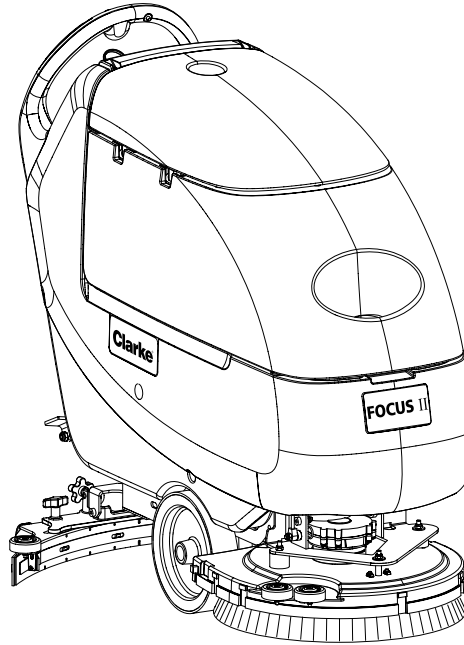


Clarke®

FOCUS® II



SERVICE MANUAL



READ THIS BOOK

This book has important information for the use and safe operation of this machine. Failure to read this book prior to operating or attempting any service or maintenance procedure to your Clarke machine could result in injury to you or to other personnel; damage to the machine or to other property could occur as well. You must have training in the operation of this machine before using it. If your operator(s) cannot read this manual, have it explained fully before attempting to operate this machine.

All directions given in this book are as seen from the operator's position at the rear of the machine. For new books write to: Clarke®, 2100 Highway 265, Springdale, Arkansas 72764.

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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 Clarke Literature Service Department:

FOCUS II: User Manual - Form Number 9097066000

SAFETY

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

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**

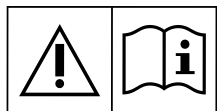
It indicates a remark related to important or useful functions.

**CONSULTATION**

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

GENERAL INFORMATION

SYMBOLS SHOWN ON THE MACHINE

**WARNING!**

Carefully read all instructions before performing any procedure.

**WARNING!**

Do not wash the machine with direct or pressurized water jets.

**WARNING!**

Do not use the machine on slopes exceeding the specifications.

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 and authorised personnel 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.*
- *Disconnect the batteries before performing any maintenance/repair procedure.*
- *Keep the battery away 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 procedure in well-ventilated areas and away from naked flames.*

GENERAL INFORMATION

**WARNING!**

- Always protect the machine against the sun, rain and bad weather, both under operation and inactivity condition. Store the machine indoors.
- Do not allow to be used as a toy. Close attention is necessary when used near children.
- Use only as shown in this Manual. Use only Alto's recommended accessories.
- Take all necessary precautions to prevent hair, jewels and loose clothes from being caught by the machine moving parts.
- Do not leave the machine unattended without being sure that it cannot move independently.
- 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 operating 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%.
- Do not use the machine as a means of transport.
- Do not use the machine on slopes with an inclination higher than 2%.
- In case of fire, use a powder fire extinguisher, not a water one.
- Do not tamper with the machine safety guards and follow the routine 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.
- If the machine is used according to the instructions, the vibrations are not dangerous. The machine vibration level is less than 2.5 m/s² (98/37/EEC-EN 1033/1995).
- 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.
- If parts must be replaced, require ORIGINAL spare parts from an Authorised Dealer or Retailer.
- 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 Center.
- 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

Model	FOCUS II L17	FOCUS II S20	FOCUS II L20	FOCUS II L20 Cyl.	FOCUS II BOOST® L20
Working Voltage	24 V DC				
Standard Batteries (2)	12 V - 130 Ah@20hr Wet				
Optional Batteries (2)	12V 114 Ah@20hr rating AGM				
Drive System Motor	0.3 hp (200 W)	—	0.3 hp (200 W)		
Drive Speed (variable)	0 to 3.5 mph (0 to 5.6 km/h)	Determined by brush rotation	0 to 3.5 mph (0 to 5.6 km/h)		
Battery Protection System	Low Voltage Cut-Off of Brush and Solution				
Vacuum Motor Power	0.5 hp, 2 stages, tangential discharge				
Vacuum Capacity	41.5 in H ₂ O (1.055 mm H ₂ O)				
Solution & Rec. Tanks	14.5 US gal (55 liters)				
Solution Flow (min/max)	0 - 0.63 gal/min (0 - 2.4 liter/min)				0 - 0.3 gal/min (0 - 0.75 liter/min)
Squeegee Width	29.9 in. (760 mm)				
Cleaning Width	17 in. (430 mm)	20 in. (508 mm)			
Brush Motor Power	0.7 hp (480 W)			(2) @ 0.4 hp (300 W) ea	0.75 hp (560 W)
Cylindrical Brush Size	—	—	—	4.3 x 19.1 in. (110 x 485 mm)	
BOOST® Pad Size	—	—	—	—	14 x 20 in. (457 x 508 mm)
Brush Speed	153 rpm			570 rpm	2250 rpm
Brush Pressure	45 and 90 lbs. (20 and 41 kg)			58.4 lbs (26,5 kg)	40 and 75 lbs. (18 and 34 kg)
Front Wheel Pressure on the floor	116 psi (0,8 N/mm ²)				
Rear Wheel Pressure on the floor	884.7 psi (6.1 N/mm ²)	406.1 psi (2.8 N/m m ²)	884.7 psi (6.1 N/mm ²)		
MIn turn around aisle width	27.5 in. (700 mm)				
On-Board Battery Charger	Standard				
Gradeability	2%				
Machine Length	52.1 in. (1.323 mm)			49.3 in. (1.253 mm)	51 in. (1.295 mm)
Machine Width without Squeegee	21.3 in. (541 mm)			22.7 in. (575.5 mm)	20.8 in. (528 mm)
Machine Height	42.8 in. (1.088 mm)				
Weight w/o Batteries and with empty tanks	209.4 lbs (95 kg)	191.8 lbs (87 kg)	209.4 lbs (95 kg)	231.5 lbs (105 kg)	203 lbs (92 kg)
Weight with batteries and full tanks	531.3 lbs (241 kg)	515.9 lbs (234 kg)	531.3 lbs (241 kg)	553.4 lbs (251 kg)	525 lbs (238 kg)
Sound level	65.8 dB(A)				
Battery compartment size (width x length x height)	13.8 x 13.8 x 11.8 in. (350 x 350 x 300 mm)				

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

- Battery maximum size
- Brush and squeegee maximum size
- Full clean water 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

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 provide 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 using the machine	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/clean water filter cleaning				
Vacuum system motor filter cleaning				
WET battery fluid level check				
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 (Only for FOCUS II L17, FOCUS II L20, FOCUS II L20 Cyl., BOOST L20)				

(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 it is required to identify a component mentioned in the text.

- | | |
|---|--|
| 1. Control panel | 48. Detergent feed hose (**) |
| 2. Handlebar | 49. Detergent pump (**) |
| 3. Brush/forward gear switch (*). Brush switch (***) | 50. Detergent tank - pump connecting hose (**) |
| 4. Drive speed adjuster (*) | 51. Detergent pump holder (**) |
| 5. Battery charger data inspection window | 52. Batteries |
| 6. Battery charger cable | 53. Battery caps |
| 7. Battery charger cable holder | 54. Solution/clean water filter |
| 8. Detergent/clean water hose | 55. Solution/clean water tap |
| 9. Reverse gear switch | 56. Reference table for detergent proportioning (**) |
| 10. Squeegee lifting/lowering lever | 57. Battery connection diagram |
| 11. Deck lifting/lowering pedal | 71. Brush/pad-holder switch |
| 11a. Pedal position when deck is lifted | 72. Brush/pad-holder switch warning light |
| 11b. Pedal position when deck is lowered | 73. Vacuum system switch |
| 11c. Extra pressure activation (optional) | 74. Vacuum system switch warning light |
| 12. Battery connector (red) (this connector also works as EMERGENCY push-button, to stop immediately all functions) | 75. Brush/pad-holder release switch |
| 13. Rear steering wheels | 76. Brush/pad-holder release switch warning light |
| 14. Front wheels on fixed axle (***). Driving wheels (*) | 77. Detergent flow control knob (**) |
| 15. Squeegee vacuum hose | 78. Reverse gear switch (*) |
| 16. Recovery water drain hose | 79. Hour meter (optional) |
| 17. Solution/clean water drain and level check hose | 80. Ignition key (0 - I) |
| 18a. Deck with one brush/pad-holder | 81. Battery charge indicator |
| 18b. Deck with two cylindrical brushes | 81a. Charged battery warning light (green) |
| 19a. Brushes/pad-holders | 81b. Semi-discharged battery warning light (yellow) |
| 19b. Cylindrical brushes | 81c. Discharged battery warning light (red) |
| 20. Solution/clean water tank | 82. Washing water flow control switches |
| 21. Recovery water tank | 82a. Flow increase switch |
| 22. Recovery water tank cover | 82b. Flow decrease switch |
| 23. Can holder | 82c. Washing water flow indicator |
| 24. Solenoid valve | 83. Brush/forward gear switch (*). Brush switch (***) |
| 25. Squeegee | 84. Speed adjuster (*) |
| 26. Squeegee Knobs | 90. Electronic battery charger |
| 27. Squeegee adjusting knobs | 91. Lead (WET) or AGM (GEL) battery selector |
| 28. Machine straight forward movement adjusting pin | 92. Green warning light (ON: the battery charger is on and batteries are charged) |
| 29. Machine forward speed adjusting pin (***) | 93. Yellow warning light (ON: the battery charger is on and batteries are semi-discharged) |
| 30. Recovery water tank cover (opened) | 94. Red warning light (ON: the battery charger is on and it is charging the batteries) |
| 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 filler neck | |
| 38. Filter (optional) | |
| 39. Deck bumper wheels | |
| 40. Recovery water tank (opened) | |
| 41. Recovery water drain hose plug | |
| 42. Tank safety cable | |
| 43. Vacuum system motor cover | |
| 44. Vacuum system motor sound-deadening filter | |
| 45. Detergent tank (**) | |
| 46. Detergent tank plug (**) | |
| 47. Detergent tank handle (**) | |

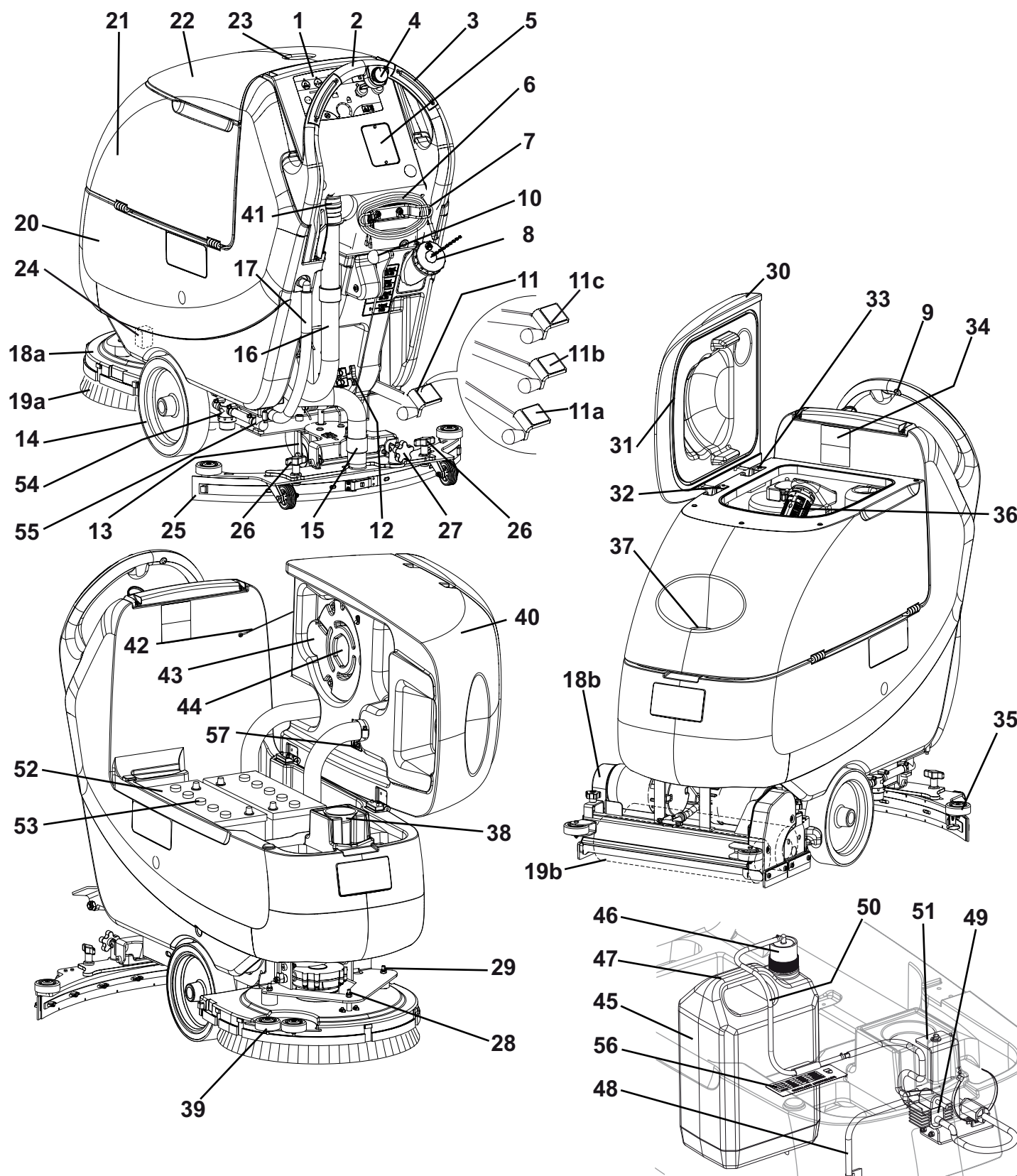
(*) Only for FOCUS II with DRIVE

(**) Only for machines with Chemical Mixing System (optional)

(***) Only for FOCUS II without DRIVE

GENERAL INFORMATION

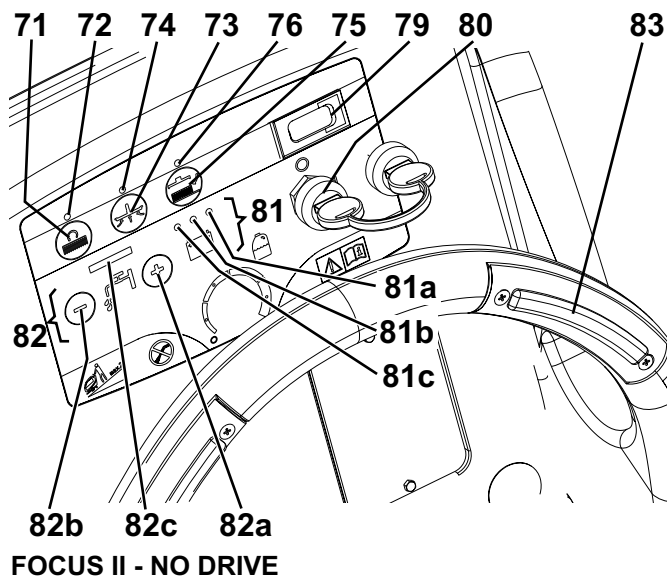
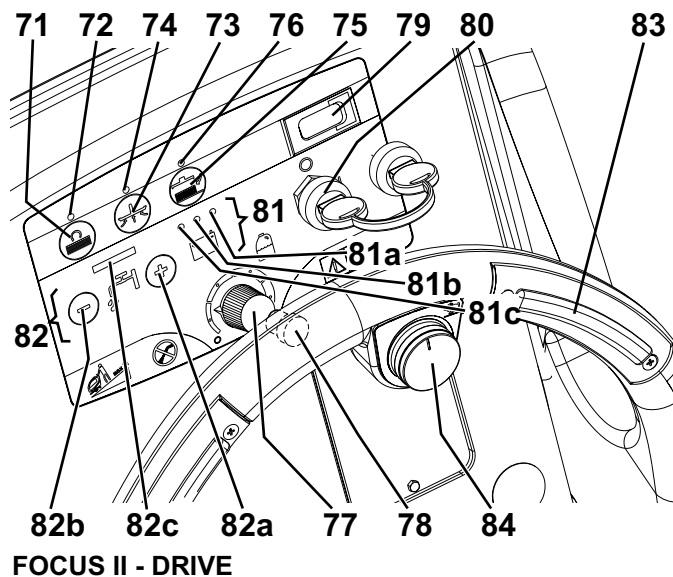
MACHINE NOMENCLATURE (continues)



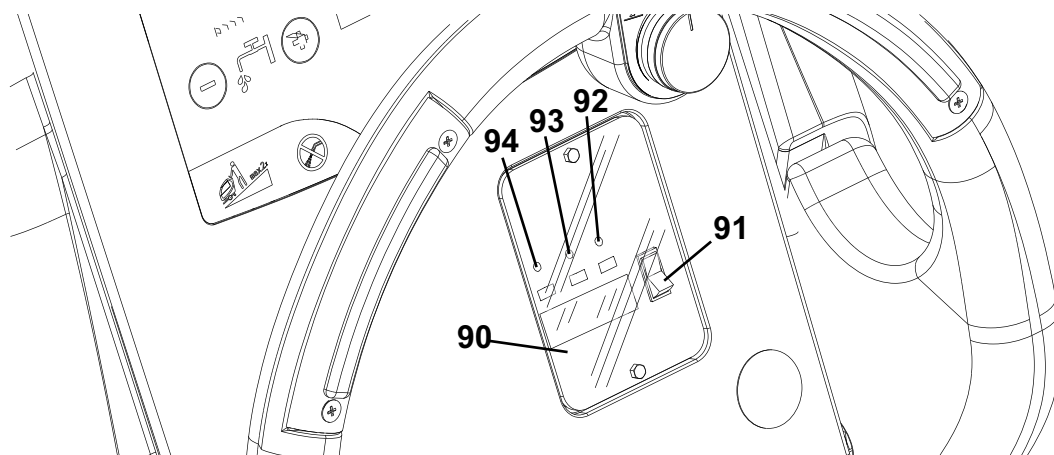
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GENERAL INFORMATION

MACHINE NOMENCLATURE (Continues)



