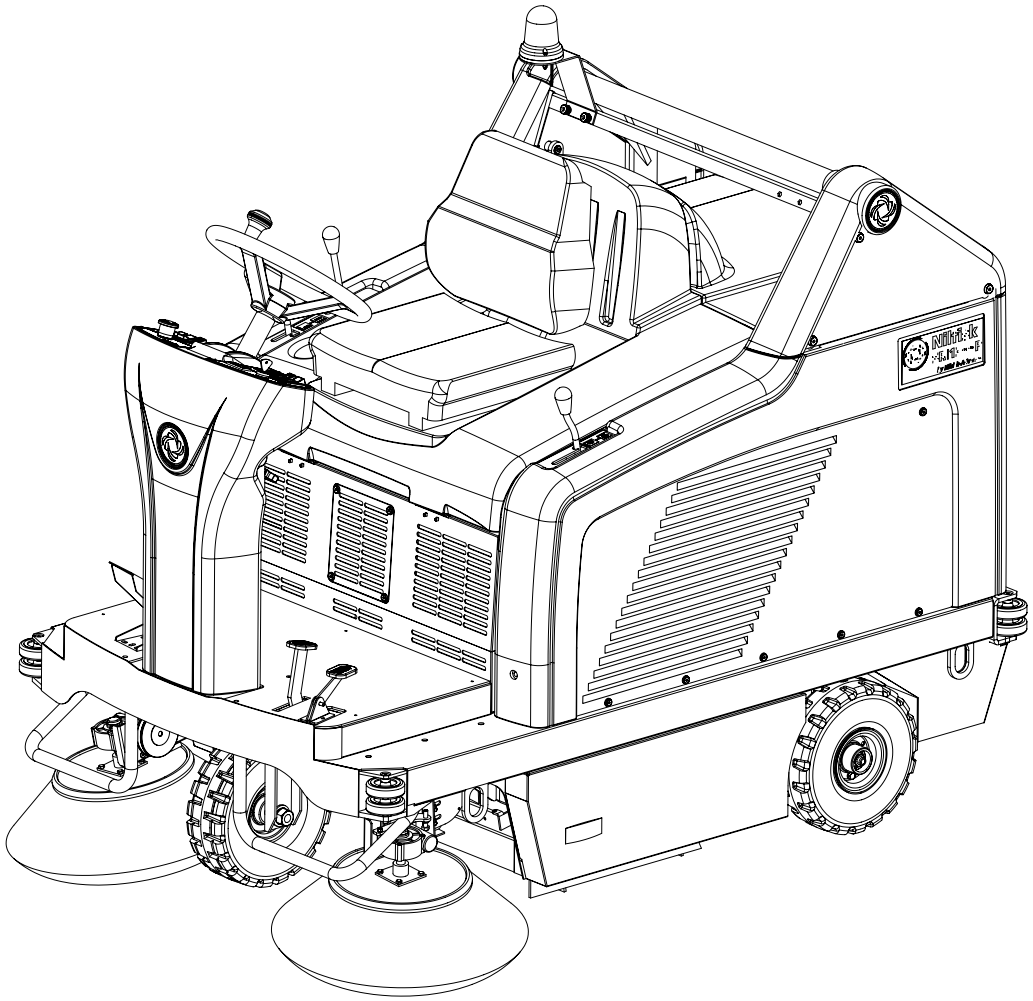
Terra™ 5200B



SERVICE MANUAL
Advance model: 908 4508 010

Advance
by Nilfisk-Advance

146 2213 000(1)2007-01

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GENERAL INFORMATION

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 doors and guards are closed.***
- ***The key is not inserted in the ignition switch.***
- ***The machine is securely fastened to the means of transport.***

PUSHING OR TOWING THE MACHINE

WARNING!
When pushing or towing the machine, carefully follow the relevant instructions given in the User Manual. If you do not follow the given instructions the machine can be damaged.

OTHER MANUALS AVAILABLE

The following Manuals are available at Nilfisk Literature Service Department:
- **Terra™ 5200B Spare Parts List – Form Number 146 1997 000**
- **Terra™ 5200B User Manual – Form Number 146 1996 000**
- **Terra™ 5200B Canopy Kit Assembly – Form Number 146 2097 000**
- **Terra™ 5200B Pivoting Light Kit Assembly On Canopy – Form Number 146 2099 000**
- **Terra™ 5200B Pivoting Light Kit Assembly On Hood – Form Number 146 1156 000**
- **Terra™ 5200B Working Light Kit Assembly – Form Number 146 1713 000**
- **Terra™ 5200B Closed Pocket Filter Kit Assembly – Form Number 146 1235 000**

SAFETY

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

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

WARNING!
It indicates a potential risk of injury for people.

CAUTION!
It indicates a caution or a remark related to important or useful functions. Pay the greatest 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

GENERAL SAFETY PRECAUTIONS

Specific warnings and cautions used to indicate potential damage to people and machines are shown below.

DANGER!

- ***Before performing any maintenance/repair operation turn the ignition switch to "0" position, engage the parking brake and disconnect the battery.***
- ***This machine must be used by properly trained and authorised personnel only.***
- ***Keep sparks, flames and smoking materials away from the batteries. During the normal operation explosive gases are released.***
- ***Do not wear jewels when working near electrical components.***
- ***Do not work under the lifted machine without supporting it with safety stands.***
- ***Each time you work under the open hood, ensure that the hood cannot be closed by accident.***
- ***Do not operate the machine near toxic, dangerous, inflammable and/or explosive powders, liquids or vapours.***
- ***Battery charging produces highly explosive hydrogen gas. Keep the hood open during battery charging and perform this operation in well-ventilated areas and far from naked flame.***

WARNING!

- ***Carefully read all the instructions before performing any maintenance/repair operation.***
- ***Take all necessary precautions to prevent hair, jewels and loose clothes from being caught in the moving parts of the machine.***
- ***Do not leave the machine unattended with the key inserted in the ignition switch and the parking brake disengaged.***
- ***Do not wash the machine with direct or pressurised water jets, or with corrosive substances. Do not clean the machine using compressed air.***
- ***The storage temperature must be between +32°F and +104°F (0°C and +40°C).***
- ***The machine operating temperature must be between +32°F and +104°F (0°C and +40°C).***
- ***The humidity must be between 30% and 95%.***
- ***In case of fire, possibly use a powder fire extinguisher, not a water one.***
- ***Do not use the machine on slopes with an inclination exceeding the specifications.***
- ***This machine cannot be used on public roads.***
- ***Do not remove or modify the plates affixed to the machine.***
- ***In case of part replacement, order ORIGINAL spare parts from an authorised Dealer or Retailer.***
- ***The machine must be disposed of properly, because of the presence of toxic-harmful materials (batteries, oils, etc.), which are subject to standards that require disposal in special centres (see the Scrapping chapter in the User Manual).***
- ***Do not use the machine on slopes with an inclination higher than 16%.***
- ***Do not smoke while charging the batteries.***
- ***Do not excessively tilt the machine to prevent the highly corrosive acid from coming out of the batteries. When the machine is to be tilted for maintenance operations, remove the batteries.***

TECHNICAL DATA

Dimensions and weights	Values	
Machine length	69.9 in (1776 mm)	
Machine width (without side broom)	47.6 in (1208 mm)	
Machine width (with two side brooms)	51.6 in (1310 mm)	
Front wheels – rear wheel wheelbase	42.9 in (1090 mm)	
Track (centres of front wheels)	38.7 in (982.7 mm)	
Machine maximum height/with canopy/with canopy and pivoting light	54.1 / 79.9 / 83.8 in (1375 / 2030 / 2130 mm)	
Seat cushion height	36.2 in (918.5 mm)	
Minimum ground clearance (skirts not included)	2.4 in (60 mm)	
Approach angle	25°	
Waste container maximum lifting height (horizontal position)	68.9 in (1750 mm)	
Minimum/maximum dumping height	11.9 / 57.1 in (300 mm / 1450 mm)	
Max overall height with the waste container lifted HxLxW	93.3 x 110.9 x 51.6 in (2370 x 2816 x 1310 mm)	
Working width (with one side broom)	41.5 in (1054 mm)	
Working width (with two side brooms)	51.5 in (1308 mm)	
Minimum outer turning radius	66.3 in (1685 mm)	
Front steering wheel size	12 x 3.6 in (305 x 92)	
Rear drive wheel size	12 x 3.6 in (305 x 92)	
Main broom size	11.8 x 31.5 in (300 x 800 mm)	
Side broom size	19.7 x 11 in (500 x 280 mm)	
Machine kerb weight (with batteries/fuel and Operator of 80 kg approx.)	4 x 6V 180 Ah	1377.9 lb (625 kg)
	1 x 24V 240 Ah	1611.6 lb (731 kg)
	1 x 24V 320 Ah	1713 lb (777 kg)
Front axle weight in running conditions	535.8 lb (243 kg)	
Rear axle weight in running conditions	850.9 lb (386 kg)	

Performance data	Values
Max forward speed	4.3 mph (7 Km/h)
Maximum reverse speed	2.2 mph (3.5 km/h)
Gradeability at full load	16%
Main broom maximum rotation speed	680 rpm
Side broom maximum rotation speed	85 rpm
Panel filter area	6975 in^2 (4.5 m^2)
Panel filter rating	5 ÷ 10 µm
Closed pocket filter area	6510 in^2 (4.2 m^2)
Closed pocket filter rating	40 ÷ 60 µm
Noise level at driver's position	66.9 dB(A)
Waste container capacity	(130 litres)

GENERAL INFORMATION

TECHNICAL DATA (continues)

Motor data		Values
Drive and hydraulic system motor	Power	750 W
	RPM	5,000 rpm
Vacuum fan/main broom motor	Power	100 W
	RPM	2,800 rpm
Side broom reduction unit	Power	90 W
	RPM	85 rpm
Panel filter shaker motor	Power	90 W
	RPM	5,700 rpm
Closed pocket filter shaker motor	Power	110 W
	RPM	3,000 rpm

Refuelling data	Values
Waste container oil tank capacity	0.2 gal (0.37 gal) (0.75 litres (1.4 litres))
Oil type	32 cSt

Electrical system data		Values
System voltage		24V
Propulsion battery	Standard	4 x 6V x 180 Ah Lead with acid electrolyte in serial connection
	Optional	1 x 24V x 240 Ah Lead with acid electrolyte
	Optional	1 x 24V x 320 Ah Lead with acid electrolyte
	Usable battery capacity	330 Ah
	Battery case dimensions	31.5 x 11.8 x 5.9 in (800 x 300 x 150 mm)
	Battery compartment maximum size	14.2 x 31.5 x 15 in (360 x 800 x 380 mm)

Hydraulic system data	Values
Waste container lifting system maximum pressure	1577 psi (110 Bar)

MAINTENANCE

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

NOTE
See GENERAL INFORMATION and SAFETY - ACCIDENT PREVENTION

The following chart 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.
The later paragraphs give further instructions about the maintenance interventions listed in the following Scheduled Maintenance Table.

SCHEDULED MAINTENANCE TABLE

Maintenance operation	On delivery	Every 10 hours	Every 50 hours	Every 100 hours	Every 200 hours	Every 400 hours
Battery fluid level check		(1)				
Waste container lifting system oil level check			(1)			
Motor-to-main broom belt visual inspection and tension check						
Skirt height and operation check						
Side and main broom height check		(1)				
Frame dust filter cleaning and integrity check						
Filter shaker operation check						
Brake adjustment						
Nut and screw tightening check				(2)		
Drive wheel gearing chain tension check and cleaning						
Steering chain cleaning						
Vacuum hose integrity check						
Pulley-to-main broom belt replacement						
Motor-to-main broom pulley V-belt replacement						
Waste container gasket integrity check						
Waste container lifted position control microswitch adjustment check						
Waste container horizontal position control microswitch adjustment check						
Motor brushes (or carbon brushes) check and replacement						
Oil change						(3)

(1): Or at every start-up.
(2): And after the first 8 running-in hours.
(3): Change the oil for the first time after 500 hours, then every 2000 hours or every year.

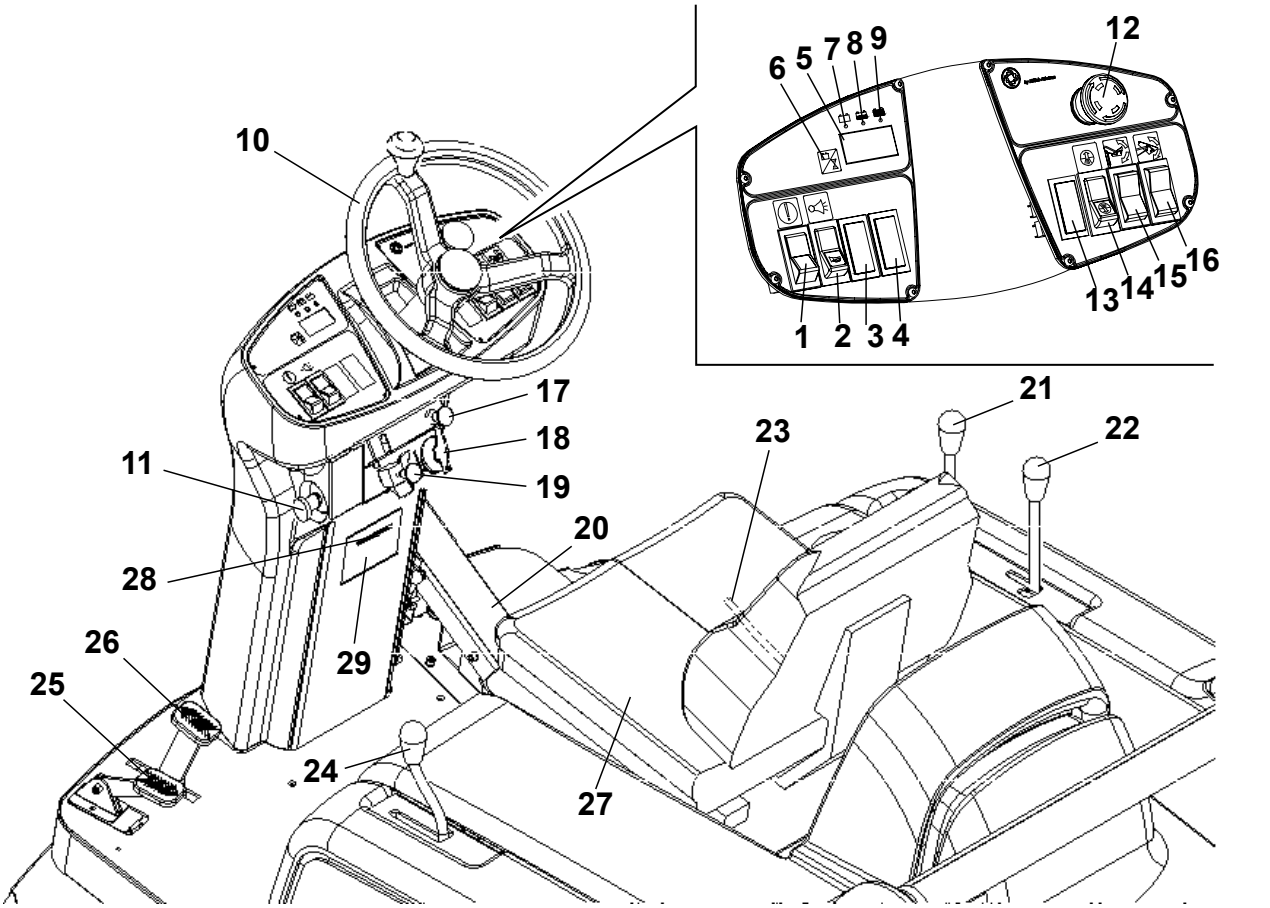
GENERAL INFORMATION

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 will be necessary to identify a component mentioned in the text.

1. Waste container enabling switch
2. Horn switch
3. Working light switch (optional)
4. Position for optional switch
5. Display
6. Display selection button for the following operations, in sequence:
   - Working hours
   - Last digit of the hours - (dot) - minutes
   - Battery voltage (V)
7. Discharged battery warning light (red)
8. Semi-discharged battery warning light (yellow)
9. Charged battery warning light (green)
10. Steering wheel
11. Steering wheel inclination adjusting knob
12. Emergency push-button
13. Position for optional switch
14. Filter shaker switch
15. Waste container lifting/lowering switch
16. Waste container overturning switch
17. Vacuum activation/deactivation lever
18. Ignition switch
19. Parking brake lock control lever (in combination with pedal position 26)
20. Forward (pushed forward) and reverse (pushed backward) gear pedal
21. Right broom lifting/lowering lever
22. Left broom lifting/lowering lever
23. Seat longitudinal position adjusting lever
24. Main broom lifting/lowering lever
25. Front skirt lifting pedal
26. Service brake pedal (parking brake when combined with lever, position 19)
27. Driver's seat with safety microswitch
28. Serial number
29. Serial number plate/technical data/EC certification
30. Dust filter cover
31. Waste container
32. Left door
33. Left fastener with locking screw
34. Right door
35. Right fastener
36. Working light (optional)
37. Right side broom
38. Left side broom
39. Main broom
40. Battery/engine compartment hood
41. Rear drive wheels on fixed axle
42. Front steering wheel
43. Left side skirt
44. Right side skirt
45. Front skirt
46. Rear skirt
47. Dust filter container
48. Hood (open)
49. Batteries
50. Battery caps
51. Battery connector
52. Main broom motor resettable thermal fuse
53. Right side broom motor resettable thermal fuse
54. Left side broom motor resettable thermal fuse
55. Lamellar fuse box
56. Vacuum/main broom motor
57. Vacuum fan
58. Drive motor
59. Electrical component box
60. Battery switch for machine pushing/towing (if equipped) (no more equipped from serial number 034110042)
61. Drive electronic board
62. Waste container lifting system oil tank
63. Battery installation diagram
64. Vacuum hose
65. Machine lifting anchors
66. Pivoting light (always on when the ignition switch is turned to "I" position)
67. Open hood support rod

MACHINE NOMENCLATURE (continues)



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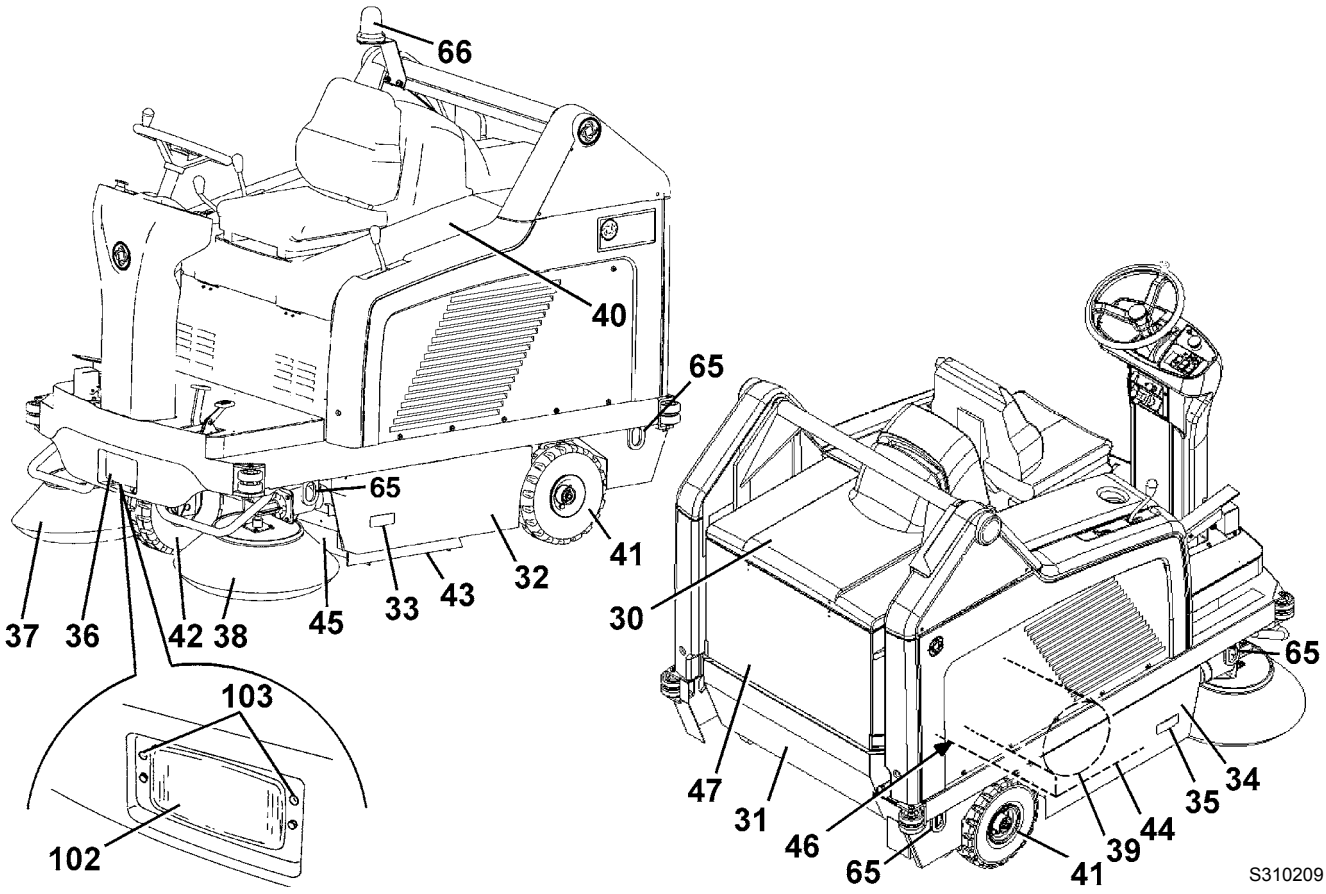

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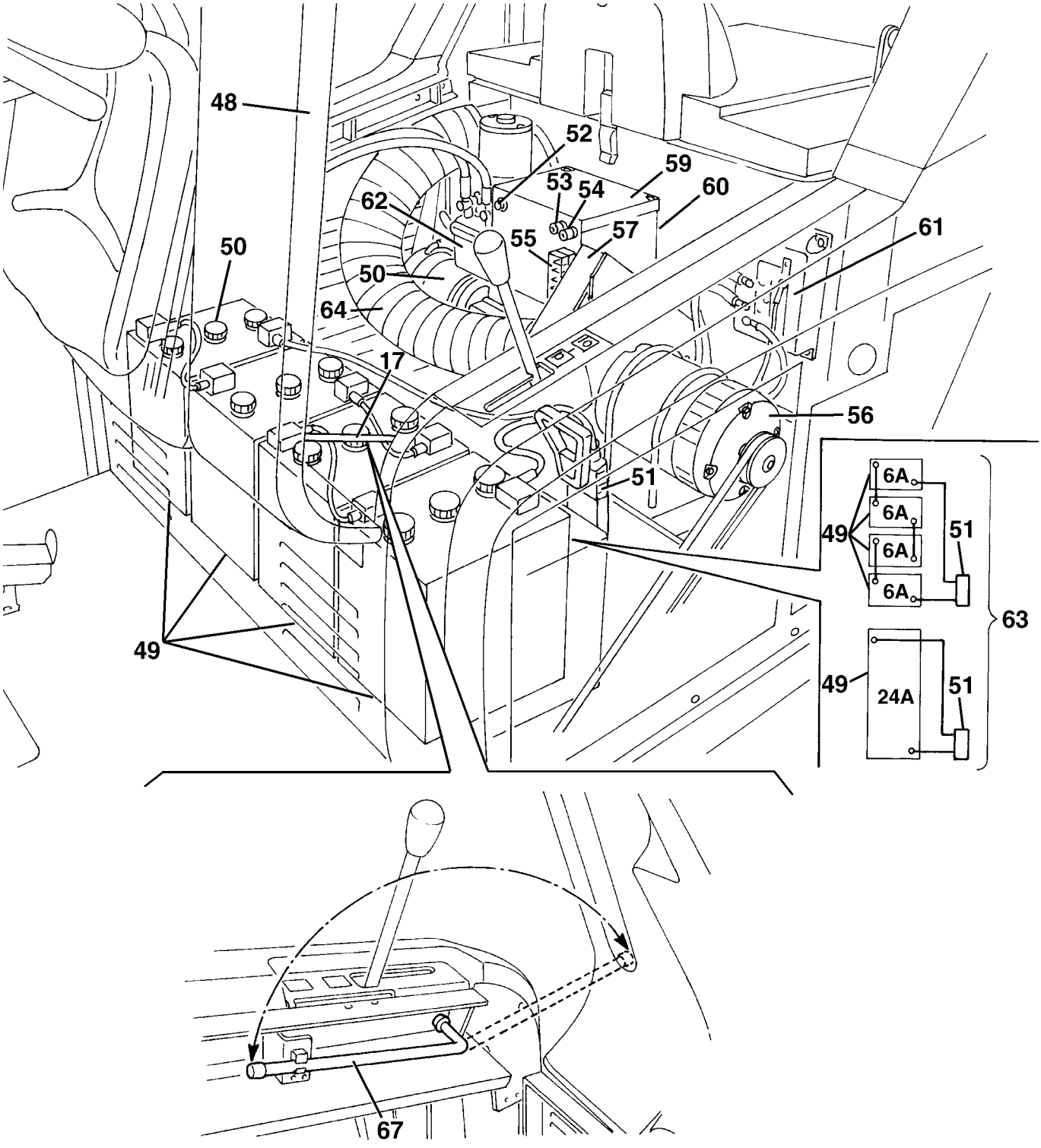
GENERAL INFORMATION

MACHINE NOMENCLATURE (continues)



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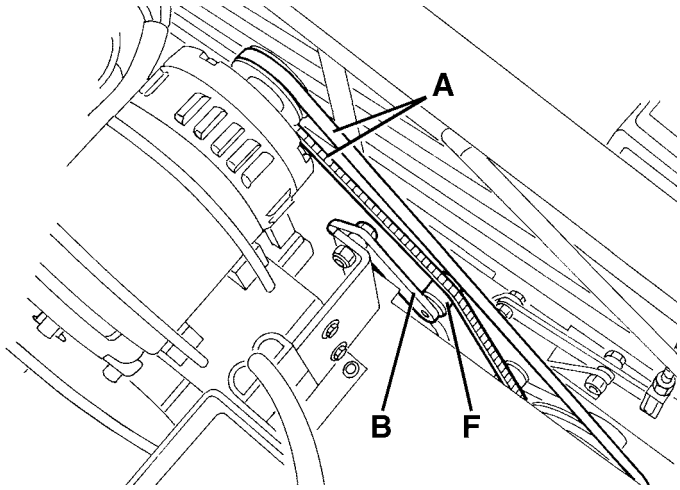
MOTOR-TO-MAIN BROOM BELT VISUAL INSPECTION AND TENSION CHECK

UPPER V-BELT CHECK

1. Turn the ignition switch (18) to “0” position and activate the parking brake with the pedal and the lever (26 and 19).
2. Open the hood (40) and secure it with the support rod (67).
3. Visually inspect the motor-to-main broom pulley V-belt (A) condition.
   Also check that the spring belt tensioner (B) keeps the belt (A) tensioned and that the pulley (F) rotates freely.
4. If the belt is worn, replace it performing the procedure on the following pages.
5. Close the hood (40).

LOWER BELT CHECK

6. Release the fastener (33) and open the left door (32).
7. Visually inspect the pulley-to-main broom belt (C) condition.
   Check the belt tension when the belt is not excessively tightened.
   If necessary adjust the belt tensioner (D) with the mounting nut (E).
8. If the belt is worn, replace it performing the procedure on the following pages.
9. Close the left door (32) and engage the fastener (33).



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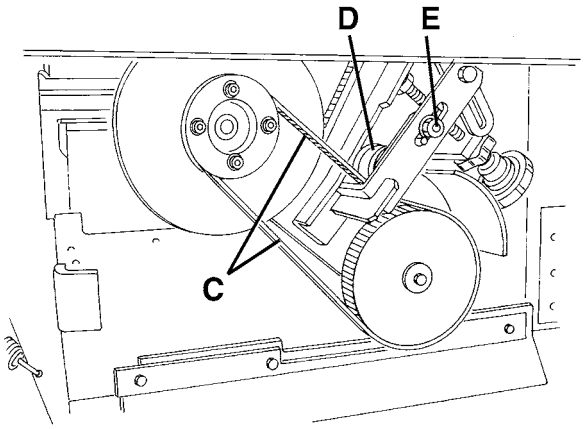
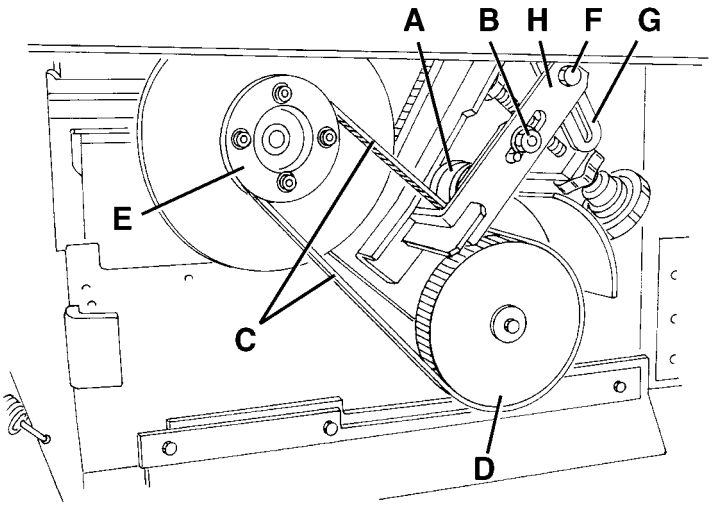


S300516

PULLEY-TO-MAIN BROOM BELT REPLACEMENT

1. Turn the ignition switch (18) to “0” position and activate the parking brake with the pedal and the lever (26 and 19).
2. Activate the lever (24) to lower the main broom.
3. Release the fastener (33) and open the left door (32).
4. Loosen the belt tensioner (A) with the nut (B).
5. Remove the belt (C) from the pulleys (D) and (E).
6. Remove the self-locking screw (F) and disengage the slotted lever (G).
7. Remove the belt (C) by sliding it between the support (H) and the lever (G).
8. Assemble the components in the reverse order of disassembly, and pay special attention to the following:
   - Do not overtighten the self-locking screw (F) so that lever (G) can slide on the support (H).
   - After installation, tension the belt (C) again with the tensioner (A) and the nut (B).

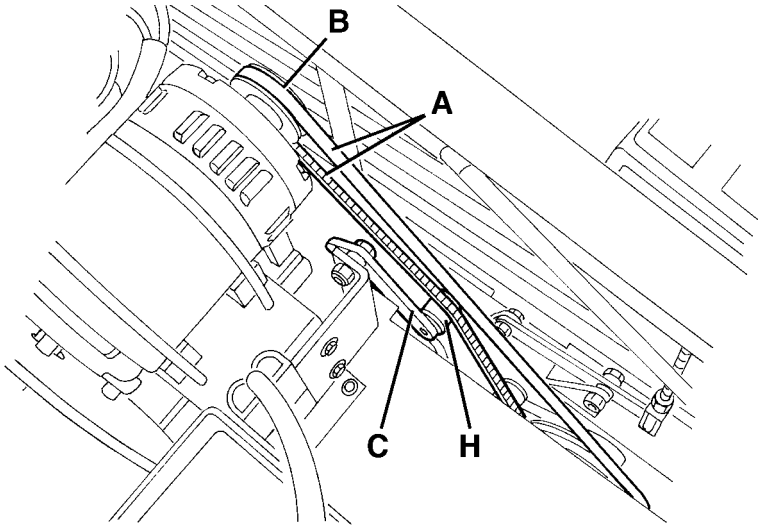


S300517

SWEEPING SYSTEM

MOTOR-TO-MAIN BROOM PULLEY V-BELT REPLACEMENT

1. Turn the ignition switch (18) to “0” position and activate the parking brake with the pedal and the lever (26 and 19).
2. Open the hood (40) and secure it with the support rod (67).
3. Remove the spring belt tensioner (C), then remove the belt (A) from the pulley (B).
4. Release the fastener (33) and open the left door (32).
5. Loosen the belt tensioner (D) with the nut (E).
6. Remove the belt (F) from the pulleys (G) and (H).
7. Remove the V-belt (I).
8. Assemble the components in the reverse order of disassembly, and pay special attention to the following:
   - After installation, tension the belt (F) again with the tensioner (D) and the nut (E).
   - After installing the belt (A), check that the belt (A) is properly tensioned by the spring belt tensioner (C) and that the pulley (H) turns freely. If not, replace the spring tensioner.



