)

Disassembly

1. Disconnect the battery connector (12).
2. Move aside the recovery water drain hose (16).
3. Remove the battery charger cable (6) from the cable holder (7).
4. Remove the screws (A) and carefully move aside the panel (B) by disengaging the cable grommet (C) from its housing on the panel (B).
5. Disconnect the connectors (D), (E), (F), and remove the panel (B).
6. Disconnect the connectors (G) of the drive system electronic board (H).
7. Remove the screws (I) and move the electrical panel (J) by disengaging it from the lower fastener (K).
8. Remove the screws (L) on the rear side of the electrical panel (J), then remove the drive system electronic board (H).

Assembly

9. Assemble the components in the reverse order of disassembly.



S301573A

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ELECTRICAL SYSTEM

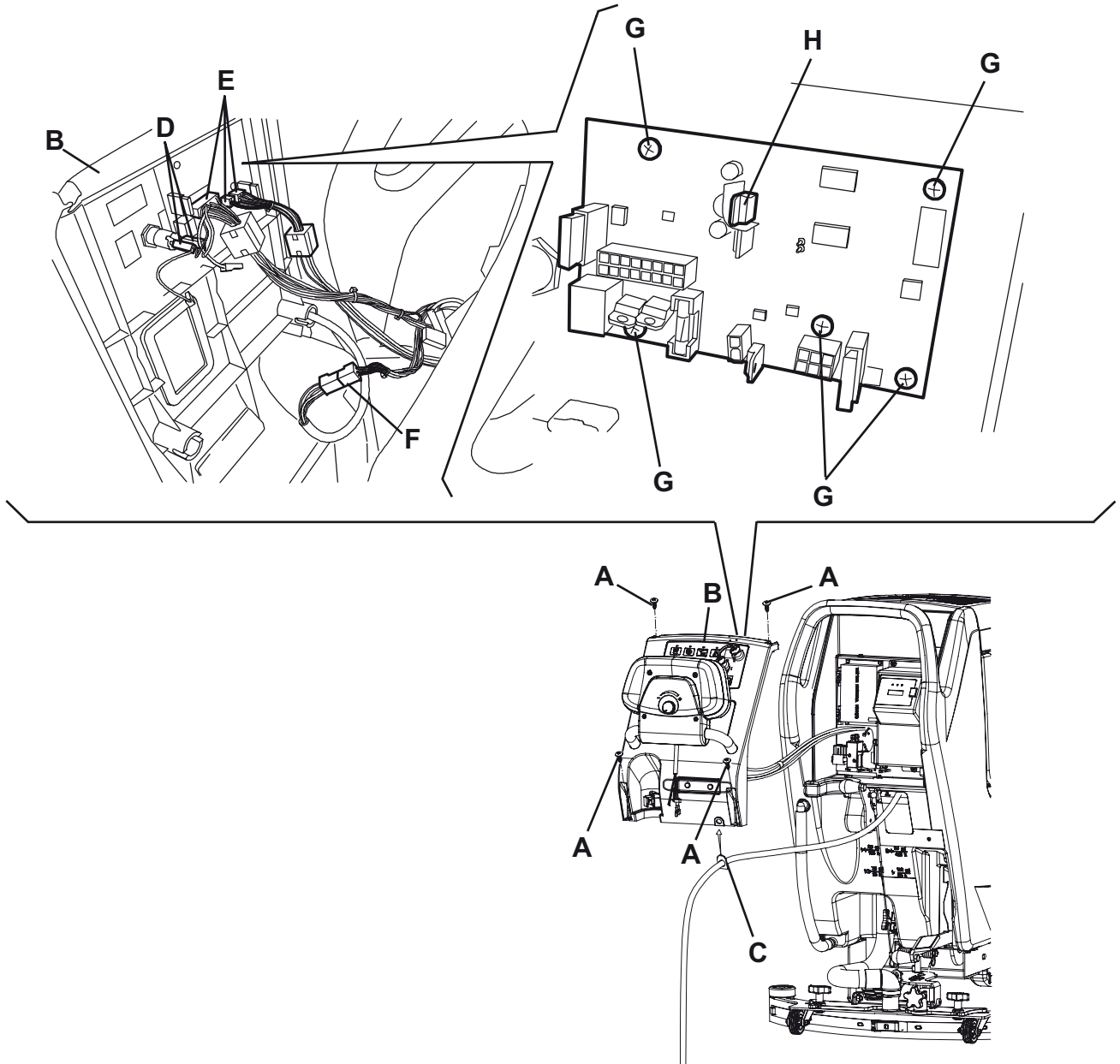
FUNCTION ELECTRONIC BOARD DISASSEMBLY/ASSEMBLY