P100163



P100164

SOLUTION/CLEAN WATER SUPPLY SYSTEM

SOLUTION/CLEAN WATER SUPPLY SYSTEM

SOLUTION/CLEAN WATER TANK AND SUPPLY SYSTEM CLEANING

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

SOLUTION FILTER CLEANING

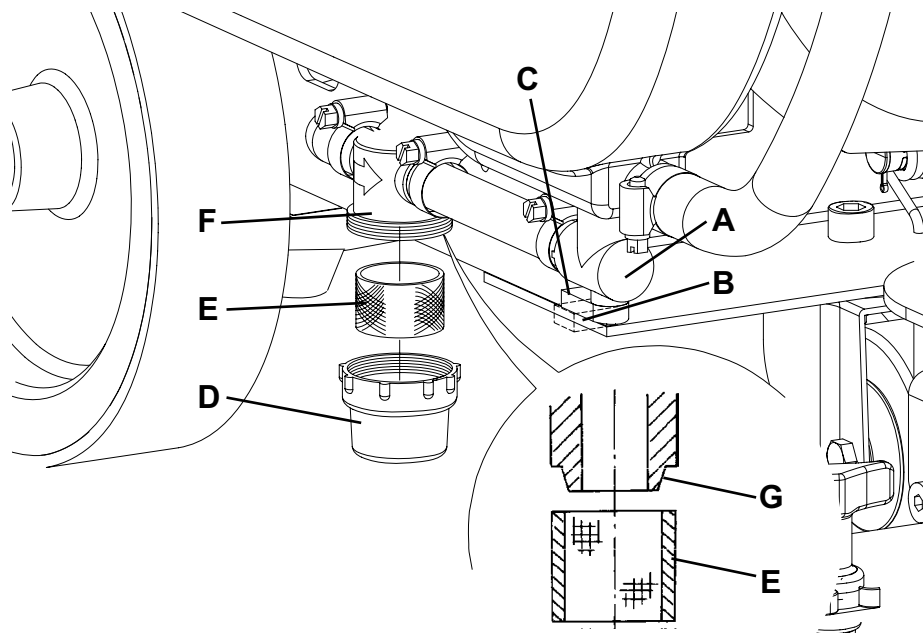
1. Drive the machine on a level floor.
2. Turn the ignition key (80) to "0".
Close the solution tap (A, Fig. 8) under the machine left lower side. The tap (A) is closed when it is in the position (B) and it is open when it is in the position (C).
3. Remove the transparent cover (D), then remove the filter 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/CLEAN WATER SUPPLY SYSTEM

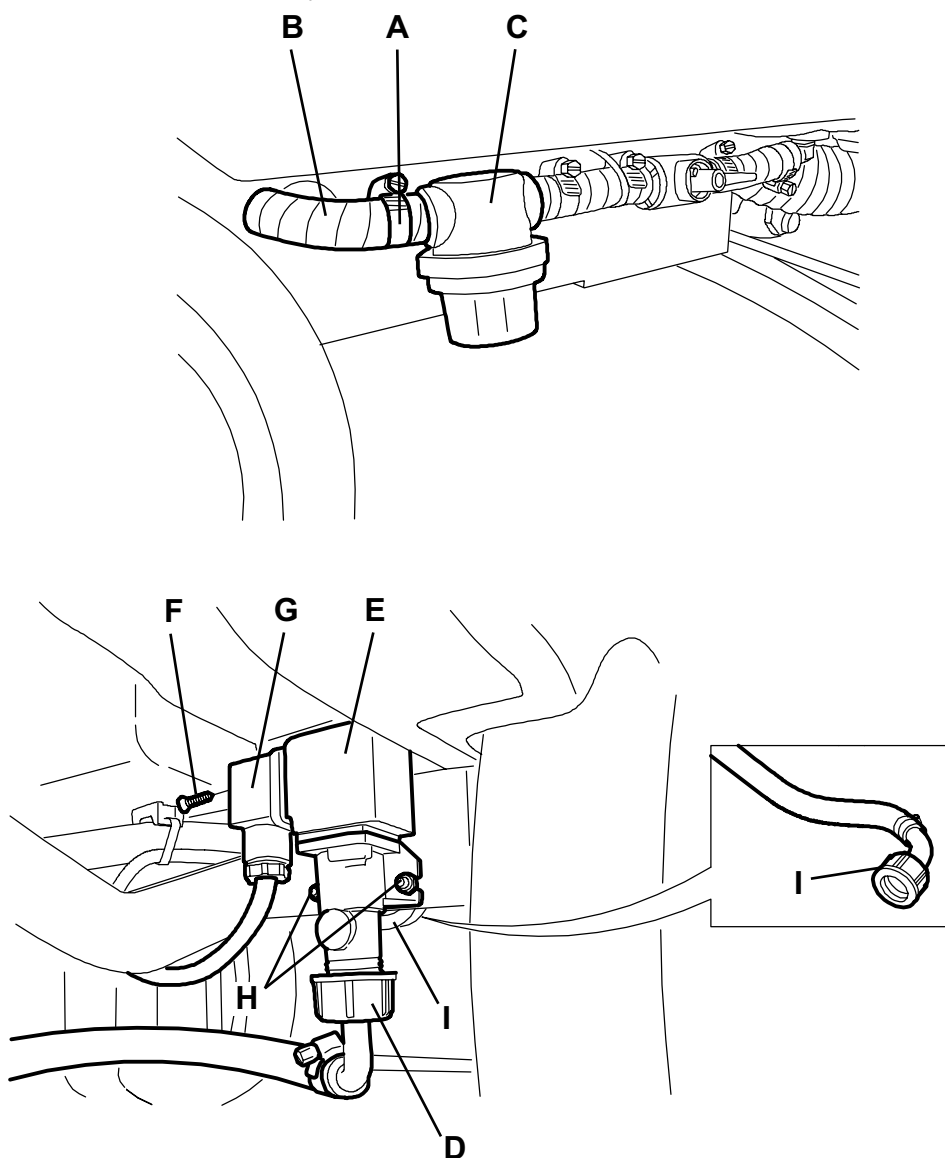
SOLENOID VALVE DISASSEMBLY/ASSEMBLY

Disassembly

1. (For machines with brushes/pad-holders) Remove the brushes/pad-holders.
2. Lower the deck by pressing the pedal (11).
3. Loosen the clamp (A) and disconnect the hoses (B) from the filter assembly (C).
4. Disconnect the union (D) from the solenoid valve (E) and recover the gasket.
5. Remove the screw (F), disconnect the connector (G) and recover the gasket.
6. Remove the nuts (H).
7. Remove the solenoid valve (E) with the hoses (B). If necessary separate the hoses (B) from the solenoid valve and disconnect it from the union (I).

Assembly

8. Assemble in the reverse order of disassembly.



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SOLUTION/CLEAN WATER SUPPLY SYSTEM

TROUBLESHOOTING

Small amount of solution or no solution reaches the brush

Possible causes:

1. The solution/clean water filter is clogged/dirty (clean).
2. The solution/clean water 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 is debris in the solution/clean water hoses clogging the flow (clean the hoses).

The solution/clean water 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).

CHEMICAL MIXING SYSTEM

CHEMICAL MIXING SYSTEM

TROUBLESHOOTING

Small amount of detergent or no detergent reaches the brush

Possible causes:

1. The detergent flow percentage is too low (check/change the percentage as shown in the User Manual).
2. The hydraulic circuit upstream of the detergent pump is not triggered (check if the hose (48) is filled and, if necessary, perform one or more draining cycle, as shown in the relevant paragraph).
3. The pump is broken or there is an open in the electrical connection (replace the pump/repair the electrical connection).
4. There is debris in the detergent tank clogging the output hole (clean the tank).
5. There is debris in the detergent hoses clogging the detergent flow (clean the hoses).
6. The function electronic board is faulty (replace).
7. The RV3 potentiometer is disconnected or faulty.
8. The one-way valve is clogged (replace or clean with compressed air).

The detergent reaches the brush also when the machine is off

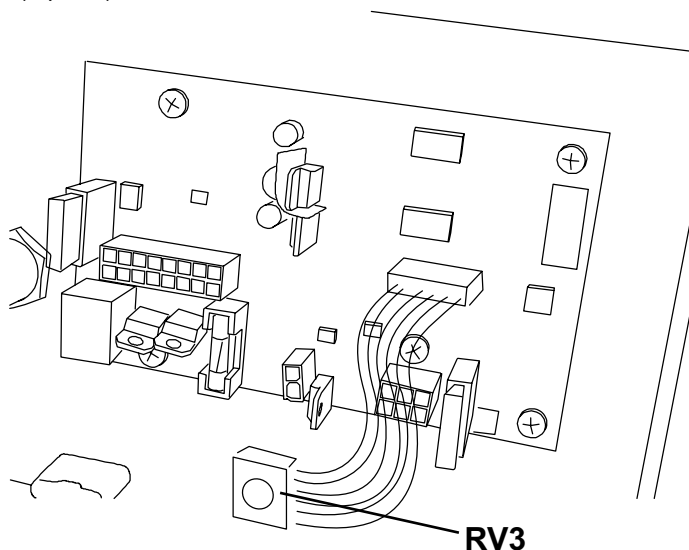
Possible causes:

1. The pump is broken (replace).
2. The one-way valve is broken (replace).

There is water in the detergent tank.

Possible causes:

1. The one-way valve is broken (replace).

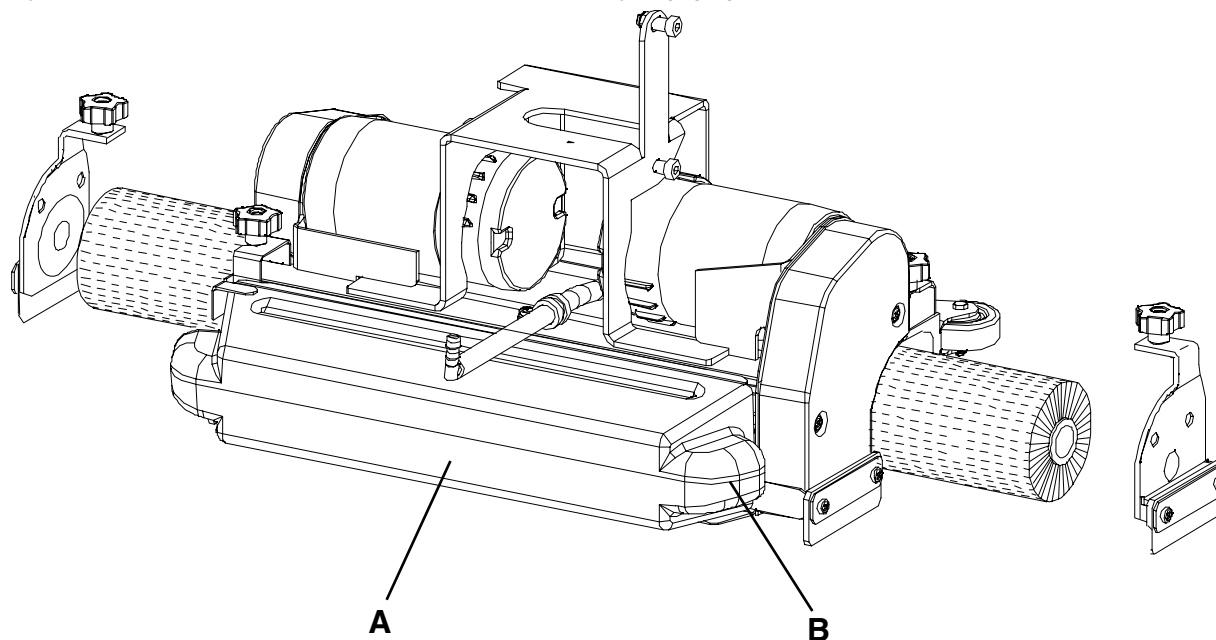


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BRUSHING SYSTEM**BRUSHING SYSTEM****BRUSH/PAD CLEANING****CAUTION!**

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 the brushes/pads for integrity and wear; if necessary, replace them.
4. (For **FOCUS II CYL. DRIVE**). Remove the debris container (A) by pulling it on one side with the handle (B). Empty and wash the debris container (A), and then install it by engaging it on the inside fasteners.



S301529

BRUSHING SYSTEM

BRUSH/PAD-HOLDER DECK OR CYLINDRICAL BRUSH DECK DISASSEMBLY/ASSEMBLY

The machine can be equipped with either the brush/pad-holder deck (18a) or the cylindrical brush deck (18b), according to the following procedures.



WARNING!

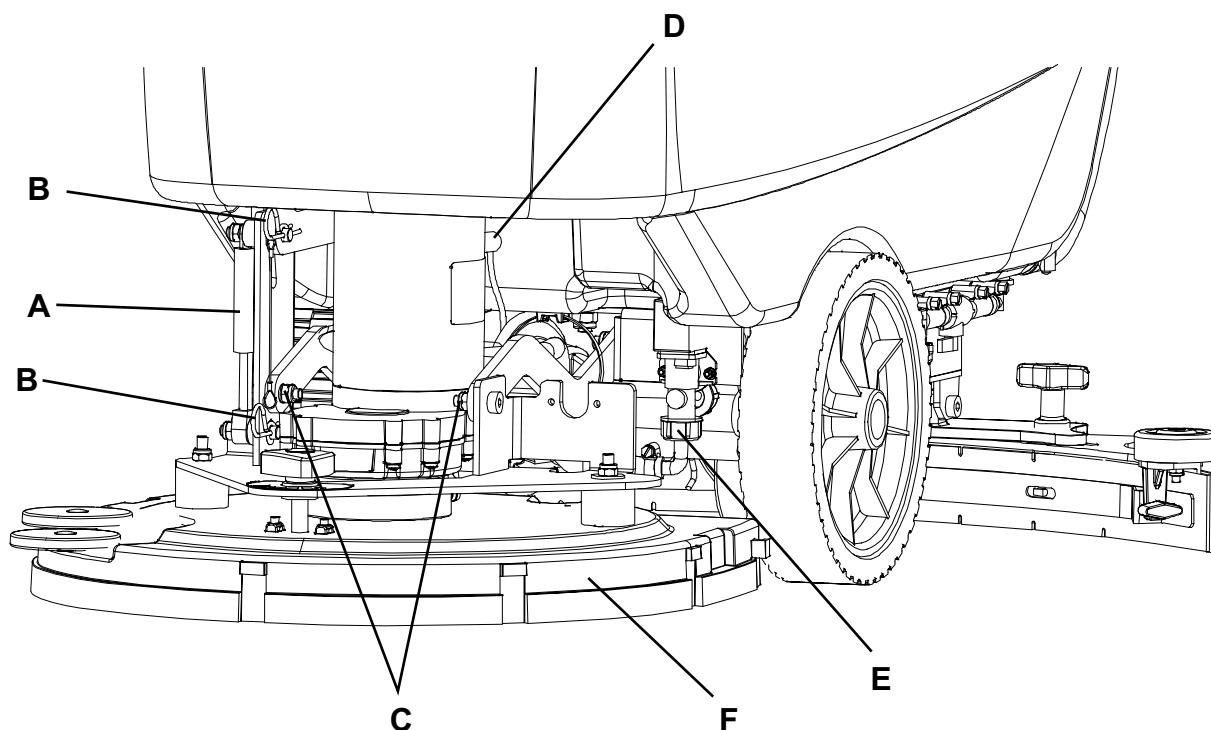
When the deck is installed/removed, it may be necessary to change the squeegee too, because they must have the same width. For correct matching of deck and squeegee, see the Squeegee Installation paragraph in the User Manual.

Disassembly

1. Drive the machine on a level floor.
2. Remove the brushes/pad-holders, as shown in the User Manual. Do not remove the cylindrical brushes.
3. Lower the brush/pad-holder deck by pressing the pedal (11).
4. Remove the cotter pins (B), then remove the gas spring (A), if equipped.
5. Disconnect the brush/pad-holder motor electrical connection (D).
6. Disconnect the solution hose connection (E).
7. Remove the screws (C), then remove the brush/pad-holder deck (F).

Assembly

1. Assemble the components in the reverse order of disassembly, and note the following:
 - When the machine is equipped with the cylindrical brush deck (18c), the gas spring (A) must not be installed.



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BRUSHING SYSTEM

BRUSH MOTOR ELECTRICAL INPUT CHECK (for FOCUS II L17 - FOCUS II S20 - FOCUS II L20)

**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.
 - Turn the ignition key (80) to "0".
 - 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 the ignition key (80) to "0".
6. Carefully lift the tank (40).
7. Apply the amperometric pliers (J) on one cable (K) of the brush motor (L).
8. (for **FOCUS II 17" DRIVE** and **FOCUS II 20" DRIVE**). Turn the speed adjuster (84) to idle and turn the ignition key (80) to "I".
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).
Turn the ignition key (80) to "0".
Remove the amperometric pliers (J).

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

**NOTE**

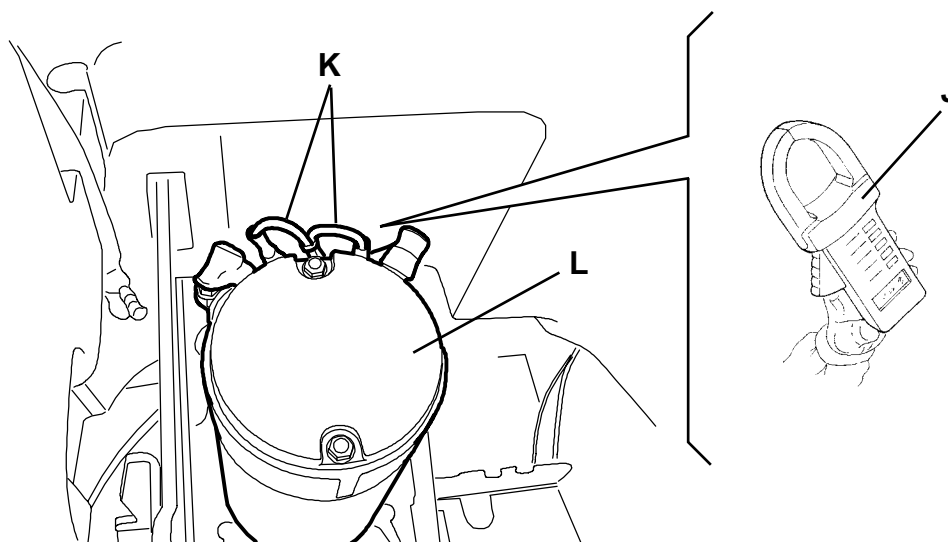
If the electrical input is higher than the maximum allowed value, the 3 battery warning lights (81) flash simultaneously.

- 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.



S301533

BRUSHING SYSTEM

BRUSH MOTOR ELECTRICAL INPUT CHECK (for FOCUS II L20 CYL.)


WARNING!

This procedure must be performed by qualified personnel only.