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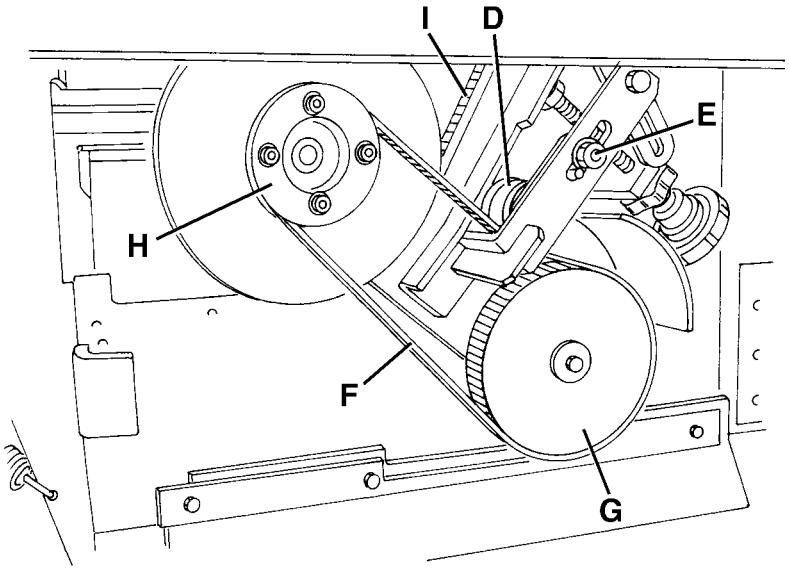


S300519

MAIN BROOM PRESSURE ON THE GROUND CHECK

NOTE
Brooms of various hardness are available. This procedure is applicable to all types of brooms.

CHECK

1. Check that the main broom is at the correct height from the ground, proceeding as follows:
   - Drive the machine on a level ground;
   - Keep the machine stationary and rotate the main broom for a few seconds;
   - Stop and lift the main broom, then move the machine;
   - Check that the main broom print (A), along its length, is 0,79 to 1,57 in (2 to 4 cm) wide.

   In case the print (A) is not within the specifications, it is possible to adjust the broom height, proceeding as follows:
   - Adjustment of the overall broom pressure on the ground (the whole broom is too much or too little pressed on the floor);
   - Adjustment of the pressure evenness across the broom length (the broom pressure differs from one end to another).

ADJUSTMENT OF THE OVERALL BROOM PRESSURE ON THE GROUND (THE WHOLE BROOM IS TOO MUCH OR TOO LITTLE PRESSED ON THE FLOOR)

2. Release the fastener (33), then open the left door (32).
3. Loosen the locknut (B).
4. Turn the handwheel (C) and remind that:
   - To decrease the broom ground pressure, it must be screwed;
   - To increase the broom ground pressure, it must be unscrewed.

NOTE
When the knob is completely unscrewed, you have reached the maximum ground pressure of the broom.

5. Tighten the locknut (B).
6. Perform step 1 again to check the main broom ground clearance for proper adjustment.
7. When the broom is too worn to be adjusted, replace it as shown in the next paragraph.

ADJUSTMENT OF THE PRESSURE EVENNESS ACROSS THE BROOM LENGTH (THE BROOM PRESSURE DIFFERS FROM ONE END TO ANOTHER).

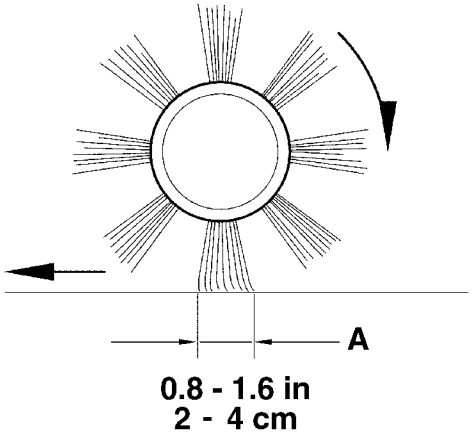
8. Release the fastener (35) and open the right door (34).
9. Loosen the locknuts (D) and (E) and operate on the screws (F) and (G) to adjust the broom pressure evenness on the ground, and remind that: To lower the broom on the right side the screw (F) must be tightened; to lift the broom on the right side the screw must be loosened.
10. Finally adjust the screw (G) until it fits on the inner bushing (H) and tighten the nuts (D) and (E).
11. Perform step 1 again to check the proper adjustment of the main broom pressure evenness on the ground.

MACHINE RESET

12. Close the left door (32) and engage the fastener (33).
13. Close the right door (34) and engage the fastener (35).

SWEEPING SYSTEM

MAIN BROOM PRESSURE ON THE GROUND CHECK (continues)



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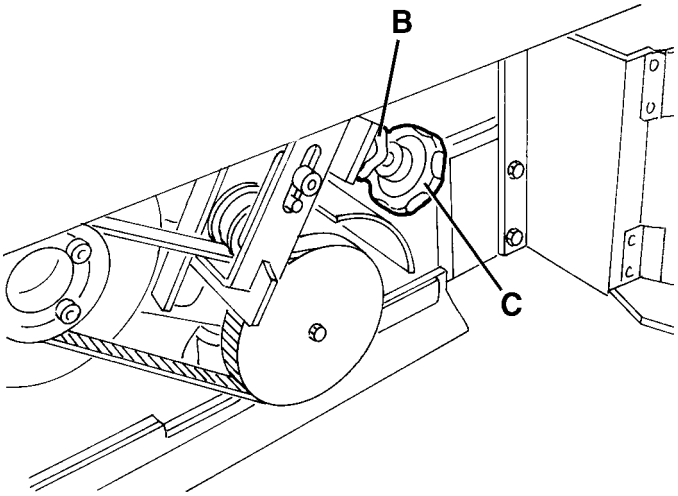

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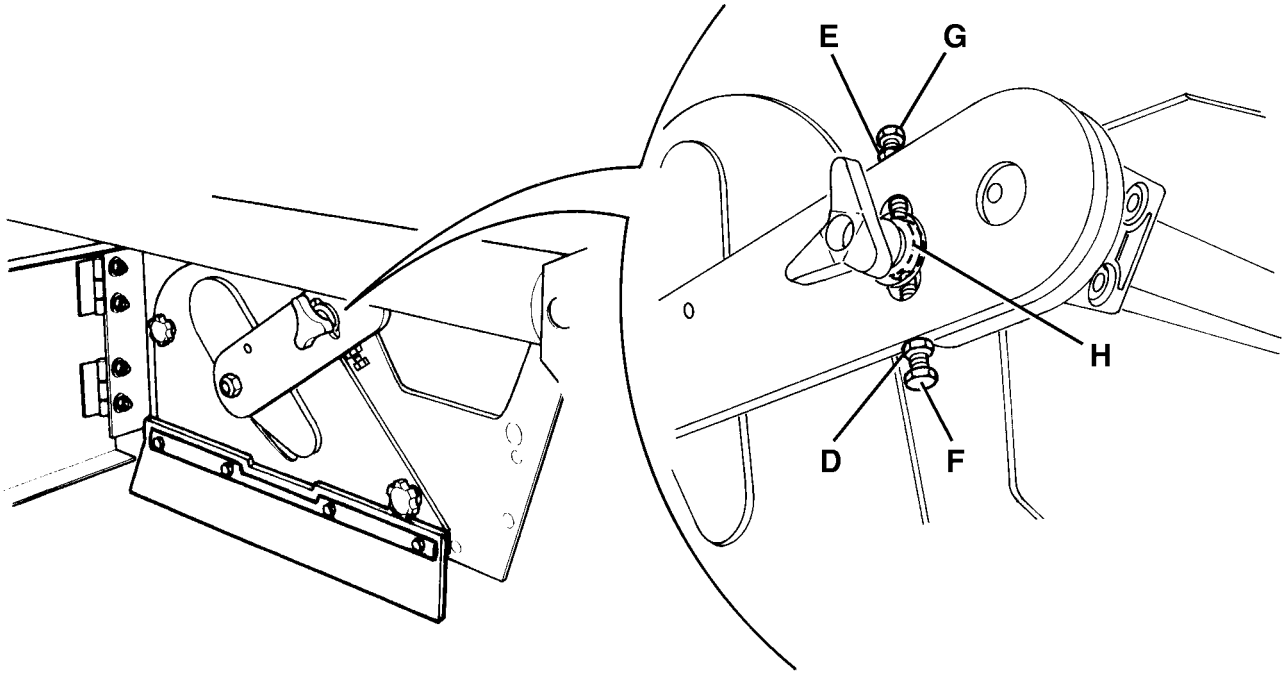


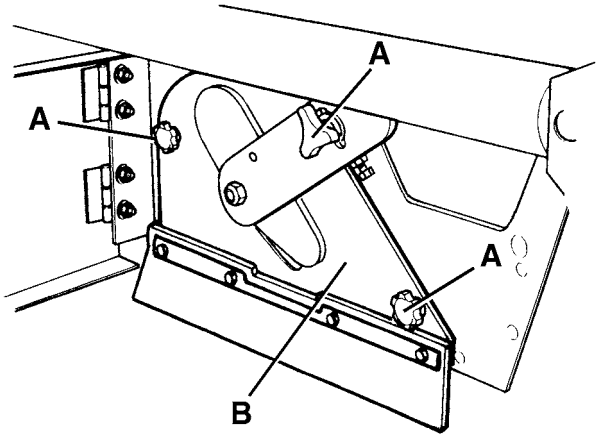
S300522

MAIN BROOM REPLACEMENT

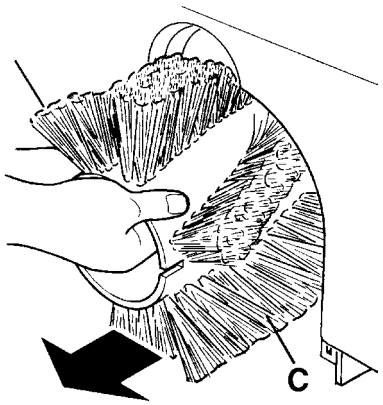
NOTE
Brooms of various hardness are available. This procedure is applicable to all types of brooms.

CAUTION!
It is advisable to use protective gloves when replacing the main broom because there can be cutting debris between the bristles.

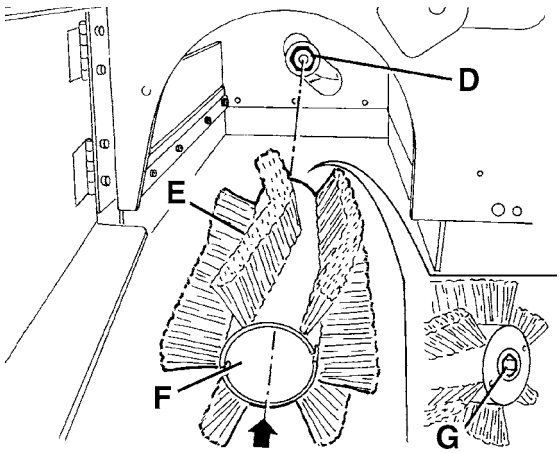
1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. Open the hood (48) and secure it with the support rod (67), then disconnect the battery connector (51).
4.
5. Unscrew and remove the knobs (A).
6. Remove the broom compartment cover (B).
7. Remove the broom (C).
8. Check that the drive hub (D) is free from dirt or foreign materials (cords, rags, etc.) accidentally rolled up.
9. The new broom must be installed with the bristles rows (E) positioned as shown in the figure.
10. Install the new broom (F) on the machine and ensure that its flange (G) correctly fits on the related drive hub (D).
11. Install the broom compartment cover (B) and screw the knobs (A).
12. Close the right door (34) and engage the fastener (35).
13. Connect the battery connector (51), disengage and place the support rod (67) in its housing, and close the hood (48).
14. Check the main broom ground pressure, as described in the previous paragraph.



S300523



S300524



S300525

SWEEPING SYSTEM

SIDE BROOM HEIGHT ADJUSTMENT

NOTE
Brooms of various hardness are available. This procedure is applicable to all types of brooms.

BROOM HEIGHT ADJUSTMENT

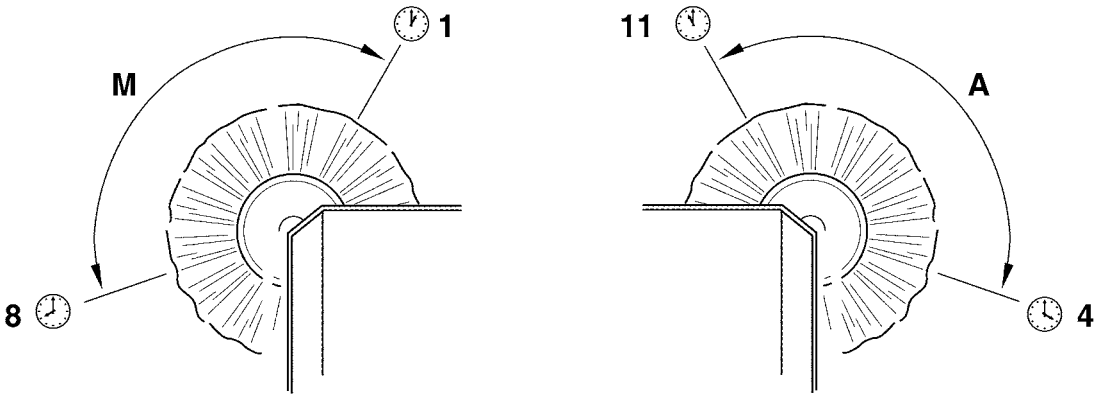
1. Check the side broom height from the ground, proceeding as follows:
   - Drive the machine on a level ground;
   - Keep the machine stationary, lower the side brooms and rotate them for a few seconds;
   - Stop and lift the side brooms, then move the machine;
   - Check that the side broom prints are, in extension and orientation, as shown in the figure (A).

   In case the prints are not within specifications, it is necessary to adjust the broom height, proceeding as described in the following steps.
2. Engage the parking brake with the pedal and the lever (26 and 19).
3. Turn the ignition switch (18) to “0” position.
4. Open the hood (48) and secure it with the support rod (67).
5. **Right side broom**: actuate the driving gear of the lever (B), by loosening the ring nut (C) and by adjusting the register (D) until the correct broom print (A) is achieved. The broom should be touching the floor in a circle arc going from the “11 o’clock” position to the “4 o’clock” position. Finally lock the register (D) into position with the ring nut (C).
   Left side broom: actuate the driving gear of the lever (E), by loosening the ring nut (F) and by adjusting the register (G) until the correct broom print (M) is achieved. The broom should be touching the floor in a circle arc going from the “8 o’clock” position to the “1 o’clock” position. Finally lock the register (G) into position with the ring nut (F).
6. Perform step 1 again to check the proper adjustment of the side broom height from the ground.
7. If necessary, the height of the side brooms (L) can be adjusted with the screw and locknut (H) or by shifting the terminals (I).
8. When the broom is too worn to be adjusted, replace it as shown in the next paragraph.

BROOM TILTING ADJUSTMENT

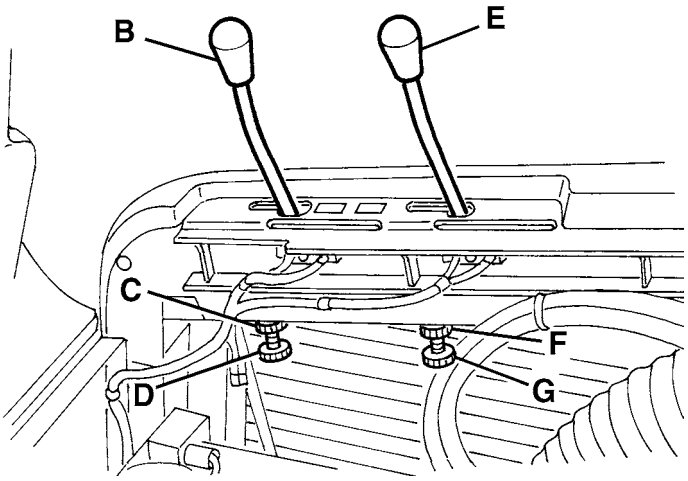
NOTE
This adjustment should be carried out only in case of real need.

9. Loosen the locknut (J) and adjust the broom tilting by operating on the screw (K).
10. Tighten the locknut (J).
11. Perform step 1 again to check the proper adjustment of the side broom height from the ground and tilting.



S300526

SIDE BROOM HEIGHT ADJUSTMENT (continues)



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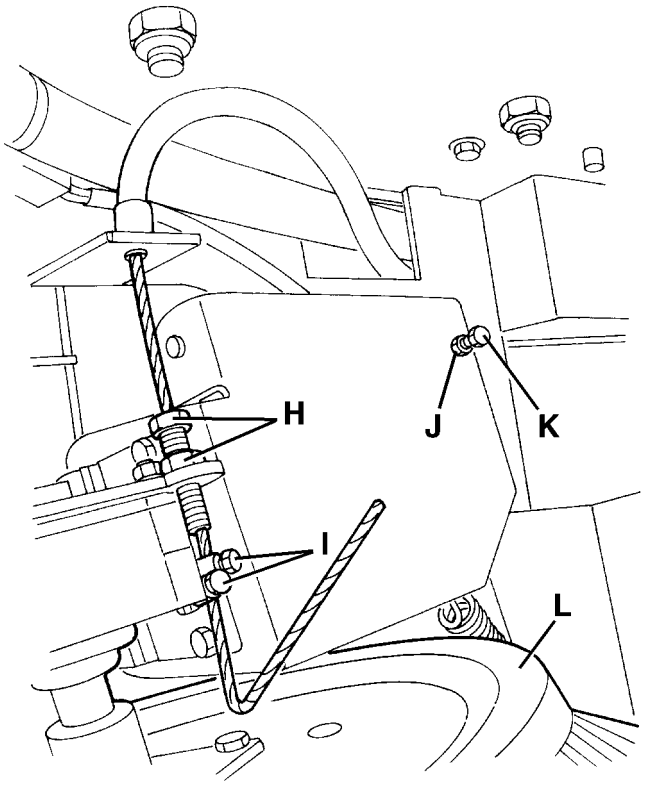


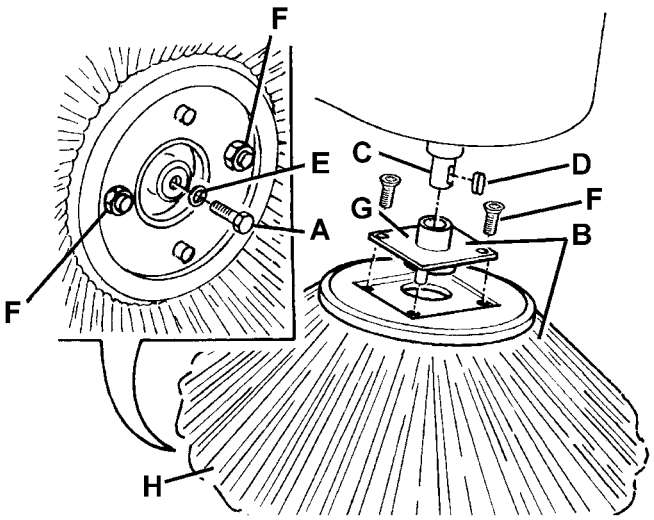
S300528

SIDE BROOM REPLACEMENT

NOTE
Brooms of various hardness are available. This procedure is applicable to all types of brooms.

CAUTION!
It is advisable to use protective gloves when replacing the side broom because there can be cutting debris between the bristles.

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. Activate the lever (21 or 22) to raise the related side broom.
4. Operating inside the side broom, loosen the screw (A) and then remove the broom with the hub (B) by disengaging it from the shaft (C). Recover the key (D) and the washer (E).
5. At the workbench, remove the two screws (F) and separate the broom (H) from the hub (G).
6. Install the new broom (H) onto the hub (G), and tighten the screws (F).
7. Fit the key (D) and install the broom with the hub (B). Install the washer (E) and tighten the screw (A).
8. Adjust the side broom height, as described in the previous paragraph.

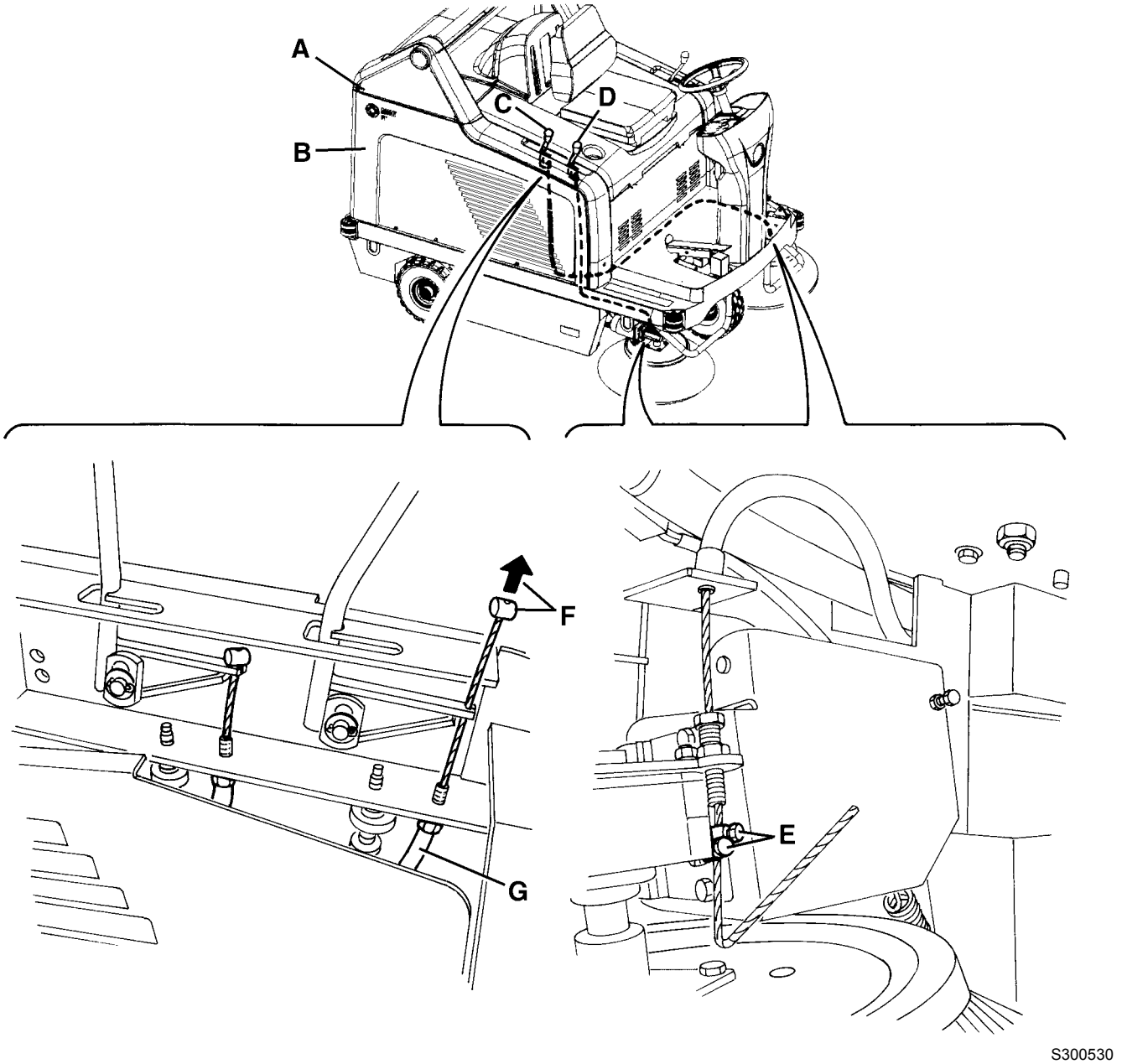


S300529

SWEEPING SYSTEM

SIDE BROOM LIFTING CABLE REMOVAL

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. Remove the screws (A), then remove the body side (B).
4. Lower the broom with the lever (C) or (D).
5. Remove the terminals (E) from the cable.
6. Remove the side broom lifting cable (F) by disengaging it from the sheath (G), on the control lever side.
7. Assemble the components in the reverse order of disassembly, and pay special attention to the following:
   - Before inserting the new cable (F) into the sheath (G), apply a thin coat of grease along the cable (so that it smoothly slides into the sheath).
8. Perform the side broom height adjustment (see the related Chapter).

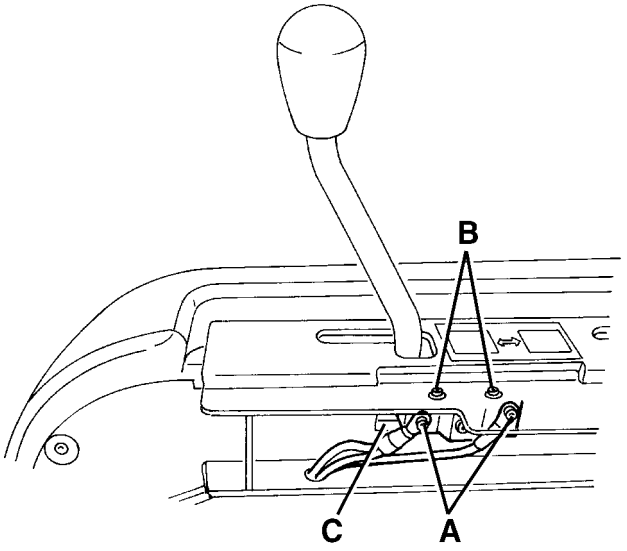


S300530

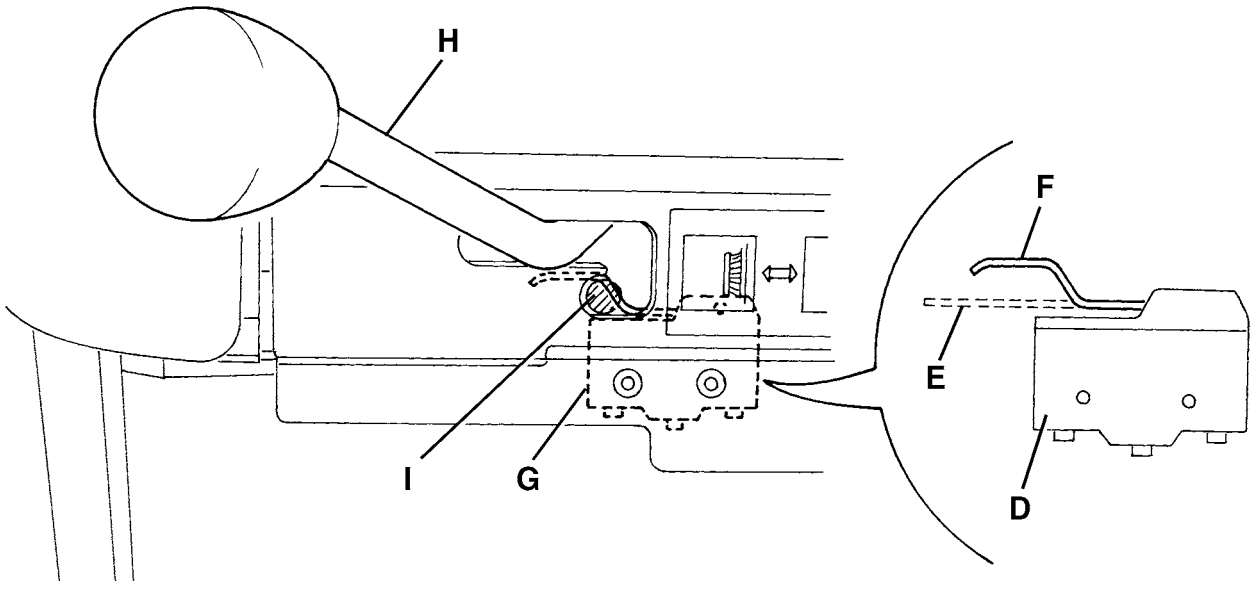
SIDE AND MAIN BROOM LIFTING LEVER MICROSWITCH REPLACEMENT

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. Open the hood (48) and secure it with the support rod (67).
4. Disconnect the battery connector (51).
5. Disconnect the electrical connections (A) from the microswitch to be replaced.
6. Remove the screws (B), then remove the microswitch (C).
7. On the new microswitch (D), bend the trigger plate (E) as shown in (F), so that when the microswitch is installed (G position) it will be triggered by the lever (H) when the latter is in the position (I) to lift the broom.
8. Assemble the components in the reverse order of disassembly, taking care to correctly reconnect the electrical connections to the new microswitch; for the correct connections, see the table below.
9. Check the operation of the new microswitch.

MICROSWITCH CONNECTION TABLE		
Microswitch	**Contact**	**Wire colour**
Main broom	C	Orange
	NA	Black - Violet
	NC	Black - Orange
Right side broom	C	Black - White
	NC	Black - Gray
Left side broom	C	Black - White
	NC	Black - Brown



S300531



S300532

SWEEPING SYSTEM

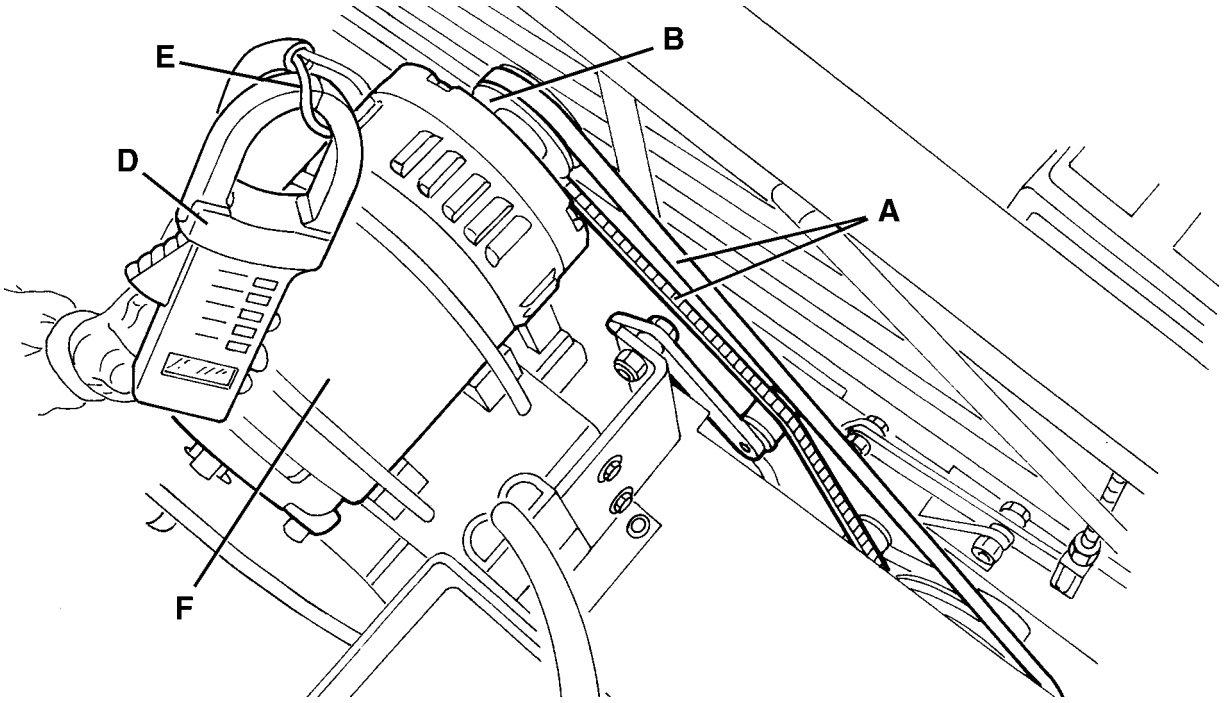
MAIN BROOM AND VACUUM FAN MOTOR ELECTRICAL INPUT CHECK

WARNING!
This procedure must be performed by qualified personnel only.

1. This check must be carried out when the battery (24V) is charged.
2. Check the main broom ground pressure (see the related paragraph).
3. Drive the machine on a level ground having a smooth concrete surface, or similar roughness (for a correct execution of this test). Engage the parking brake with the pedal and the lever (26 and 19).
4. Check that brooms and vacuum system are deactivated.
5. Turn the ignition switch (18) to “0” position.
6. Open the hood (48) and secure it with the support rod (67).

WARNING!
Pay attention to the pulley rotation (B) while performing the following steps.