Disassembly

1. Disconnect the battery connector (12).
2. Move aside the recovery water drain hose (16).
3. Remove the battery charger cable (6) from the cable holder (7).
4. Remove the screws (A) and carefully move aside the panel (B) by disengaging the cable grommet (C) from its housing on the panel (B).
5. Disconnect the connectors (D), (E), (F), and remove the panel (B).
6. On the panel, remove the screws (G), then remove the function electronic board (H).

Assembly

9. Assemble the components in the reverse order of disassembly.



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ELECTRICAL SYSTEM

TROUBLESHOOTING

See the previous chapters related to the use of the electrical system.

Other possible causes:

1. The batteries are discharged or the connections are not efficient (charge the batteries or clean the connections).
2. The batteries are broken (check the battery no-load voltage). Assembly



NOTE

A fault in the battery charger and relevant connections can affect the machine operation.

3. The battery charger is broken (replace).
4. There is an open in the fuses (replace).
5. The harness is cut, pressed or short-circuited (repair).
6. Error codes indicated by LEDs (81a - 81b - 81c):

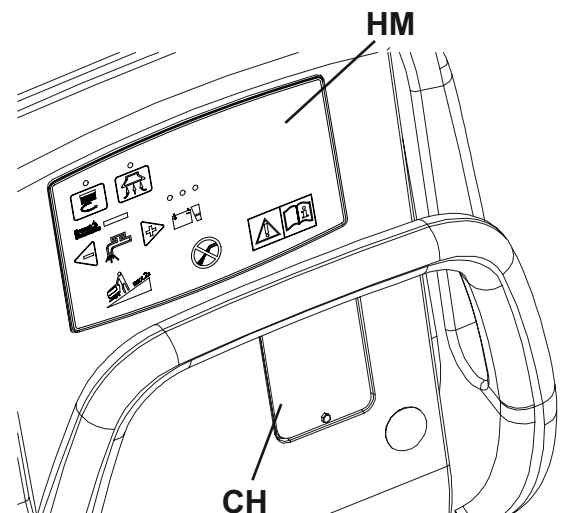
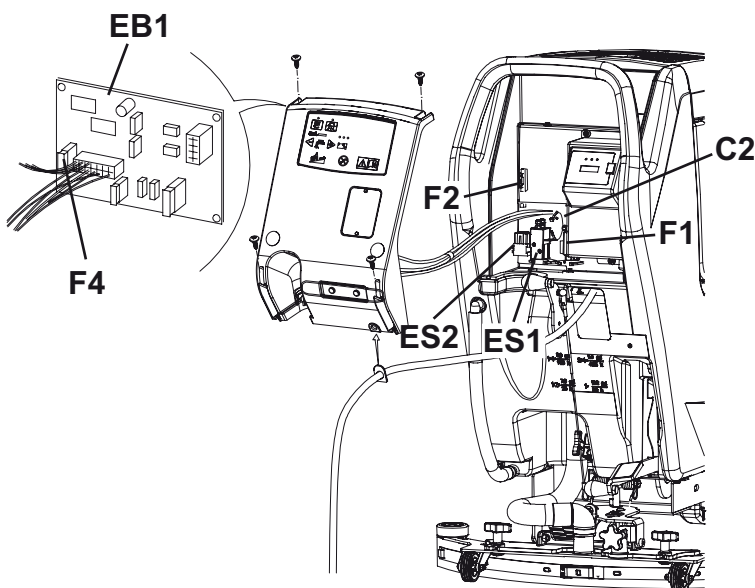
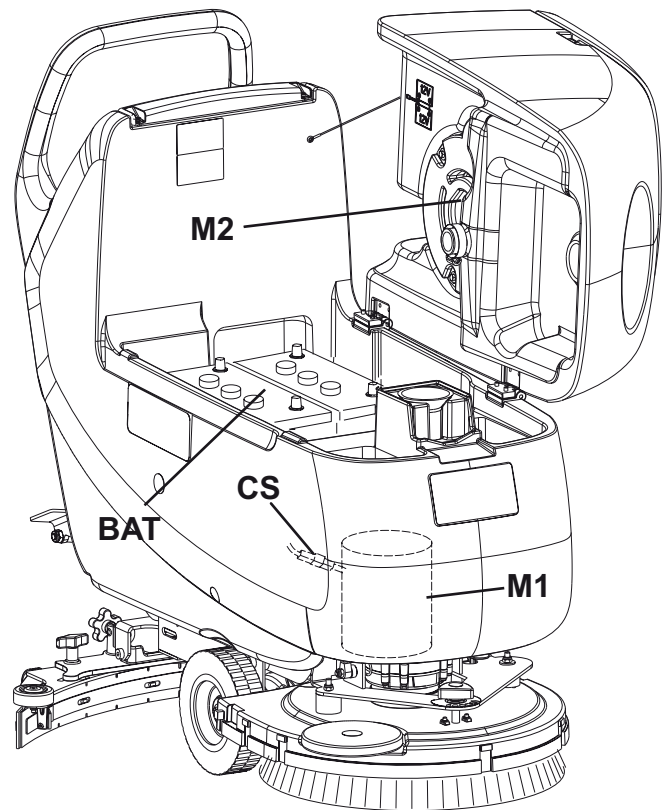
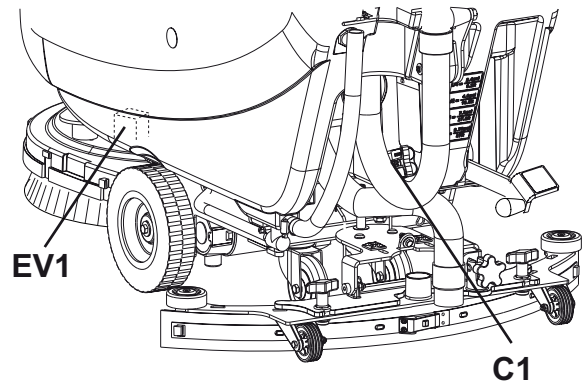
Flashes	Meaning	Action
Green, yellow and red LED flashing simultaneously.	Problem related to brush motor overload.	Perform checks shown in BRUSH MOTOR ELECTRICAL INPUT CHECK.
		If check results are negative, check the F1 fuse for integrity and its nut tightness.
Red LED flashing.	The batteries are discharged.	Charge the batteries.
		If the problem persists, replace them.

ELECTRICAL SYSTEM

COMPONENT LAYOUT - Razor™ 20

Key

BAT	24 V battery
C1	Battery connector
C2	Battery charger connector
CH	Battery charger
CS	Deck connector
EB1	Function electronic board
ES1	Brush electromagnetic switches
ES2	Vacuum system relay
EV1	Water solenoid valve
F1	Deck fuse
F2	Vacuum system fuse
F4	Signal circuit fuse
HM	Hour counter (optional)
M1	Brush/pad-holder motor
M2	Vacuum system motor