Check

1. Remove the brushes, as shown in the User Manual.
2. Lower the deck by pressing the pedal (11).
3. Disconnect the motor which does not have to be checked.
4. Apply the amperometric pliers (A) on one cable (B) of the brush motor (C).
5. Turn the speed adjuster (84) to idle and turn the ignition key (80) to "I".
6. Turn on the brushes by pressing the switch (71) and check that the motor electrical input is 5 - 8 A at 24 V. Turn off the brushes by pressing the switch (71).

Turn the ignition key (80) to "0".

Remove the amperometric pliers (A).

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


NOTE

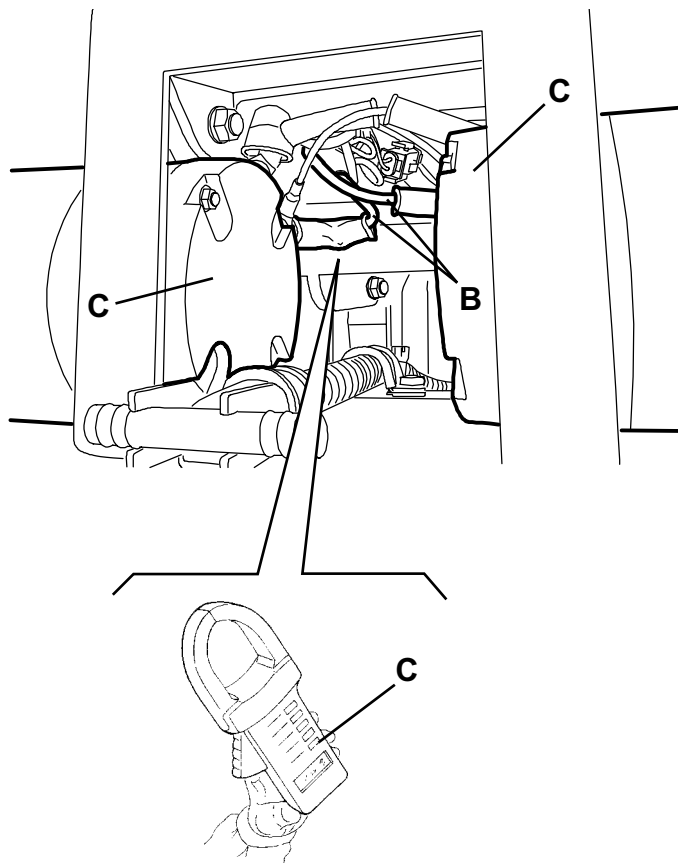
If the electrical input is higher than the maximum allowed value, the 3 battery warning lights (81) flash simultaneously.

- 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 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

7. Perform steps 1 and 2 in the reverse order.



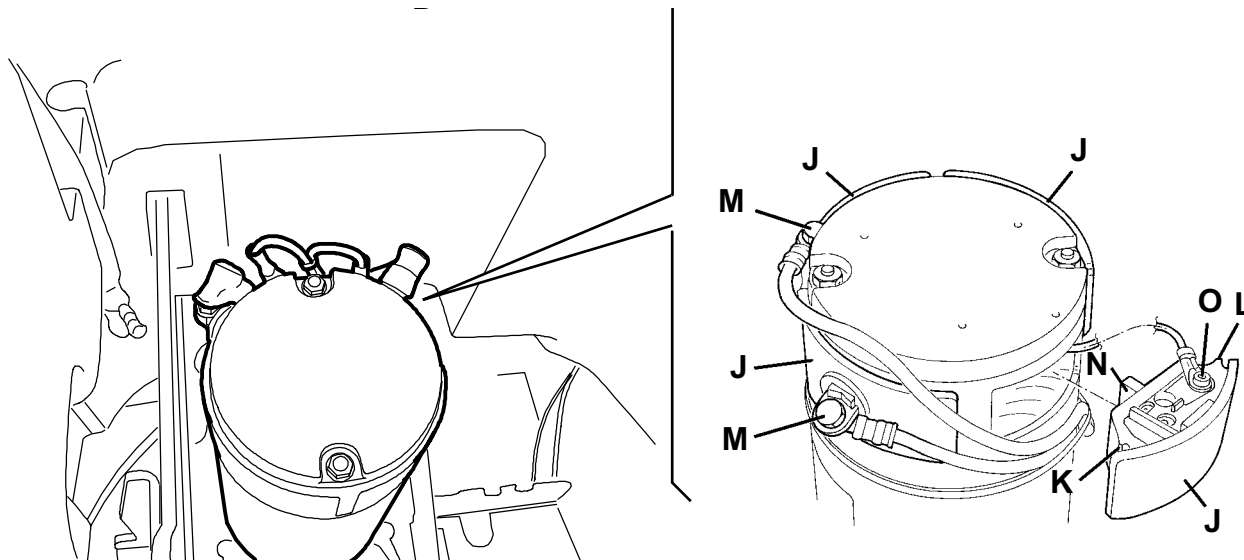
S301535

BRUSHING SYSTEM**BRUSH MOTOR CARBON BRUSH CHECK/REPLACEMENT (for FOCUS II L17 - FOCUS II S20 - FOCUS II L20)****Check**

1. 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).
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 the ignition key (80) to "0".
6. Carefully lift the tank (40).
9. Disconnect the battery connector (12).
10. Remove dust and dirt from the motor carbon brush support area (A).
11. Disengage the fasteners (K) and (L) and remove four carbon brush supports (J). If necessary, disconnect the electrical connections (M).
12. Check the carbon brushes (N) 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.
13. If necessary, disconnect the connections (O) and remove the carbon brushes with their supports (J) and 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 (O), take care of their insulation from the surrounding parts of the frame.



S301539

BRUSHING SYSTEM

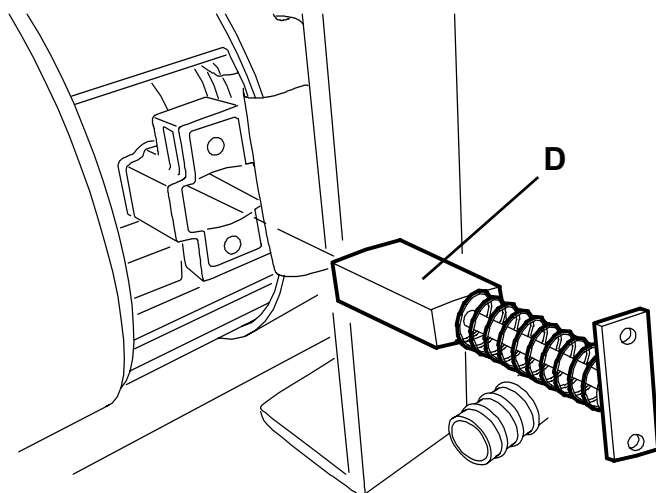
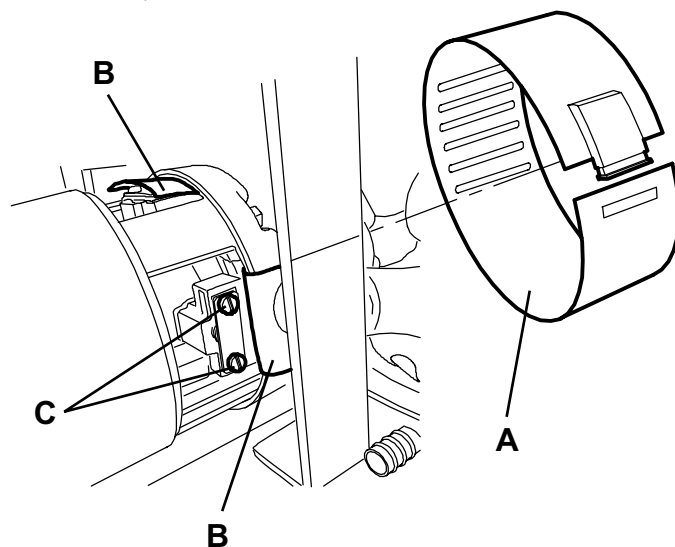
BRUSH MOTOR CARBON BRUSH CHECK/REPLACEMENT (for FOCUS II L20 CYL.)

Check

1. Remove the brush motor (see the procedure in the relevant paragraph).
2. At the workbench, remove dust and debris from the motor, especially in the area of the protection clamp (A).
3. Remove the protection clamp (A).
4. For each carbon brush, move the protection (B) and remove the screws (C).
5. Remove the carbon brushes (D).
6. Check the carbon brushes (D) 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.
Replace the carbon brushes as an assembly.

Reset

7. Assemble in the reverse order of disassembly.



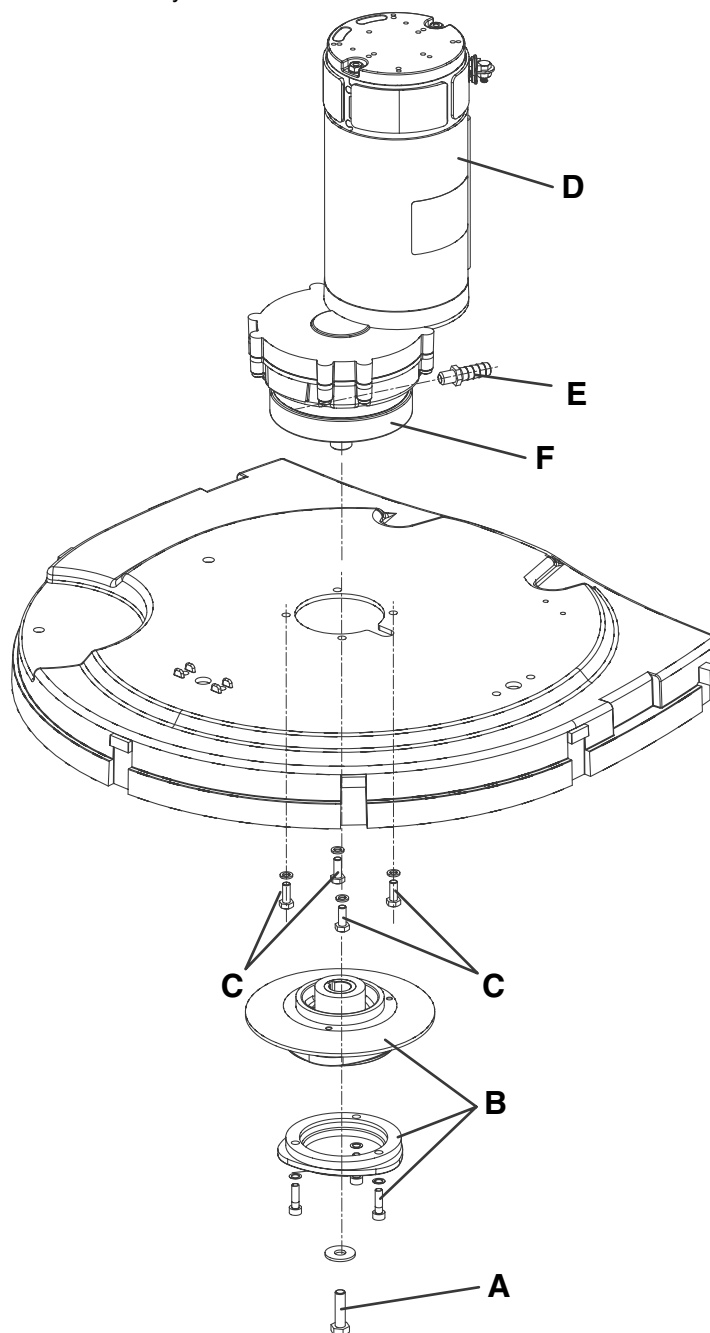
S301542

BRUSHING SYSTEM**BRUSH MOTOR DISASSEMBLY/ASSEMBLY (for FOCUS II L17 - FOCUS II S20 - FOCUS II L20)****Disassembly**

1. Remove the cylindrical brush 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 in the reverse order of disassembly.



S301544

BRUSHING SYSTEM

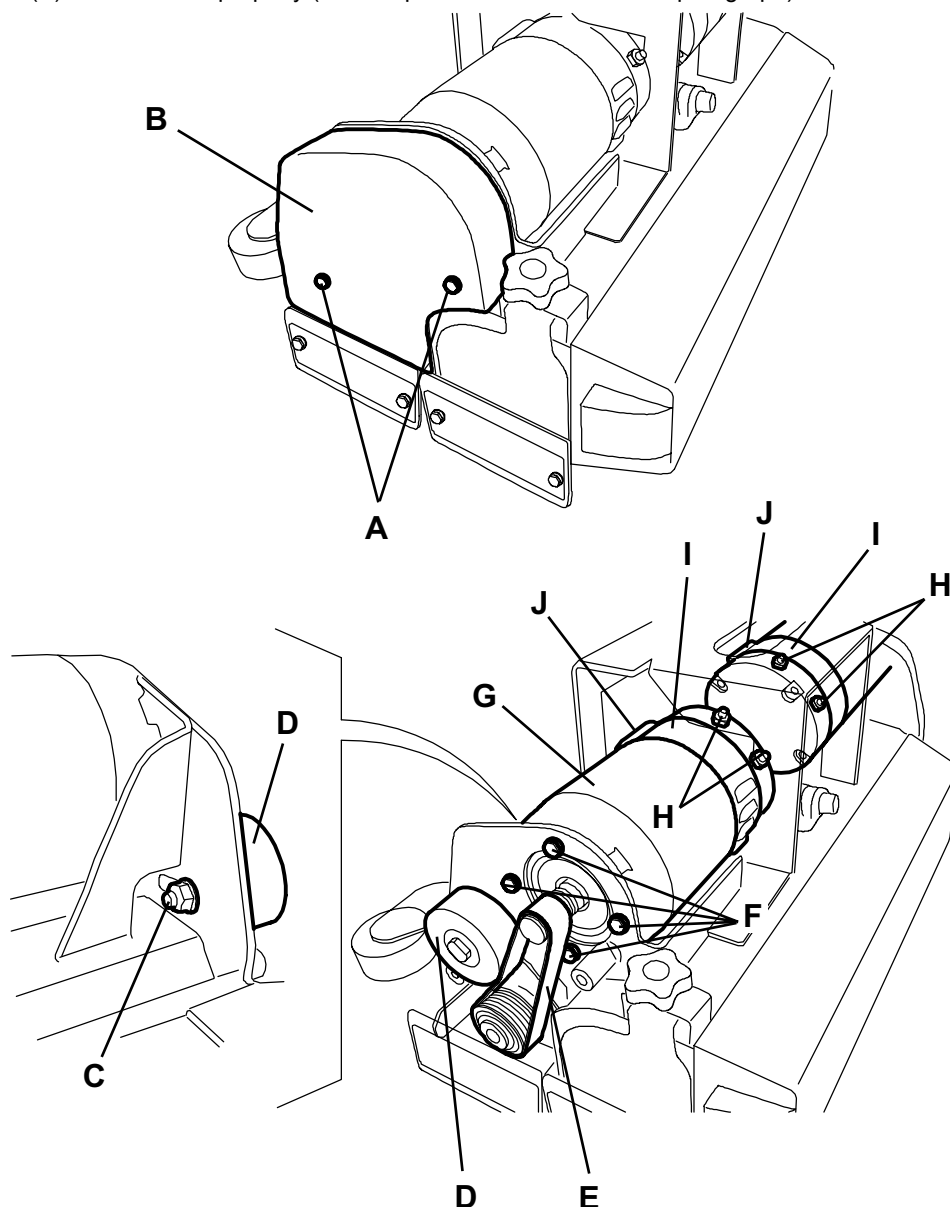
BRUSH MOTOR DISASSEMBLY/ASSEMBLY (for FOCUS II L20 CYL.)

Disassembly

1. Remove the cylindrical brush deck (see the procedure in the relevant paragraph).
2. At the workbench, remove the screw (A) from the motor which has to be disassembled.
3. Remove the case (B).
4. Loosen the nut (C) and move the pulley (D) to loosen the belt (E).
5. Remove the belt (E).
6. Remove the screws (F).
7. Remove the motor (G).

Assembly

8. Assemble the components in the reverse order of disassembly, and note the following:
 - The electrical connections (H) of the motor (G) must be turned upwards.
 - The connection (J) of the carbon brush protection clamps (I) must be positioned as shown in the figure.
 - Install the belt (E) and tension it properly (see the procedure in the relevant paragraph).



S301545

BRUSHING SYSTEM**CHECK/REPLACEMENT/ADJUSTMENT OF DRIVING BELTS BETWEEN MOTORS AND CYLINDRICAL BRUSHES (for FOCUS II L20 CYL.)****Check**

1. Drive the machine on a level floor.
2. Turn the ignition key (12) to "0".
3. Lower the cylindrical brush deck by pressing the pedal (11).
4. Remove the screws (A) and remove the covers (B).
5. Visually inspect the belt (C) for integrity, cuts, tears or cracks, if necessary replace it according to the following procedure.
6. Check the tension of the belt (C) according to the following procedure.

Replacement

7. If the belt (G) is to be replaced, loosen the nut (D) and move the pulley (K) to loosen the belt.
8. Tension the belt (according to the following procedure).