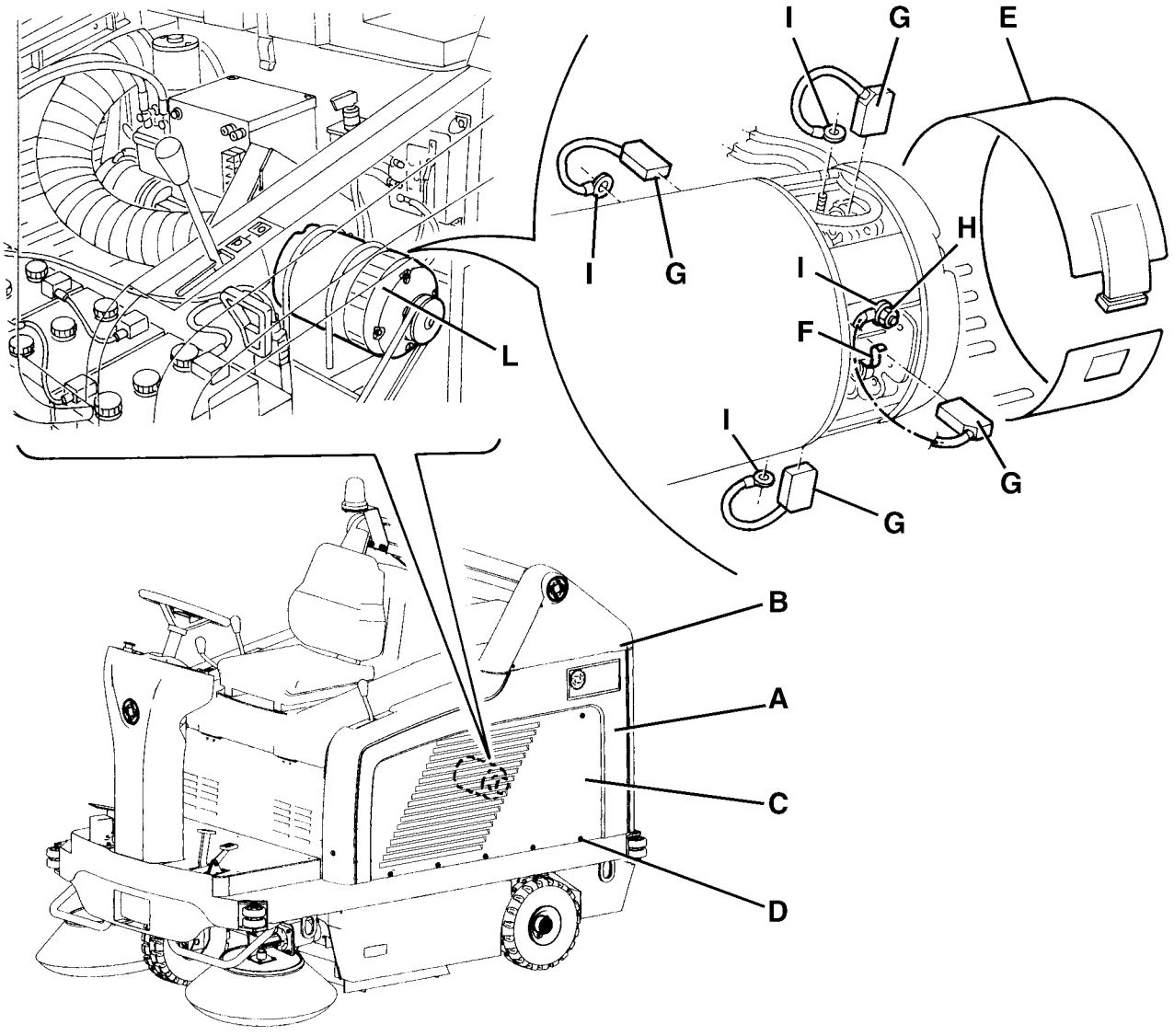
7. Apply amperometric pliers (D) on a cable (E) of the main broom motor (F).
8. Turn the ignition switch (18) to “I” position.
9. Lower the main broom with the lever (24) and check that the electrical input of the main broom motor (F) between 30 and 35A at 24V. Lift the main broom with the lever (24). Turn the ignition switch (18) to “0” position and remove the amperometric pliers (D).
   If the electrical input is higher, check the transmission elements from the motor (F) to the main broom. If necessary, carry out the motor brush check (see the procedure on the following page). If necessary, disassemble the motor (see the procedure in the related paragraph), clean it and check its moving parts. Also check the vacuum fan condition.
   If the above-mentioned procedures do not lead to a correct electrical input, it is necessary to replace the motor (see the procedure on the following page).
10. Disengage the support rod (67) and close the hood (48).



S300533

MAIN BROOM AND VACUUM FAN MOTOR BRUSH CHECK AND REPLACEMENT

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. Open the hood (48) and secure it with the support rod (67).
4. Disconnect the battery connector (51).
5. Remove the mounting screws (B), then remove the left body side (A).
6. Remove the mounting screws (D), then remove the left bulkhead (C).
7. Clean the outside of the main broom motor, then disengage and remove the clamp (E) of the motor.
8. For each of the four brooms, lift the retaining spring (F) and remove the brooms (G).
9. Check if the four brooms are worn. The brooms are worn when there is not a sufficient contact with the motor armature, because of their use, of the contact surface which is not integral or because the thrust spring is broken, etc. The minimum length of the brooms (G) is 0,24 in (6 mm), then they must be replaced.
10. If necessary, remove the brooms to replace them, by unscrewing the nuts (H) and disengaging the lead-in wires (I). It is advisable to replace all the brooms at the same time.
11. Assemble the components in the reverse order of disassembly.



S300534

SWEEPING SYSTEM

MAIN BROOM AND VACUUM FAN MOTOR REMOVAL

REMOVAL

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. Open the hood (48) and secure it with the support rod (67).
4. Disconnect the battery connector (51).
5. Remove the screws (A), then remove the cover (B).
6. Disconnect the electrical connections (J) and (K) of the motor from both the thermal fuse and the electromagnetic switch.
7. Loosen the clamp (C) and disconnect the hose (D) from the vacuum fan cover (E).
8. Remove the belt (F) from the pulley (G).
9. Measure the distance (W) between the collar (M) and the pulley (G), to carry out an equal positioning of the motor (V) when reinstalling (in order to ensure that the drive pulley (G) is aligned with the driven pulley).
10. Remove the nuts (L) and the collars (M).
11. Remove the motor-vacuum fan unit (I) and take it to the workbench.

DISASSEMBLY AT THE WORKBENCH

12. Remove the screw (N), then remove the pulley (G) and recover the key (O).
13. Remove the screws (P), then remove the cover (E).
14. Remove the screw (Q), then remove the fan (R) and recover the key.
15. Remove the four screws (S), then remove the plate (U) and recover the spacers (T).
16. Remove the motor (V).

ASSEMBLY

17. Assemble the components in the reverse order of disassembly.
18. Check that the drive pulley (G) is correctly aligned with the driven pulley.

SIDE BROOM MOTOR ELECTRICAL INPUT CHECK

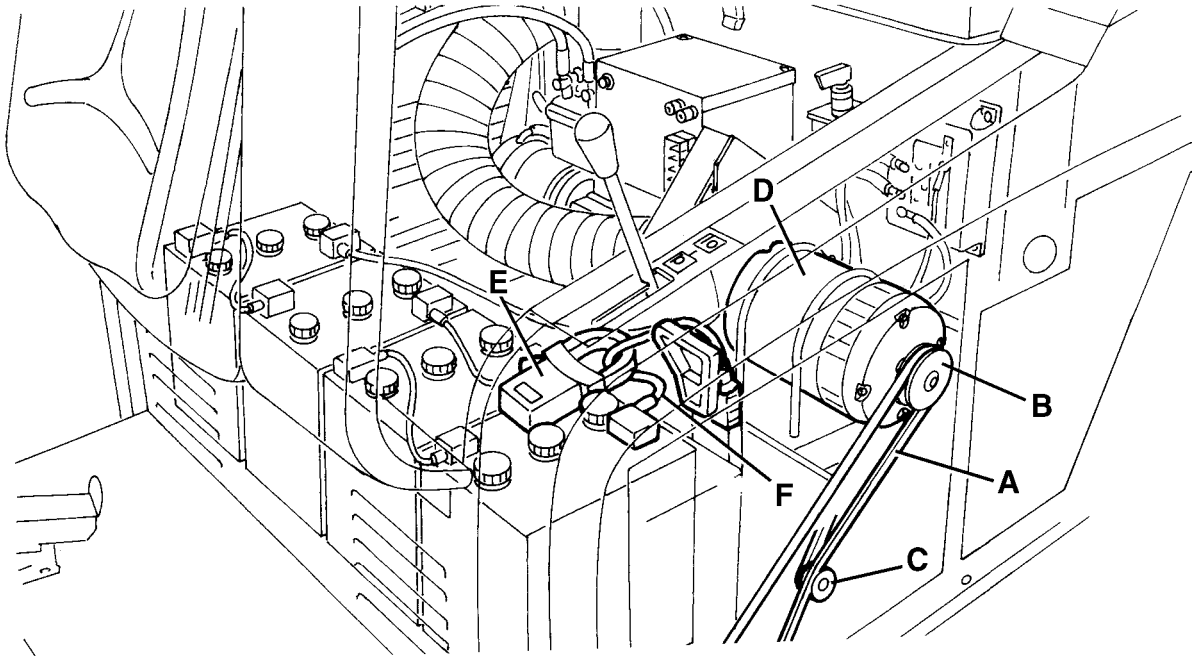
NOTE
The following procedure refers to the right broom, the procedure for the left broom is the same.

WARNING!
This procedure must be performed by qualified personnel only.

1. Remove the motor of the side broom to be inspected (see the procedure in the related paragraph).
2. Open the hood (48) and secure it with the support rod (67).
3. On the motor (D) of the main broom, remove the spring belt tensioner (C), then remove the belt (A) from the pulley (B).

WARNING!
Pay attention to the pulley rotation (B) while performing the following steps.

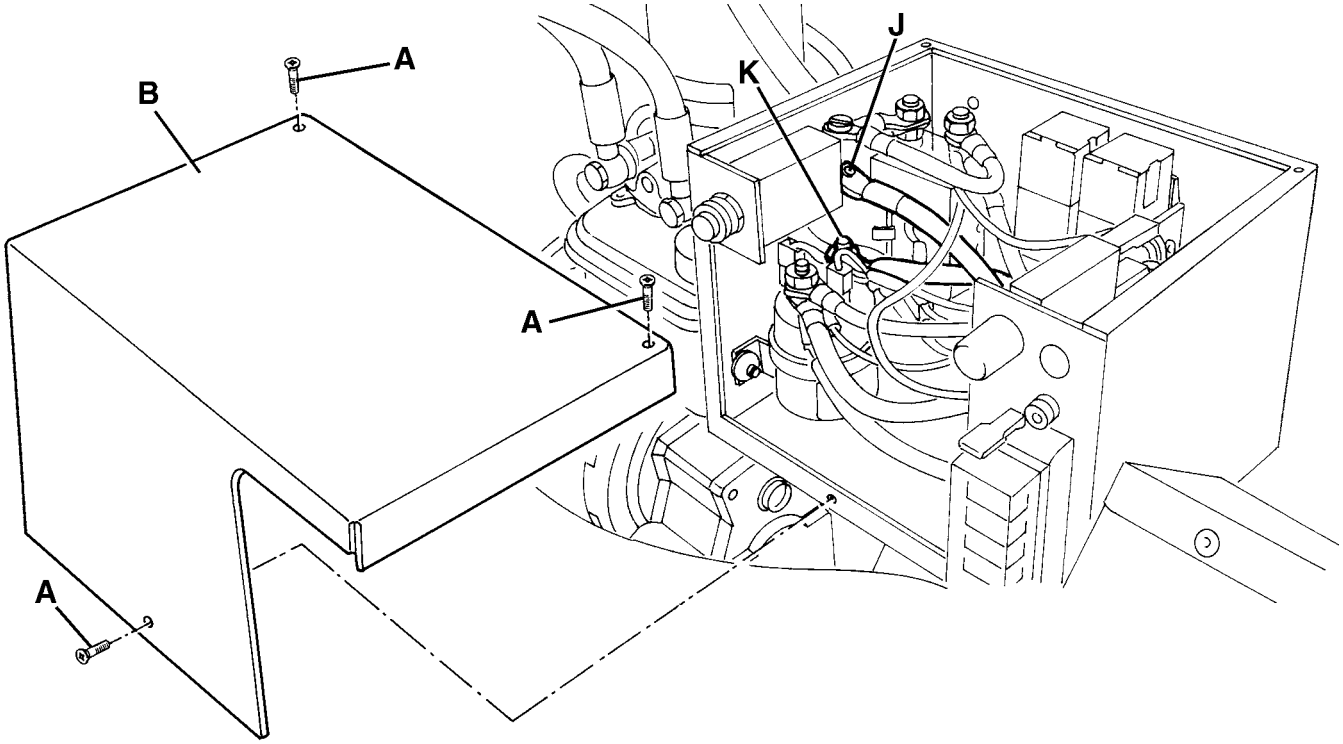
4. Apply amperometric pliers (E) on a cable (F) of the battery.
5. Turn the ignition switch (18) to “I” position.
6. Lower the main broom with the lever (24) and write down the electrical input (in Amps at 24 V) of the motor (D) detected by the amperometric pliers (E).
7. Lower the side broom with the lever (21) or (22) and write down the electrical input (in Amps at 24 V) detected by the amperometric pliers (E).
8. Lift the lowered brooms with the levers (21) or (22), and (24). Turn the ignition switch (18) to “0” position and remove the amperometric pliers (E).
9. Subtract the value detected at step 7 from the value detected at step 6; check that the resulting value is 1-2A at 24 V.
   If the electrical input is higher, perform the motor brush check (see the procedure on the following pages). If necessary, disassemble the motor (see the procedure in the following paragraph), clean it and check its moving parts.
   If the above-mentioned procedures do not lead to a correct electrical input, it is necessary to replace the motor (see the procedure on the following paragraphs).
10. Carry out steps from 1 to 3 in the reverse order.



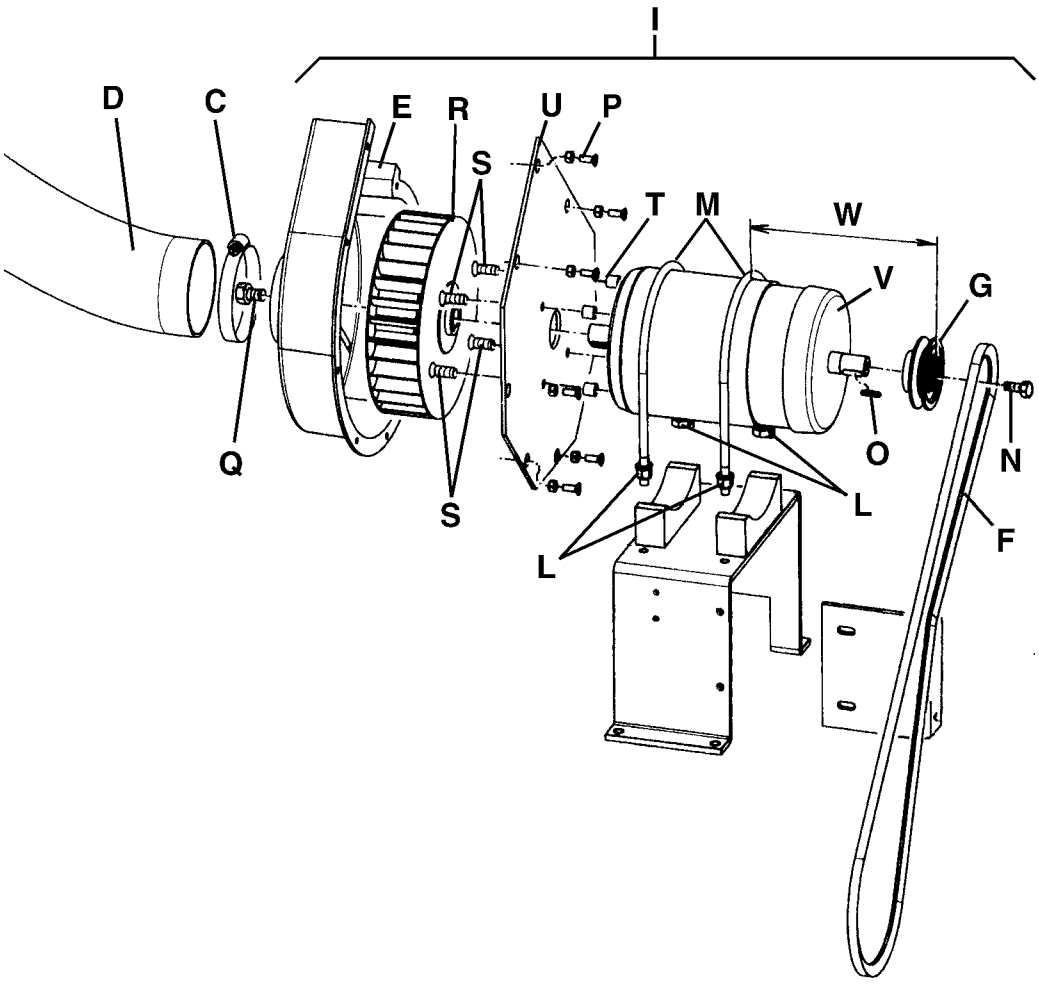
S300537

SWEEPING SYSTEM

SIDE BROOM MOTOR ELECTRICAL INPUT CHECK (continues)



S300535



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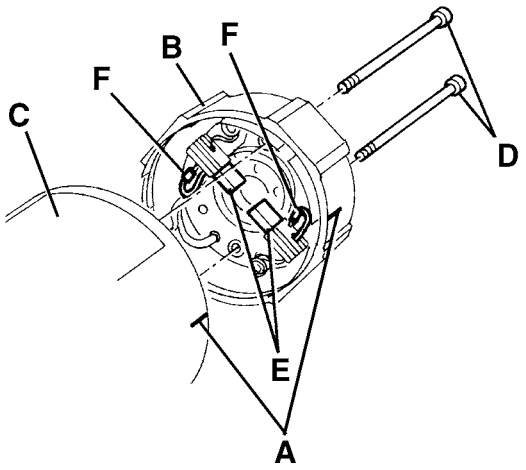
SIDE BROOM MOTOR CARBON BRUSH CHECK AND REPLACEMENT

1. Remove the motor of the side broom to be inspected (see the procedure in the related paragraph).
2. At the workbench, clean the outside of the motor from dirt and dust, then mark the reciprocal position (A) between the cover (B) and the motor body (C).
3. Remove the screws (D), then carefully remove the cover (B).
4. Check if the two brooms (E) are worn. The brooms are worn when there is not sufficient contact with the motor armature, because of their short length, of the contact surface which is not integral or because the thrust spring is broken, etc. The minimum length of the brooms (E) is 0,39 in (10 mm), then they must be replaced.
5. If necessary, remove the brooms to replace them, by disengaging the lead-in wires (F).
   It is advisable to replace all the brooms at the same time.
6. Assemble the components in the reverse order of disassembly.



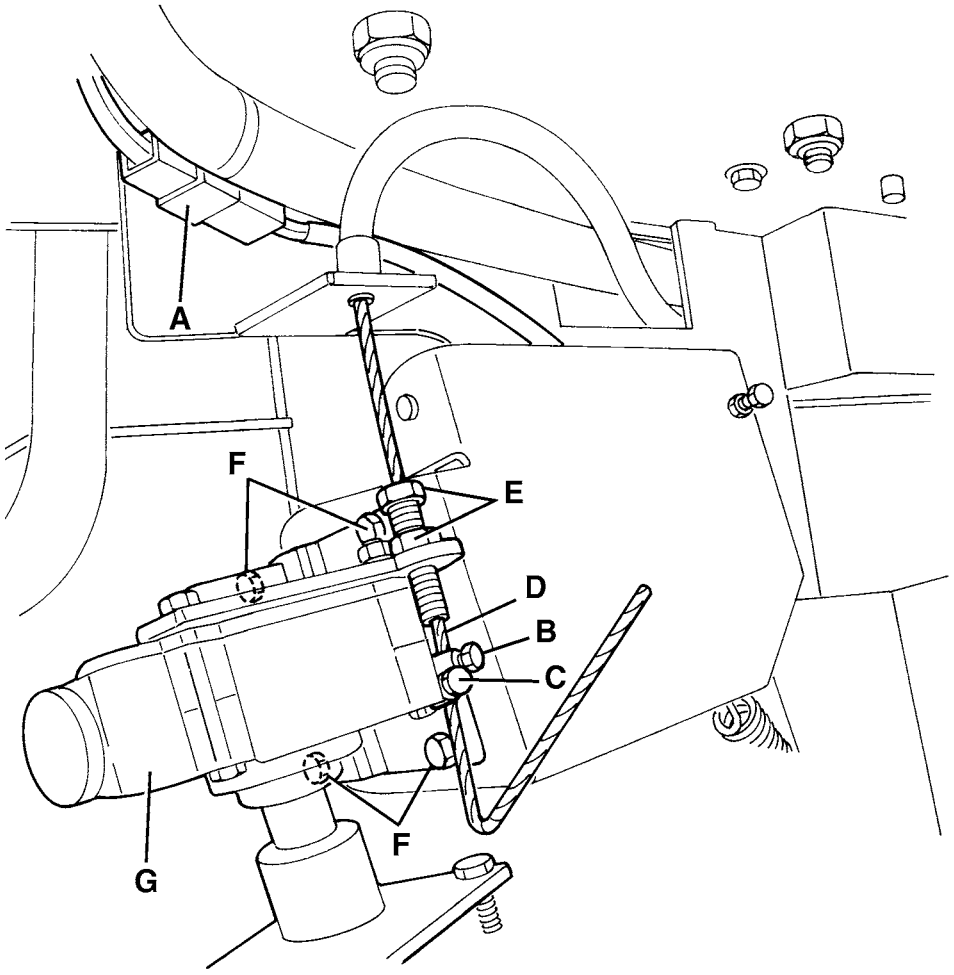
S300538

SWEEPING SYSTEM

SIDE BROOM MOTOR REMOVAL

NOTE
This procedure refers to the right broom: the procedure for the left broom is the same.

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. Open the hood (48) and secure it with the support rod (67).
4. Disconnect the battery connector (51).
5. Remove the relevant side broom (see the procedure in the related paragraph).
6. Disconnect the motor electrical connection (A).
7. Disconnect the terminals (B) and (C) and then remove the cable (D) from the fairlead (E).
8. Remove the mounting screws (F) of the reduction unit (G).
9. Remove the reduction unit (G).
10. Assemble the components in the reverse order of disassembly, tighten the terminals (B) and (C) on the cable (D) under the following conditions:
    - Lever (21) in lifted position
    - Side broom (37) lifted 0,39-1,18 in (2-3 cm) from the ground.
11. Perform the side broom height adjustment (see the procedure in the related paragraph).



S300539

SKIRT HEIGHT CHECK AND ADJUSTMENT AND OPERATION CHECK

SIDE SKIRTS

1. Drive the machine on a level ground that is suitable for checking the skirt height.
2. Engage the parking brake with the pedal and the lever (26 and 19).
3. Turn the ignition switch (18) to “0” position.
4. Release the fasteners (35 and 33) and open the right and left door (34 and 32).
5. Check the side skirts (A) for integrity.
   Replace the skirts when they have cuts (B) larger than 0,78 in (20 mm) or cracks/tears (C) larger than 0,39 in (10 mm) (for skirt replacement, see the following paragraphs).
6. Check that side skirts (D) height from ground is within 0 - 0,12 in (0 – 3 mm) approximately (as shown in the figure).
   If necessary, loosen the screws (E) and adjust the skirt position. Then tighten the screws (E).

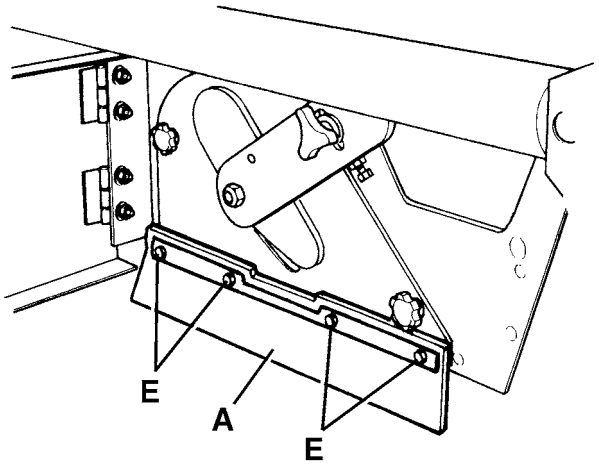
FRONT AND REAR SKIRT

7. Remove the main broom, as described in the related paragraph.
8. Check the front (F) and rear (G) skirt for integrity.
   Replace the skirts when they have cuts (B) larger than 0,78 in (20 mm) or cracks/tears (C) larger than 0,39 in (10 mm) (for skirt replacement, see the following paragraphs).
9. Check that the front and rear skirts (H) slightly touch the ground (as shown in the figure).
   If necessary, loosen the screws (E) and adjust the skirt position. Then tighten the screws (I).
10. Press the front skirt lifting pedal (25) completely and check that the front skirt lifts 1,95 in (5 cm) approximately.

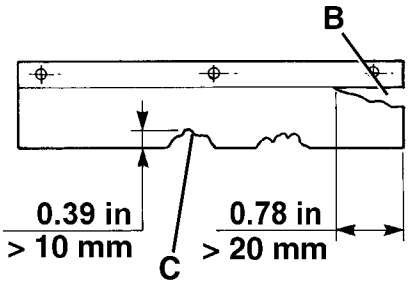
Release the pedal and check that the skirt returns to the initial position and does not stop in an intermediate position. If necessary, adjust the skirt lifting cable (L) with the register (M), located on the front side of the skirt (if necessary, refer to the skirt control cable replacement in the following paragraphs).

ASSEMBLY

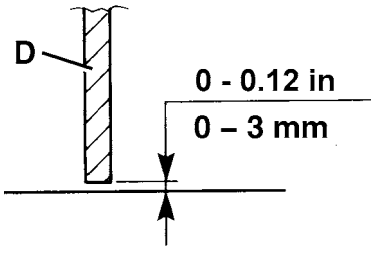
11. Assemble the components in the reverse order of disassembly.



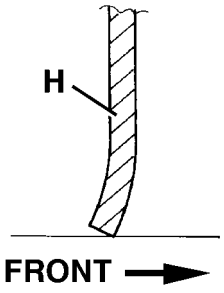
S300540



S300541



S300542



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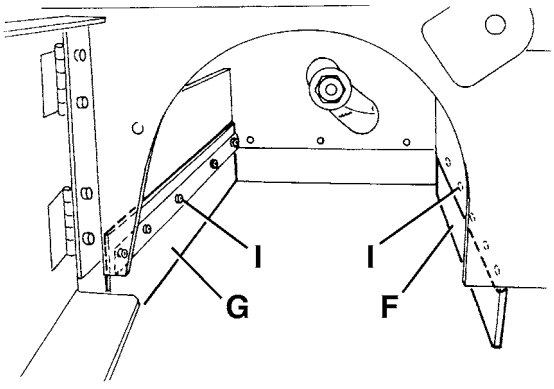
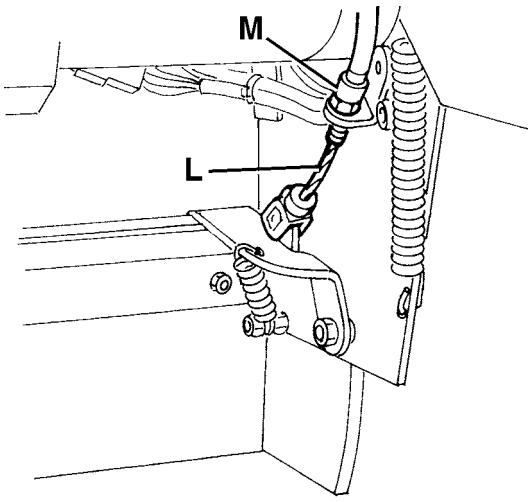


S300544

SKIRT

SKIRT HEIGHT CHECK AND ADJUSTMENT AND OPERATION CHECK (continues)



S300545

TROUBLESHOOTING

OPEN CIRCUIT

The thermal fuses (52), (53), (54) determine the open circuit. This system allows to prevent the circuits and broom motors from being damaged under overload conditions.
If there is an open in the electrical circuit, the possible causes are the following.

MAIN BROOM - VACUUM FAN MOTOR; THE THERMAL FUSE (52) ACTIVATES AND OPENS THE ELECTRICAL CIRCUIT.

Possible causes:
1. Bulky debris or cords around the broom or between the broom and its flange (remove the broom and the debris or cords).
2. The broom is too much pressed on the floor (check the broom height).
3. The broom motor electrical input is too high (check the electrical input).
4. Vacuum fan lock (repair).
   Wait at least 2 minutes after the open circuit occurs and, when the problem is solved, push the thermal fuse button (52).

SIDE BROOM MOTOR; THE THERMAL FUSE (53) OR (54) ACTIVATES AND OPENS THE ELECTRICAL CIRCUIT.

Possible causes:
1. Bulky debris or cords around the broom or between the broom and its flange (remove the broom and the debris or cords).
2. The broom is too much pressed on the floor (check the broom height).
3. The broom motor electrical input is too high (check the electrical input).
   Wait at least 2 minutes after the open and, when the problem is solved, push the thermal fuse button (35).

After the activation of the emergency switch, in order to restore the machine functions, it is necessary to turn the switch clockwise, as indicated by the arrow on the switch; make sure to perform this operation.

THE MAIN BROOM DOES NOT ROTATE

Possible causes:
1. The battery voltage is too low; the warning light (7) is on (charge the battery).
2. The motor brushes are worn (replace).
3. The motor is malfunctioning (repair or replace).
4. Poor operation or damage of motor driving belts (adjust or replace).
5. The microswitch on the lifting/lowering lever does not operate (replace).
6. Damaged wiring harness (repair).

THE SIDE BROOM DOES NOT ROTATE

Possible causes:
1. The battery voltage is too low; the warning light (7) is on (charge the battery).
2. The motor brushes are worn (replace).
3. The motor is malfunctioning (repair or replace).
4. The microswitch (allowing the lowered side broom to rotate) on the lifting/lowering lever does not operate (replace).
5. Damaged wiring harness (repair).

VACUUM FAN REMOVAL

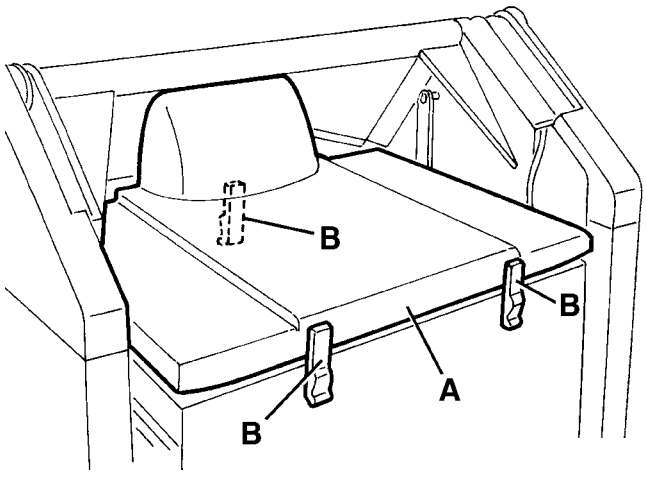
See the Main Broom-Vacuum Fan Motor Replacement paragraph

FILTER SHAKER OPERATION CHECK

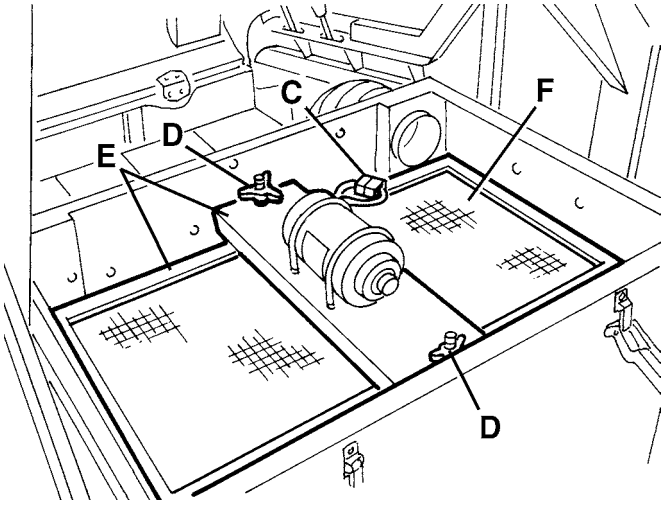
1. During machine operation, when the panel filter is supposed to be obstructed, deactivate the vacuum with the lever (17), then push the switch (14) to activate the filter shaker motor and check that the related noise is audible. Restart machine operation and check if the filter has been shaken. If the filter has been shaken correctly, the machine vacuuming capability is greatly improved.
2. If necessary, check or replace the filter shaker motor, as shown below.