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ELECTRICAL SYSTEM

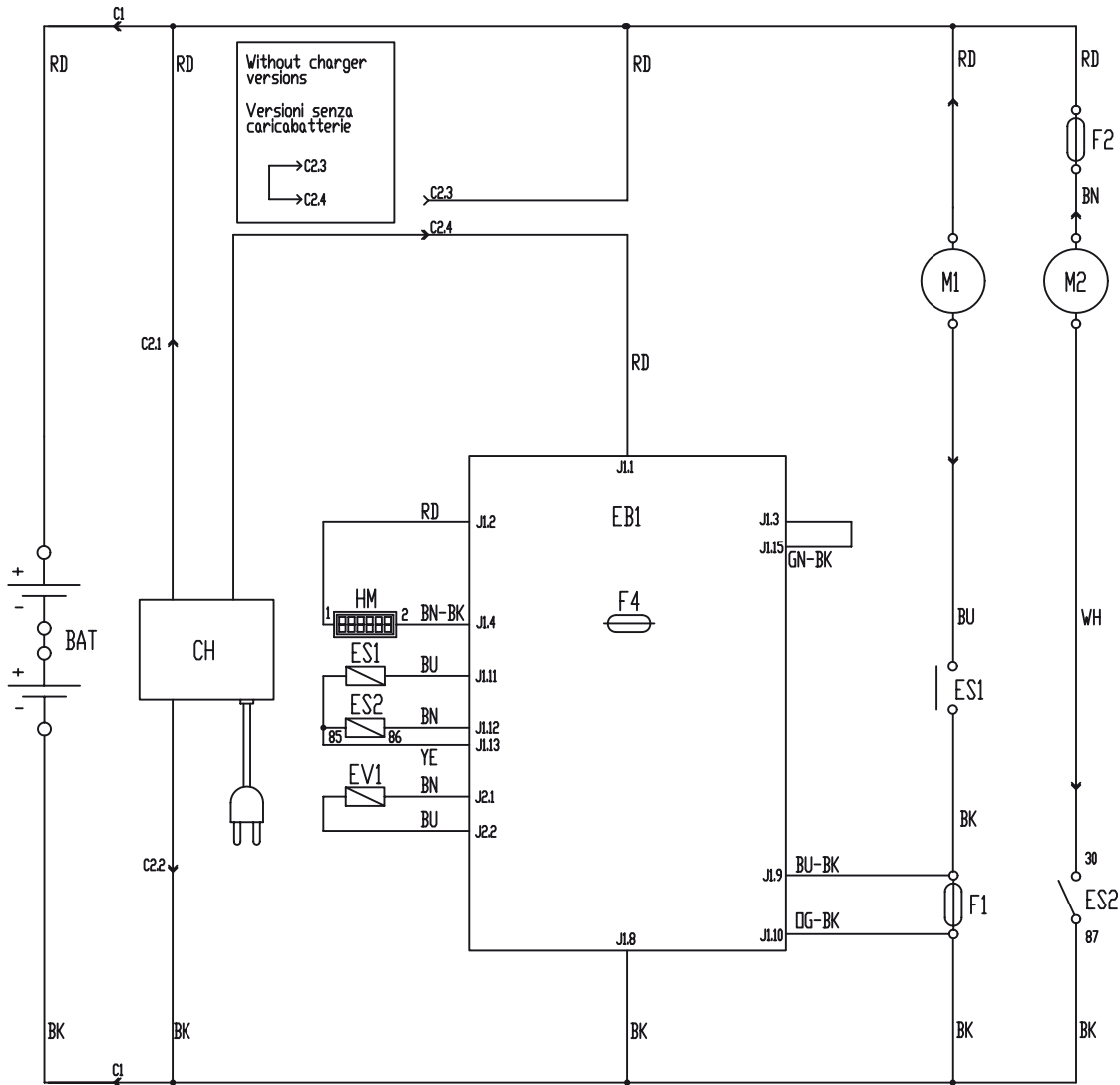
WIRING DIAGRAM - Razor™ 20

Key

BAT	24 V battery
C1	Battery connector
C2	Battery charger connector
CH	Battery charger
CS	Deck connector
EB1	Function electronic board
ES1	Brush electromagnetic switches
ES2	Vacuum system relay
EV1	Water solenoid valve
F1	Deck fuse
F2	Vacuum system fuse
F4	Signal circuit fuse
HM	Hour counter (optional)
M1	Brush/pad-holder motor
M2	Vacuum system motor