Belt tensioning

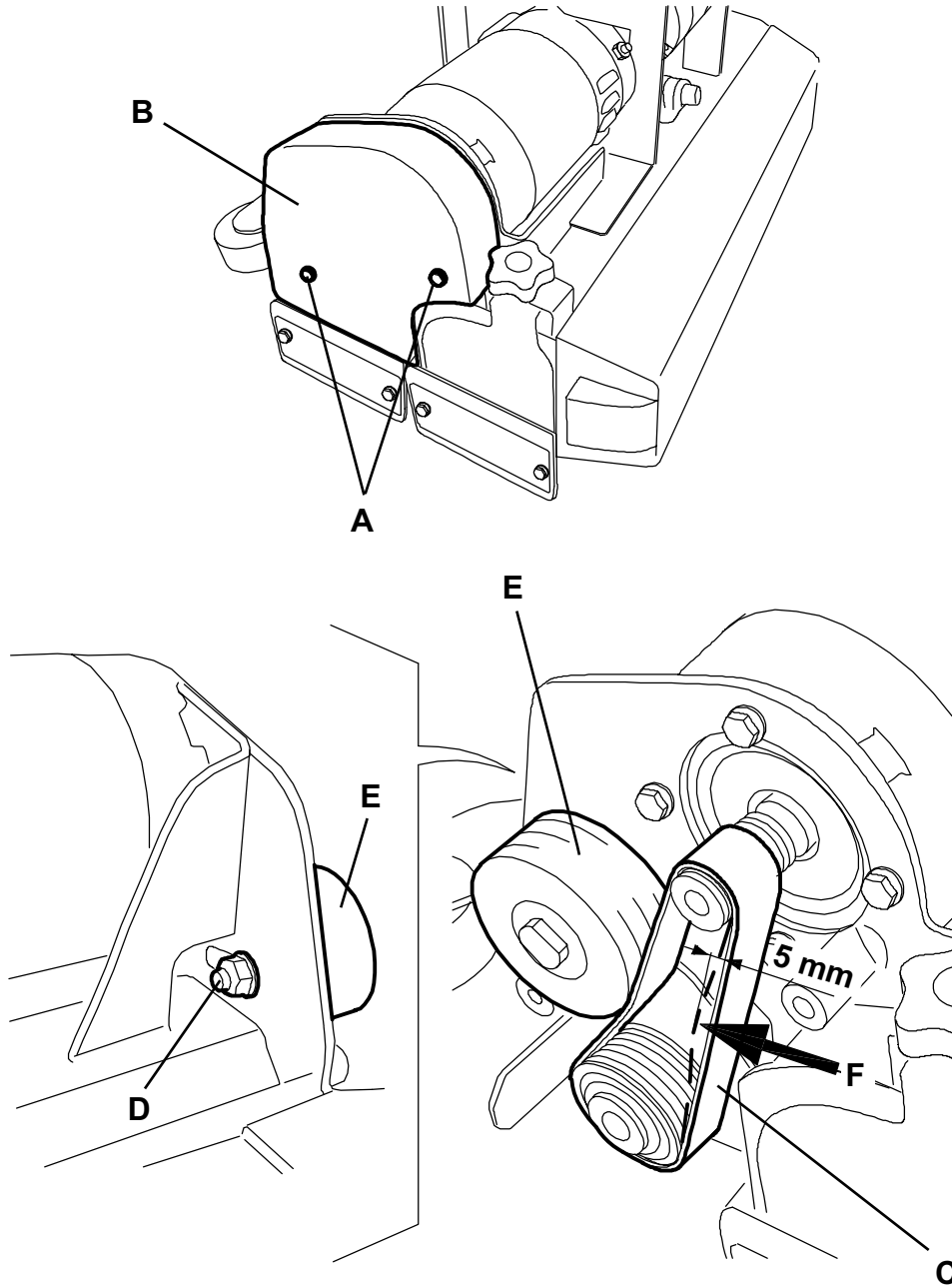
9. Check the tension of the belt (C) between motor and brush. The tension is correct:
 - When pressing the belt in its centre with a force of 22 lb (10 kg) (F), the belt bends for 0.20 in (5 mm).If necessary, tension the belt according to the following procedure:
10. Loosen the nut (D) and adjust the position of the pulley (E). When tensioning procedure has been performed, tighten the nut (D).
11. Repeat step 8.

Reset

12. Perform steps 3 and 4 in the reverse order.

BRUSHING SYSTEM

CHECK/REPLACEMENT/ADJUSTMENT OF DRIVING BELTS BETWEEN MOTORS AND CYLINDRICAL BRUSHES (for FOCUS II L20 CYL.) (Continues)



S301548

TROUBLESHOOTING

All brushes do not turn

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. Turn the ignition key (80) to "0".
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.

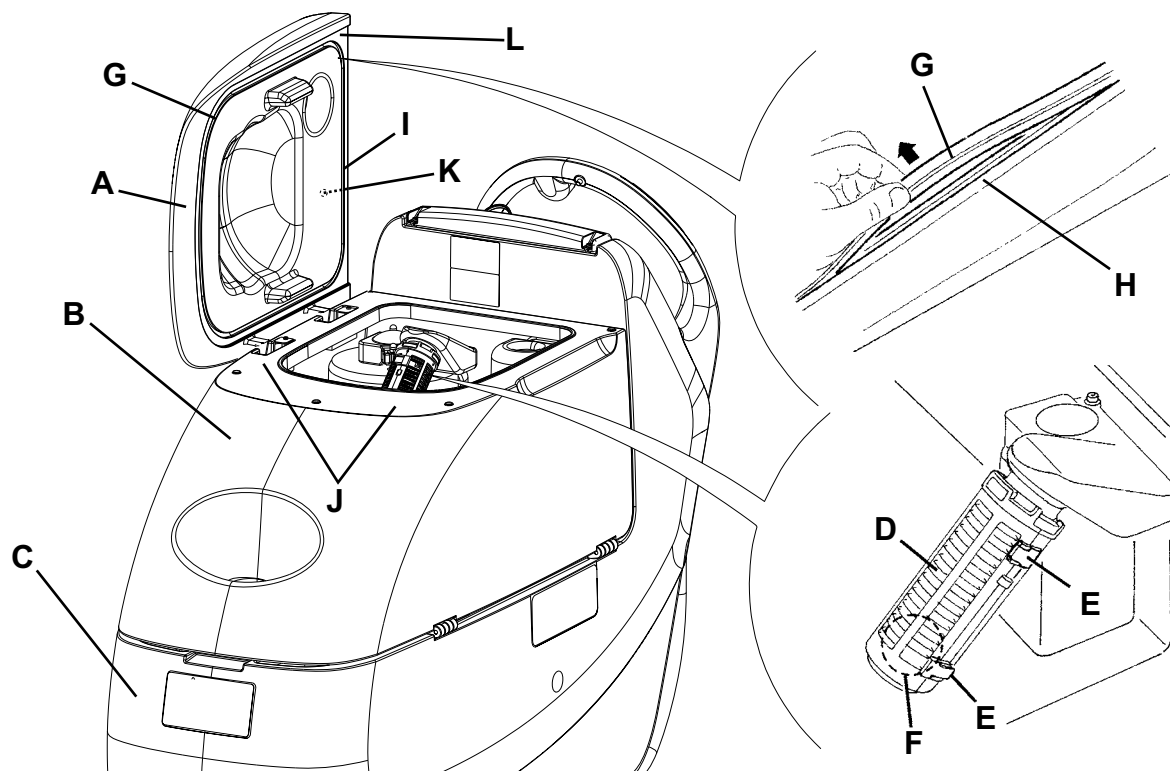
If necessary replace the gasket (G) by removing it from its housing (H). When assembling the new gasket, install the joint (I) in the rear central area, as shown in the figure.

7. Check that the seating surface (J) of the gasket (G) is integral and adequate for the gasket itself.


NOTE

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

8. Close the cover (A).



P100119

RECOVERY WATER SYSTEM

SQUEEGEE CLEANING/CHECK/REPLACEMENT AND SQUEEGEE BLADE REPLACEMENT (All models)

**CAUTION!**

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

Disassembly and cleaning

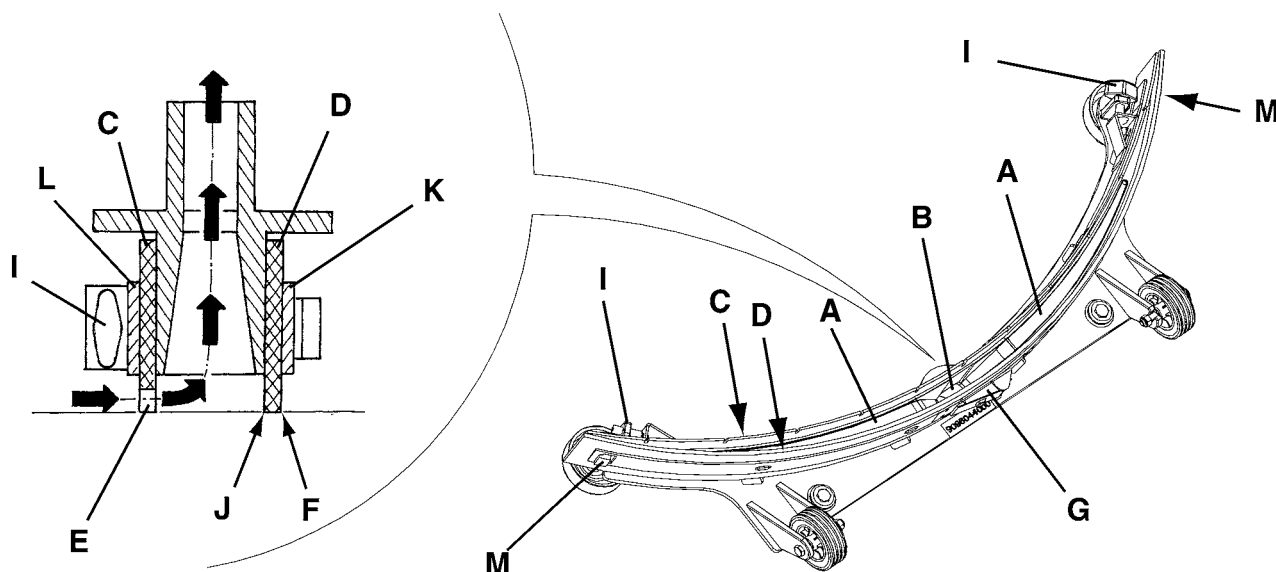
1. Drive the machine on a level floor.
2. Turn the ignition key (80) to "0".
3. Lower the squeegee (25) with the lever (10).
4. Loosen the knobs (26) and remove the squeegee (25).
5. Disconnect the vacuum hose (15) from the squeegee.
6. Clean the steel squeegee (Fig. 1) or the aluminium squeegee (Fig. 2). Clean the compartments (A, Fig. 1 or 2) and the hole (B) especially. Check the front blade (C) and the rear blade (D) for integrity, cuts and tears; if necessary 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 steel squeegee (Fig. 1) or the aluminium squeegee (Fig. 2), as shown in the previous paragraph.
2. Check that the edges (E, Fig. 1 or 2) 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, Fig. 1 or 2) and loosen the wing nuts (H, Fig. 1), or disengage the fasteners (M, Fig. 2) and adjust the rear blade (D, Fig. 1 or 2), then tighten the wing nuts, or engage the fasteners, and then engage the tie rod.
 - Loosen the knobs (I) and adjust the front blade (C, Fig. 1 or 2); then tighten the knobs.
3. Check the front blade (C, Fig. 1 or 2) 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 knobs (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 knobs (26).
6. If necessary, adjust the squeegee balance adjusting knob (27).



S301552

RECOVERY WATER SYSTEM

VACUUM SYSTEM MOTOR FILTER CLEANING

Disassembly and cleaning

1. If the tank (21) contains recovery water:
2. Drive the machine to the appointed recovery water disposal area.
3. Turn the ignition key (80) to "0".
4. Empty the recovery water tank (21) with the hose (16).
5. Drive the machine on a level floor.
6. Turn the ignition key (80) to "0".
7. Carefully lift the tank (40).
8. Remove the vacuum system motor filter (44) and clean it with water and compressed air.
9. Install the filter (44).

Assembly

10. Assemble in the reverse order of disassembly.

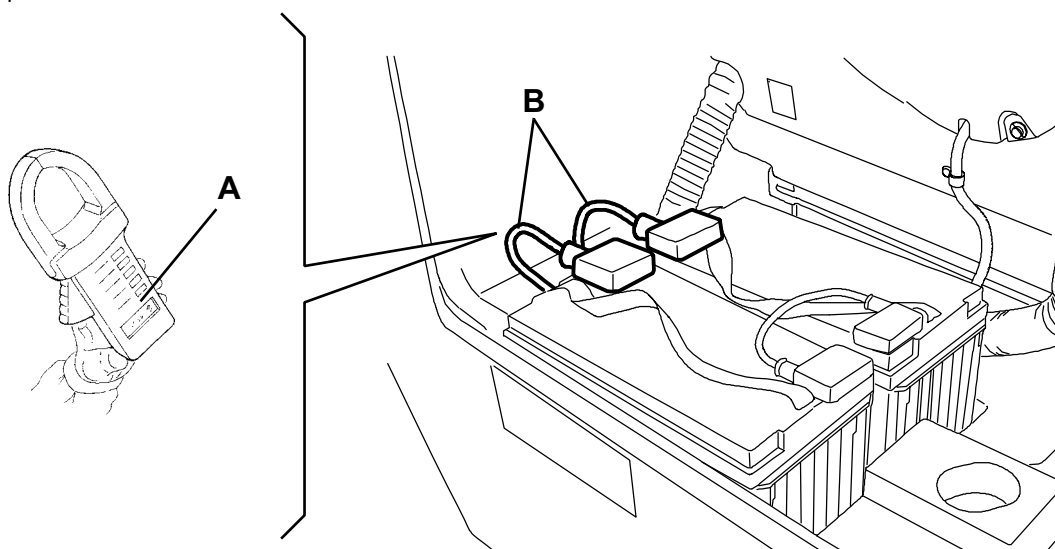
RECOVERY WATER SYSTEM

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.
Turn the ignition key (80) to "0".
Empty the recovery water tank (21) with the hose (16).
2. Drive the machine on a level floor.
3. Turn the ignition key (80) to "0".
4. Disconnect the battery connector (12).
5. Carefully lift the tank (40).
6. Apply the amperometric pliers (A) on one cable (B) of the batteries.
7. 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 motor 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 its moving parts.
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.

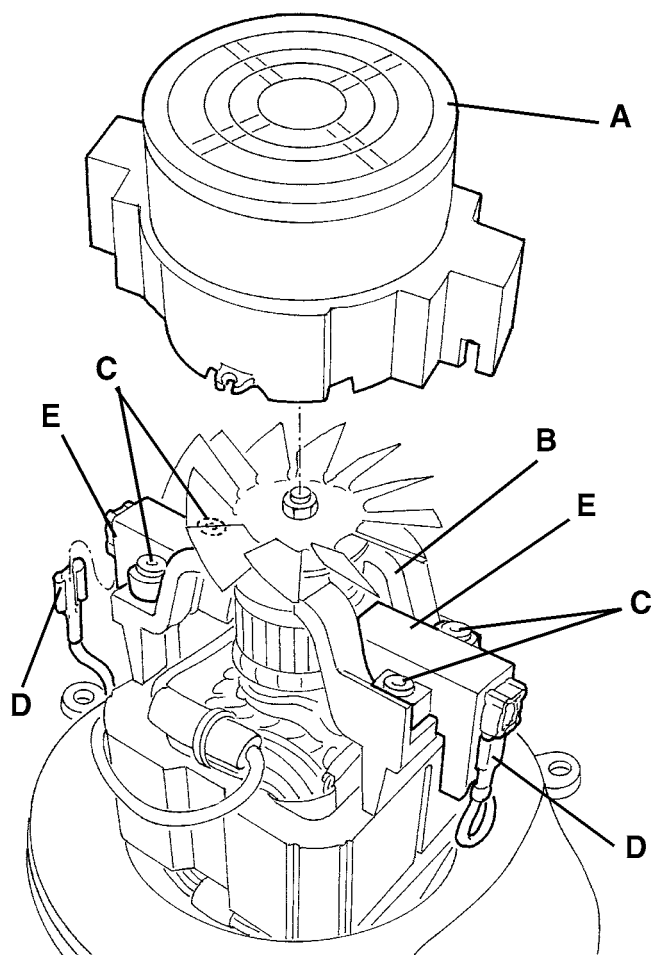


S301553

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 in the reverse order of disassembly.



S301555

RECOVERY WATER SYSTEM

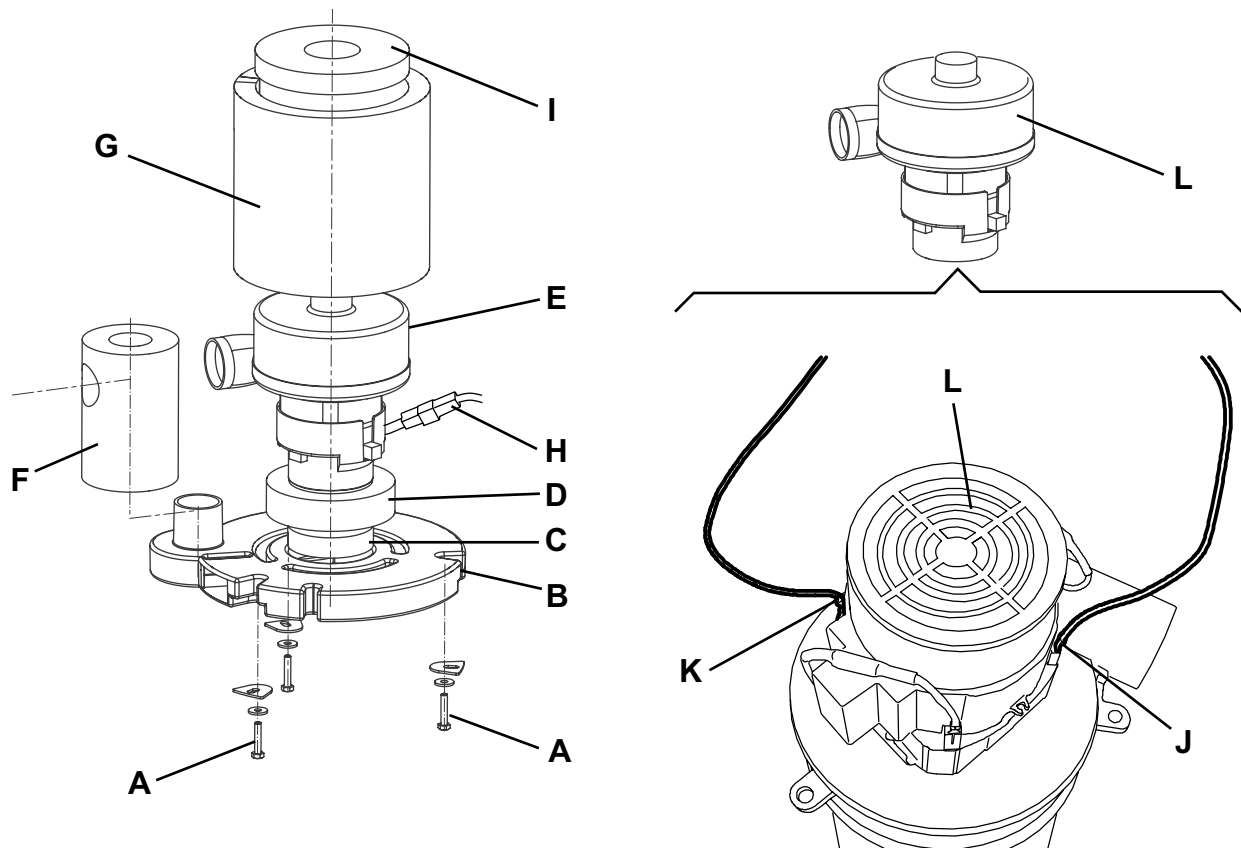
VACUUM SYSTEM MOTOR DISASSEMBLY/ASSEMBLY

Disassembly

1. If the tank (21) contains recovery water:
 - Drive the machine to the appointed recovery water disposal area.
 - Turn the ignition key (80) to "0".
 - Empty the recovery water tank (21) with the hose (16).
2. Drive the machine on a level floor.
3. Turn the ignition key (80) to "0".
4. Disconnect the battery connector (12).
5. 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) or (L), the sound-deadening pipe (F) and the sound-deadening panel (G).
10. Disconnect the electrical connector (H) of the motor (E).
11. Check the gasket (I) for efficiency 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).