FILTER SHAKER MOTOR REMOVAL

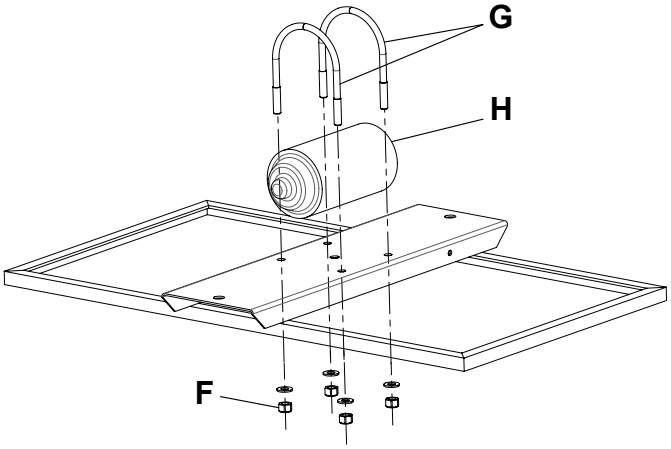
1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. Open the hood (48) and secure it with the support rod (67).
4. Disconnect the battery connector (51); leave the hood open.
5. Release the fasteners (B) and remove the dust filter cover (A).
6. Disconnect the electrical connector (C) from the filter shaker.
7. Remove the filter shaker support frame fastening handwheels (D).
8. Remove the filter shaker support frame (E).
9. At the workbench, remove the nuts (F) and the two collars (G).
10. Recover the filter shaker motor (H).
11. Assemble the components in the reverse order of disassembly.



S300550



S300551

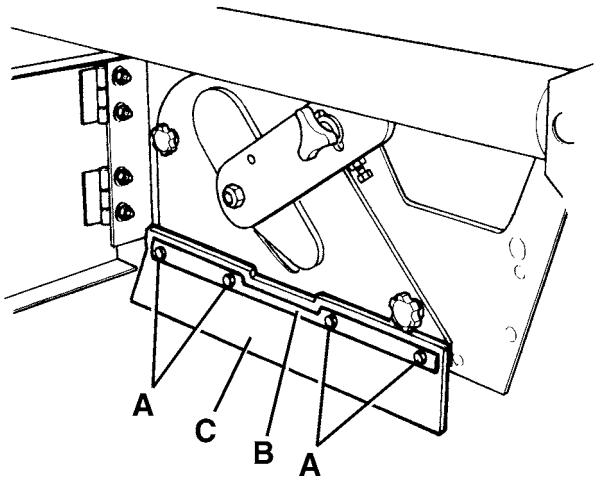


S300556

SKIRT

SIDE SKIRT REPLACEMENT

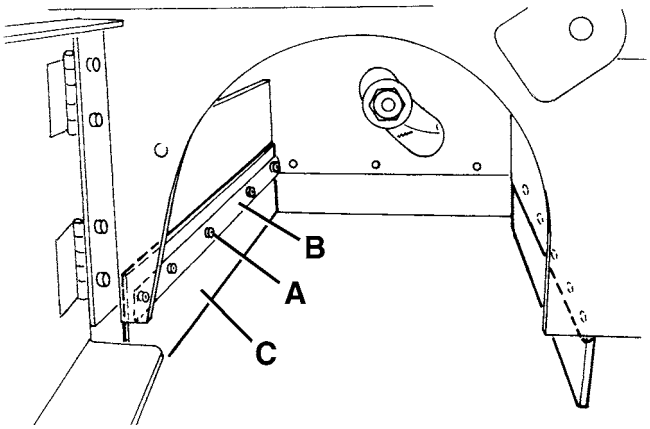
1. Drive the machine on a level ground that is suitable for checking the skirt height.
2. Engage the parking brake with the pedal and the lever (26 and 19).
3. Turn the ignition switch (18) to “0” position.
4. Release the fasteners (35 and 33), then open the right and left door (34 and 32).
5. Remove the screws (A), the strap (B), the right and left side skirts (C).
6. Assemble the new side skirts (C) with the strap (B) and the screws (A).
7. Adjust the side skirt height as described in the previous paragraph.
8. Close the right and left doors (34 and 32), and engage the fasteners (35 and 33).



S300546

REAR SKIRT REPLACEMENT

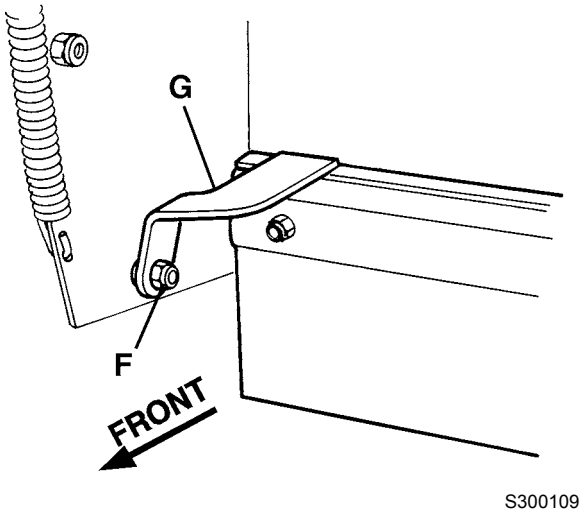
1. Drive the machine on a level ground that is suitable for checking the skirt height.
2. Remove the main broom, as described in the related paragraph.
3. Remove the screws (A), the strap (B) and the rear skirt (C).
4. Assemble the new rear skirt (C) with the strap (B) and the screws (A).
5. Adjust the rear skirt height as described in the previous paragraphs.
6. Assemble the main broom, as described in the related paragraph.



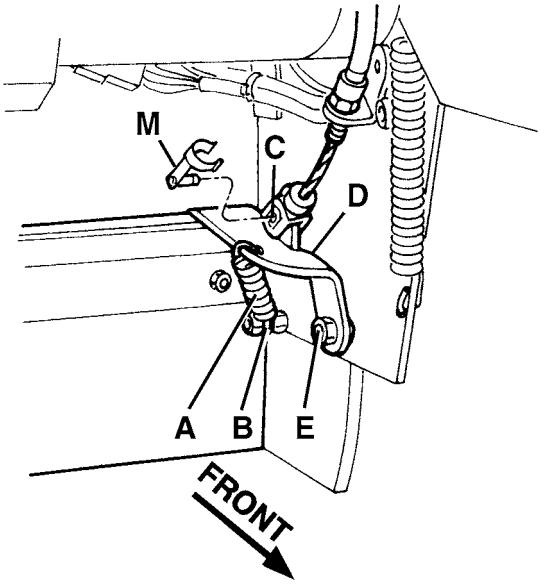
S300547

FRONT SKIRT REPLACEMENT

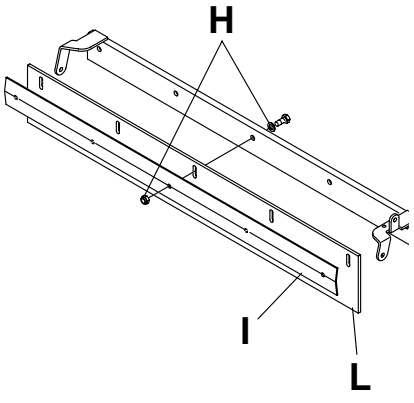
1. Drive the machine on a level ground that is suitable for checking the skirt height.
2. Engage the parking brake with the pedal and the lever (26 and 19).
3. Turn the ignition switch (18) to “0” position.
4. Remove the left side broom (38) (if present) (see the procedure in the related paragraph)
5. Operating on the left front side of the front skirt, disengage the spring (A) from the side (B).
6. Disconnect the clip (M) and detach the cable end (C) from the support (D).
7. Loosen the nut (E).
8. Operating on the right front side of the front skirt, remove the nut (F) and then remove the skirt from its support (G).
9. At the workbench, remove the screws (H), the strap (I) and the front skirt (L).
   Assemble the new front flap (L) with the strap (I) and the nuts (H).
10. Carry out steps from 5 to 8 in the reverse order.
11. Adjust the height and check the operation of the front skirt, as described on the previous pages.
12. Carry out steps from 1 to 4 in the reverse order.



S300109



S300548

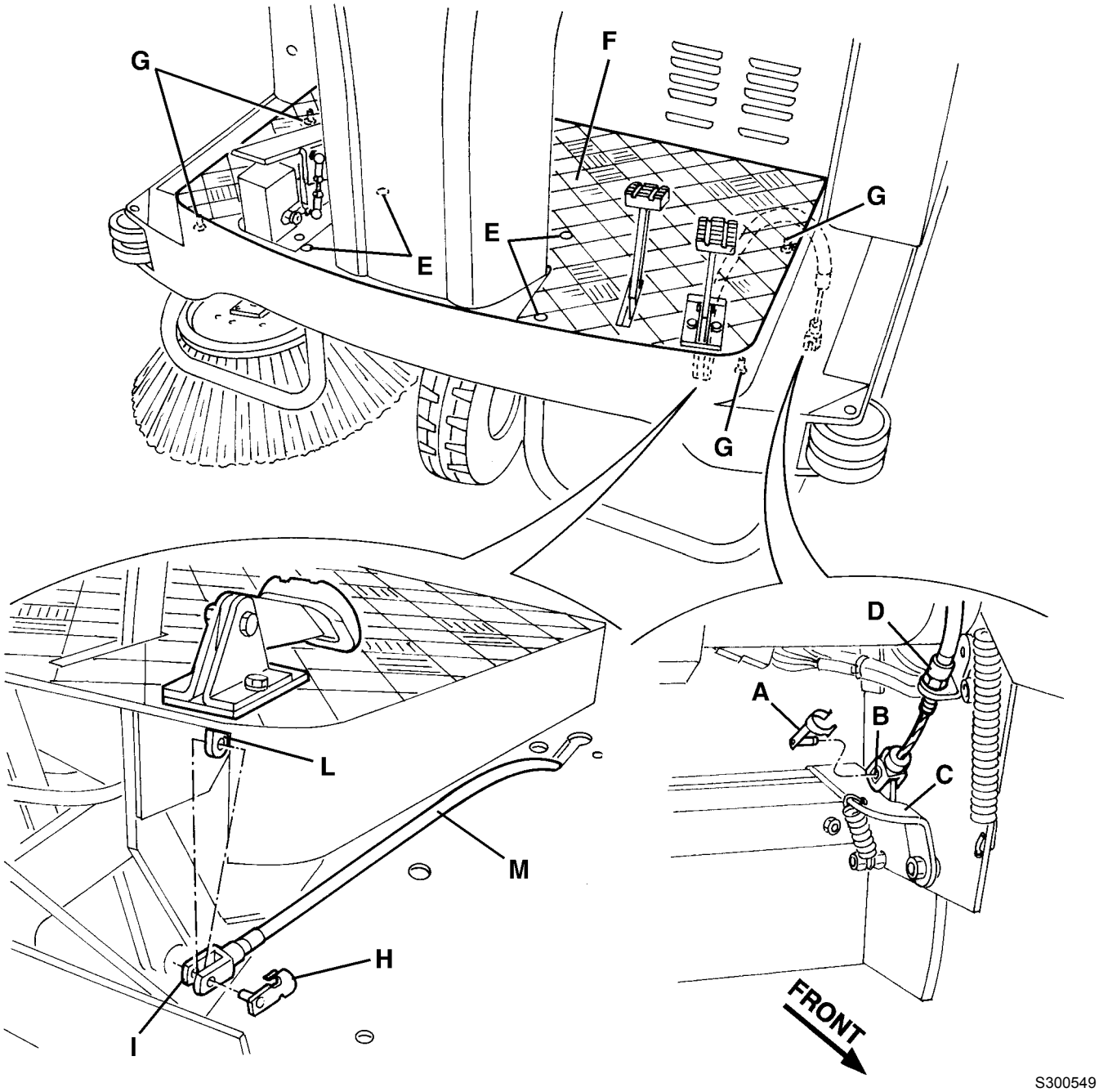


S300111

SKIRT

FRONT SKIRT CONTROL CABLE REPLACEMENT

1. Drive the machine on a level ground that is suitable for checking the skirt height.
2. Engage the parking brake with the pedal and the lever (26 and 19).
3. Turn the ignition switch (18) to “0” position.
4. Remove the left side broom (38) (if present) (see the procedure in the related paragraph).
5. Operating on the left front side of the front skirt, disconnect the clip (A) and detach the cable end (B) from the support (C).
6. Loosen the register (D) and remove it from the support.
7. Remove the upper mounting screws (E) of the footboard (F).
8. Remove the lower mounting screws (G) of the footboard (F).
9. Slightly lift the footboard (F), then disconnect the clip (H) and remove the cable end (I) from the lever (L).
10. Remove the front skirt control cable (M).
11. Carry out steps from 5 to 10 in the reverse order.
12. Adjust the height and check the operation of the front skirt, proceeding as follows:
    - Press the front skirt lifting pedal (25) completely and check that the front skirt lifts 1,97 in (5 cm) approximately.
    - Release the pedal and check that the skirt returns to the initial position and does not stop in an intermediate position. If necessary, adjust the skirt lifting cable with the register (D).
13. Carry out steps from 1 to 4 in the reverse order.



S300549

DUST AND DEBRIS COLLECTION SYSTEM

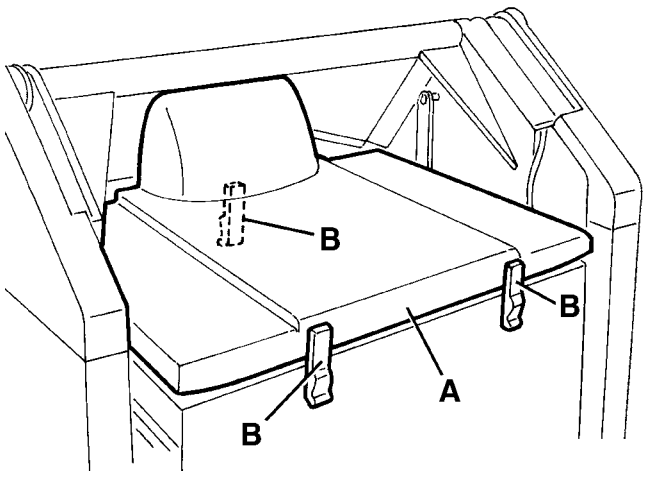
FRAME DUST FILTER CLEANING AND INTEGRITY CHECK

NOTE
Besides the standard paper filter, polyester filters are also available. The following procedure is applicable to each type of filter.

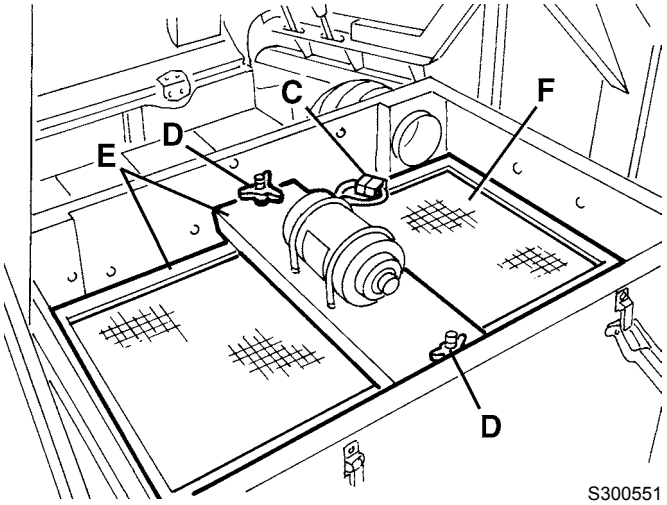
1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. Open the hood (48) and secure it with the support rod (67).
4. Disconnect the battery connector (51); leave the hood open.
5. Release the fasteners (B) and remove the dust filter cover (A).
6. Disconnect the electrical connector (C) from the filter shaker.
7. Remove the filter shaker support frame fastening handwheels (D).
8. Remove the filter shaker support frame (E).
9. Remove the dust filter (F).
10. In an outdoor area, clean the filter by shaking it on a level and clean surface, tapping the side (G), opposite to the wire gauze (H). Complete the cleaning by means of compressed air (I) of max. 86 psi (6 bars), blowing only from the side protected by the wire gauze (H), at a minimum distance of 11.8 in (30 cm).
    According to the filter type, observe the following cautions:
    - Paper filter (standard): do not use water or detergents to clean it; the filter can be damaged;
    - Polyester filter (optional): To clean it, see the above-mentioned instructions. If necessary, for a better cleaning, it is allowed to wash the filter with water and non-lathering detergents. This provides better quality cleaning but reduces the life of the filter, which will have to be replaced more frequently. The use of unsuitable detergents can damage the filter.

    Check the filter body for tears.
11. Clean the filter compartment rubber seal (L) along its perimeter and check it for integrity. If necessary, replace it.
12. Assemble the components in the reverse order of disassembly.

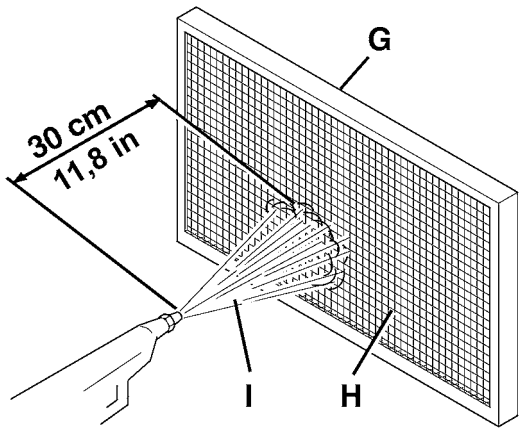
NOTE
When reinstalling the filter, the wire gauze (H) must be facing upward.



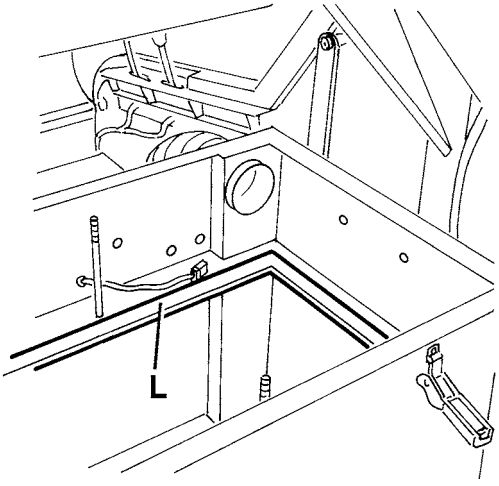
S300550



S300551



S300552



S300553

DUST AND DEBRIS COLLECTION SYSTEM

CLOSED POCKET FILTER CLEANING AND INTEGRITY CHECK

NOTE
The polyester closed pocket filters are normally kept clean by activating the electric filter shaker supplied with the machine.
If necessary, they can be cleaned using the procedure indicated below.
When the filtration surfaces are no longer suitable, the filter must be replaced.

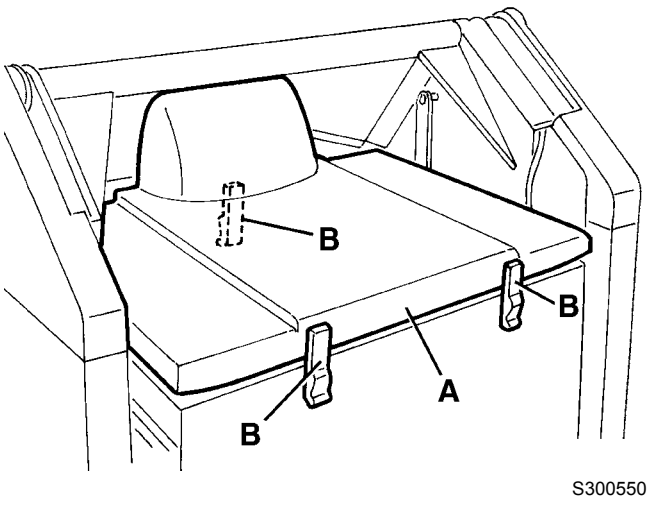
1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. Open the hood (48) and secure it with the support rod (67).
4. Disconnect the battery connector (51); leave the hood open.
5. Release the fasteners (B) and remove the dust filter cover (A).
6. Remove the handwheels (C) and the brackets (D).
7. Disconnect the filter shaker connector (F) and remove the dust filter (E).
8. Working in a suitable outside area, and wearing suitable equipment (gloves, mask, glasses), remove the polyester filtering surface, as indicated by the following steps.
9. Remove the filter shaker motor (G) by removing the two relevant mounting screws.
10. Fully open the filter shaker motor support unit (H), thus releasing the filtering pocket tension rods (I).
11. Remove all the filtering pocket tension rods (J).
12. Open the upper retaining cord (K) of the closed pocket filter to remove it from the upper frame (L).
13. Remove the internal pocket separator (M).
14. Clean the polyester surface (N) (from the dirty side, by using an external vacuum cleaner), by spreading it out completely or cleaning pocket by pocket. At the same time, clean both the surfaces of the pocket separator (M) removing anything deposited on them. Check the filtering surface for tears. In case of tears, replace it. It is also possible to use compressed air (max. 6 bar) by directing the air jet from the clean side to the dirty one.

CAUTION!
Do not wash the filter with water. The polyester fibre may shrink and not be usable anymore.

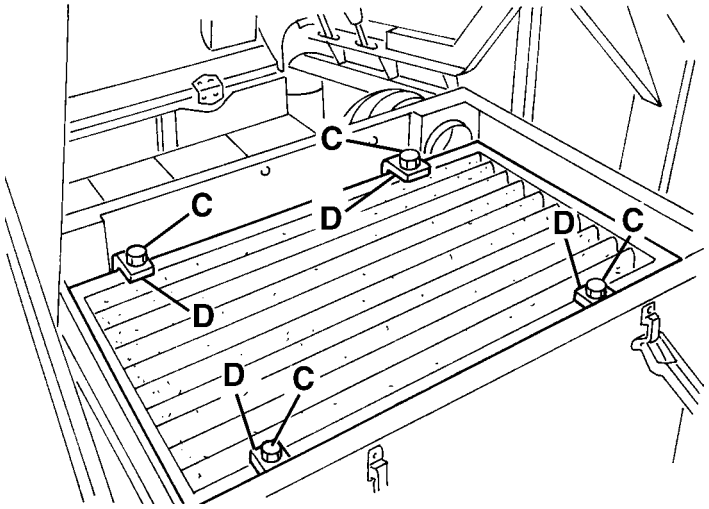
15. Assemble the components in the reverse order of disassembly.
16. If necessary, clean the filter compartment rubber seal (O) along its perimeter and check it for integrity. If necessary, replace it.
17. Assemble the components in the reverse order of disassembly.

DUST AND DEBRIS COLLECTION SYSTEM

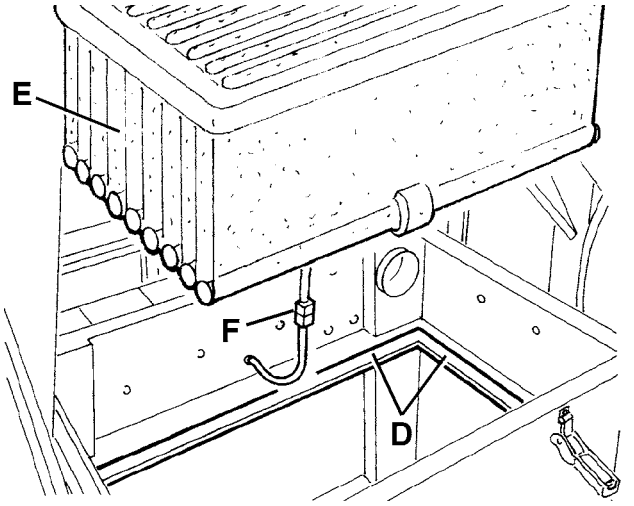
CLOSED POCKET FILTER CLEANING AND INTEGRITY CHECK (continues)



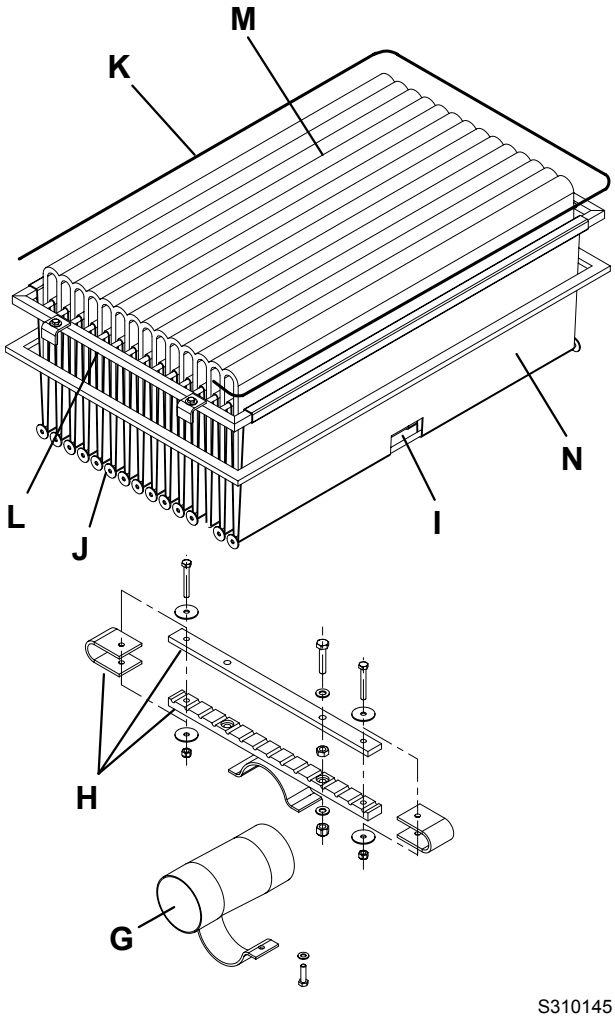
S300550



S310186



S310187

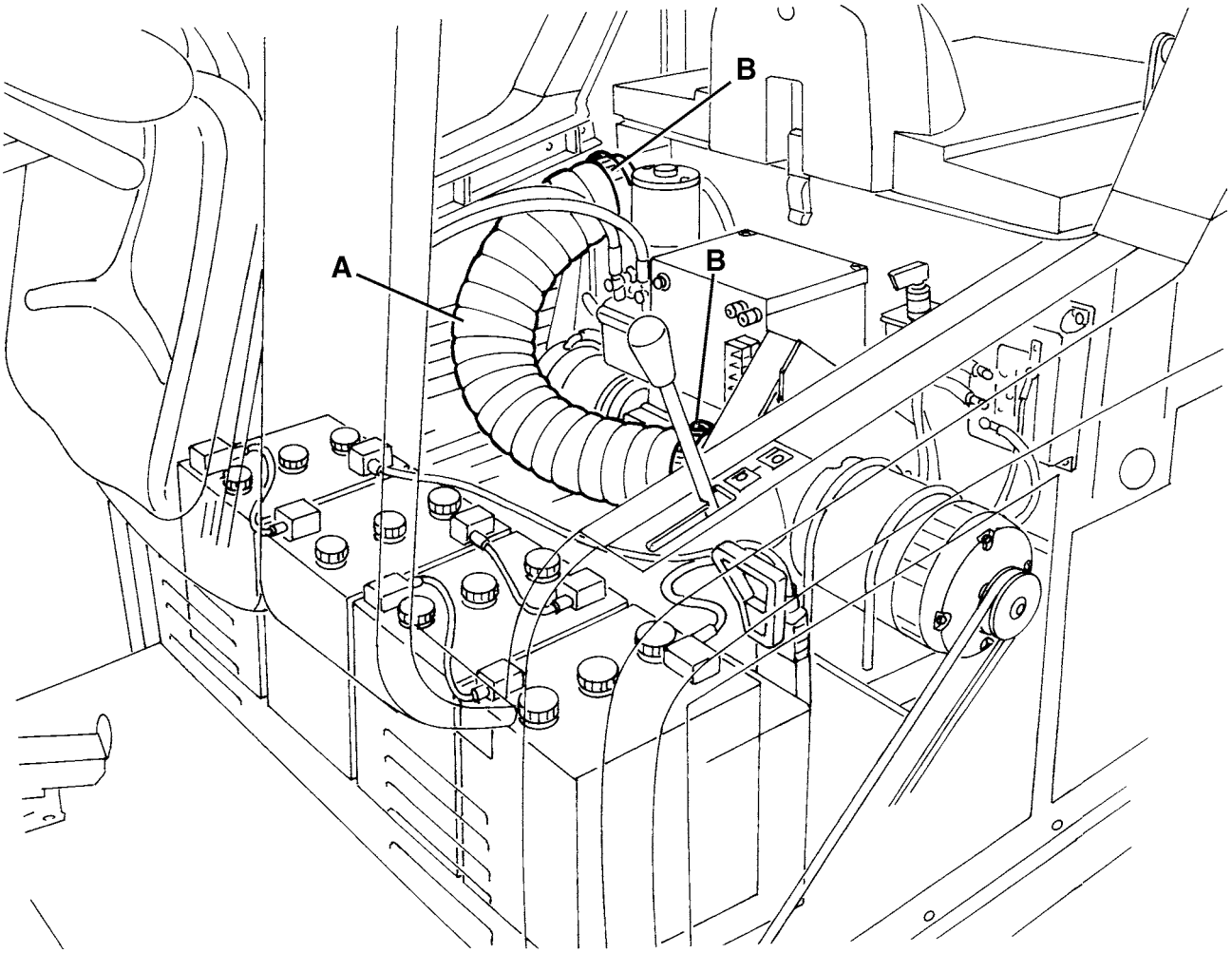


S310145

DUST AND DEBRIS COLLECTION SYSTEM

VACUUM HOSE INTEGRITY CHECK AND REPLACEMENT

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. Open the hood (48) and secure it with the support rod (67).
4. Check the hose (A) for cracks or tears, then check that the fixing clamps (B) are tightened.
5. If necessary, release the clamps (B) and replace the hose (A).
6. Disengage the support rod (67) and close the hood (48).



S300557

DUST AND DEBRIS COLLECTION SYSTEM

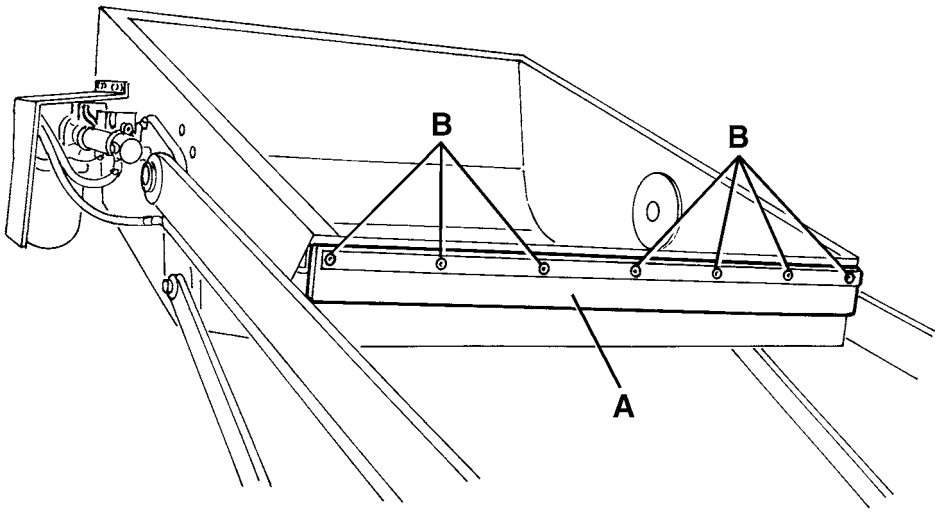
WASTE CONTAINER GASKET INTEGRITY CHECK AND REPLACEMENT

NOTE
A poor integrity of the waste container gaskets can affect the machine vacuuming capabilities.

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Lift the waste container (31) completely (see the User Manual).
3. Turn the ignition switch (18) to “0” position.
4. Apply a proper safety stand under the lifted waste container to prevent it from lowering incidentally.

WARNING!
Apply a proper safety stand under the lifted waste container even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks.

5. Check the waste container gasket (A) for cracks or tears which can reduce its sealing efficiency.
6. If necessary, remove the screws (B) and replace the gasket (A).
7. Check on the machine structure the gaskets (C), (D) and (E) for cracks or tears which can reduce their sealing efficiency.
8. If necessary, release the fasteners and replace the gaskets.
9. Carry out steps from 1 to 4 in the reverse order.