Colour codes

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



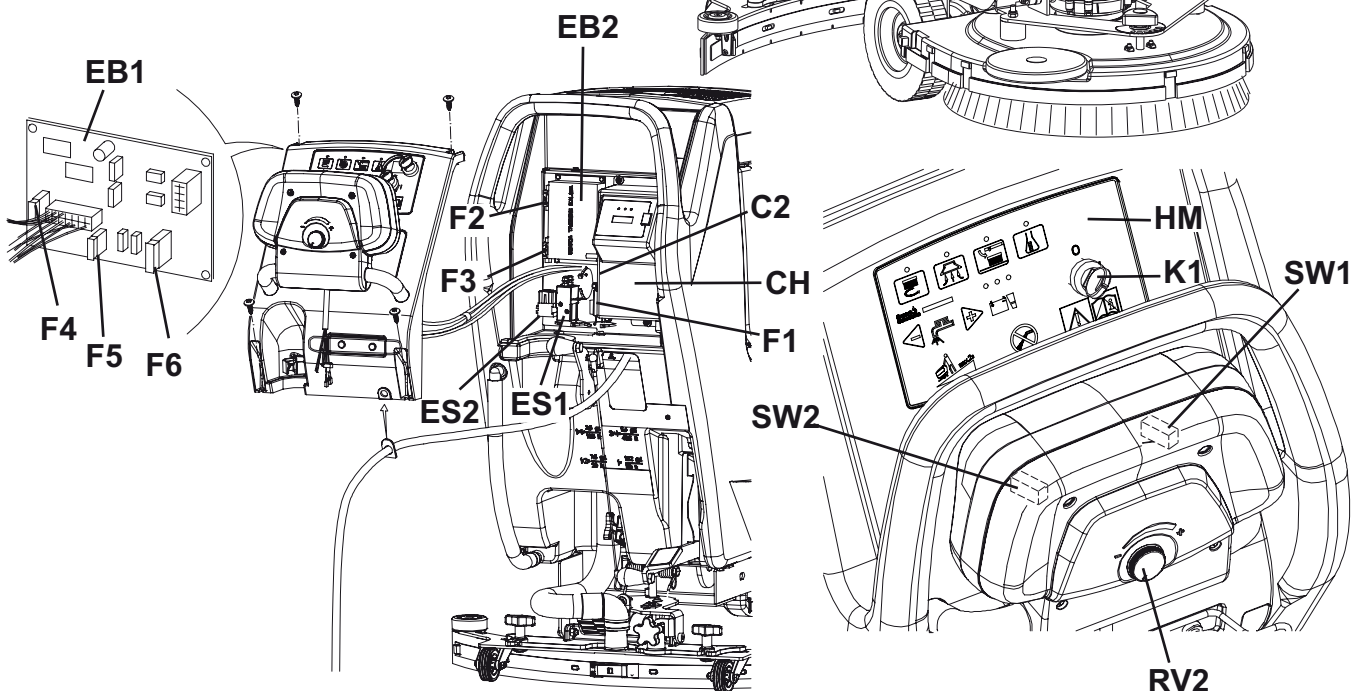