S301556

RECOVERY WATER SYSTEM

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

Check

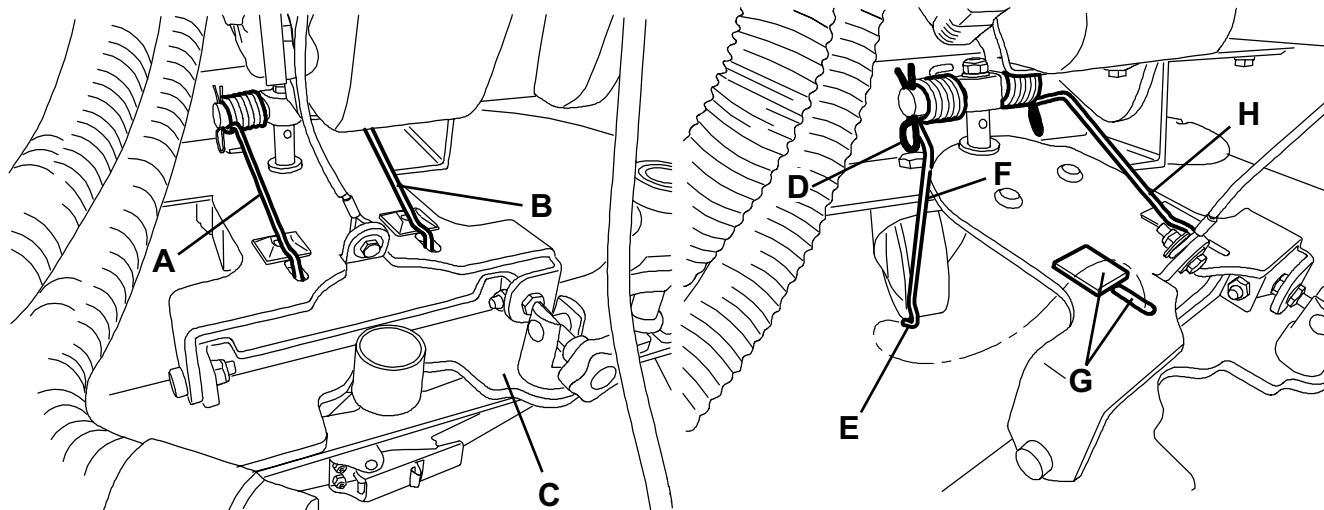
1. Drive the machine on a level floor.
2. Turn the ignition key (80) to "0".
3. Check that the springs (A) and (B) push the squeegee (C) on the floor correctly.
4. If necessary, disassemble and replace the springs according to the following procedure.

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.



S301557

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

Possible causes:

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 knob).
4. (For aluminium squeegee) The squeegee springs are not efficient (check/replace).

DRIVE SYSTEM

DRIVE SYSTEM

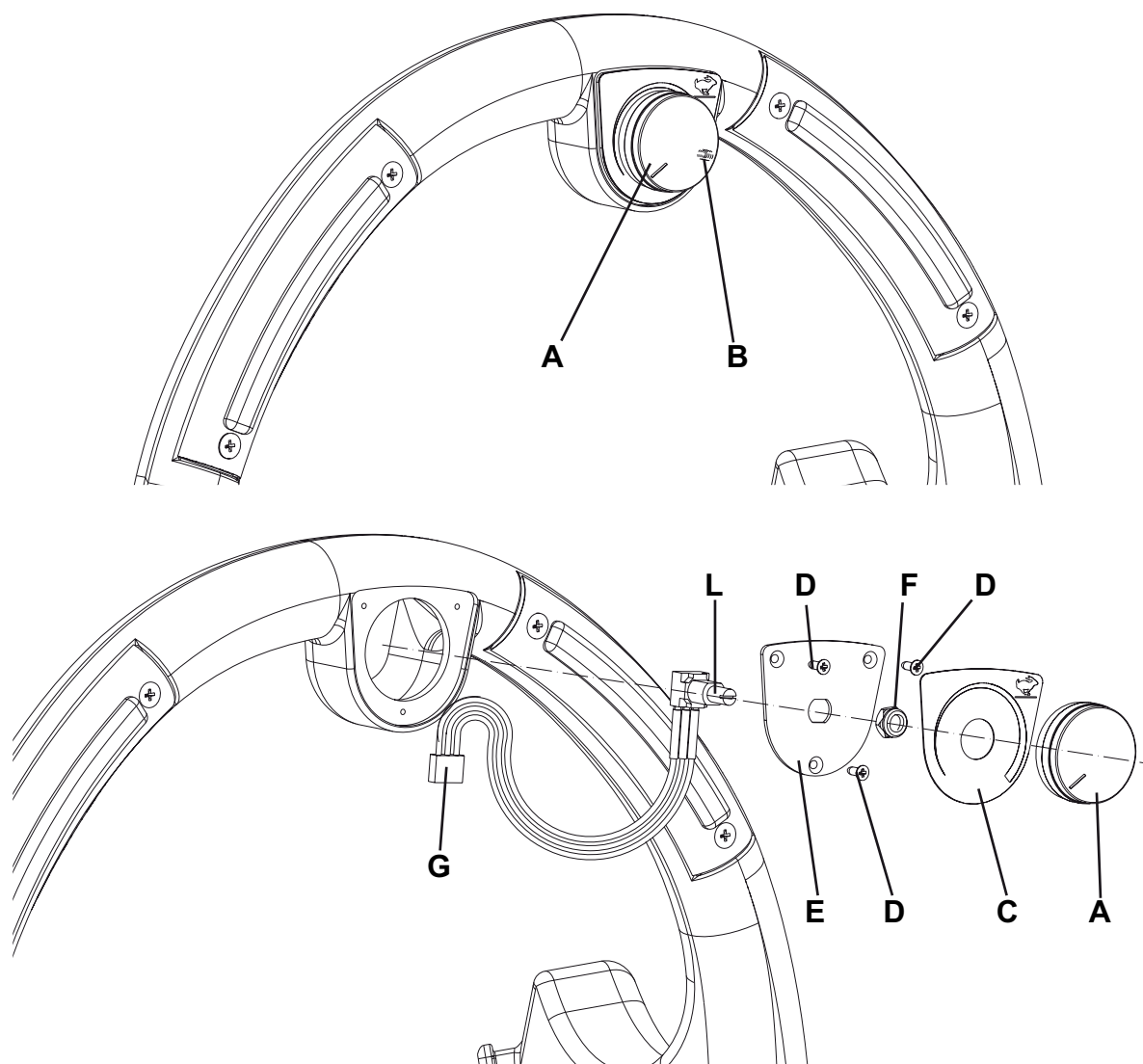
MAXIMUM SPEED POTENTIOMETER DISASSEMBLY/ASSEMBLY (for FOCUS II L17 - FOCUS II L20 - FOCUS II L20 Cyl. - FOCUS II BOOST L20)

Disassembly

1. Disconnect the battery connector (12).
2. Operating inside the hole (B), loosen the threaded dowel and remove the maximum speed adjuster knob (A).
3. Remove the adhesive (C).
4. Remove the screws (D) and move the cover (E).
5. Unscrew the potentiometer mounting nut (F).
6. Disconnect the potentiometer connector (G).
7. Remove the potentiometer.

Assembly

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



DRIVE SYSTEM MOTOR ELECTRICAL INPUT CHECK (for FOCUS II L17 - FOCUS II L20 - FOCUS II L20 Cyl. - FOCUS II BOOST L20)



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.



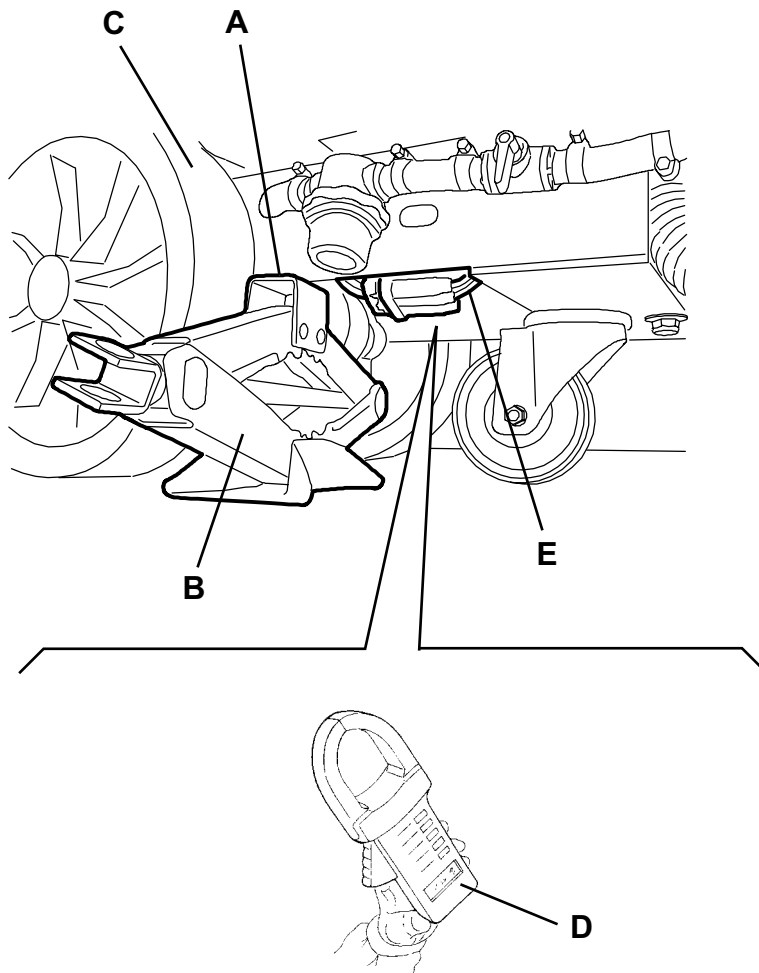
WARNING!

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, press one of the switches (83) and check that the electrical input is 1.5 - 2.5 A at 24 V. Release the switches (83). 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

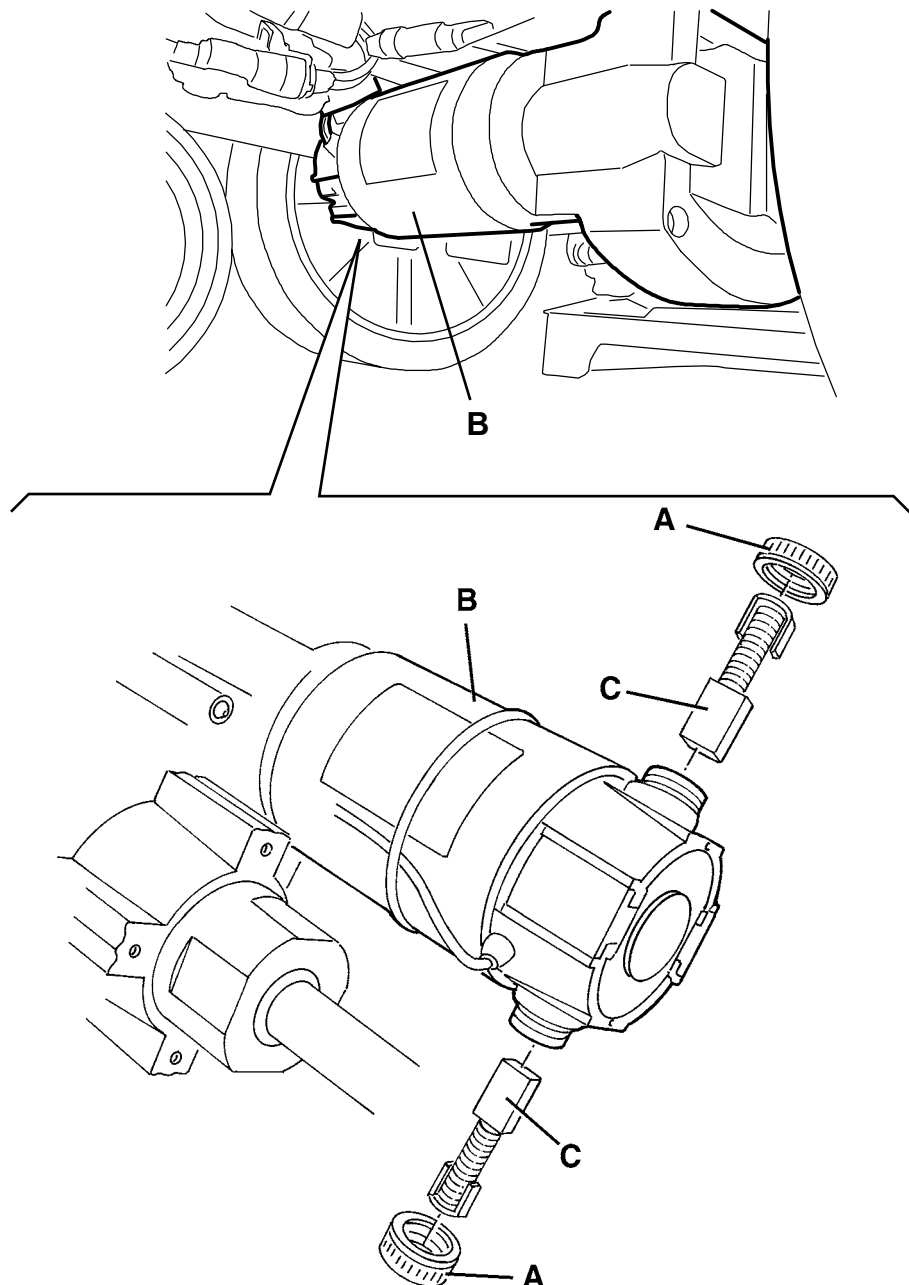
DRIVE SYSTEM MOTOR ELECTRICAL INPUT CHECK (for FOCUS II L17 - FOCUS II L20 - FOCUS II L20 Cyl. - FOCUS II BOOST L20) (Continues)



S301562

DRIVE SYSTEM**DRIVE SYSTEM MOTOR CARBON BRUSH CHECK AND REPLACEMENT (for FOCUS II L17 - FOCUS II L20 - FOCUS II L20 Cyl. - FOCUS II BOOST L20)**

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), thus removing dirt and dust.
6. Unscrew the covers (A) and remove the carbon brushes (C).
7. Check the carbon brushes (C) 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.
If necessary, replace the carbon brushes. Replace the carbon brushes as an assembly.
8. Assemble in the reverse order of disassembly.



S301563A

DRIVE SYSTEM

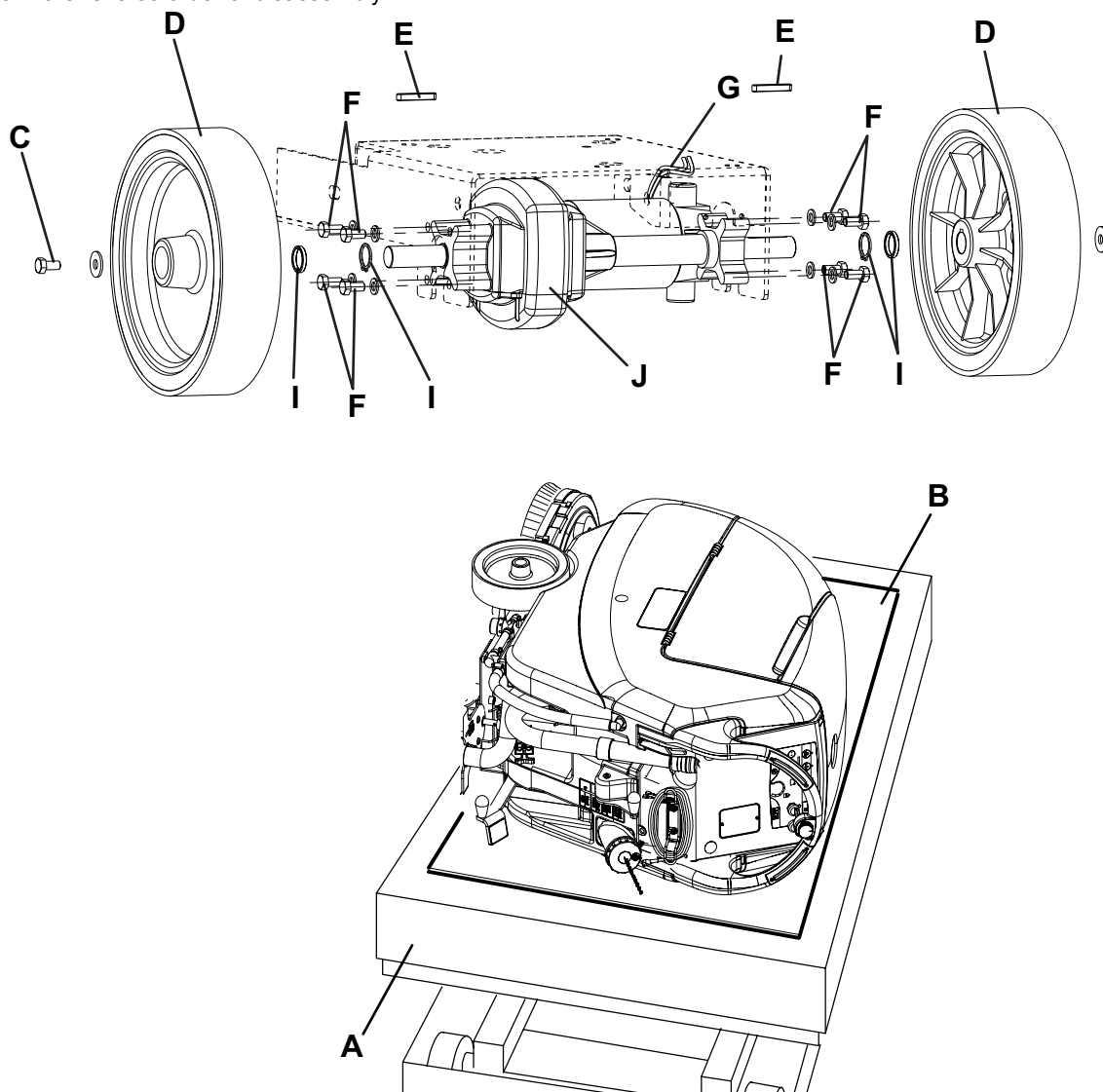
DRIVE SYSTEM MOTOR-DIFFERENTIAL DISASSEMBLY/ASSEMBLY (for FOCUS II L17 - FOCUS II L20 - FOCUS II L20 Cyl. - FOCUS II BOOST L20)

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/clean water 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 in the reverse order of disassembly.