S300558

DUST AND DEBRIS COLLECTION SYSTEM

WASTE CONTAINER HORIZONTAL POSITION CONTROL MICROSWITCH ADJUSTMENT CHECK

CHECK

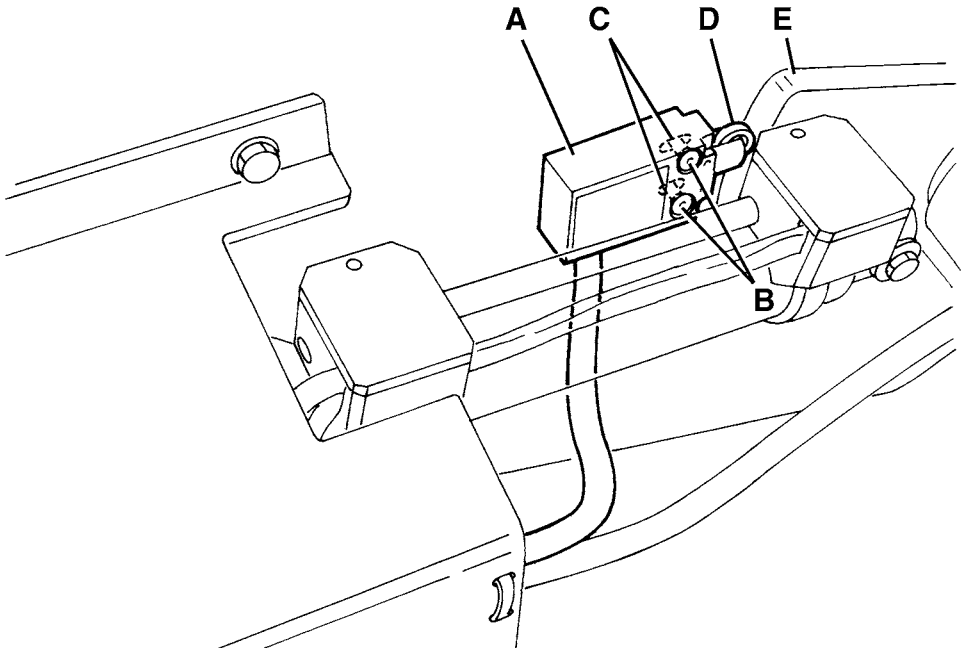
1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Lift the waste container (31) (see the User Manual) until the related side microswitch (A) is accessible.
3. Turn partially the waste container (31) (see the User Manual), then lower it and check that this operation is inhibited, otherwise it is necessary to adjust the microswitch (A) by proceeding as follows.

ADJUSTMENT

4. Turn the waste container (31) completely in horizontal position (see the User Manual).
5. Turn the ignition switch (18) to “0” position.
6. Apply a proper safety stand under the lifted waste container to prevent it from lowering incidentally.

WARNING!
Apply a proper safety stand under the lifted waste container even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks.

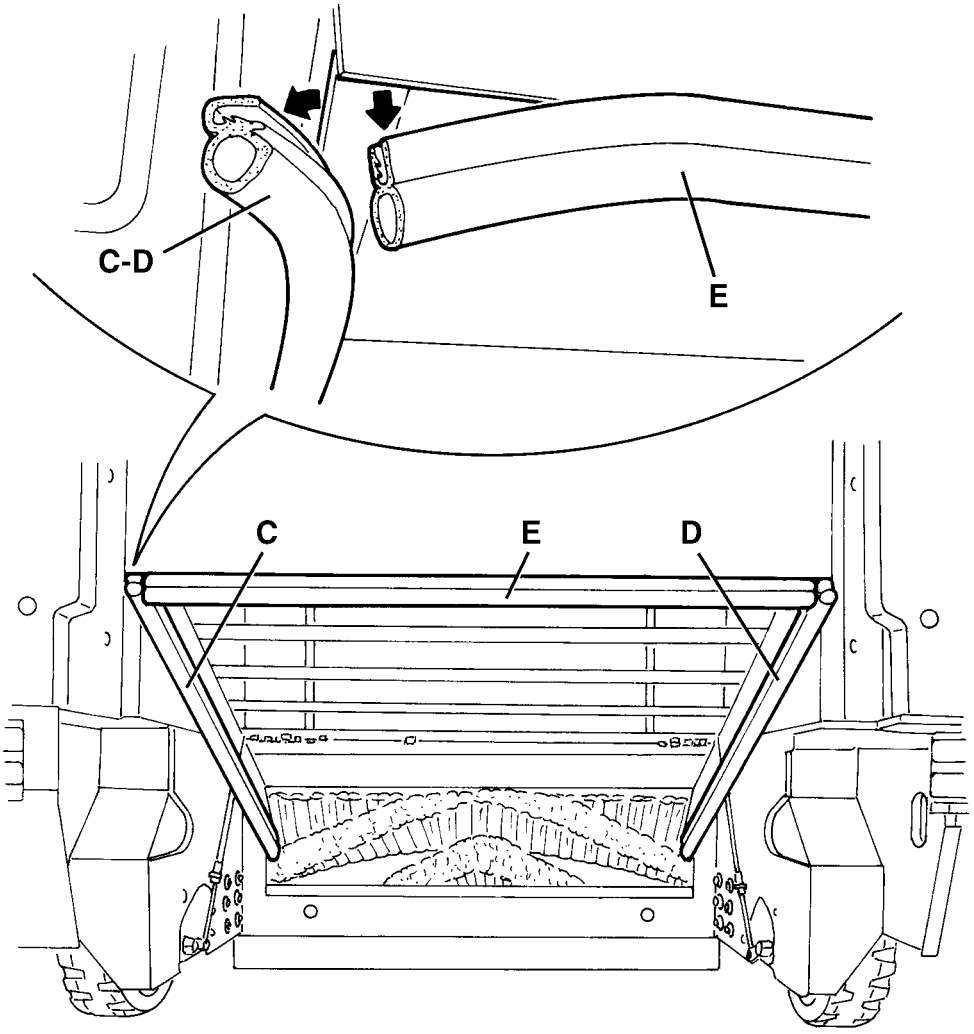
7. Loosen the mounting screws (B) of the microswitch (A).
8. Using the slots (C), turn the microswitch (A) in the position in which is activated by the related terminal (D) in contact with the cam (E) (determine the activation point by moving forward and backward the microswitch so that a “click” sound is heard), then tighten the screws (B).
9. Carry out steps 5 and 6 in the reverse order.
10. Check the microswitch operation by carrying out step 3 again.
11. Place the waste container (31) in its seat (see the User Manual), then turn the ignition switch (18) to “0” position.



S300560

DUST AND DEBRIS COLLECTION SYSTEM

WASTE CONTAINER HORIZONTAL POSITION CONTROL MICROSWITCH ADJUSTMENT CHECK (continues)



S300559

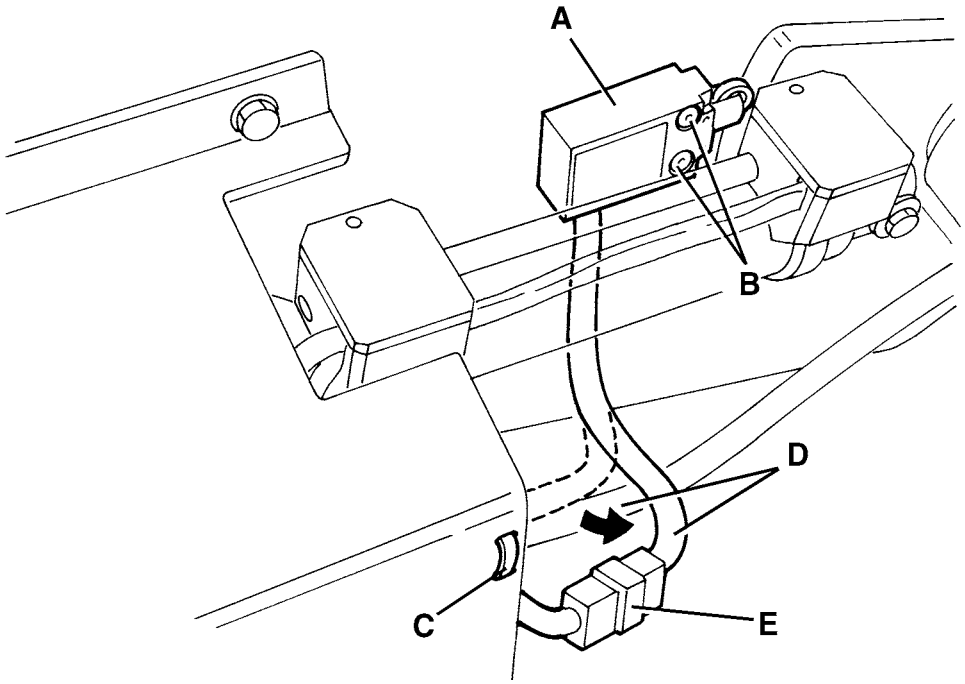
DUST AND DEBRIS COLLECTION SYSTEM

WASTE CONTAINER HORIZONTAL POSITION CONTROL MICROSWITCH REPLACEMENT

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Lift the waste container (31) (see the User Manual) until the related side microswitch (A) is accessible.
3. Turn the ignition switch (18) to “0” position.
4. Apply a proper safety stand under the lifted waste container to prevent it from lowering incidentally.

WARNING!
Apply a proper safety stand under the lifted waste container even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks.

5. Remove the screws (B) and move the microswitch (A).
6. Cut the cable clamp (C) and pull out the wiring harness (D).
7. Disconnect the electrical connector (E).
8. Recover the microswitch (A) with bridle.
9. Assemble the components in the reverse order of disassembly.
10. Adjust the waste container horizontal position control microswitch by proceeding as indicated in the previous paragraph.



S300561

DUST AND DEBRIS COLLECTION SYSTEM

WASTE CONTAINER LIFTED POSITION CONTROL MICROSWITCH ADJUSTMENT CHECK

CHECK

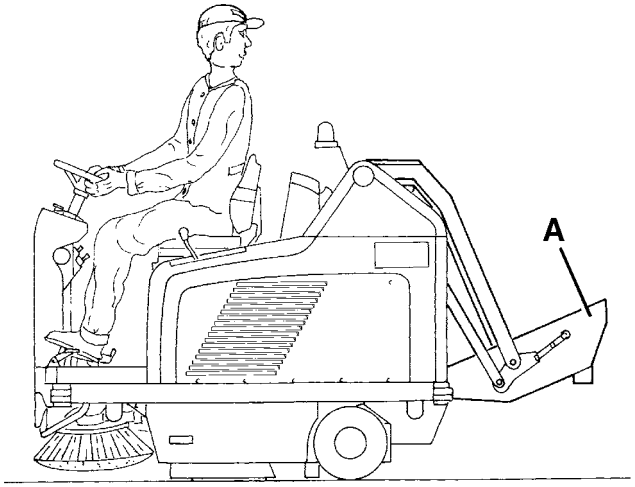
1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Lift the waste container (31) (see the User Manual) until it reaches the position (A). In this position try to overturn the waste container and confirm that it is impossible to perform this operation.
3. Lift the waste container (31) (see the User Manual) until it reaches the position (B). In this position try to overturn the waste container and confirm that it is possible to perform this operation.

ADJUSTMENT

4. In case it is impossible to obtain one or both the conditions indicated in the two previous steps, adjust the position of the related microswitch by proceeding as follows.
5. Check that the waste container (31) is in position (B); then turn the ignition switch (18) to “0” position.
6. Apply a proper safety stand under the lifted waste container to prevent it from lowering incidentally.

WARNING!
Apply a proper safety stand under the lifted waste container even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks.

7. Remove the screws (C) and the right guard (D).
8. Loosen the nuts (E) with the mounting screws (F) of the waste container lifted position control microswitch (G).
9. Using the slots (H), turn the microswitch (G) in the position in which is activated by the related terminal (I) (determine the activation point by moving forward and backward the microswitch so that a “click” sound is heard); check also that the terminal (I) is just inside the arc (L) of the activation cam (M) (as shown in the figure); then tighten the nuts (E) with screws (F).
10. Assemble the components in the reverse order of disassembly.
11. Check the microswitch operation by carrying out step 2 - 4 again.



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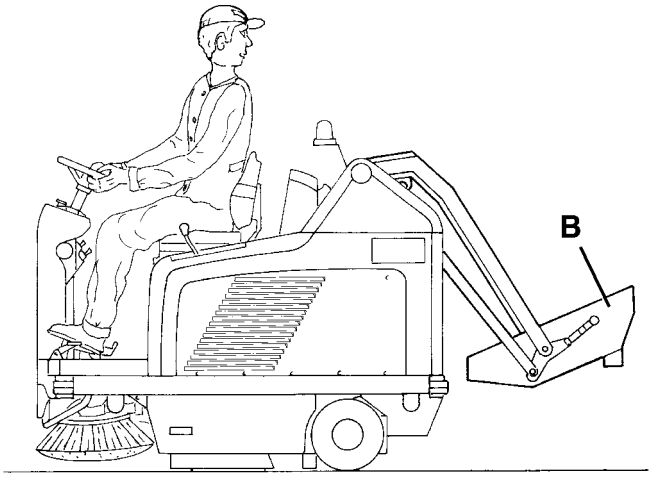
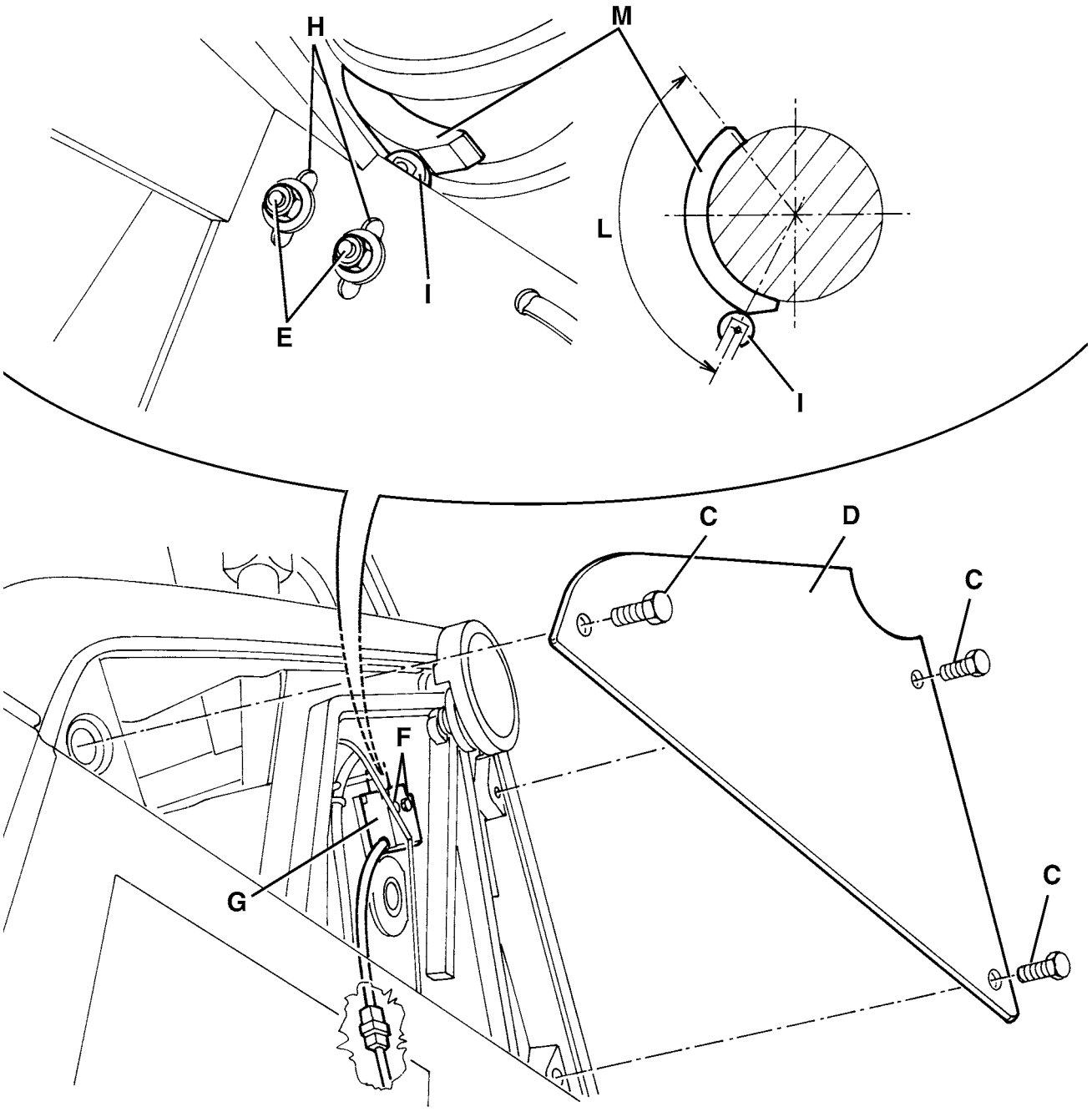


S300563

DUST AND DEBRIS COLLECTION SYSTEM

WASTE CONTAINER LIFTED POSITION CONTROL MICROSWITCH ADJUSTMENT CHECK (continues)



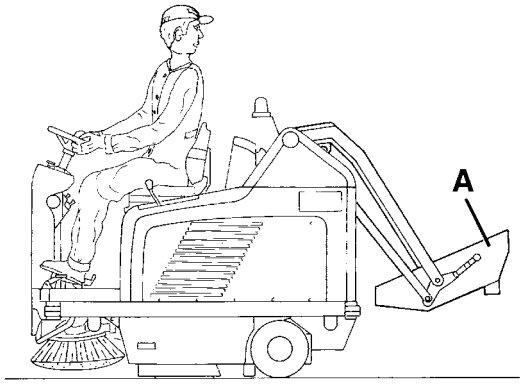
DUST AND DEBRIS COLLECTION SYSTEM

WASTE CONTAINER LIFTED POSITION CONTROL MICROSWITCH REPLACEMENT

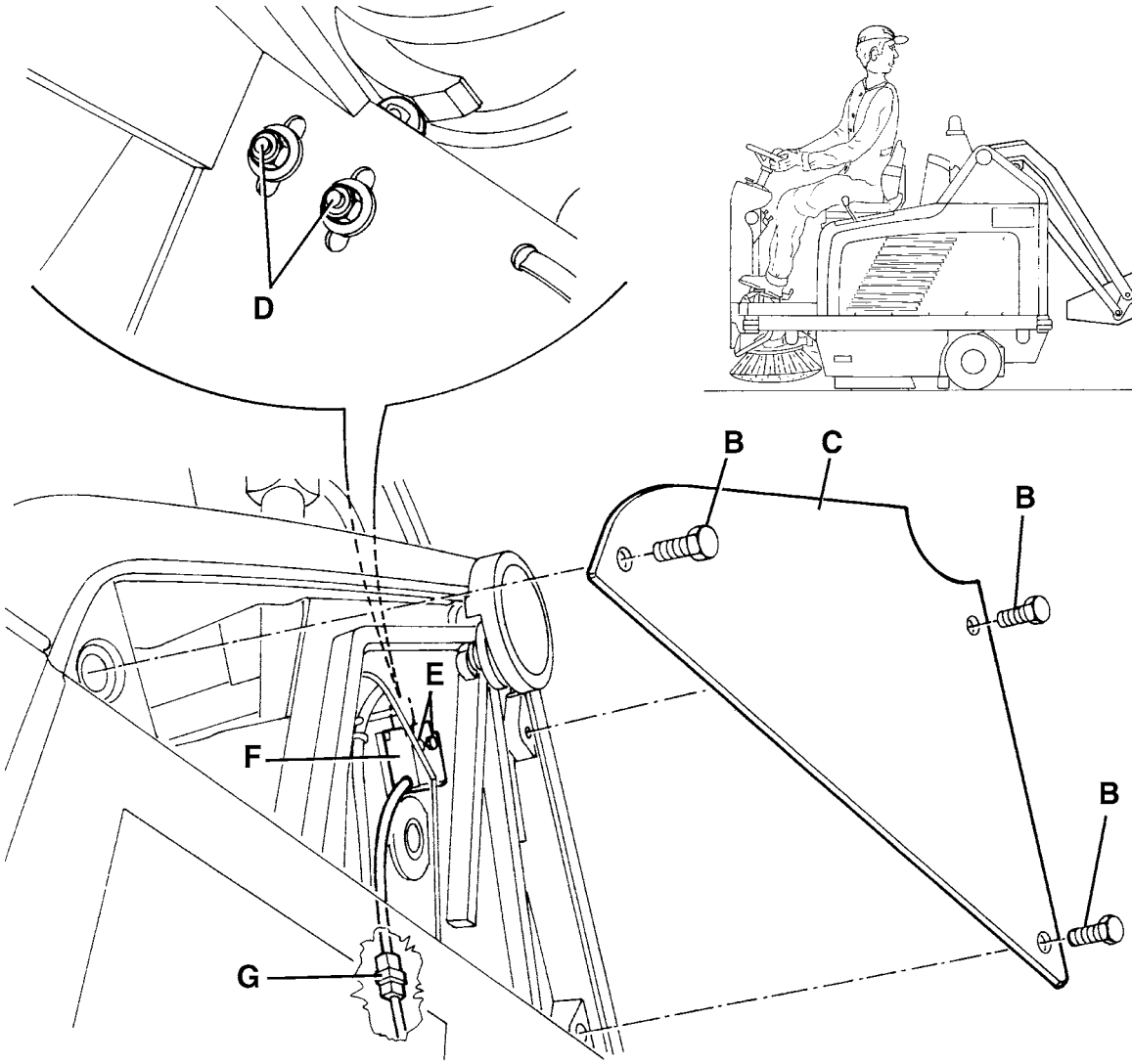
1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Lift the waste container (31) (see the User Manual) until it reaches the position (A); then turn the ignition switch (18) to “0” position.
3. Apply a proper safety stand under the lifted waste container to prevent it from lowering incidentally.

WARNING!
Apply a proper safety stand under the lifted waste container even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks.

4. Remove the screws (B), then remove the right guard (C).
5. Loosen the nuts (D) with the screws (E) and remove the waste container lifted position control microswitch (F).
6. Disconnect the electrical connector (G) and recover the microswitch (F).
7. Assemble the new microswitch by carrying out steps 5 and 6 in the reverse order.
8. Adjust the microswitch as indicated in the previous paragraph.
9. Carry out steps from 1 to 4 in the reverse order.



S300565



S300566

DUST AND DEBRIS COLLECTION SYSTEM

WASTE CONTAINER ROTATION ACTUATOR CHECK AND ADJUSTMENT

CHECK

1. Remove the main broom (see the procedure in the related paragraph).
2. Start to lift the waste container (31) by moving it of few centimetres from the closed position (for the related instructions, see the User Manual); then turn the waste container (31) toward the closed position, stopping it when its upper rear side (A) is at a distance (B) of approximately 0,79 in (2 cm) from the machine structure.
3. Turn the ignition switch (18) to “0” position.

WARNING!
The waste container (31) can close accidentally.

4. Once obtained the distance (B), check (through the opening created by the main broom) that the similar front distances (E) of the waste container from the machine structure are bigger than the distance (B) of approximately 0,39-0,79 in (1-2 cm). If the measures are not as indicated in step 4, adjust the waste container rotation actuator (F), by proceeding as follows.

ADJUSTMENT

5. Lift the waste container (31) so that the waste container rotation actuator (F) is high enough to allow adjustment. (For instructions related to the waste container handling, see the User Manual).
   Do not rotate the waste container, keep it in the horizontal position.
6. Apply a proper safety stand under the lifted waste container to prevent it from lowering incidentally.

WARNING!
Apply a proper safety stand under the lifted waste container even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks.

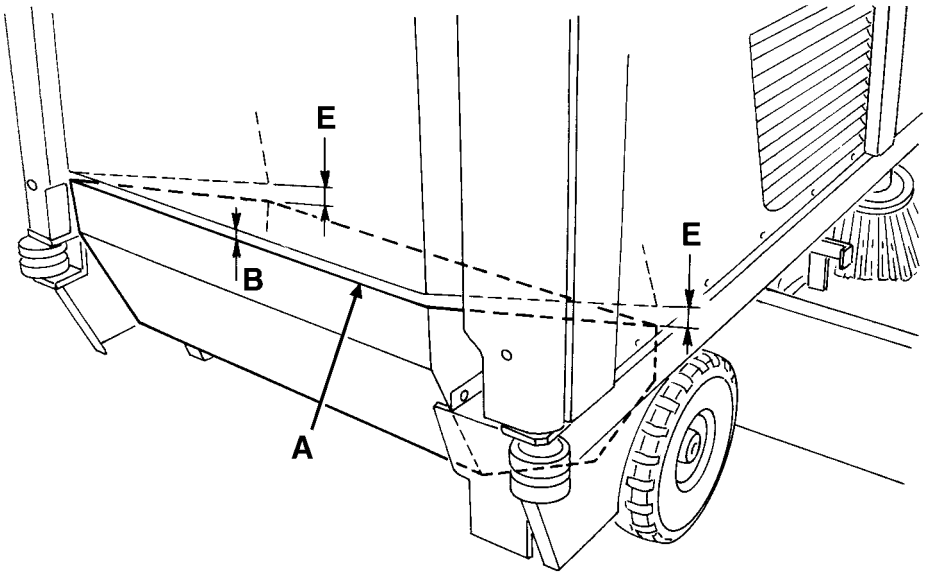
7. Remove the nuts (H) and insert the threaded pins (I) of the limit switch for approximately 0,2 in (5 mm).
8. Remove the microswitch protection covers (L) by releasing the related inner fasteners.

NOTE
To adjust the waste container rotation actuator, take into consideration that:
- ***The microswitch (M) indicates the waste container horizontal position;***
- ***The microswitch (N) indicates the waste container maximum vertical position;***
- ***When the waste container is in the horizontal position, the tilted head of the stem (P) is in the position (O) as to microswitch (M);***
- ***When the waste container is in the maximum vertical position, the tilted head of the stem (P) is in the position (Q) as to microswitch (M);***

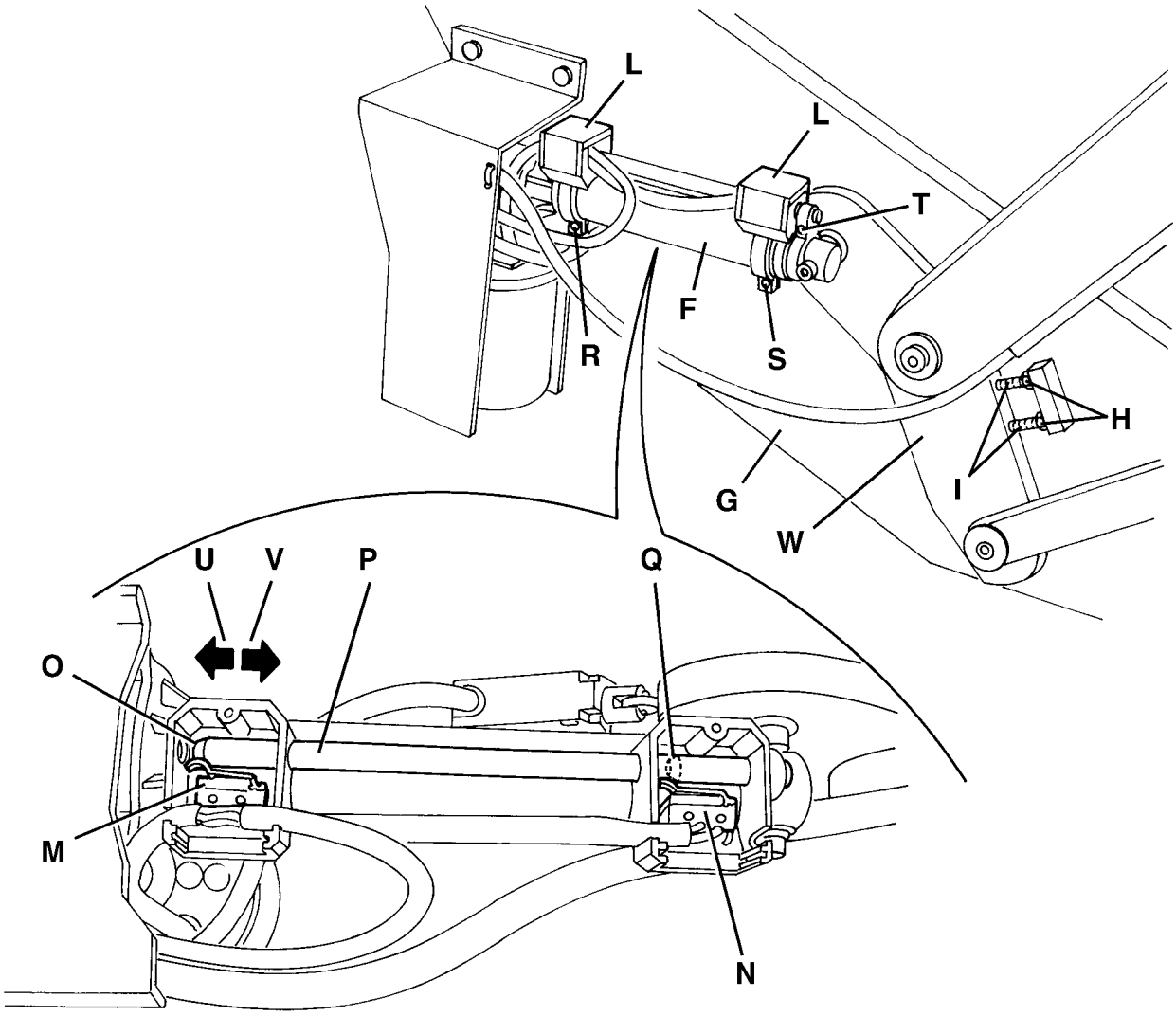
9. Check the mounting screws (S) and (T) of the microswitch collars (N) and stem collars (P) for proper tightening, otherwise tighten them.
10. Loosen the screw (R) and adjust the position of the collar/microswitch assembly (M), as indicated below:
    - If the distance (E) should be increased, move slightly the collar/microswitch assembly (M) in the direction of the arrow (U), then tighten the screw (R)
    - If the distance (E) should be decreased, move slightly the collar/microswitch assembly (M) in the direction of the arrow (V), then tighten the screw (R).
11. Perform again the above check (see steps 1 through 4).
12. Remove the threaded pins (I) until they reach the lever (W); then tighten the nuts (H).
13. Place the waste container (31) in its seat.
14. Reinstall the main broom (see the procedure in the related paragraph).

DUST AND DEBRIS COLLECTION SYSTEM

WASTE CONTAINER ROTATION ACTUATOR CHECK AND ADJUSTMENT (continues)



S300567



S300568

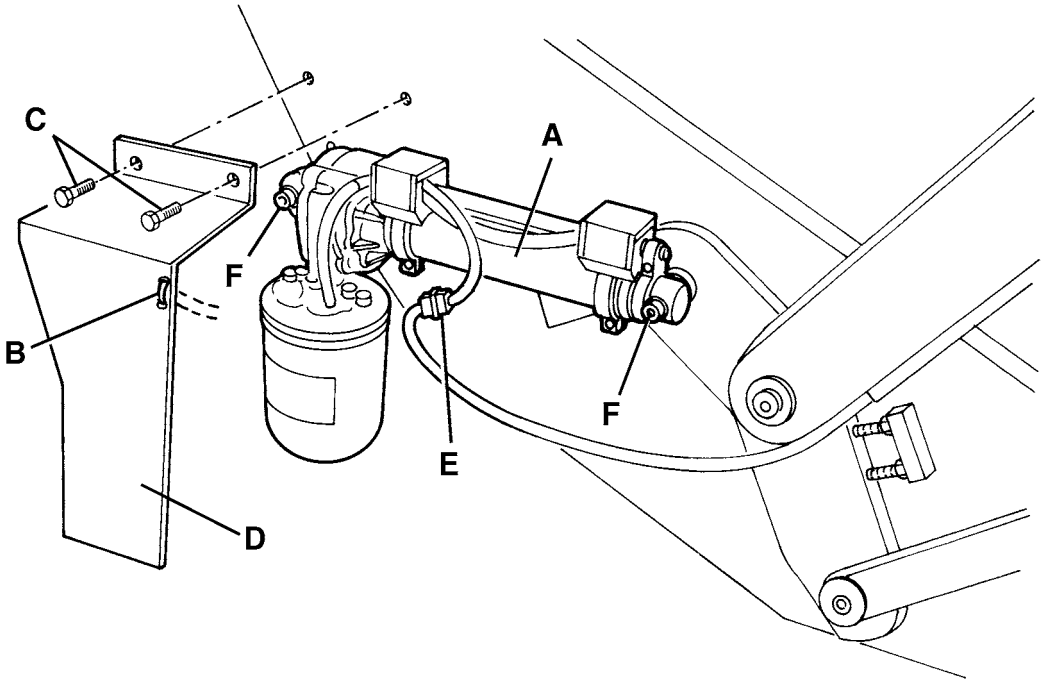
DUST AND DEBRIS COLLECTION SYSTEM

WASTE CONTAINER ROTATION ACTUATOR REPLACEMENT

1. Lift the waste container (31) in order that the waste container rotation actuator (A) is high enough to allow adjustment. (For instructions related to the waste container handling, see the User Manual).
2. Apply a proper safety stand under the lifted waste container to prevent it from lowering incidentally.