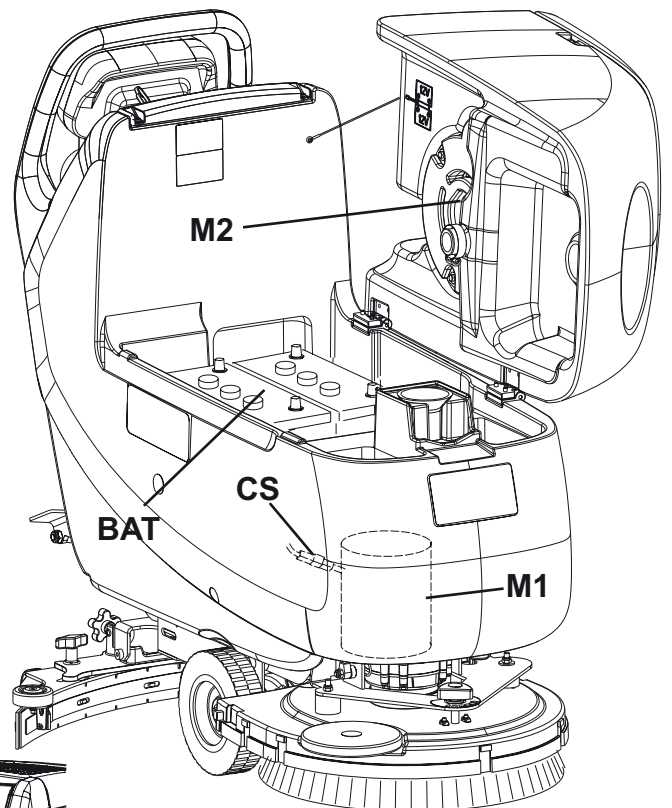
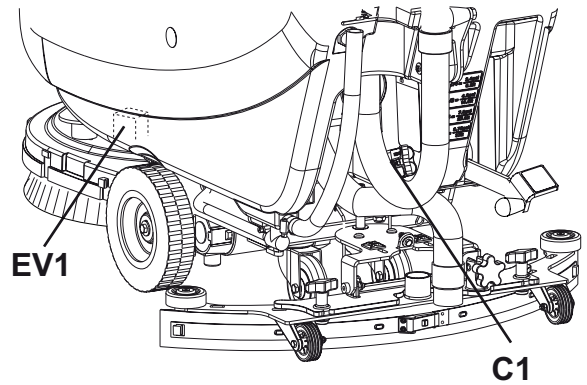
S301575A