P100155

TROUBLESHOOTING

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 wiring 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 (83) is misadjusted or broken (adjust or replace).
3. The speed adjuster (84) 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).

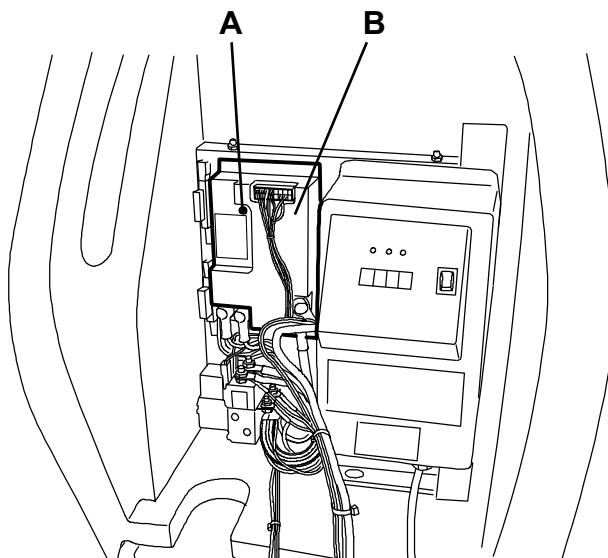
DRIVE SYSTEM

TROUBLESHOOTING (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 SW1 switches
2	Reverse gear switch closed when starting the machine	Check the switch SW2
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 (All models)**

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. 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 (for FOCUS II equipped with optional hour meter)

1. Turn the ignition key (80) to "I".
2. Press the vacuum system switch (73) and read on the hour meter (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. Turn the ignition key (80) to "0".

BATTERY CHARGE AND MAINTENANCE

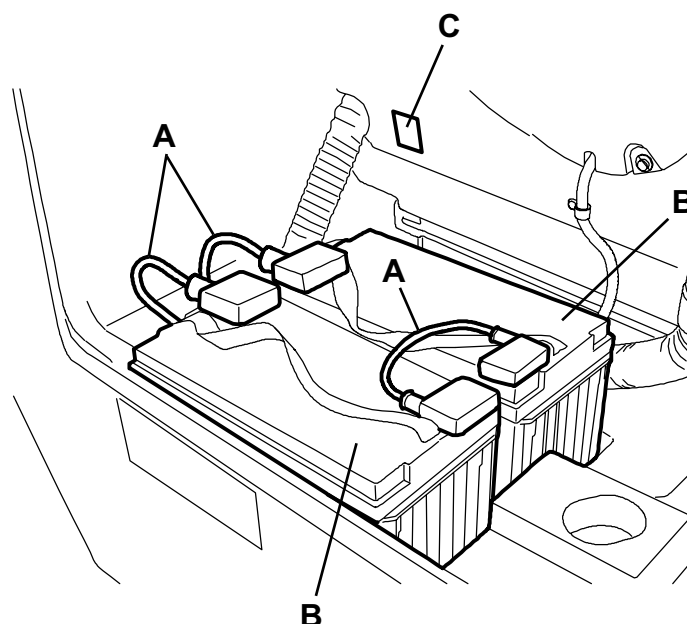
See the User Manual.

BATTERY DISASSEMBLY/ASSEMBLY**Disassembly**

1. If the tank (21) contains recovery water:
 - Drive the machine to the appointed recovery water disposal area.
 - Turn the ignition key (80) to "0".
 - Empty the recovery water tank (21) with the hose (16).
2. Drive the machine on a level floor.
3. Turn the ignition key (80) to "0".
4. Disconnect the battery connector (12).
5. Carefully lift the tank (40).
6. Disconnect the cables (A) from the battery terminals.
7. Remove the battery shims, if equipped.
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 AGM) as shown in the relevant paragraph.



S301566

ELECTRICAL SYSTEM

BATTERY TYPE SETTING (WET OR AGM) (for FOCUS II NO DRIVE)

Set the electronic board of the machine and of the battery charger according to the type of batteries installed (WET or AGM) according to the following procedure:

Machine setting

1. 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.
2. If the setting is to be changed, perform the following procedure.
3. Make sure that the switches (71) and (73) are turned off.
4. Press and hold the switches (71) and (73) at the same time.
5. Release the switches (71) and (73) at least 8 seconds after starting the machine.
6. 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

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

BATTERY TYPE SETTING (WET OR AGM) (for FOCUS II DRIVE)

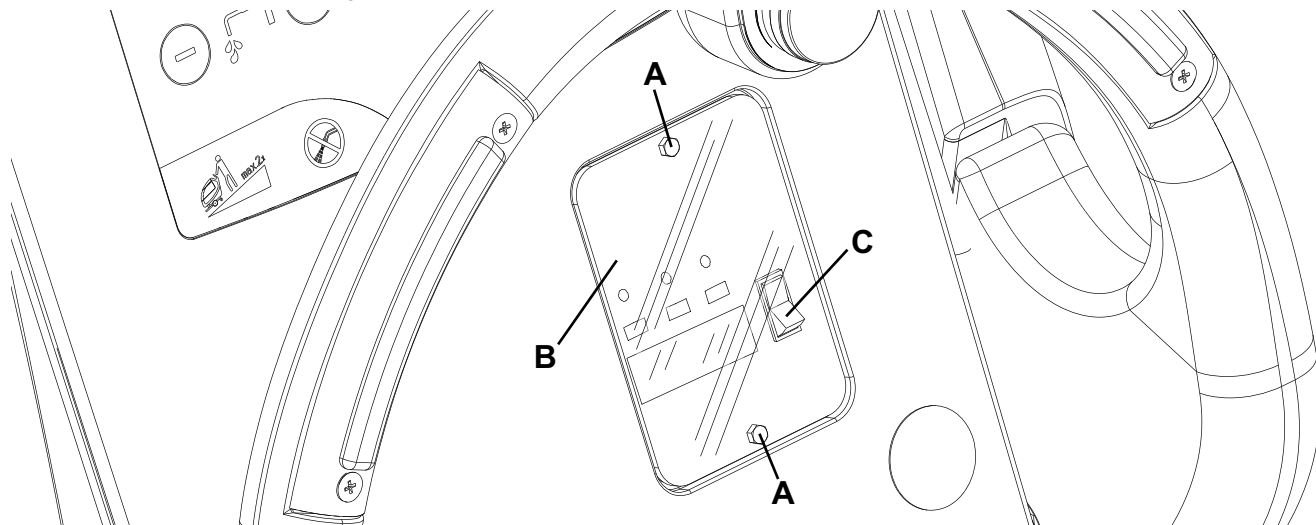
Set the electronic board of the machine and of the battery charger according to the type of batteries installed (WET or AGM) according to the following procedure:

Machine setting

1. Turn the ignition key (80) to "I" 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.
2. If the setting is to be changed, perform the following procedure.
3. Turn off the machine by turning the ignition key (80) to "0".
4. Press and hold the switches (71) and (73) at the same time, then turn the ignition key (80) to "I".
5. Release the switches (71) and (73) at least 8 seconds after starting the machine.
6. 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

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

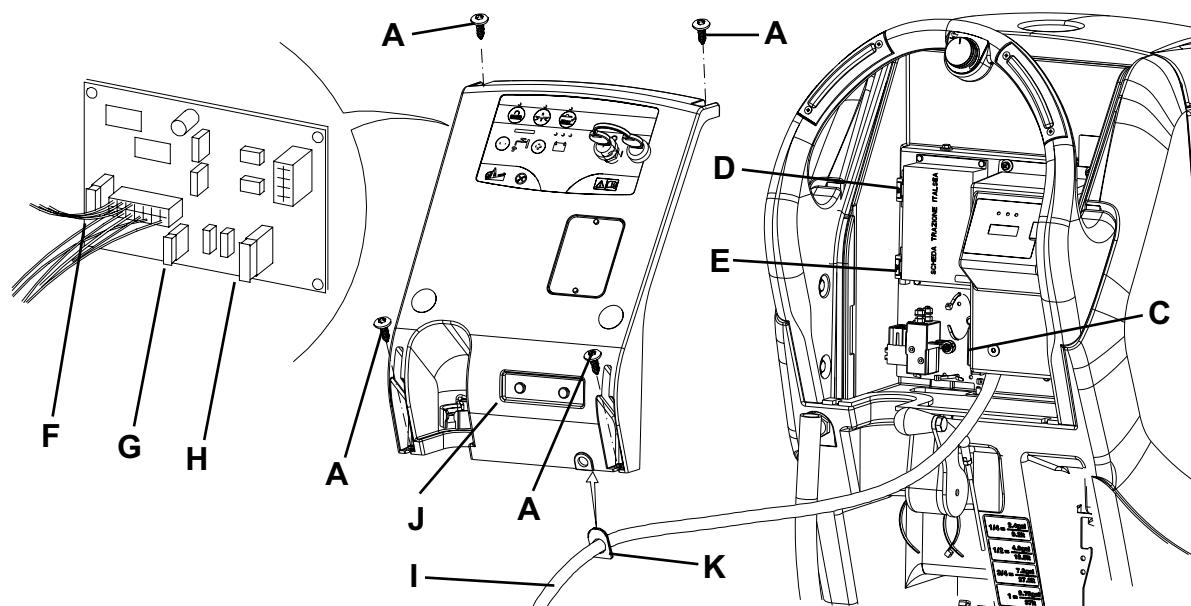


P100105

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) Deck fuse F1: (40 A)
 - D) Vacuum system fuse F2: (30 A)
 - E) Drive system fuse F3: (30 A) (*)
 - F) Signal circuits fuse F4: (3 A)
 - G) Brush/pad-holder release fuse F5: (20 A)
 - H) Pump fuse F6: (3 A)
- (*) Only for **FOCUS II DRIVE**
6. Perform steps 1 to 4 in the reverse order.



P100110

ELECTRICAL SYSTEM

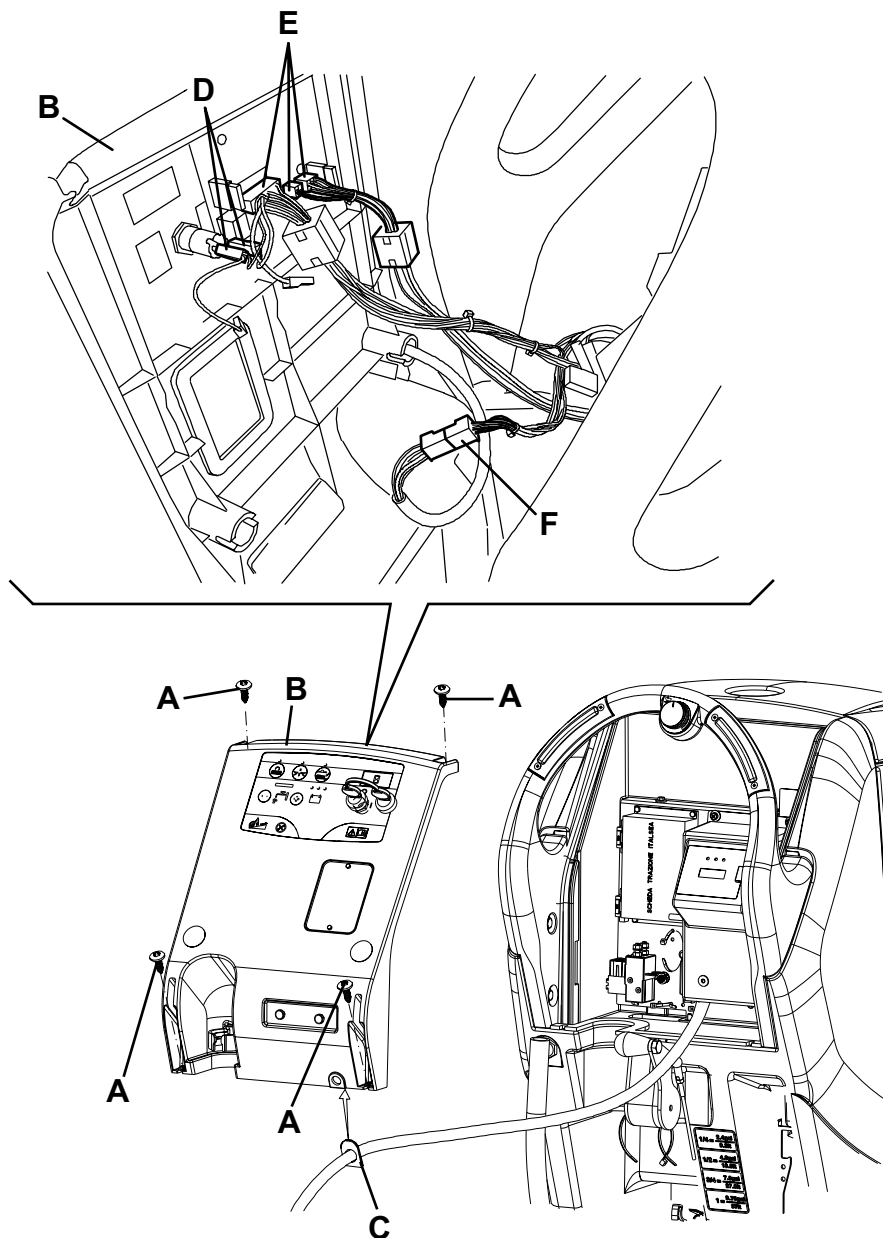
BRUSH MOTOR ELECTROMAGNETIC SWITCH DISASSEMBLY/ASSEMBLY

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 and carefully move aside the panel (B) by disengaging the cable grommet 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 only on models equipped 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

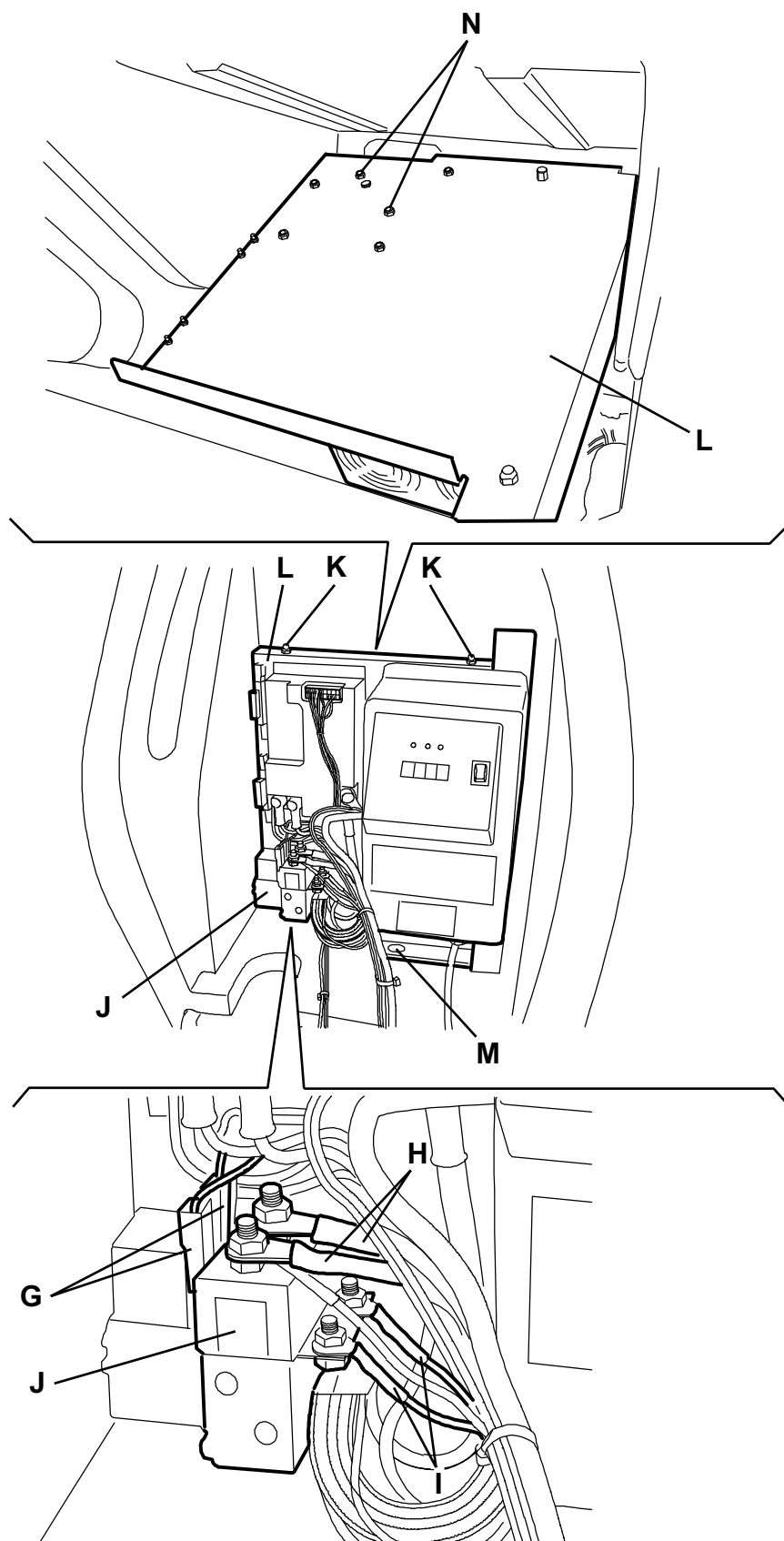
9. Assemble in the reverse order of disassembly.