WARNING!
Apply a proper safety stand under the lifted waste container even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks.

3. Cut the wiring harness retaining clamp (B).
4. Remove the screws (C), then remove the cover (D).
5. Disconnect the actuator electrical connection (E).
6. Remove the screws (F) and the actuator (A).
7. To assemble, carry out steps from 2 to 6 in the reverse order.
8. Adjust the waste container rotation actuator (see the procedure in the related paragraph).



S300569

DUST AND DEBRIS COLLECTION SYSTEM

WASTE CONTAINER MECHANICAL STABILIZER CHECK AND ADJUSTMENT

CHECK

1. Lift the waste container (31) in order that the waste container mechanical stabilizer (A) is high enough to allow adjustment. (For instructions related to the waste container handling, see the User Manual).

WARNING!
The waste container (31) can close accidentally.

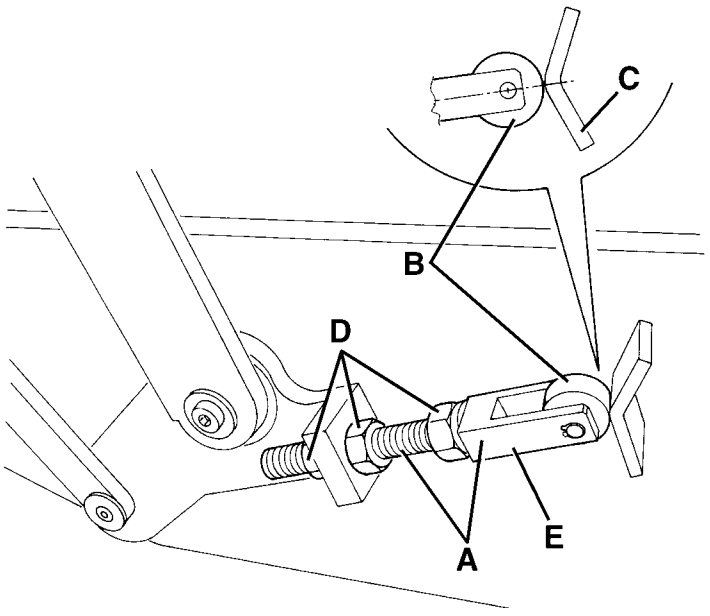
2. The waste container mechanical stabilizer (A) is properly adjusted when, during the waste container rotation, the wheel (B) comes slightly in contact with the top of the cam (C) (as shown in the figure).
3. Rotate the waste container and, with the help of an assistant, check that the waste container is in the condition described in the previous step.
   Otherwise, adjust the mechanical stabilizer (A) by proceeding as follows.

ADJUSTMENT

4. Loosen the nuts (D).
5. Rotate carefully the waste container until the wheel (B) is aligned with the top of the cam (C) (as shown in the figure).
6. Apply a proper safety stand under the lifted waste container to prevent it from lowering incidentally.

WARNING!
Apply a proper safety stand under the lifted waste container even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks.

7. Screw/unscrew the stabilizer (A) until the condition described in step 2 is reached.
8. Tighten the nuts (D) by holding the fork (E) in vertical position, as shown in the figure.
9. Carry out steps 5 and 6 in the reverse order.
10. Rotate and lower the waste container (31) until it is completely retracted (for the instructions related to the waste container handling, see the User Manual).



S300570

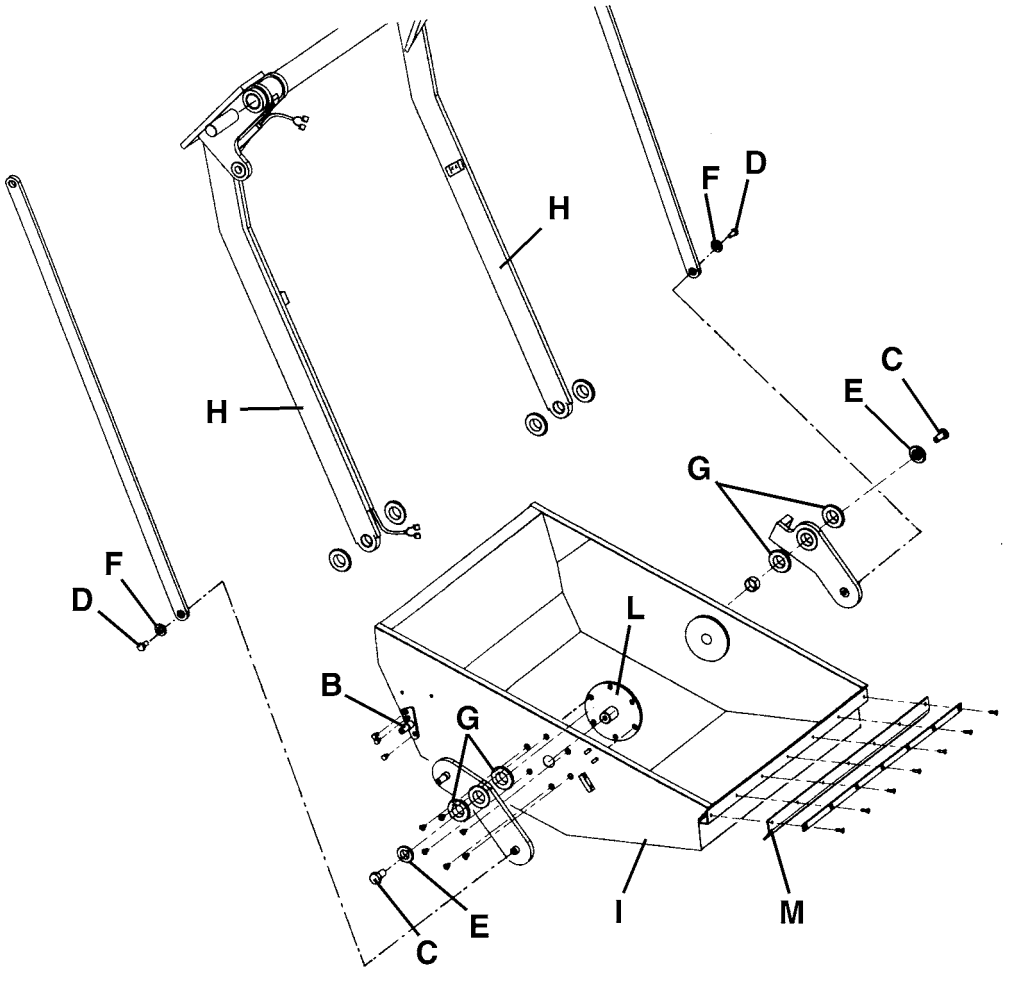
DUST AND DEBRIS COLLECTION SYSTEM

WASTE CONTAINER REMOVAL

1. Lift the waste container (31) in order that it is high enough to allow operation on its fasteners. (For instructions related to the waste container handling, see the User Manual).

WARNING!
The waste container (31) can close accidentally.

2. Place a stand under the waste container to support it when detached.
   Lower the waste container (31) until it is completely seated on the stand.
3. Remove the waste container rotation actuator (see the procedure in the related paragraph).
4. Remove the waste container horizontal position control microswitch (see the procedure in the related paragraph).
5. From both waste container sides, remove the screws (C) and (D), then recover the washers (E) and (F) and the spacers (G).
6. Slightly extend the arms (H) and remove carefully the waste container (I).
7. If necessary, remove the actuator fastening pin (B), the waste container pin (L) and the gasket (M).
8. To assemble, carry out steps from 1 to 7 in the reverse order.
9. Adjust the waste container rotation actuator (see the procedure in the related paragraph).
10. Adjust the waste container mechanical stabilizer (see the procedure in the related paragraph).

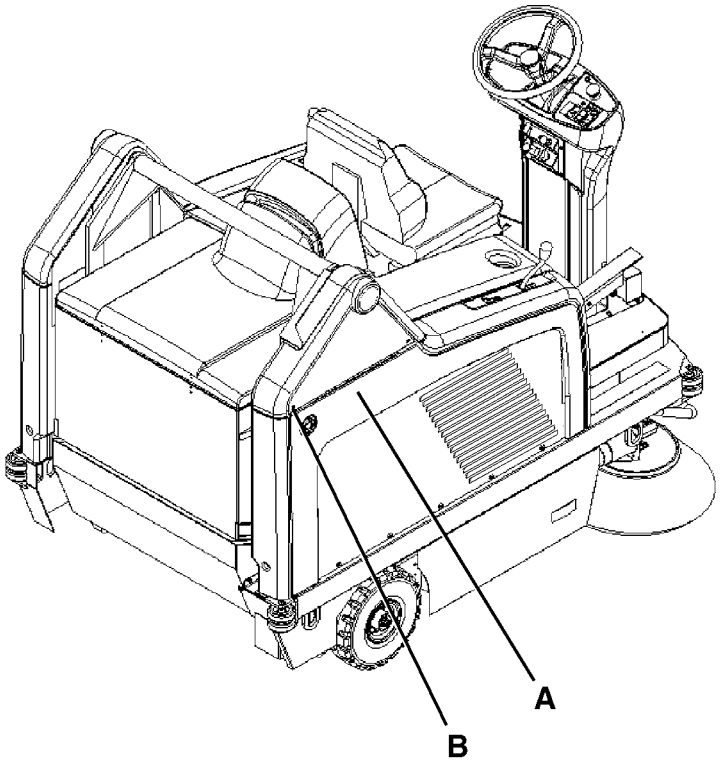


L310004

DUST AND DEBRIS COLLECTION SYSTEM

WASTE CONTAINER LIFTING LEVER ASSEMBLY REMOVAL

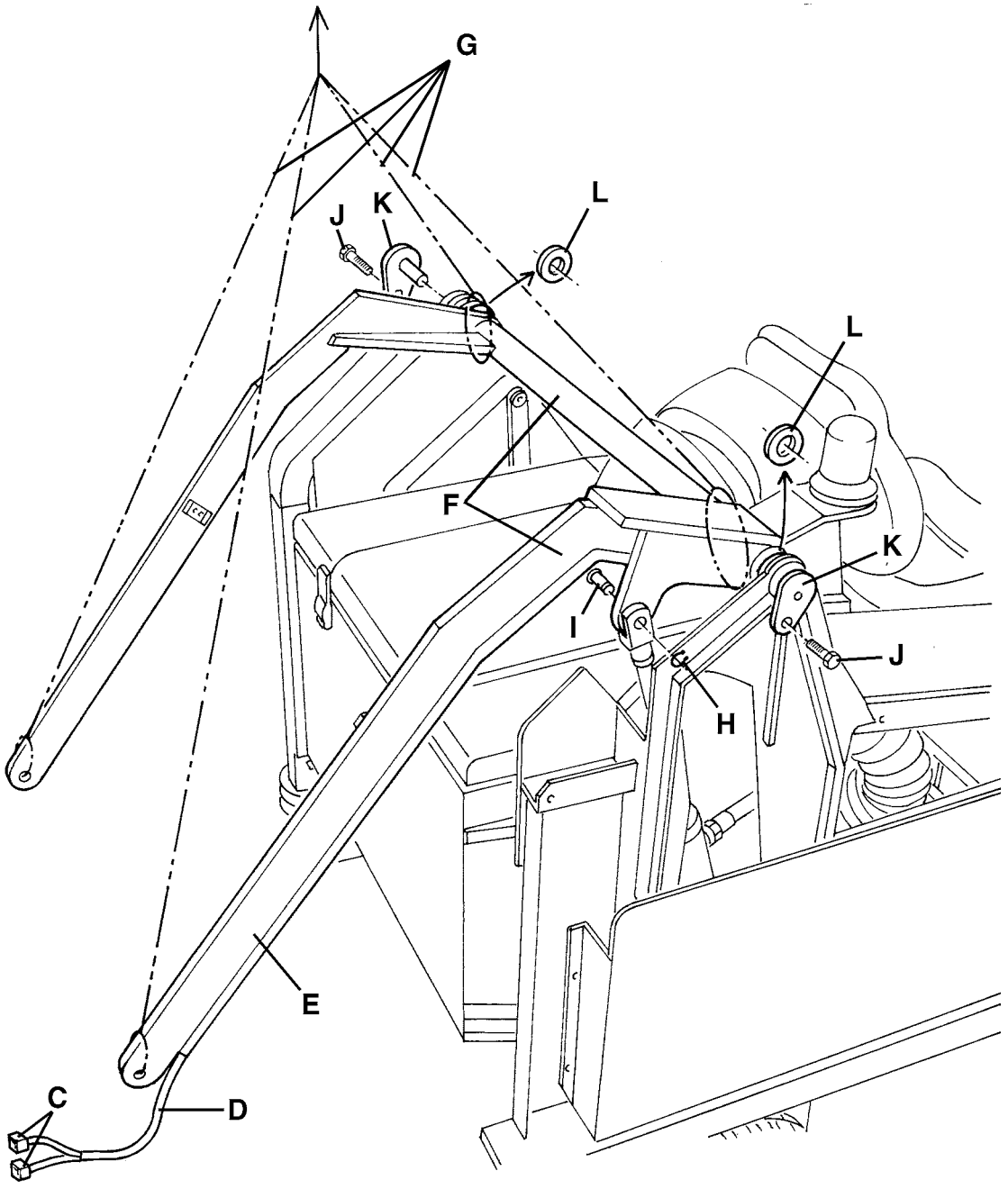
1. Remove the waste container (see the procedure in the related paragraph).
2. On both sides of the machine, remove the screws (B), then remove the body sides (A).
3. Disconnect the connectors (C) from the related electrical cables (D).
4. Pull out the electrical cables (D) from the duct (E).
5. Secure the waste container lifting lever assembly (F) with a proper sling (G).
   Using a proper hoisting system slightly put the sling (G) under tension in order to support the waste container lifting lever assembly (F).
6. Disengage the snap ring (H) and pull out the cylinder fastening pin (I).
7. On both sides of the machines, remove the screws (J) and the pins (K). Recover the shims (L).
8. Using the sling (G), remove carefully the waste container lifting lever assembly (F).
9. To assemble, carry out steps from 1 to 8 in the reverse order.



S300572

DUST AND DEBRIS COLLECTION SYSTEM

WASTE CONTAINER LIFTING LEVER ASSEMBLY REMOVAL (continues)



L310005

DUST AND DEBRIS COLLECTION SYSTEM

TROUBLESHOOTING

OPEN CIRCUIT

The thermal fuse (52) and the lamellar fuse in the box (55) determine the open circuit. This system allows to prevent the motor circuits from being damaged under overload conditions.
If there is an open in the electrical circuit, the possible causes are the following.

MAIN BROOM AND VACUUM FAN MOTOR: THE THERMAL FUSE (52) ACTIVATES AND OPENS THE ELECTRICAL CIRCUIT

Possible causes:
1. Vacuum fan lock (repair).
2. Bulky debris or cords around the broom or between the broom and its flange (remove the broom and the debris or cords).
3. The broom is too much pressed on the floor (check the broom height).
4. The broom motor electrical input is too high (check the electrical input).
   Wait at least 2 minutes after the open circuit occurs and, when the problem is solved, push the thermal fuse button (52).

FILTER SHAKER MOTOR: THE RELEVANT LAMELLAR FUSE IN THE BOX (55) BURNS AND OPENS THE ELECTRICAL CIRCUIT.

Possible causes:
1. Motor failure (replace).
2. Short circuit in the wiring harness (repair).

After the activation of the emergency switch, in order to restore the machine functions, it is necessary to turn the switch clockwise, as indicated by the arrow on the switch; make sure to perform this operation.

POOR OPERATION OF THE VACUUM FAN

Possible causes:
1. Dust filter obstructed (clean).
2. Vacuum fan with broken/worn wings (replace the vacuum fan).
3. Cut/torn vacuum hose (replace).
4. Waste container gaskets damaged (replace).
5. Vacuum activating/deactivating lever malfunction (repair).

THE FILTER SHAKER MOTOR DOES NOT OPERATE

Possible causes:
1. The motor is malfunctioning (repair or replace).
2. The filter shaker switch (14) is broken (replace).
3. Damaged wiring harness (repair).

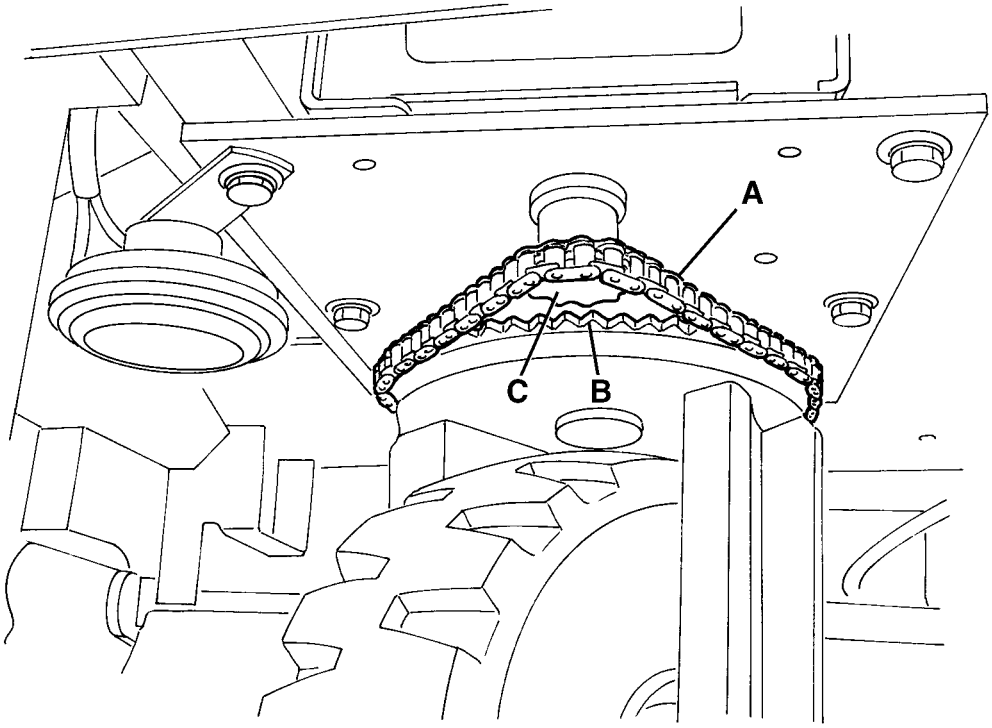
STEERING AND BRAKING SYSTEM

STEERING CHAIN CHECK AND CLEANING

NOTE
The steering chain is not adjustable.

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. Check that the steering chain (A) and the related ring gears (B and C) are free from dirt or foreign materials (cords, clothes, etc.) and excessive dirt. If necessary, wipe the debris off the chain with a brush and a solvent, making the whole chain (A) slide in the accessible area, by moving the steering wheel.
   Wipe off the solvent from the machine parts.

WARNING!
Do not lubricate the chain after cleaning.



S300574

TROUBLESHOOTING

THE WASTE CONTAINER DOES NOT OVERTURN

Possible causes:
The waste container lifted position control microswitch is misadjusted or damaged (adjust or replace).
The control push-button is damaged (replace).
The waste container rotation actuator microswitches are damaged (replace).
The waste container rotation actuator is damaged (replace).
The F3 fuse in the box (55) is damaged (replace).

THE WASTE CONTAINER DOES NOT LOWER

Possible causes:
The waste container lifted position control microswitch is misadjusted or damaged (adjust or replace).
The control push-button is damaged (replace).
The control relay is damaged (replace).

THE WASTE CONTAINER DOES NOT MOVE (the pump does not operate)

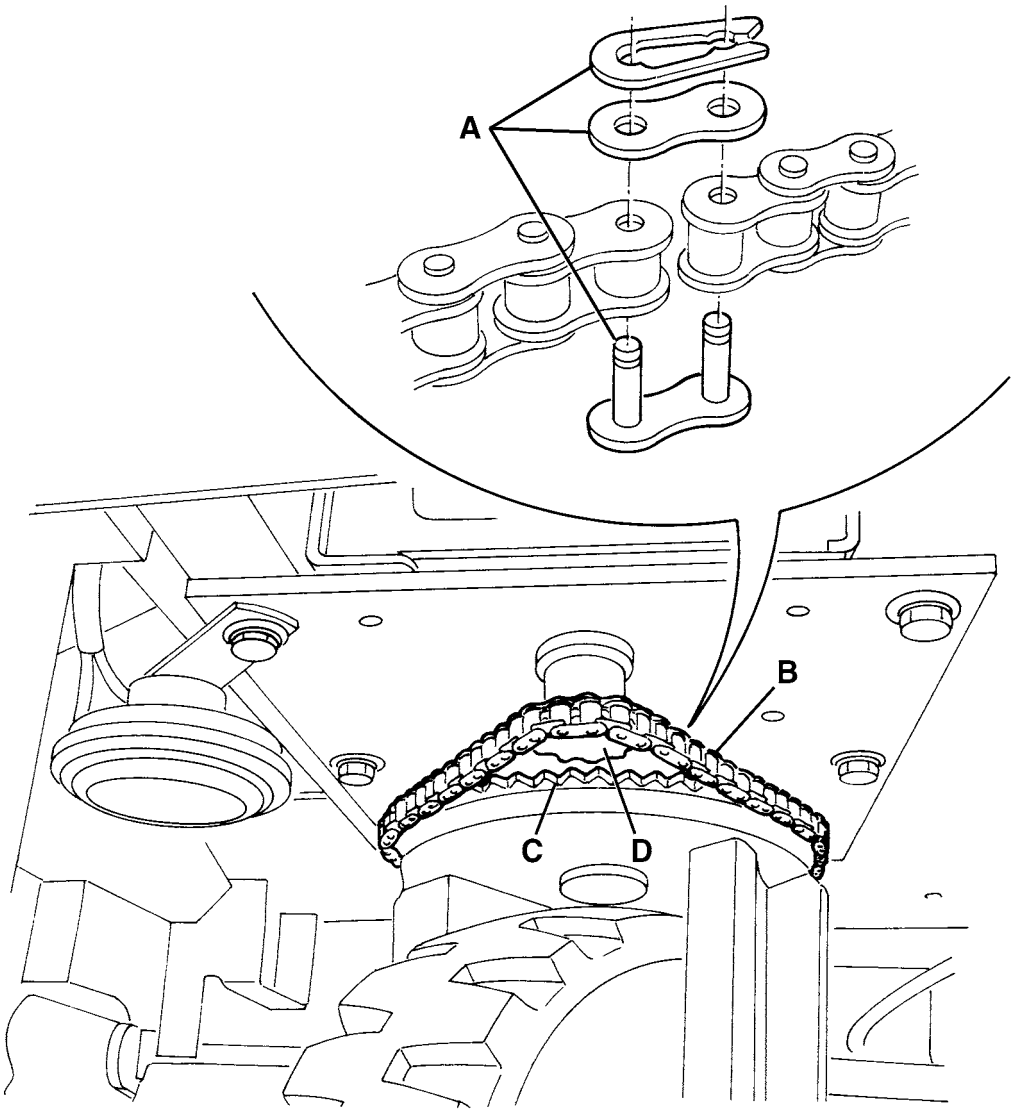
Possible causes:
The control push-button is damaged (replace).
The drive relays are damaged (replace).
Damaged wiring harness (repair).
Pump malfunction (replace).
F2 and F3 fuses in the box (55) are damaged (replace).

STEERING CHAIN REPLACEMENT

NOTE
The steering chain is not adjustable.

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. By turning the steering wheel, take the steering chain junction link (A) at an accessible position.
4. Open the junction link (A) and remove the chain (B) from the two ring gears (C) and (D).
5. If necessary, wipe off debris and dust off the ring gears (C) and (D) using a broom and a solvent. Wipe off the solvent from the machine parts.
6. Assemble the components in the reverse order of disassembly.

WARNING!
Do not lubricate the chain after the installation.



S300575

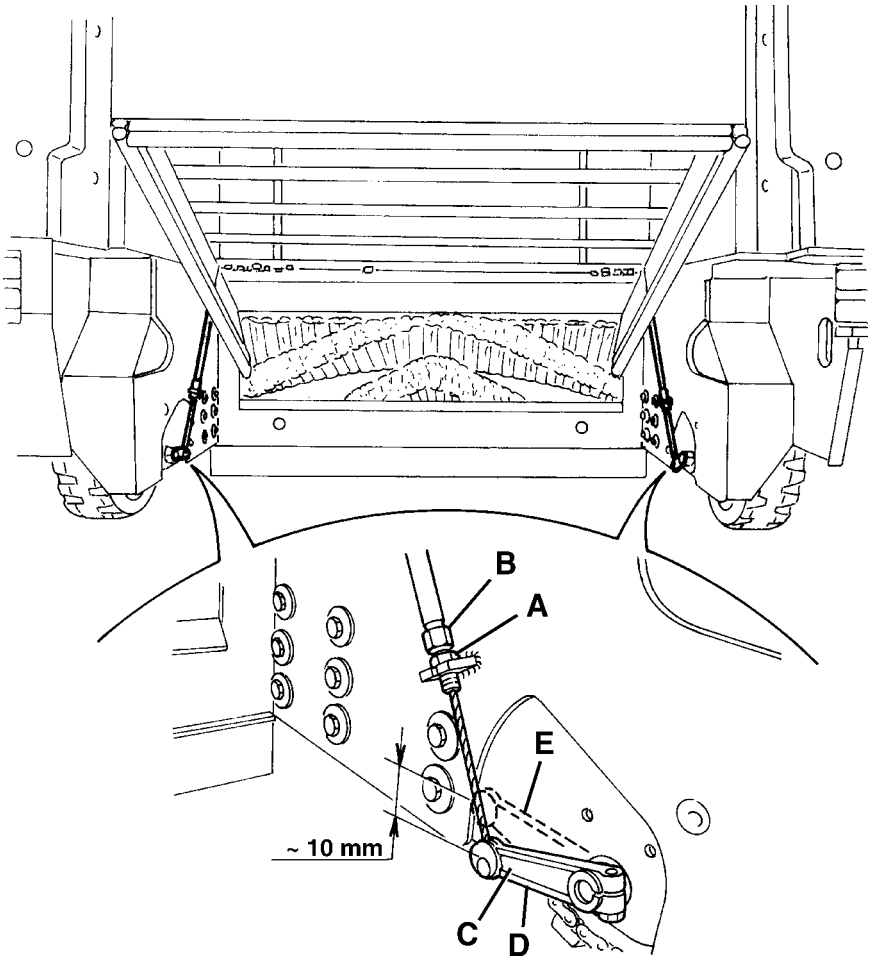
STEERING AND BRAKING SYSTEM

BRAKE ADJUSTMENT

1. Drive the machine on a level ground.
2. Do not engage the parking brake with the pedal and the lever (26 and 19), but make sure that the machine cannot move independently.
3. Lift the waste container (31) completely (see the User Manual).
4. Turn the ignition switch (18) to “0” position.
5. Apply a proper safety stand under the lifted waste container to prevent it from lowering incidentally.

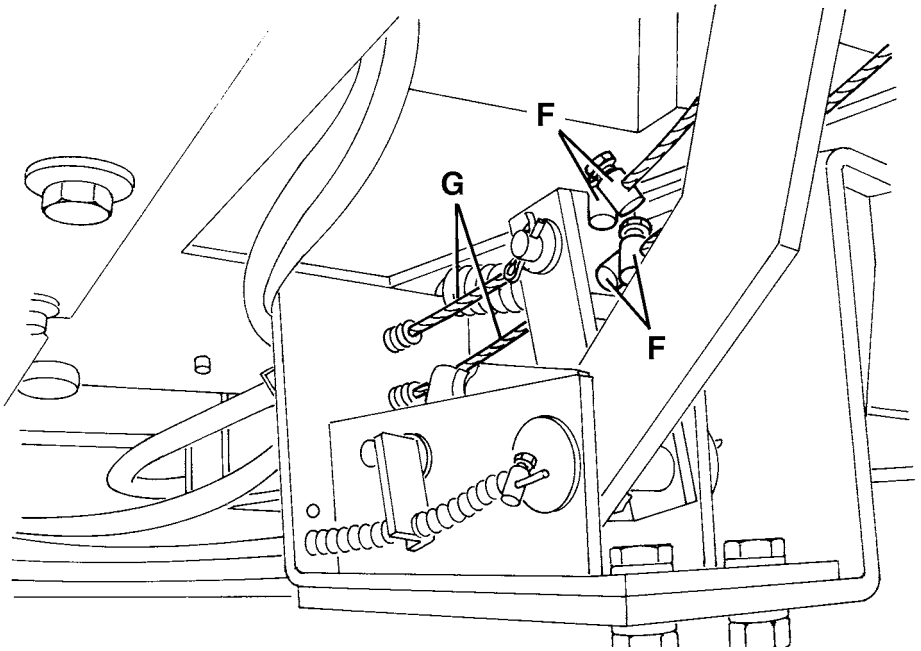
WARNING!
Apply a proper safety stand under the lifted waste container even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks.

6. From the waste container (31) compartment, loosen the locknuts (A) and adjust the brakes using the registers (B) until the following condition is achieved:
   - On both sides of the machines, the stroke of the lever (C) between the position (D) (released brake) and the position (E) (braking elements in contact with the drum) should be approximately 0,39 in (10 mm).
7. Tighten the locknuts (A).
8. If it is not possible to achieve the condition described at the previous step for one or both brakes, it is necessary to modify the position of the terminals (F) of the brake cables (G), located under the brake pedal, then repeat steps 6 and 7.
9. Carry out steps from 1 to 5 in the reverse order.
10. Carry out some tests to check the brake operation.



S300576

BRAKE ADJUSTMENT (continues)



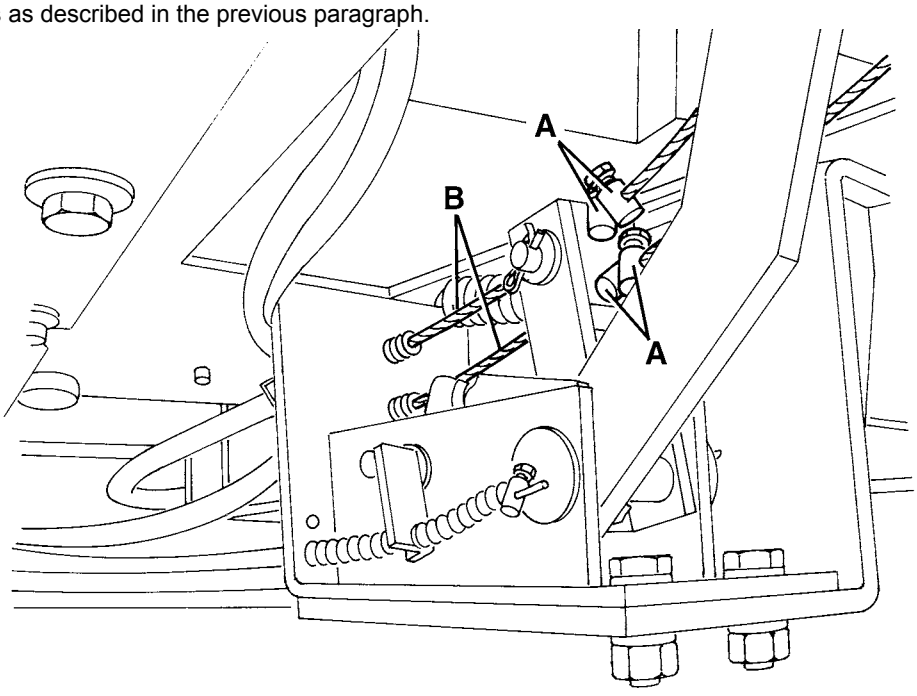
S300577

BRAKE CONTROL CABLE REPLACEMENT

1. Drive the machine on a level ground.
2. Do not engage the parking brake with the pedal and the lever (26 and 19), but make sure that the machine cannot move independently.
3. Lift the waste container (31) completely (see the User Manual).
4. Turn the ignition switch (18) to “0” position.
5. Apply a proper safety stand under the lifted waste container to prevent it from lowering incidentally.