ELECTRICAL SYSTEM

COMPONENT LAYOUT - Razor™ 20T

Key

BAT	24 V battery
C1	Battery connector
C2	Battery charger connector
CH	Battery charger
EB1	Function electronic board
EB2	Drive system electronic board
ES1	Brush electromagnetic switches
ES2	Vacuum system relay
EV1	Water solenoid valve
F1	Deck fuse
F2	Vacuum system fuse
F3	Drive system fuse
F4	Signal circuit fuse
F5	Brush/pad-holder release fuse
F6	Pump fuse
HM	Hour counter (optional)
K1	Ignition key
M1	Brush/pad-holder motor
M2	Vacuum system motor
M3	Drive system motor
RV2	Maximum speed potentiometer
SW1	Brush/drive system enabling switch
SW2	Reverse gear switch



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ELECTRICAL SYSTEM

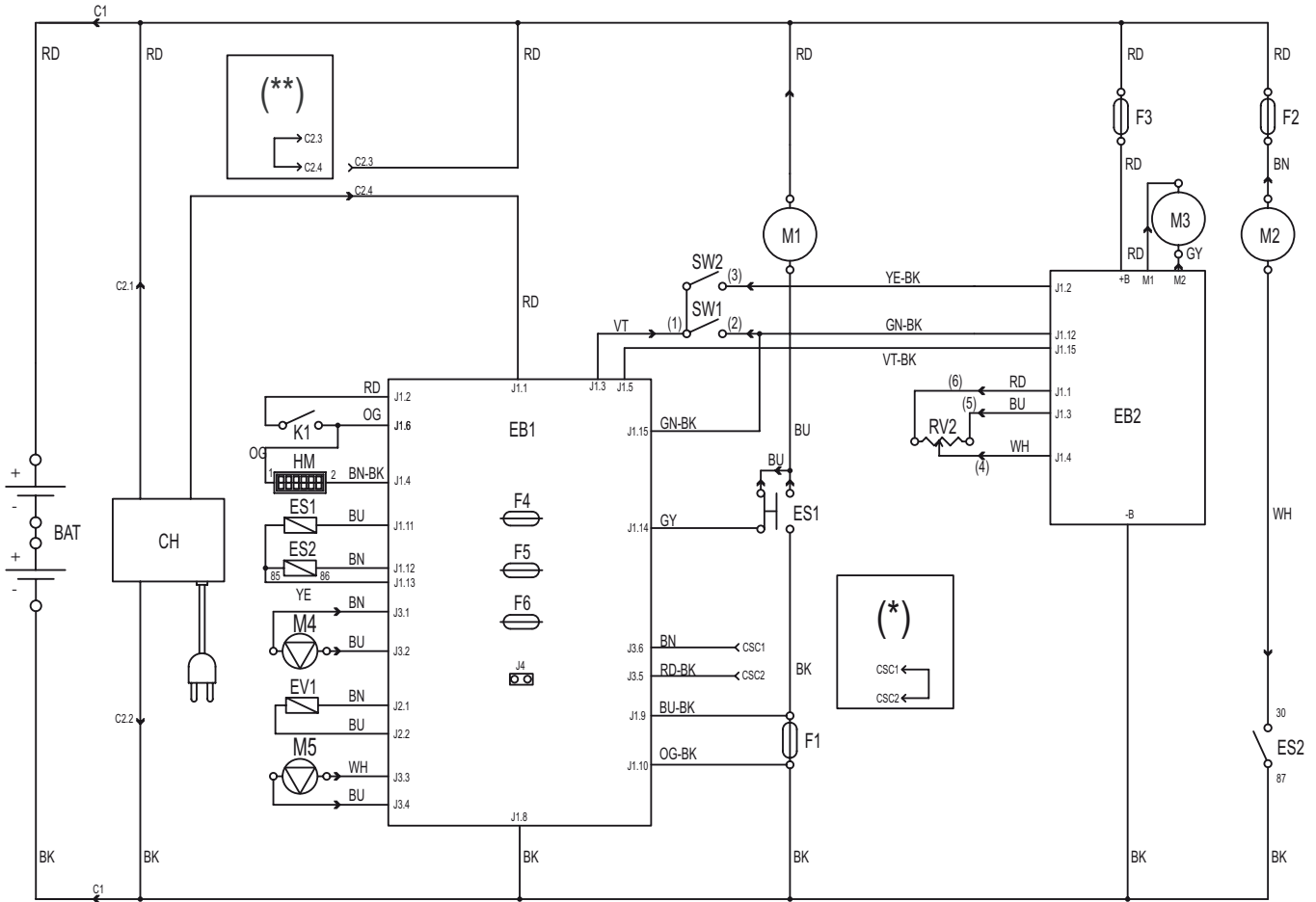
WIRING DIAGRAM - Razor™ 20T

Key

BAT	24 V battery
C1	Battery connector
C2	Battery charger connector
CH	Battery charger
EB1	Function electronic board
EB2	Drive system electronic board
ES1	Brush electromagnetic switches
ES2	Vacuum system relay
EV1	Water solenoid valve
F1	Deck fuse
F2	Vacuum system fuse
F3	Drive system fuse
F4	Signal circuit fuse
F5	Brush/pad-holder release fuse
F6	Pump fuse
HM	Hour counter (optional)
K1	Ignition key
M1	Brush/pad-holder motor
M2	Vacuum system motor
M3	Drive system motor
RV2	Maximum speed potentiometer
SW1	Brush/drive system enabling switch
SW2	Reverse gear switch