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ELECTRICAL SYSTEM

BRUSH MOTOR ELECTROMAGNETIC SWITCH DISASSEMBLY/ASSEMBLY (Continues)



S301572

ELECTRICAL SYSTEM

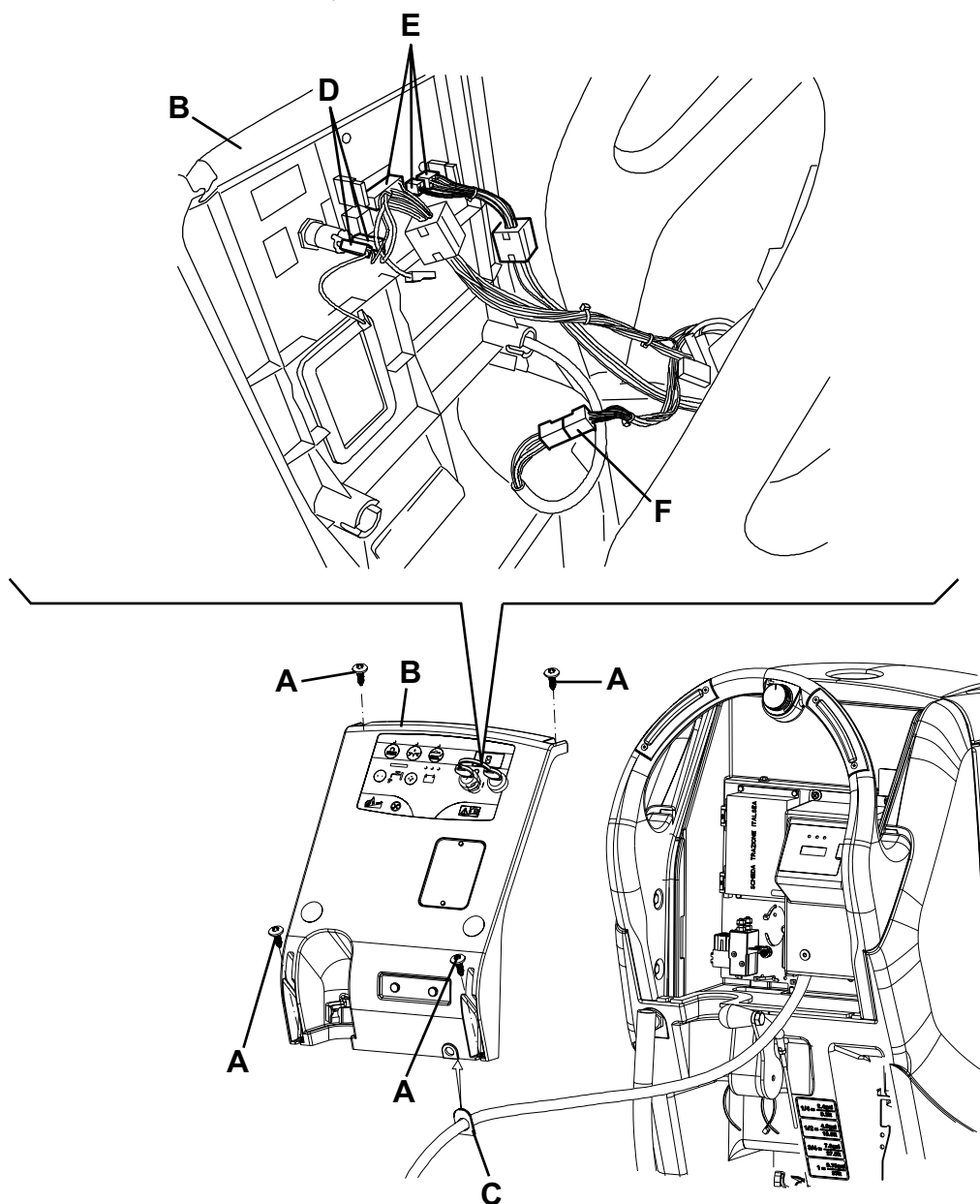
DRIVE SYSTEM ELECTRONIC BOARD DISASSEMBLY/ASSEMBLY (for FOCUS II DRIVE)

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 and carefully move aside the panel (B) by disengaging the cable grommet 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

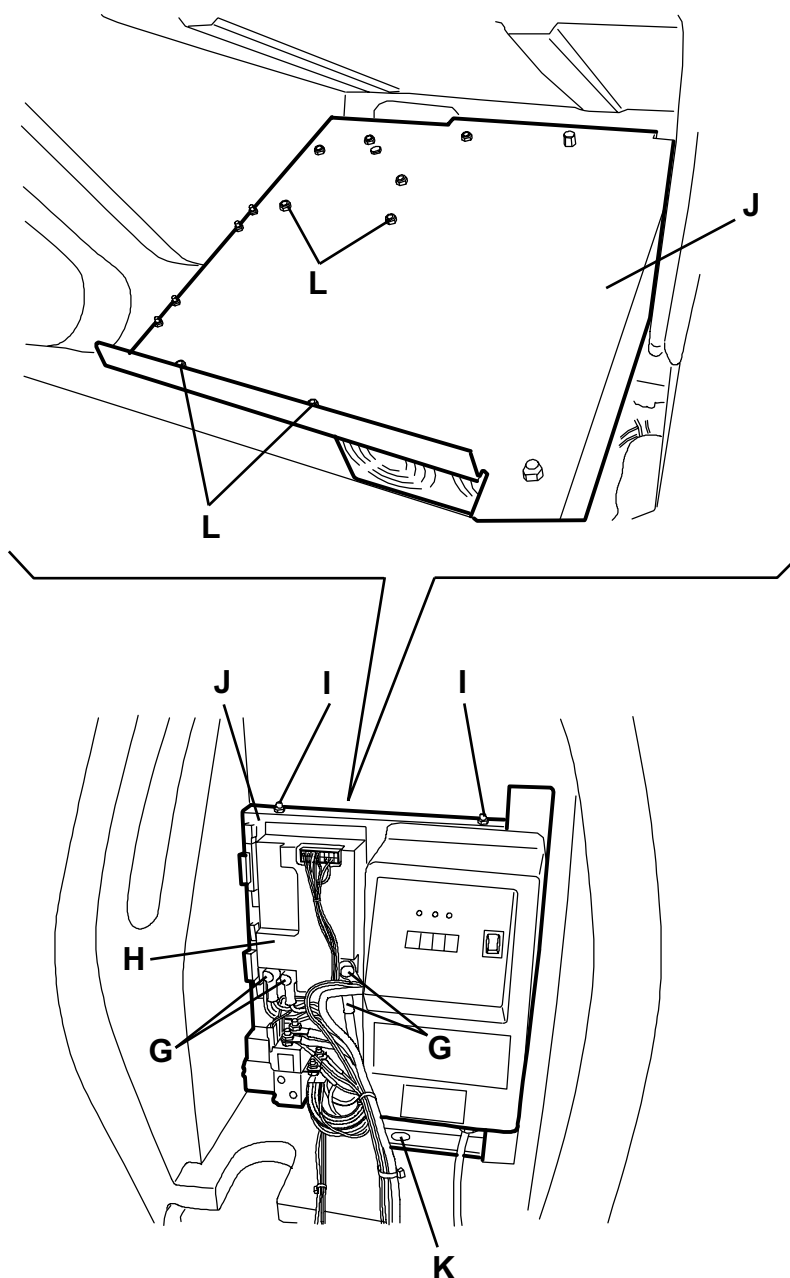
9. Assemble in the reverse order of disassembly.



P100158

ELECTRICAL SYSTEM

DRIVE SYSTEM ELECTRONIC BOARD DISASSEMBLY/ASSEMBLY (for FOCUS II DRIVE) (Continues)



S301574

ELECTRICAL SYSTEM

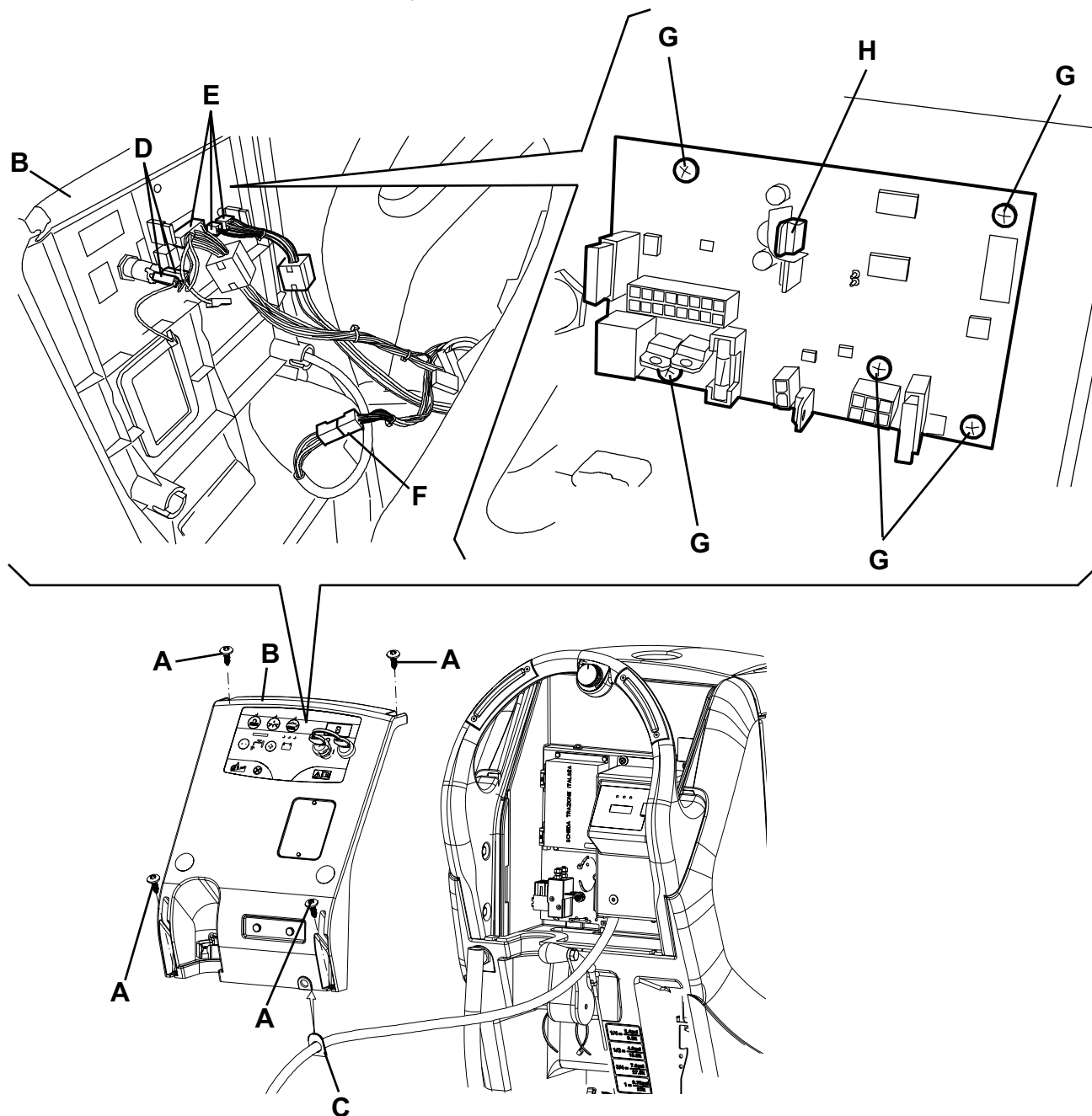
FUNCTION ELECTRONIC BOARD DISASSEMBLY/ASSEMBLY

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 and carefully move aside the panel (B) by disengaging the cable grommet 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

7. Assemble 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).

**NOTE**

In the machines equipped with on-board battery charger, a fault in the battery charger and relevant connections can affect the machine operation.

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

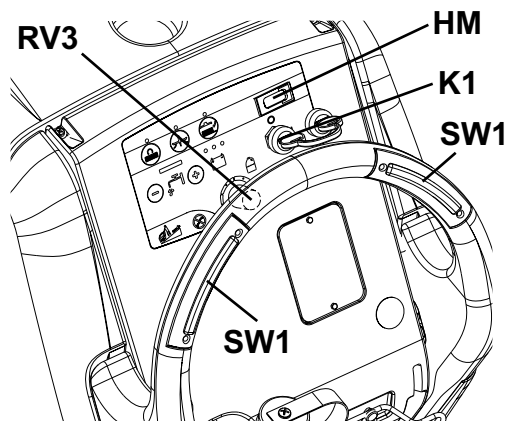
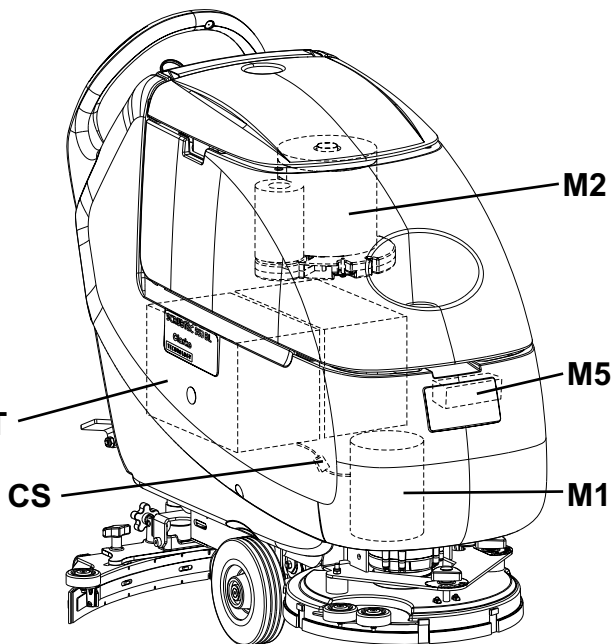
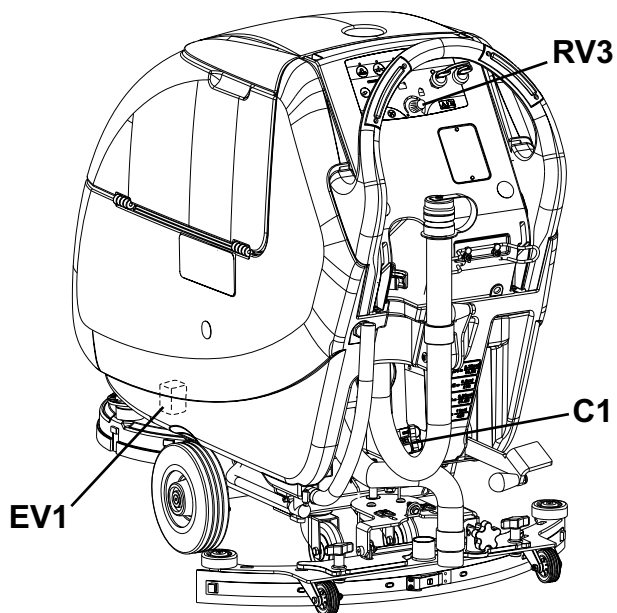
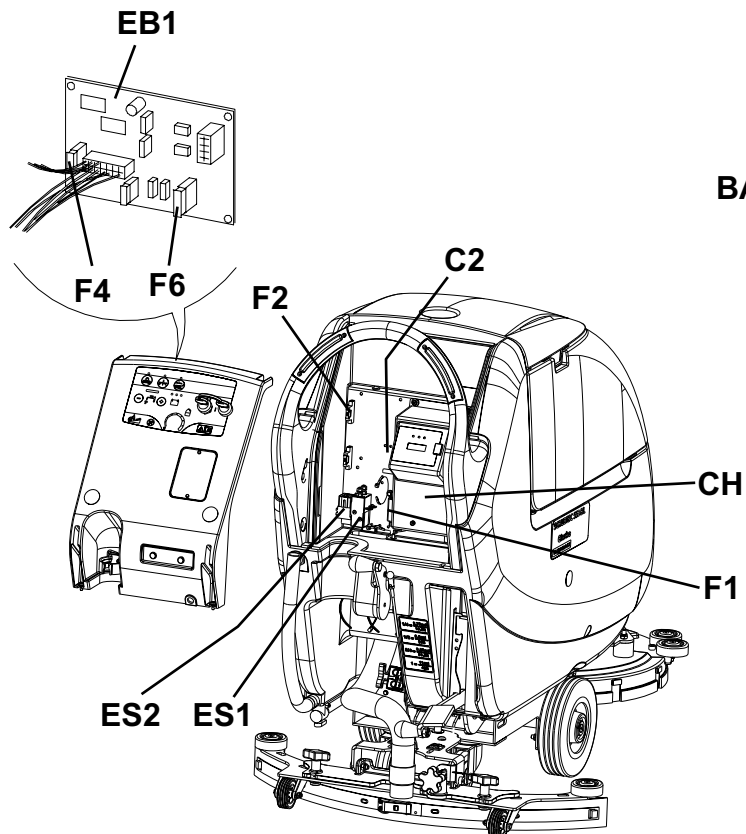
Flashes	Meaning	Action
Green, yellow and red LED flashing simultaneously.	Problem related to brush motor overload.	Perform checks shown in BRUSH MOTOR ELECTRICAL INPUT CHECK.
		If check results are negative, check the F1 fuse for integrity and its nut tightness.
Red LED flashing.	The batteries are discharged.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

ELECTRICAL SYSTEM

COMPONENT LAYOUT (for FOCUS II NO DRIVE)

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
F5	Brush release fuse
F6	Pump fuse
HM	Hour meter (optional)
K1	Ignition key
M1	Brush/pad-holder motor
M2	Vacuum system motor
M5	Detergent pump (optional)
RV3	Detergent % potentiometer (optional)
SW1	Brush/drive system enabling switch



P100147

ELECTRICAL SYSTEM

WIRING DIAGRAM (for FOCUS II NO DRIVE)