WARNING!
Apply a proper safety stand under the lifted waste container even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks.

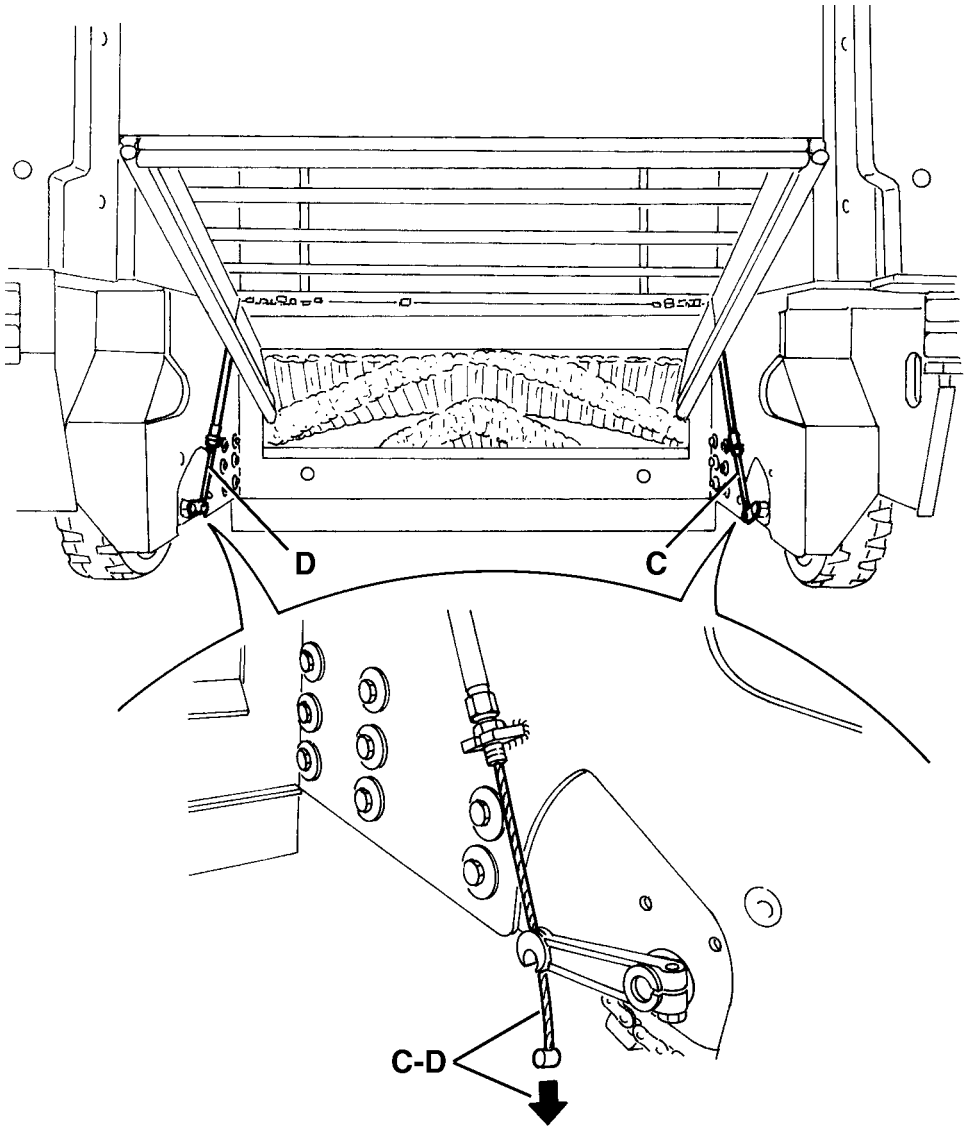
6. Operating under the brake pedal, remove the terminals (A) from the brake control cables (B).
7. From the waste container (31) compartment, pull out the brake control cables (C) and (D) from the housings.
8. Insert the new cables (C) and (D) into their housings and apply a thin coat of grease along the cable (so that it smoothly slides into the sheaths).
9. Insert and tighten the terminals (A) of the brake control cables (B).
10. Adjust the brakes as described in the previous paragraph.



S300578

STEERING AND BRAKING SYSTEM

BRAKE CONTROL CABLE REPLACEMENT (continues)



S300579

BRAKE REPLACEMENT

NOTE
The following procedure refers to the right brake replacement; the procedure to replace the left brake is the same.

1. Drive the machine on a level ground.
2. Do not activate the parking brake with the pedal and the lever (26 and 19), but make sure that the machine cannot move independently, applying wedges (Z) to the left wheel.
3. Turn the ignition switch (18) to “0” position.
4. Open the hood (40) and secure it with the support rod (67).
5. Remove the mounting screws (B), then remove the right body side (A).
6. Remove the screws (D), then remove the bulkhead (C).
7. Operating according to the safety rules, with a proper hoisting system, lift the right rear part of the machine for few centimetres, using the lifting anchor (W). Keep the machine lifted with the hoisting system.
8. Carefully lift the waste container (H) completely (for the related instructions see the User Manual).
9. Insert a hard wood stand (E) under the machine frame end (G), as shown in the figure; the stand (E) must be at an adequate height to keep the wheel (F) slightly lifted from the ground, for the removal.
   With the hoisting system, lower the machine and lay it on the stand (E), then check that the wheel (F) remains lifted from the ground to allow removal.
   However, the hoisting system must be kept in traction on the anchor (W).

WARNING!
The stand (E) must engage the machine frame end (G), without touching the wheel (F) that has to be removed.

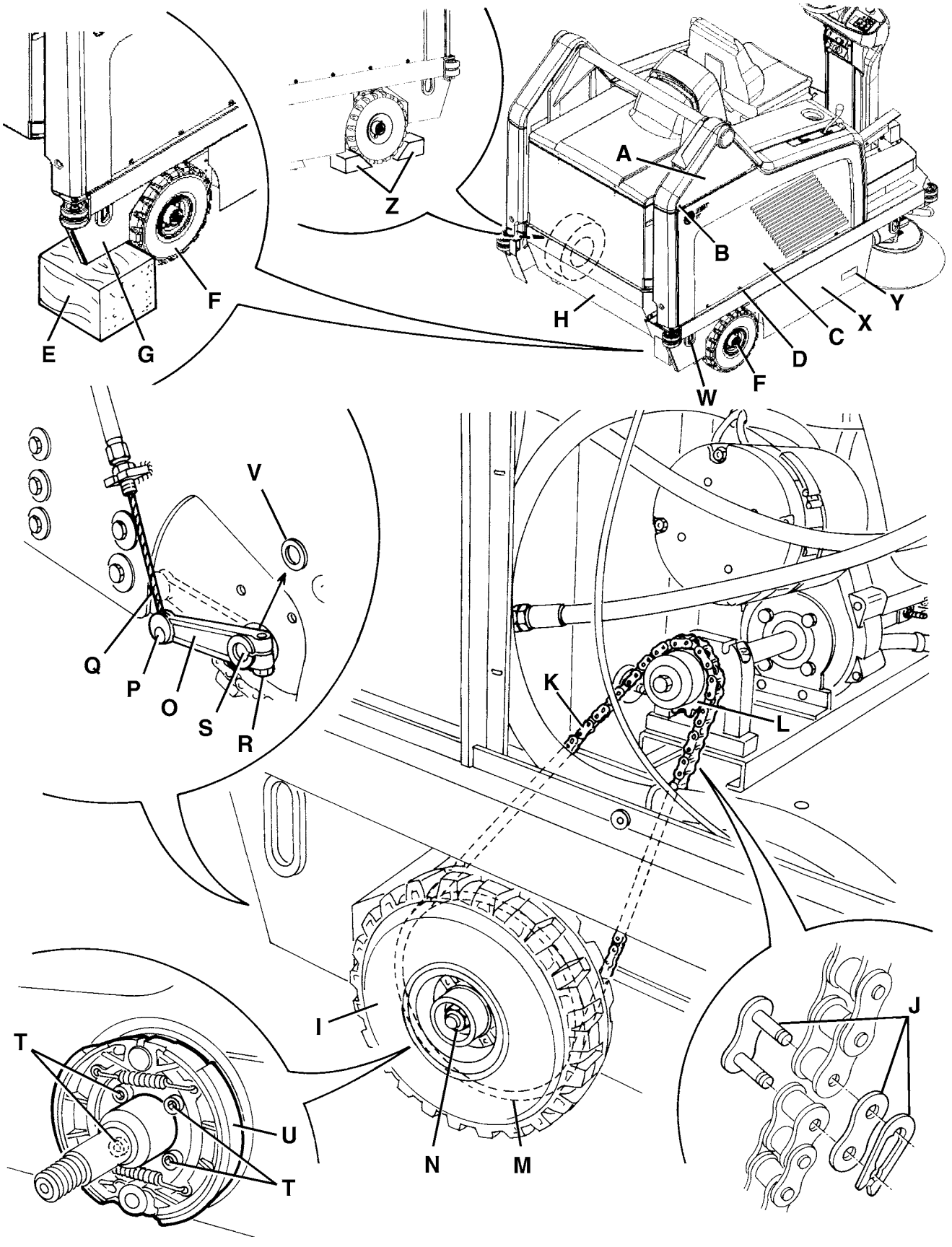
10. Apply a proper safety stand under the lifted waste container to prevent it from lowering incidentally.

WARNING!
Apply a proper safety stand under the lifted waste container even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks.

11. Release the fastener (Y), then open the right door (X).
12. Turn the wheel (I) gradually, to take the junction link (J) of the drive chain (K) at an accessible position.
13. Open the junction link (J) and remove the drive chain (K) from the related ring gears (L) and (M).
14. Remove the nut (N), then remove the wheel (I).
15. Manually turn the brake lever (O) upward, and disconnect it from the head (P) of the cable (Q).
16. Mark the position of the lever (O) and of the pin (S) (for a correct assembly), then loosen the screw (R) and remove the lever (O). Recover the shim (V).
17. Remove the screws (T) and the brake (U).
18. Assemble the components in the reverse order of disassembly.
19. Carry out some tests to check the brake operation.

STEERING AND BRAKING SYSTEM

BRAKE REPLACEMENT (continues)



S300580

DRIVE MOTOR ELECTRICAL INPUT CHECK

WARNING!
This procedure must be performed by qualified personnel only.

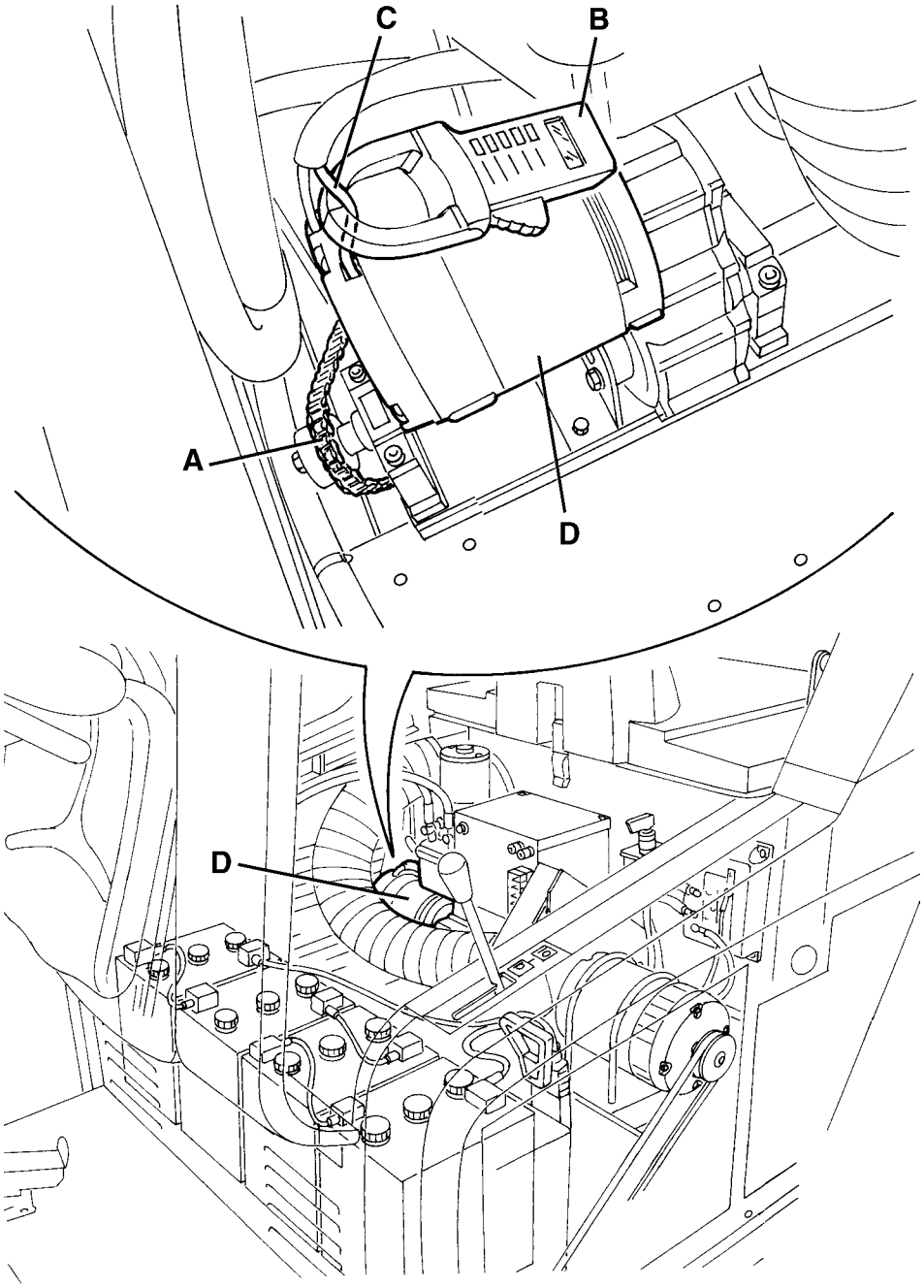
1. Drive the machine on a level ground.
2. Do not engage the parking brake with the pedal and the lever (26 and 19), but make sure that the machine cannot move independently.
3. Check that brooms and vacuum system are deactivated.
4. Turn the ignition switch (18) to “0” position.
5. With a proper and safe hoisting system, hook the machine on the rear lifting anchors (65), then lift it until the rear wheels (41) are at 1,57-1,97 in (4-5 cm) from the ground.
6. Open the hood (48) and secure it with the support rod (67).

WARNING!
Pay attention to the chain (A) and shaft rotation while performing the following steps.

7. Apply amperometric pliers (B) on a cable (C) of the drive motor (D).
8. Turn the ignition switch (18) to “I” position.
9. Press the forward gear pedal (20) until the end of the stroke, and check that the electrical input of the drive motor (D) is 15-20 A at 24V. Release the pedal (20). Turn the ignition switch (18) to “0” position and remove the amperometric pliers (B).
   If the input is greater, perform the motor brushes check (see the procedure on the following pages). If necessary, disassemble the motor (see the procedure on the following page), clean it and check its moving parts.
   If the above-mentioned procedures do not lead to a correct electrical input it is necessary to replace the motor (see the procedure on the following page).
10. Carry out steps from 1 to 6 in the reverse order.

DRIVE SYSTEM

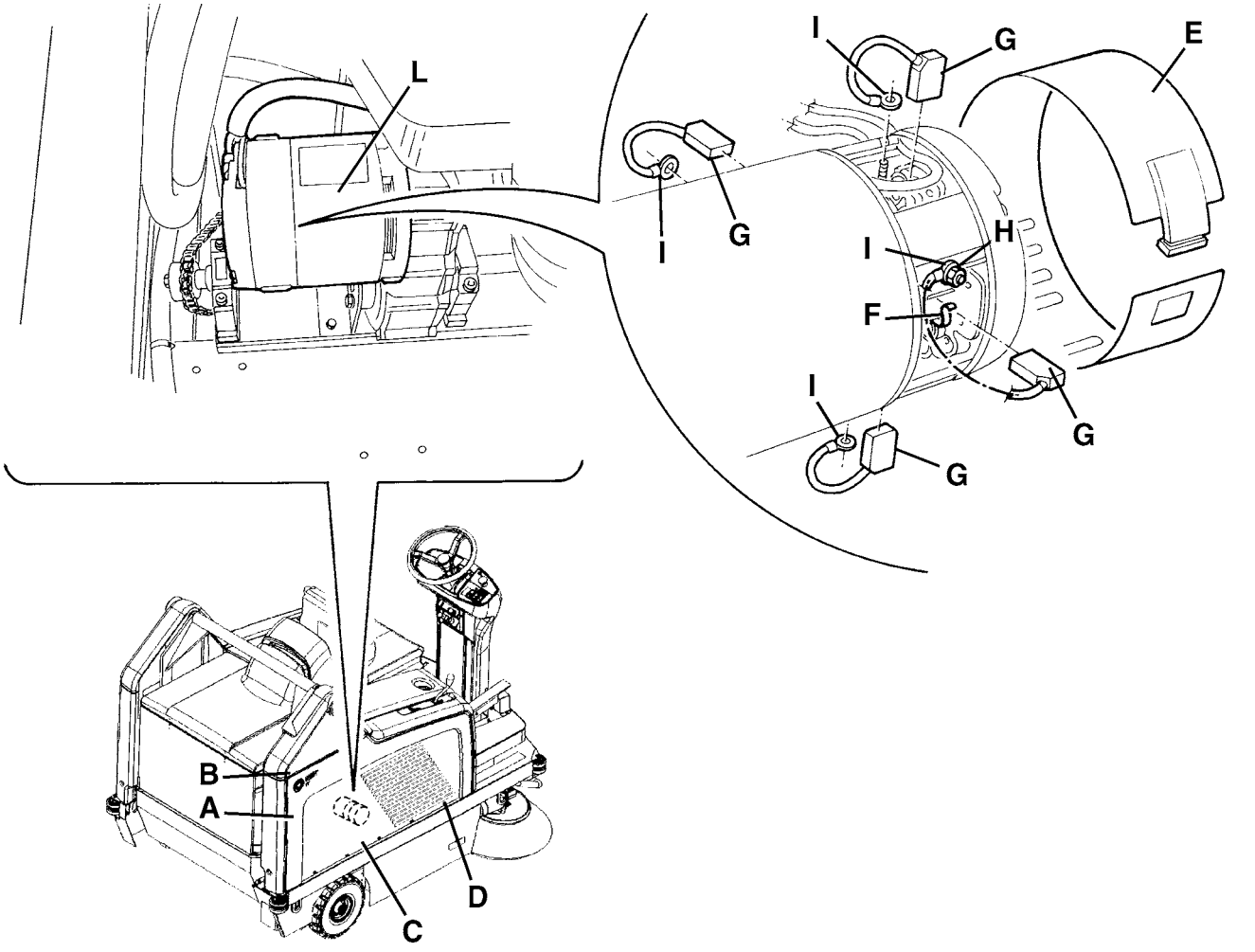
DRIVE MOTOR ELECTRICAL INPUT CHECK (continues)



S300581

DRIVE MOTOR BRUSH CHECK AND REPLACEMENT

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. Open the hood (48) and secure it with the support rod (67).
4. Disconnect the battery connector (51).
5. Remove the mounting screws (B), then remove the right body side (A).
6. Remove the mounting screws (D), then remove the right bulkhead (C).
7. Disengage and remove the clamp (E) of the drive motor (L), after cleaning its outside part.
8. For each of the four brooms, lift the retaining spring (F) and remove the brooms (G).
9. Check if the four brooms are worn. The brooms are worn when there is not a sufficient contact with the motor armature, because of their use, of the contact surface which is not integral or because the thrust spring is broken, etc. The minimum length of the brooms (G) is 0,24 in (6 mm), then they must be replaced.
10. If necessary, remove the brooms to replace them by unscrewing the nuts (H) and disengaging the lead-in wires (I). It is advisable to replace all the brooms at the same time.
11. Assemble the components in the reverse order of disassembly.



S300582

DRIVE SYSTEM

DRIVE MOTOR REMOVAL

DISASSEMBLY

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Lift the waste container (31) completely.
3. Turn the ignition switch (18) to “0” position.
4. Apply a proper safety stand under the lifted waste container to prevent it from lowering incidentally.

WARNING!
Apply a proper safety stand under the lifted waste container even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks.

5. Open the hood (48) and secure it with the support rod (67).
6. Disconnect the battery connector (51).
7. On both sides of the machine, remove the screws (B), then remove the body sides (A).
8. On both sides of the machine, remove the screws (D), then remove the bulkheads (C).
9. From the waste container (31) compartment, loosen the drive assembly mounting screws (E).
10. On both sides of the machine, loosen the locknuts (F) and operate on the tie rods (G) by loosening the drive chains (H), then disconnect the chains from the pinions (I) and (S).
11. Disconnect the drive motor harness (N) from the electrical connections of the drive electronic board (L) and (if equipped) the battery switch (M).
12. Disconnect the drive motor harness (N) from the machine fasteners.
13. Disconnect the clamp (O) from the stand.
14. Remove the drive reduction unit assembly (P) with the stand and take them to the workbench; if necessary, when removing, slightly turn the assembly (P) according to the direction shown by the arrow (Q) to disengage the left pinion (S).

DISASSEMBLY AT THE WORKBENCH

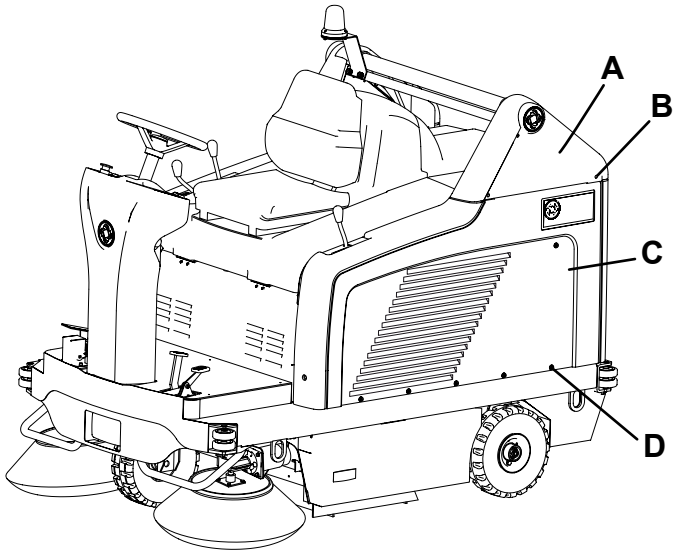
15. At the workbench, unscrew the dowels (T).
16. Move the two driveshafts (U) and (V) outward, until they come out from the reduction unit (W).
17. Remove the four screws (X).
18. Remove the reduction unit (Y).

ASSEMBLY AT THE WORKBENCH AND ASSEMBLY

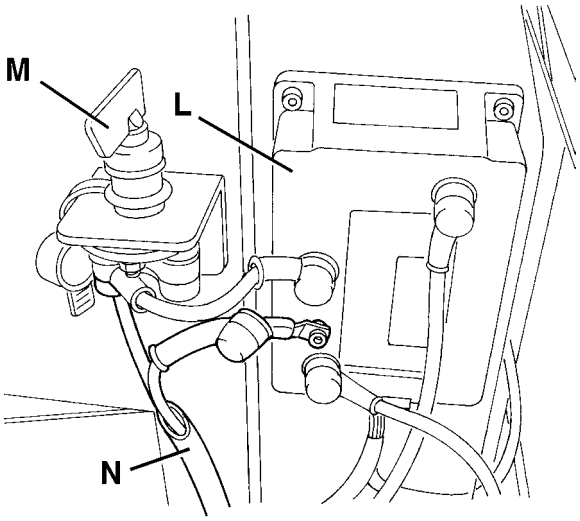
19. Assemble the components in the reverse order of disassembly, and pay special attention to the following:
    - Make sure that the driveshafts (U) and (V) are correctly inserted in their housing inside the reduction unit (W)
    - Before fixing the two pinions (AA) with the dowels (T), set the pinions at the values indicated in the figure (to have the wheels driven pinions correctly aligned).
    - In case of installation of a new reduction unit, after assembling at the workbench, fill the reduction unit with oil through the plug (Z); use the type and quantity indicated below:
    - Oil type: FINA GIRAN 220 or equivalent (see the following table)
    - Quantity: 0.25 - 0.35 litres
    - After having installed the chains (H) on the pinions (I) and (S), adjust the drive chain tension, as indicated in the relevant paragraph.

DRIVE MOTOR REMOVAL (continues)

LUBRICANT OIL TABLE	
Ambient temperature	+30°C ÷ +65°C
ISO VG Viscosity	220
°E/50°C Viscosity	15 ÷ 18
AGIP - IP	MELLANA - BLASIA 220
BP-MACH	ENERGOL GR-HP220
CASTROL	ALPHA SP 220
CHEVRON	NL GEAR COMPOUND 220
ELF	REDUCTELF SP 220
ESSO	SPARTAN EP 220
FINA	GIRAN 220
IP	MELLANA 220
MOBIL	MOBILGEAR 630
SHELL	OMALA EP 220
TOTAL	CARTER EP 220
KLUBER	KLUBER OIL GEM 1-220



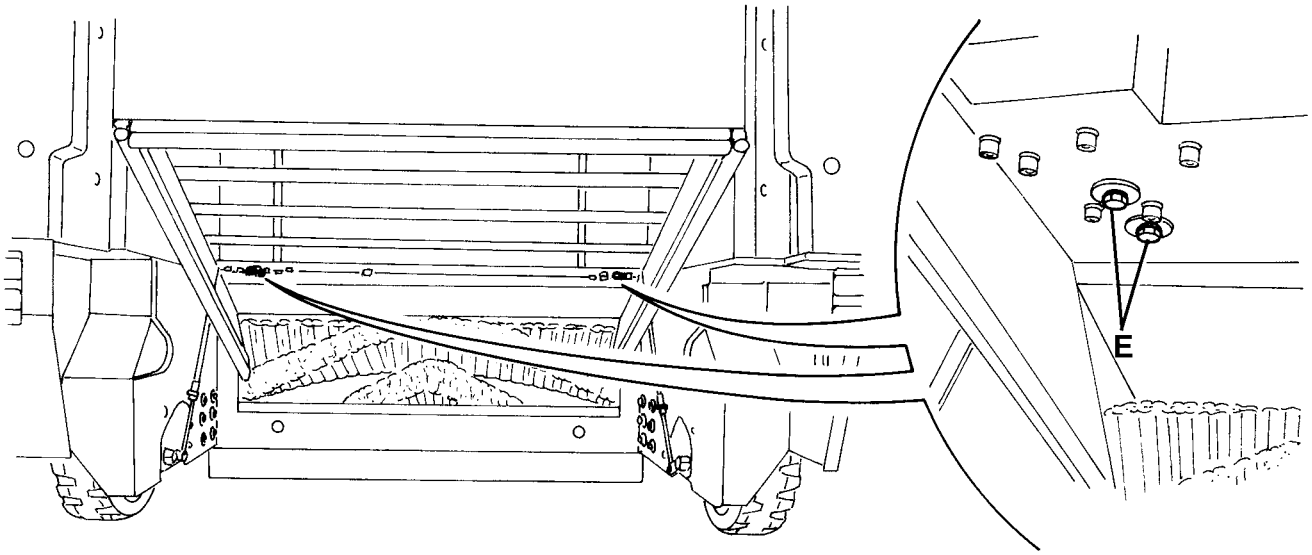
S300583



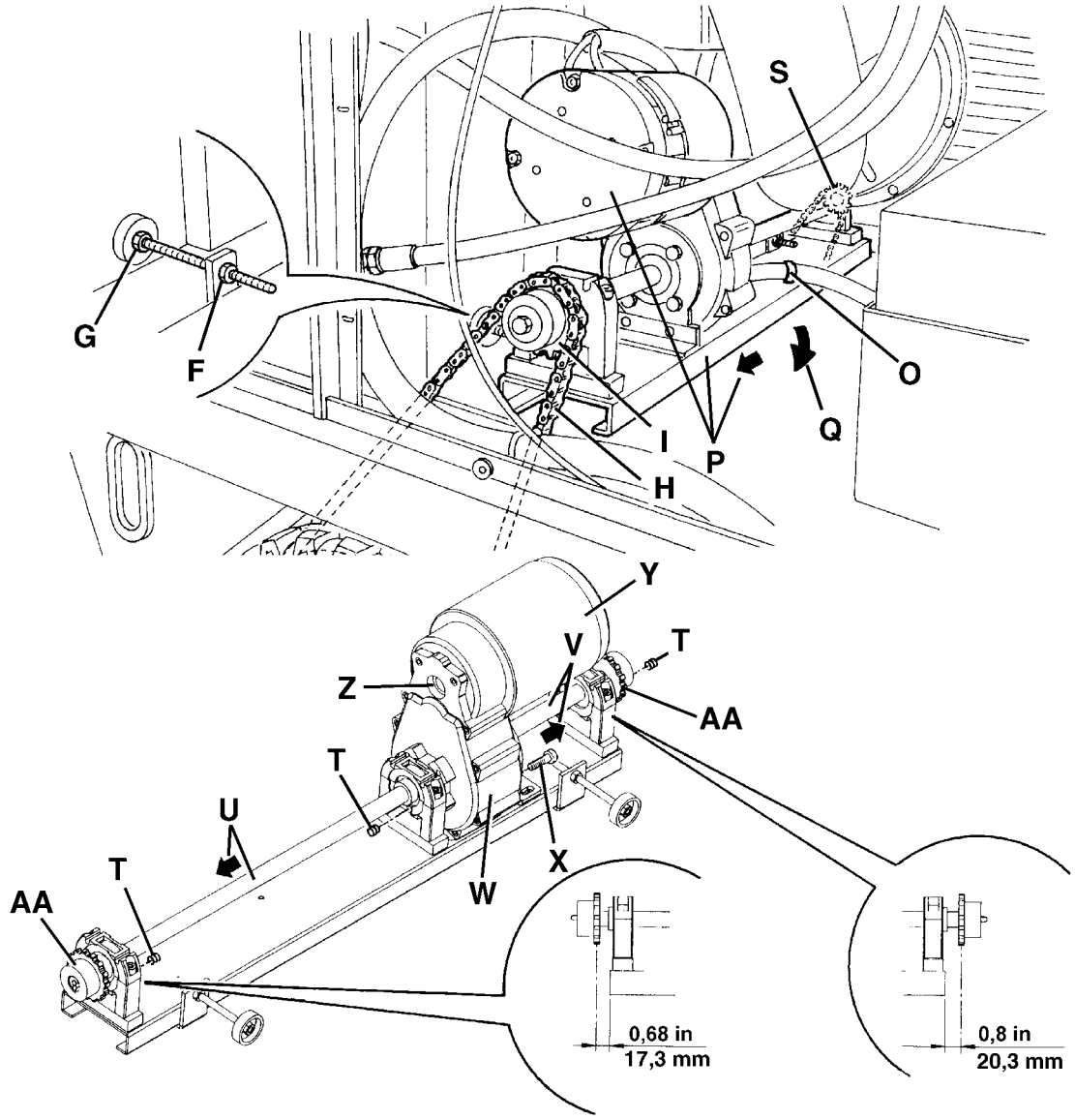
S300584

DRIVE SYSTEM

DRIVE MOTOR REMOVAL (continues)



S300585



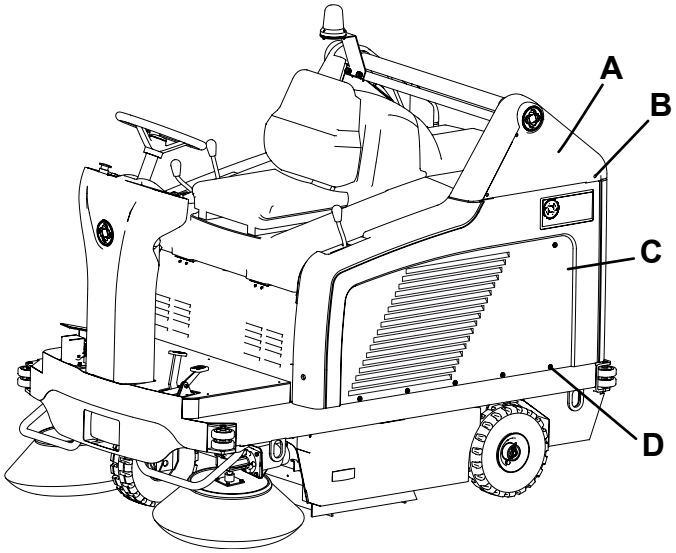
S300586

DRIVESHAFT BEARING REPLACEMENT

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Lift the waste container (31) completely (see the User Manual).
3. Turn the ignition switch (18) to “0” position.
4. Apply a proper safety stand under the lifted waste container to prevent it from lowering incidentally.