Colour codes

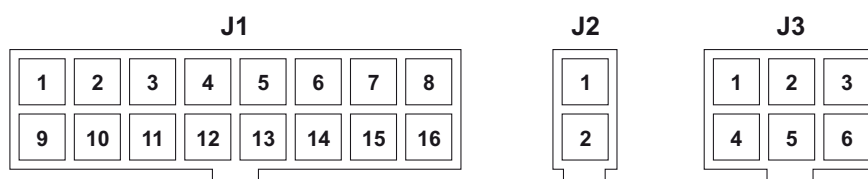
BK	Black
BU	Blue
BN	Brown
GN	Green
GY	Grey
OG	Orange
PK	Pink
RD	Red
VT	Violet
WH	White
YE	Yellow



S301575A

ELECTRICAL SYSTEM

EB1 ELECTRONIC BOARD CONNECTOR PINS



S301581

Electronic board for Razor™ 20

Supplier Ref.	Ref. Rev. Spec.
7CFBA600	Till S/N 072115094
7CFBA606	current version

Electronic board for Razor™ 20T

Supplier Ref.	Ref. Rev. Spec.
7CFBA700	Till S/N 072014255
7CFBA706	current version

CONNECTORS (on B side card)

J1: MOLEX MINIFIT type 16 ways vertical

PIN	Description	Electronic board in/out	V ref.	Connected to
1	Electronic board power supply +	BOARD	24V always, with connected batteries	BAT
2	Ignition key circuit power supply	IN/OUT	24V always, with connected batteries	K1
3	Auxiliary signal power supply	OUT	24V always, with connected batteries	SW1 SW2
4	Hour counter power supply	OUT	0V with Vacuum function activated	HM
5	Drive system electronic board enabling	OUT	24V with key on "I"	EB2.J1.15
6	Return from ignition key	IN	24V with key on "I"	K1
7	-	-	-	-
8	Electronic board power supply -	IN	0V always, with connected batteries	BAT
9	Brush fuse voltage drop reading +	IN	0 ÷ 50mV nearly proportional to the current in brush motors	F1
10	Brush fuse voltage drop reading -	IN	0V always, with connected batteries	F1
11	Brush electromagnetic switch power supply -	OUT	0V with brush function activated	ES1
12	Vacuum system relay power supply -	OUT	0V with Vacuum function activated	ES2
13	Electromagnetic switch/relay power supply +	OUT	24V with key on "I"	ES1-ES2
14	Brush motor braking circuit	IN	24V with brush function deactivated	ES1.NC
15	Drive system/brush enabling (panel)	IN	24V with pressed paddle	SW1
16				-

ELECTRICAL SYSTEM**EB1 ELECTRONIC BOARD CONNECTOR PINS 6 (continues)****J2: MOLEX MINIFIT type 2 ways vertical**

PIN	Description	Electronic board in/out	V ref.	Connected to
1	Solenoid valve power supply +	OUT	24V with key on "I"	EV1
2	Solenoid valve power supply -	OUT	0V pulsed, according to water flow setting, only with paddle pressed and brush function activated	EV1

J3: MOLEX MINIFIT type 6 ways vertical (only version CFBA706)

PIN	Description	Electronic board in/out	V ref.	Connected to
1	Water pump power supply +	OUT	24V with key on "I"	M4 (only for CFBA706)
2	Water pump power supply -	OUT	0V pulsed, according to water flow setting, only with paddle pressed and brush function activated	M4 (only for CFBA706)
3	Solution pump power supply +	OUT	24V with key on "I"	M5
4	Solution pump power supply -	OUT	0V pulsed as J3.2, when active squared wave with different frequencies according to the setting solution flow	M5
5	B-type deck configuration return	IN	24V always with cylindrical brush deck installed	CSC.2
6	Auxiliary power supply +	OUT	24V with key on "I"	CSC.1

KENT

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