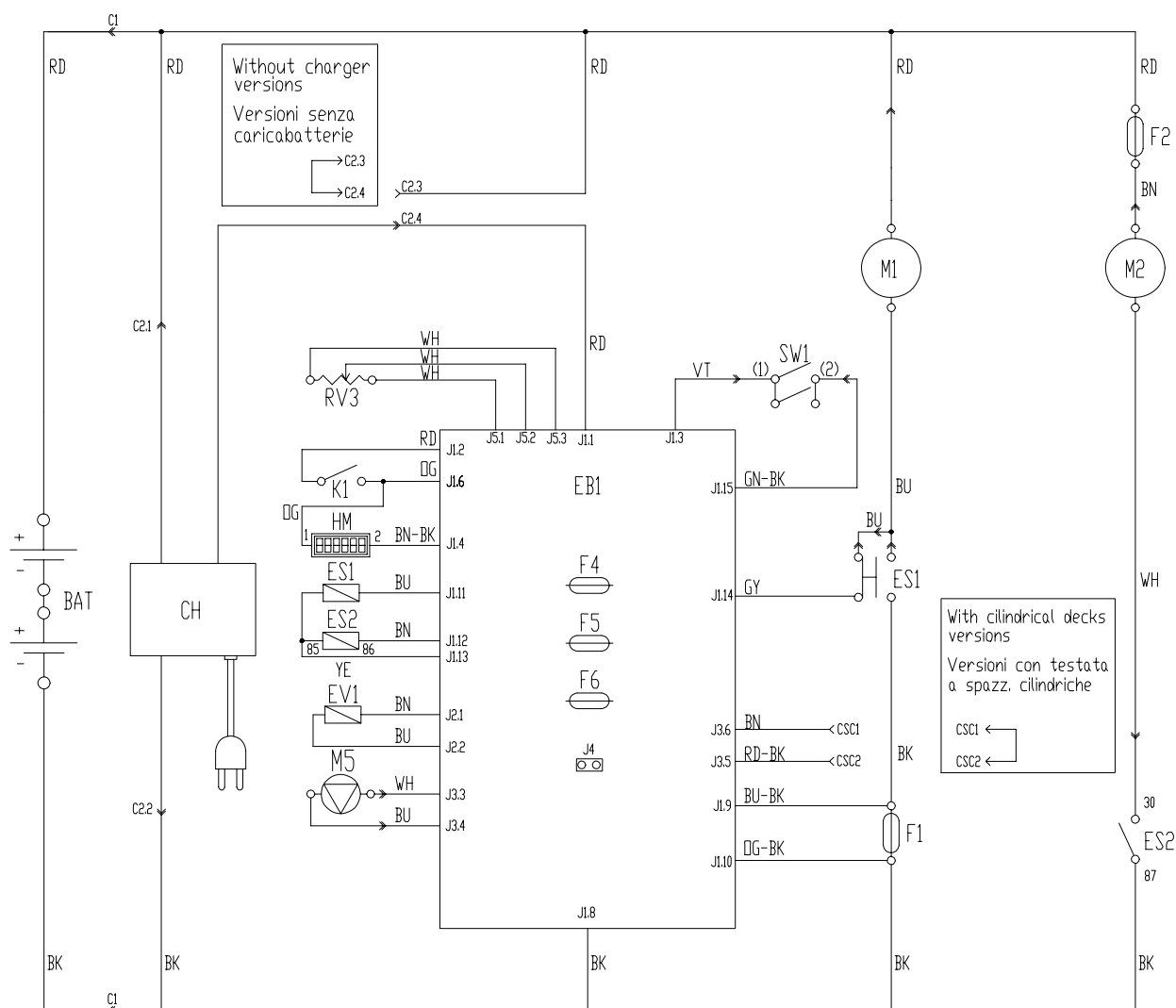
Key

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
F5	Brush release fuse
F6	Pump fuse
HM	Hour meter (optional)
K1	Ignition key
M1	Brush/pad-holder motor

M2	Vacuum system motor
M5	Detergent pump (optional)
RV3	Detergent % potentiometer (optional)
SW1	Brush/drive system enabling 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



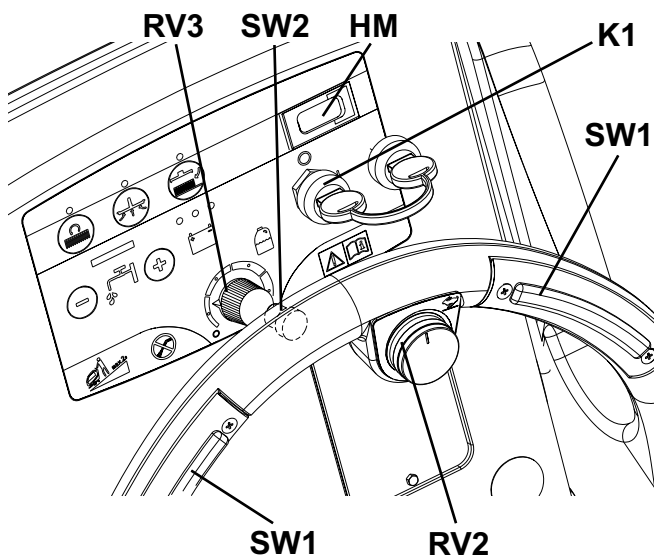
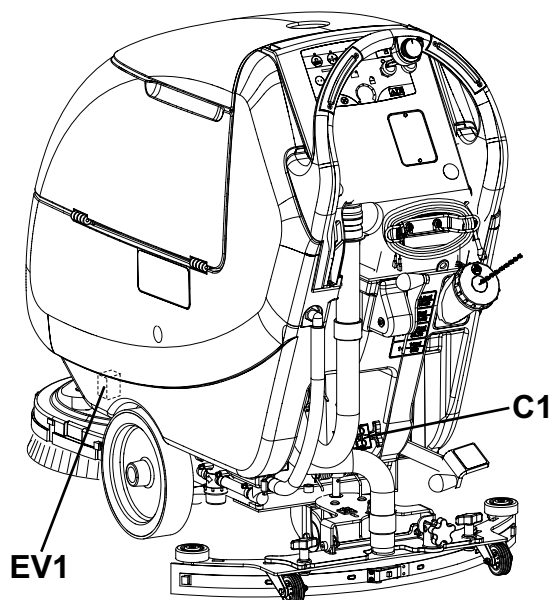
P100127

ELECTRICAL SYSTEM

COMPONENT LAYOUT (for FOCUS II DRIVE)

Key

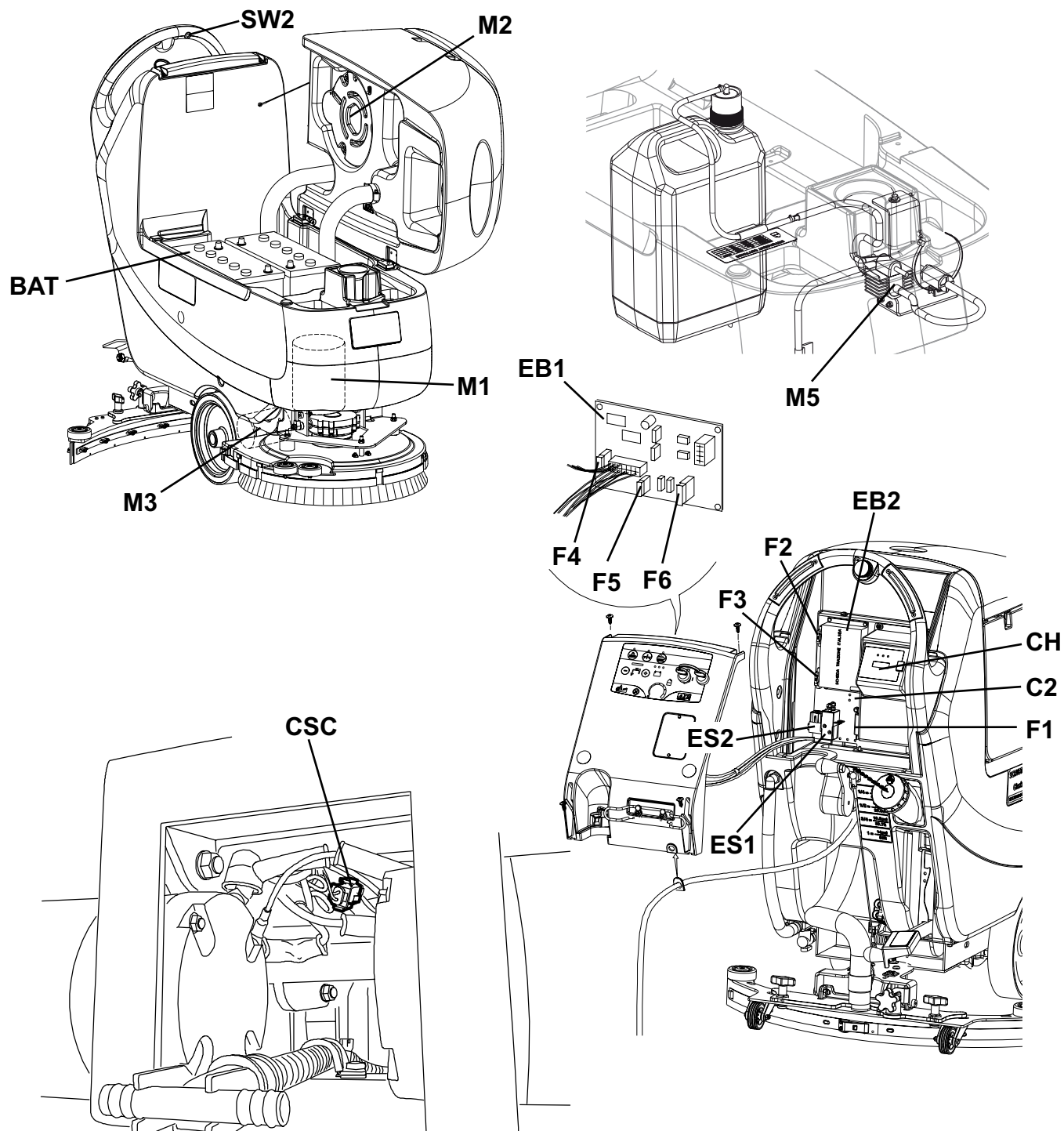
BAT	24 V battery
C1	Battery connector
C2	Battery charger connector
CH	Battery charger
CSC	Cylindrical brush deck sub-connector
EB1	Function electronic board
EB2	Drive system electronic board
ES1	Brush electromagnetic switches
ES2	Vacuum system relay
EV1	Water solenoid valve
F1	Deck fuse
F2	Vacuum system fuse
F3	Drive system fuse
F4	Signal circuit fuse
F5	Brush/pad-holder release fuse
F6	Pump fuse
HM	Hour meter (optional)
K1	Ignition key
M1	Brush/pad-holder motor
M2	Vacuum system motor
M3	Drive system motor
M5	Detergent pump (optional)
RV2	Maximum speed potentiometer
RV3	Detergent % potentiometer (optional)
SW1	Brush/drive system enabling switch
SW2	Reverse gear switch



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ELECTRICAL SYSTEM

COMPONENT LAYOUT (for FOCUS II DRIVE) (Continues)



P100149

ELECTRICAL SYSTEM

WIRING DIAGRAM (for FOCUS II DRIVE)

Key

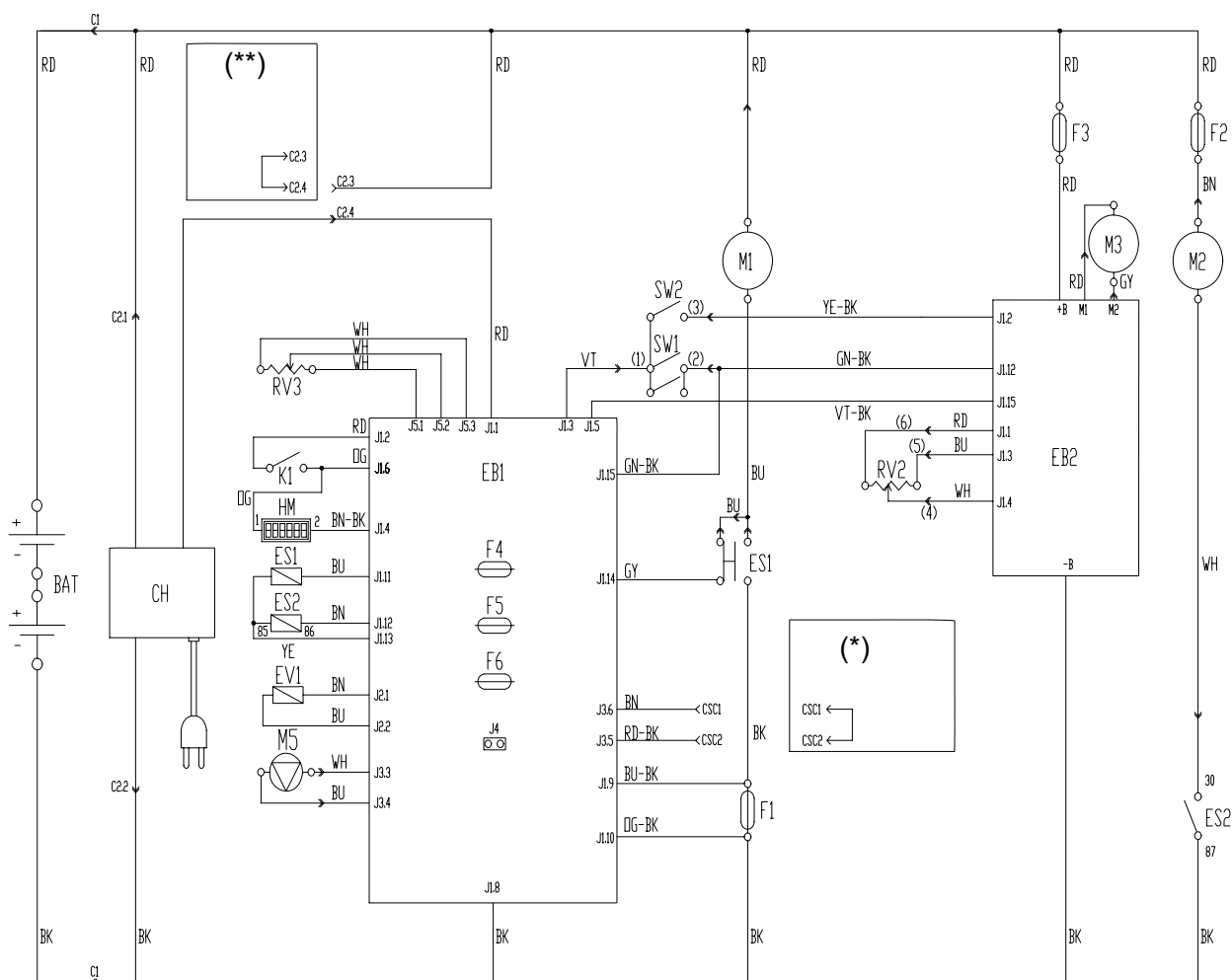
BAT	24 V battery
C1	Battery connector
C2	Battery charger connector
CH	Battery charger
CSC	Cylindrical brush deck sub-connector
EB1	Function electronic board
EB2	Drive system electronic board
ES1	Brush electromagnetic switches
ES2	Vacuum system relay
EV1	Water solenoid valve
F1	Deck fuse
F2	Vacuum system fuse
F3	Drive system fuse
F4	Signal circuit fuse
F5	Brush/pad-holder release fuse
F6	Pump fuse
HM	Hour meter (optional)
K1	Ignition key
M1	Brush/pad-holder motor
M2	Vacuum system motor

M3	Drive system motor
M5	Detergent pump (optional)
RV2	Maximum speed potentiometer
RV3	Detergent % potentiometer (optional)
SW1	Brush/drive system enabling switch
SW2	Reverse gear switch

(*) Only for machines with cylindrical brush deck

Colour codes

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



P100128

CLARKE PRODUCT SUPPORT BRANCHES

U. S. A. Locations

PRODUCTION FACILITIES

Clarke®, Springdale, Arkansas
2100 Highway 265
Springdale, Arkansas 72764
(479) 750-1000
Customer Service - 1-800-253-0367
Technical Service - 1-800-356-7274

American Lincoln®, Bowling Green, Ohio 43402
1100 Haskins Road

SERVICE FACILITIES

Clarke®, Elk Grove, Illinois 60007
2280 Elmhurst Road
(847) 956-7900

Clarke®, Denver, Colorado 80204
1955 West 13th Ave.
(303) 623-4367

Clarke®, Houston, Texas 77040
7215 North Gessner Road
713-937-7717

SERVICE AND SALES FACILITY

American Lincoln® / Clarke, Madison Heights,
Michigan 48071-0158
29815 John R.
(810) 544-6300

American Lincoln® / Clarke, Marietta, Georgia 30066
1455 Canton Road
(770) 973-5225

Clarke®

Clarke American Sanders

A.L. Cook

Customer Service Headquarters and Factory
2100 Highway 265
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Technical Service
1-800-356-7274

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ALTO Deutschland GmbH, Bellenberg (Germany)
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ALTO Norge A/S, Oslo (Norway)
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+47 2275 1770

Clarke® LIMITED U.S. WARRANTY

This Clarke Product is warranted to be free from defects in materials and workmanship under normal use and service, when operated and maintained in accordance with Clarke's Maintenance and Operations instructions. The warranty period is subject to the conditions stated below.

3 YEARS FOR PARTS AND 1 YEAR FOR SERVICE LABOR (See exceptions below)

Motors must be inspected for carbon motor brush wear at six-month intervals by an authorized Clarke repair station. Failure to comply with the six-month inspection requirement or failure to replace worn motor brushes identified during the inspection will void the warranty on the motors. Cost of the six-month inspection and replacement of carbon motor brushes is the responsibility of the purchaser. In the event of a warranty claim on the motors, proof of inspection and any required motor brush replacement must be provided. This warranty is extended only to the original purchaser for use of the product. It does not cover normal wear parts such as electrical cable, rubber parts, hoses and motor brushes.

BATTERY WARRANTY

In addition to the items above, any original equipment Clarke Battery which becomes unserviceable under normal use within a period of ninety (90) days from date of sale to the original user will be repaired or replaced with one of equal specification at our option, F.O.B. any authorized Clarke Sales or Service Branch, with no charge to the user, except transportation costs. After expiration of the above ninety (90) day period, any battery which fails under normal use will be adjusted to the original user with a new battery of equal specification on an eighteen (18) months pro rate basis from the date of purchase. Adjustment will be determined using the then current list price, plus transportation costs.

Warranty is rendered null and void if battery is not kept filled to the proper level with DISTILLED WATER.

Clarke: POLYDUR® AUTOMATIC SCRUBBER SOLUTION AND RECOVERY TANK EIGHT-YEAR U.S. GUARANTEE

Your new Clarke machine has polydur Solution and Recovery Tanks. Polydur is a rotationally molded, low-density linear polyethylene that won't crack or dent, and withstands most corrosives and temperature extremes. Clarke backs up your Polydur tanks with an eight-year guarantee. If a tank breaks or leaks under normal use within eight years of the date of purchase, it will be replaced free.

STATED WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED

Clarke's liability under this warranty is limited to repair of the product and/or replacement of parts and is given to purchaser in lieu of all other remedies, including INCIDENTAL AND CONSEQUENTIAL DAMAGES.

THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE SPECIFIED HEREIN. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION OF THE FACE HEREOF. NO WARRANTIES, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY, SHALL BE IMPLIED. A warranty registration card is provided with your Clarke product. Return the card to assist Clarke in providing the performance you expect from your new floor machine.

If a difficulty develops with the product, you should: a) Contact the nearest authorized Clarke repair location or contact the Clarke Service Operations Department, 2100 Highway 265, Springdale, Arkansas 72764, for the nearest authorized Clarke repair location. Only these locations are authorized to make repairs to the product under this warranty. (b) Return the product to the nearest Clarke repair location. Transportation charges to and from the repair location must be prepaid by the purchaser. Clarke will repair the product and/or replace any defective parts with out charge within a reasonable time after receipt of the product.

Clarke, 2100 Highway 265, Springdale, Arkansas 72764.

**Clarke reserves the right to make changes or improvements to its machine without notice.
Always use genuine Clarke Parts for repair.**

Clarke®

**2100 Highway 265
Springdale, Arkansas, 72764**