WARNING!
Apply a proper safety stand under the lifted waste container even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks.

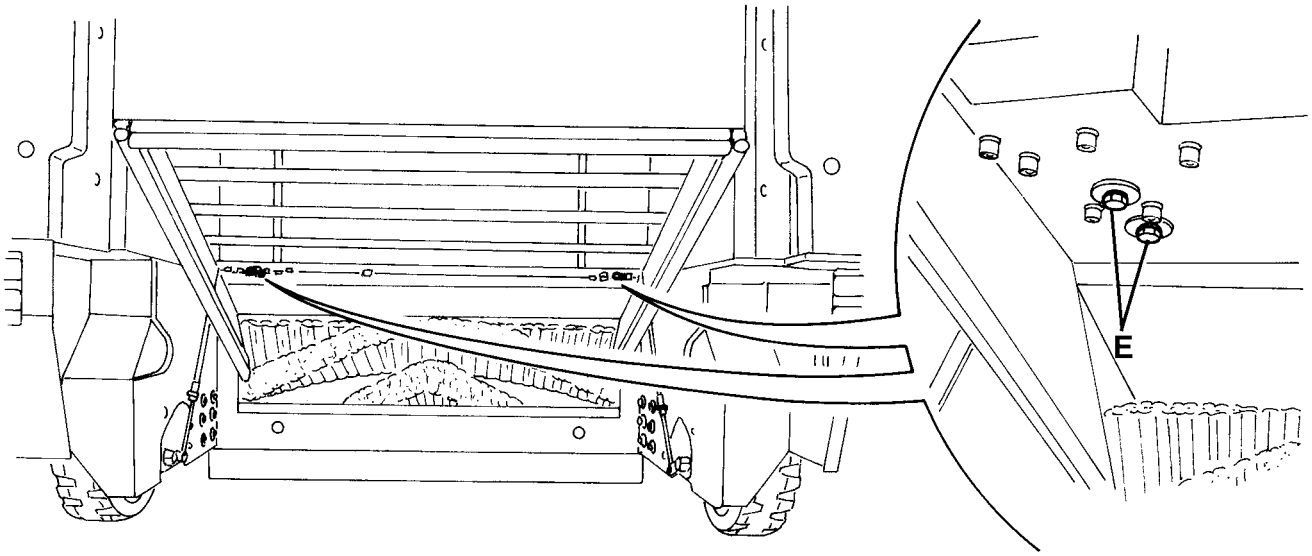
5. Open the hood (48) and secure it with the support rod (67).
6. Disconnect the battery connector (51).
7. On both sides of the machine, remove the screws (B), then remove the body sides (A).
8. On both sides of the machine, remove the screws (D), then remove the bulkheads (C).
9. From the waste container (31) compartment, loosen the drive assembly mounting screws (E).
10. On both sides of the machine, loosen the locknuts (F) and operate on the tie rods (G) by loosening the drive chains (H), then disconnect the chains from the pinions (I) and (J).
11. Remove the screws (K) and the pinions (L). Recover the keys (M).
12. Move the two driveshafts (P) and (Q) outward, until they come out from the reduction unit (R).
13. Loosen the dowels (T), remove the bolts (N) from the bearing carriers (O) and remove the bearings (S) from the driveshafts (P) and (Q).
14. Assemble the components in the reverse order of disassembly, and pay special attention to the following:
    - Before fixing the two pinions (L) with the dowels (T), set the pinions at the values indicated in the figure (to have the wheels driven pinions correctly aligned).
    - After having installed the chains (H) on the pinions (I) and (J), adjust the drive chain tension, as indicated in the relevant paragraph.



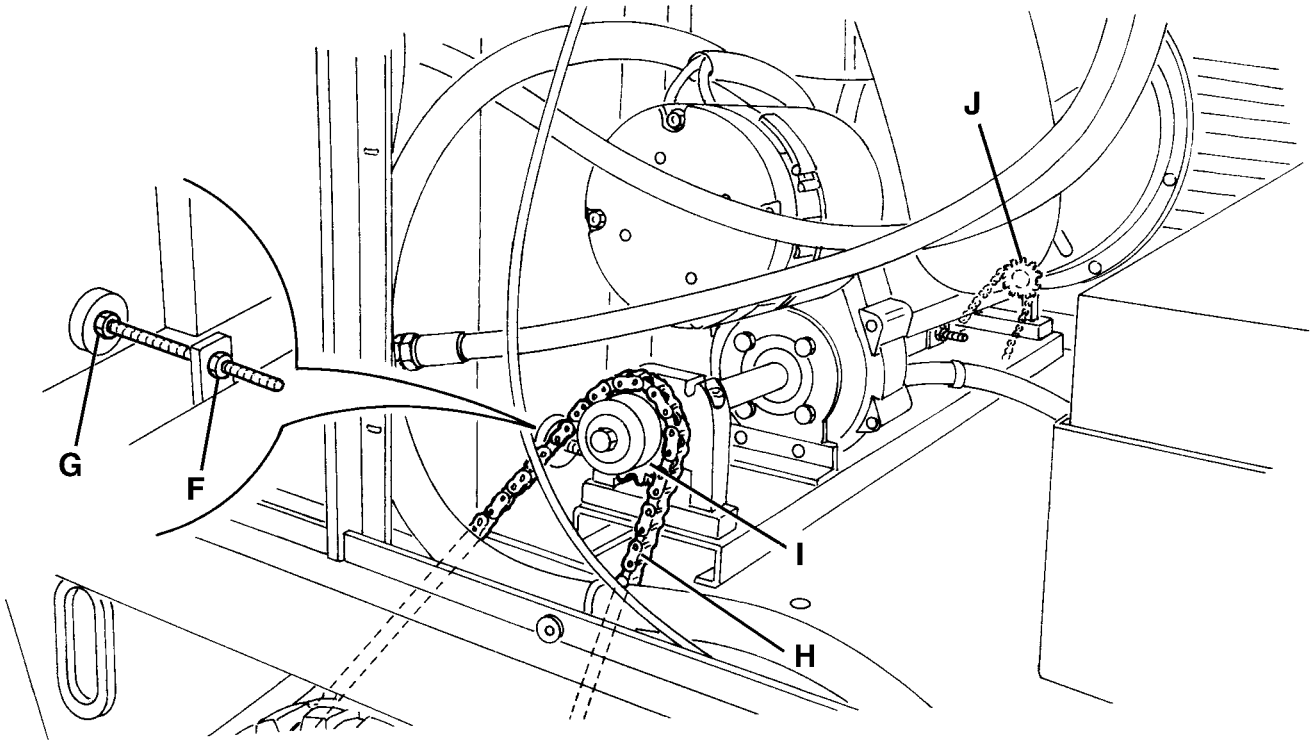
S300583

DRIVE SYSTEM

DRIVESHAFT BEARING REPLACEMENT (continues)

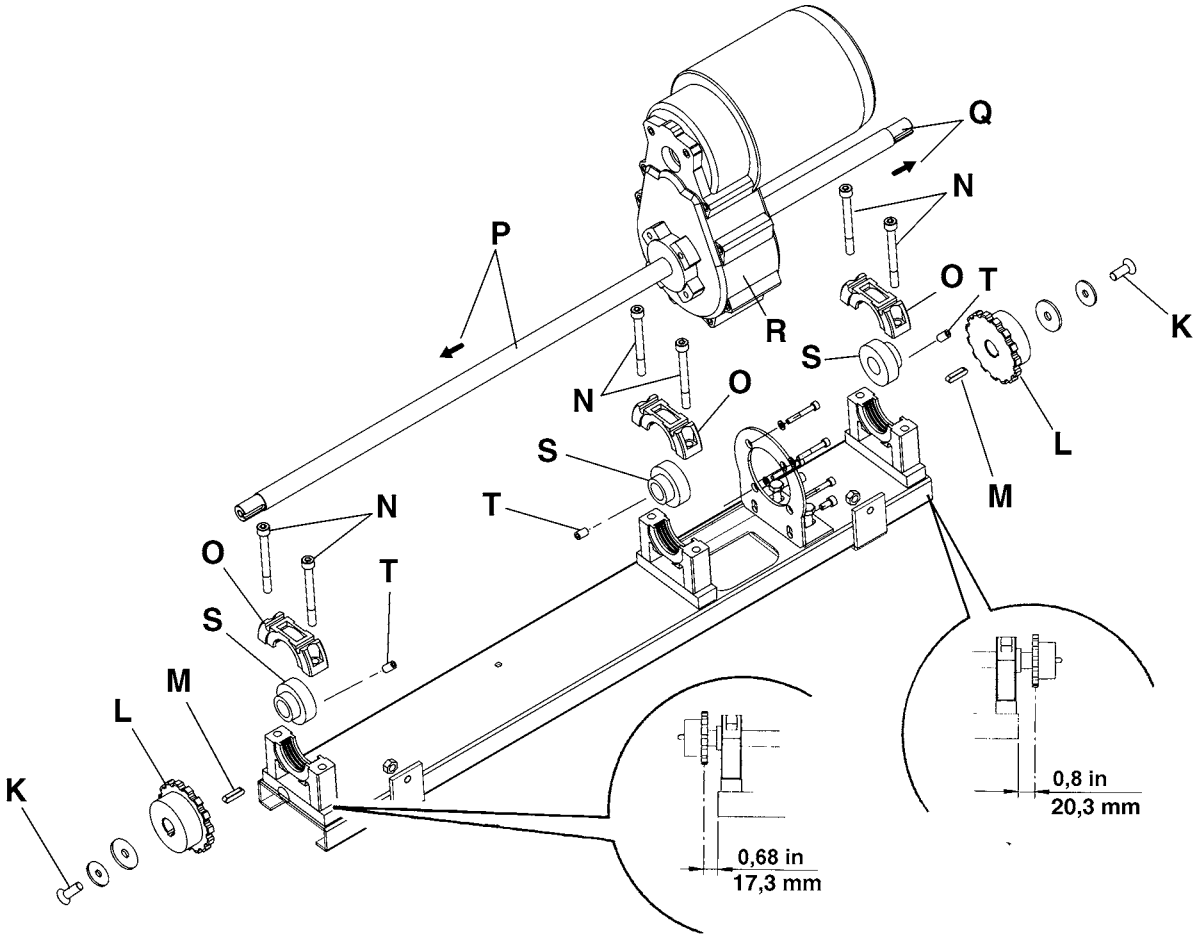


S300585



S300589

DRIVESHAFT BEARING REPLACEMENT (continues)



S300590

DRIVE SYSTEM

DRIVE CHAIN CLEANING AND TENSION CHECK

CLEANING AND TENSION CHECK

1. Drive the machine on a level ground.
2. Do not engage the parking brake with the pedal and the lever (26 and 19), but make sure that the machine cannot move independently.
3. Turn the ignition switch (18) to “0” position.
4. Open the hood (40) and secure it with the support rod (67).
5. Release the fasteners (35 and 33), then open the right and left door (34 and 32).
6. On both sides of the machine, check that the drive chains (A) and the related ring gears (B) and (C) are free from debris (cords, clothes, etc.) and excessive dust. If necessary, wipe the debris off the chain with a brush and a solvent, making the whole chain (A) slide in the accessible area, by slowly moving the machine.
   Wipe off the solvent from the machine parts.
7. On both sides of the machine, check that the drive chains (A) are slightly loose. If necessary, adjust the tension following the instructions below.

WARNING!
Do not lubricate the chain after the cleaning.

TENSION ADJUSTMENT

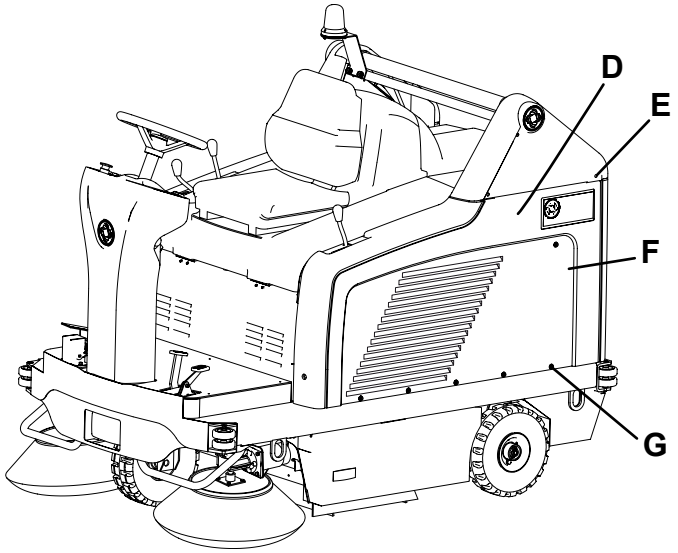
8. Engage the parking brake with the pedal and the lever (26 and 19).
9. Disengage the support rod (67) and close the hood (40).
10. Lift the waste container (31) completely (see the User Manual).
11. Apply a proper safety stand under the lifted waste container to prevent it from lowering incidentally.

WARNING!
Apply a proper safety stand under the lifted waste container even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks.

12. On both sides of the machine, remove the screws (E), then remove the body sides (D).
13. On both sides of the machine, remove the screws (G), then remove the bulkheads (F).
14. From the waste container (31) compartment, loosen the drive assembly mounting screws (H).
15. On both sides of the machine, loosen the locknuts (I) and operate on the tie rods (L) until the drive chain (A) tension is correct. Tighten the locknuts (I).

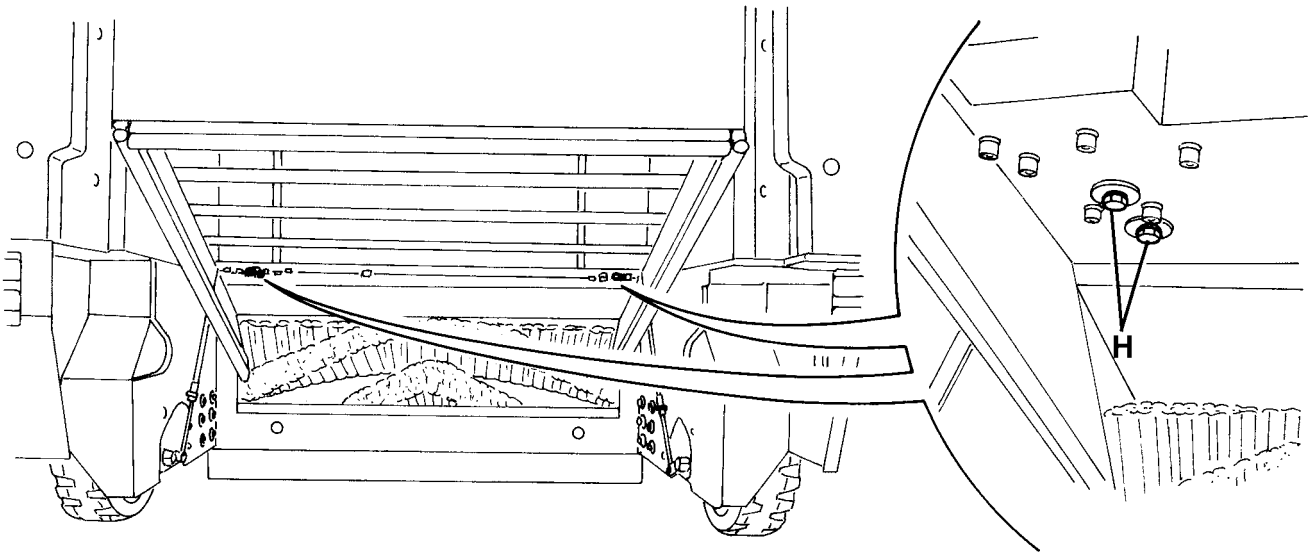
ASSEMBLY

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

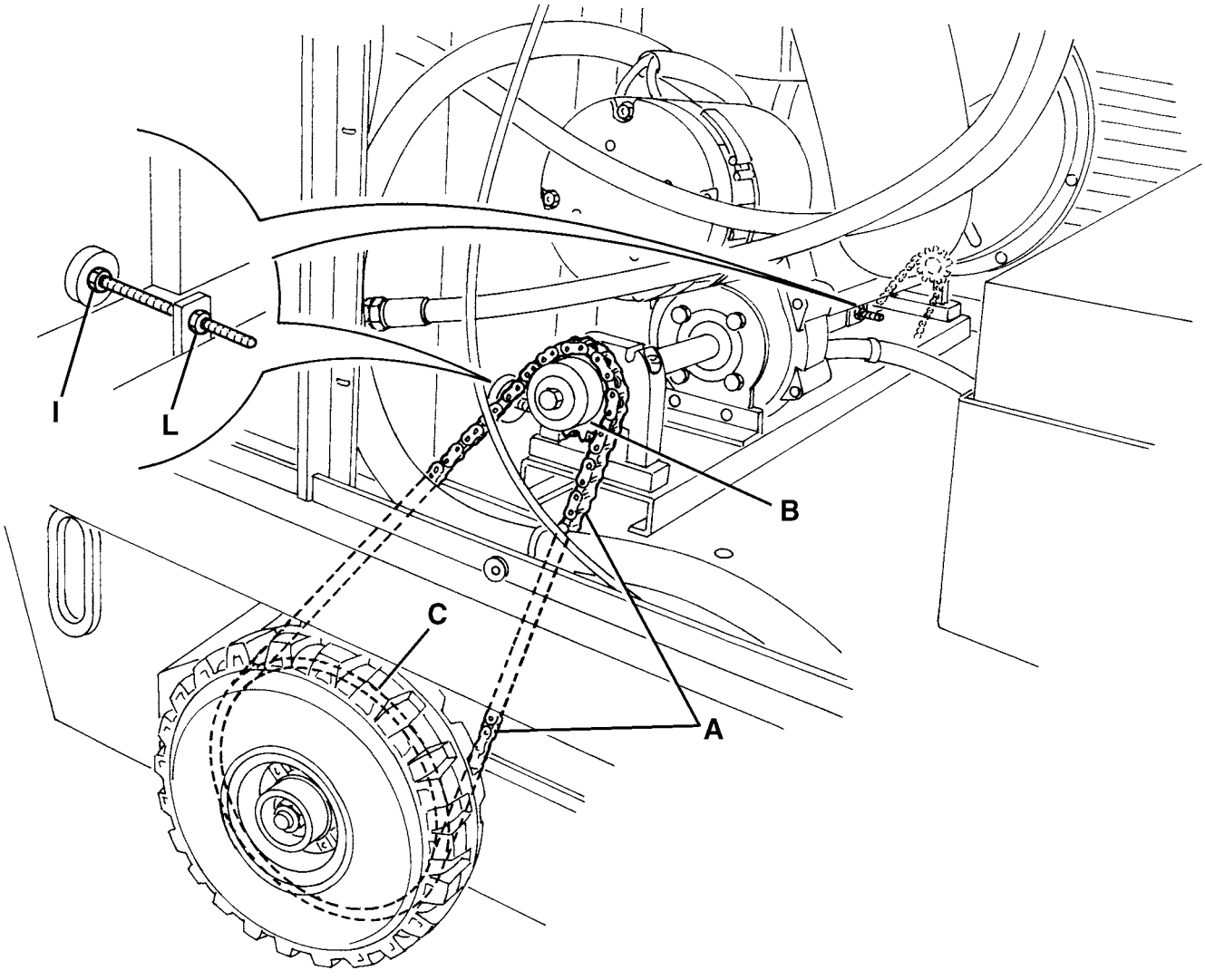


S300591

DRIVE CHAIN CLEANING AND TENSION CHECK (continues)



S300592



S300593

DRIVE SYSTEM

DRIVE CHAIN REPLACEMENT

CAUTION!
It is advisable to replace both chains at the same time.

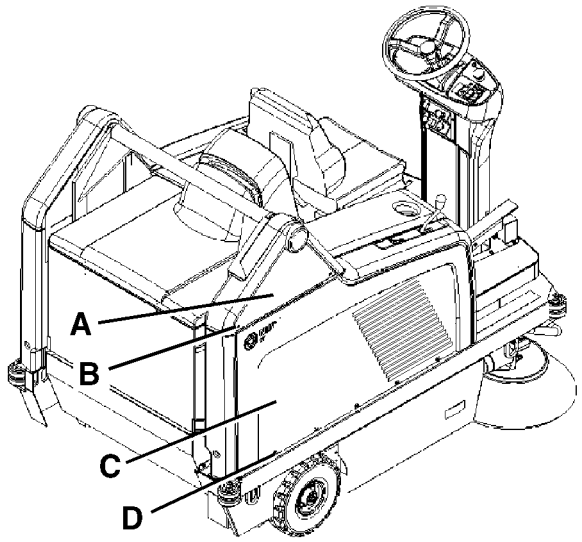
1. Drive the machine on a level ground.
2. Do not engage the parking brake with the pedal and the lever (26 and 19), but make sure that the machine cannot move independently.
3. Turn the ignition switch (18) to “0” position.
4. Open the hood (40) and secure it with the support rod (67).
5. On both sides of the machine, remove the screws (B), then remove the body sides (A).
6. On both sides of the machine, remove the screws (D), then remove the bulkheads (C).
7. Release the fasteners (35 and 33), then open the right and left door (34 and 32).
8. Slowly move the machine to set the junction links (E) of the drive chains (F) at an accessible position.
9. Open the junction links (E) and remove the drive chains (F) from the related ring gears (G) and (H).
10. Engage the parking brake with the pedal and the lever (26 and 19).
11. Disengage the support rod (67) and close the hood (40).
12. Carefully lift the waste container (31) completely (see the User Manual).
13. Apply a proper safety stand under the lifted waste container to prevent it from lowering incidentally.

WARNING!
Apply a proper safety stand under the lifted waste container even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks.

14. If necessary, on both sides of the machine, wipe debris and dust off the ring gears (G) and (H) with a brush and a solvent. Wipe off the solvent from the machine parts.
15. Install the new chains (F) by engaging them on the related ring gears (G) and (H), then connect them by the junction links (E).

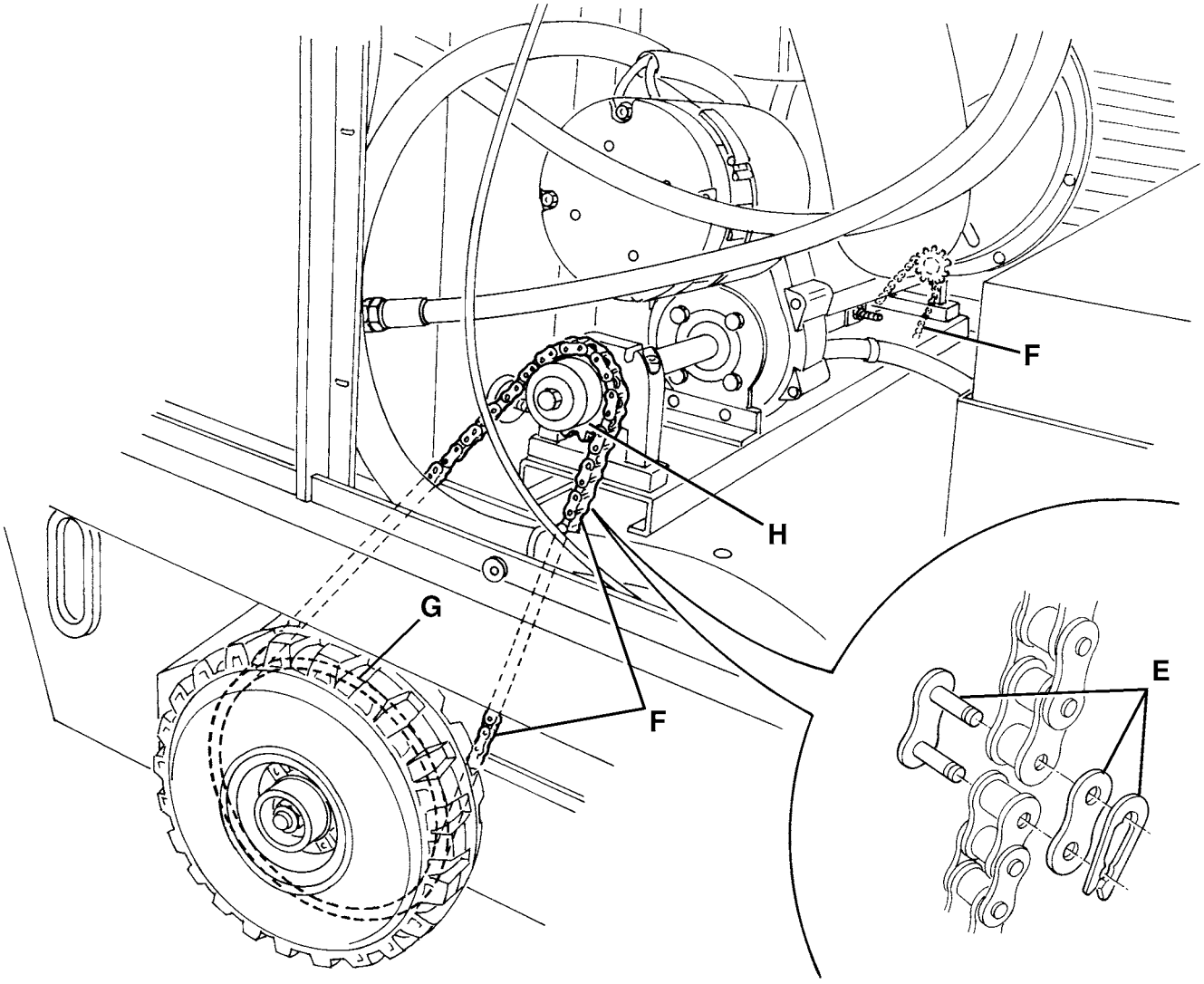
WARNING!
Do not lubricate the chains and the ring gears after cleaning/installation.

16. On both sides of the machine, check that the drive chains (F) are slightly loose. If necessary, adjust the tension as indicated in the previous paragraph.
17. Assemble the components in the reverse order of disassembly.



S300594

DRIVE CHAIN REPLACEMENT (continues)



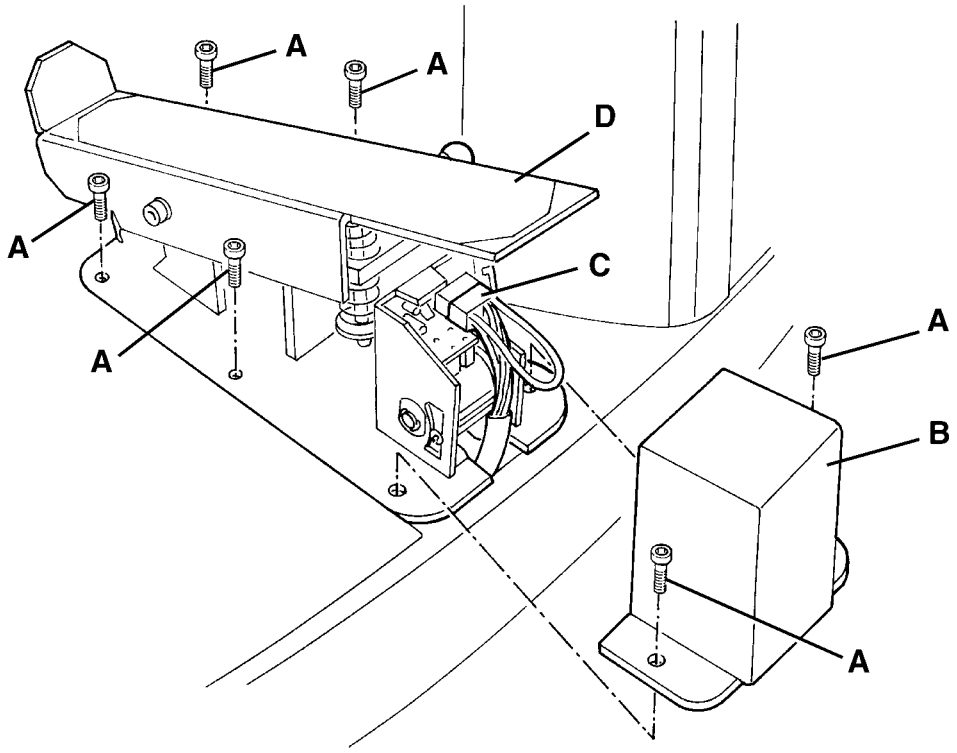
S300595

DRIVE SYSTEM

FORWARD/REVERSE GEAR PEDAL CONTROL BOARD REPLACEMENT

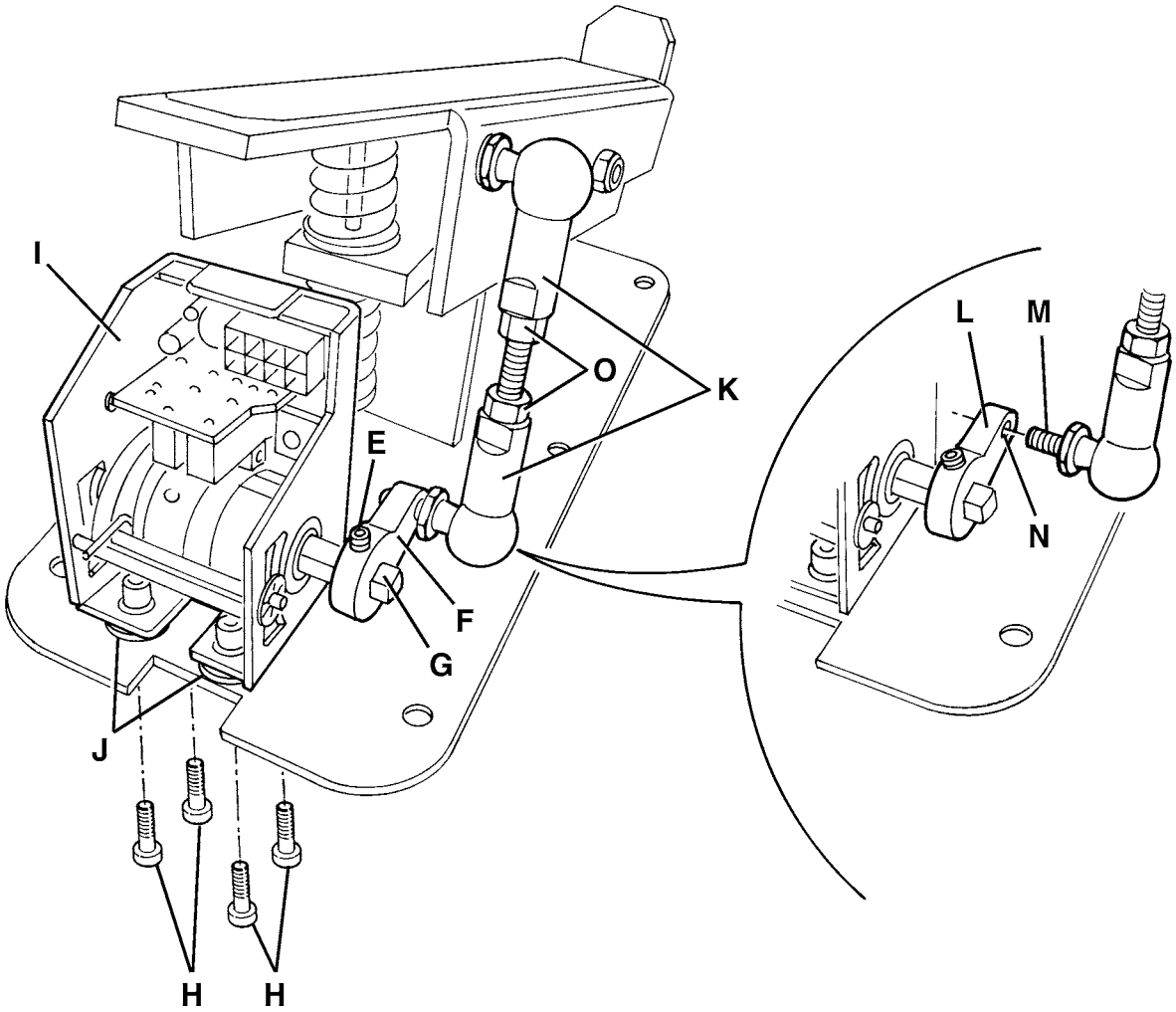
1. Drive the machine on a level ground.
2. Engage the parking brake with the pedal and the lever (26 and 19).
3. Turn the ignition switch (18) to “0” position.
4. Remove the forward/reverse gear pedal mounting screws (A).
5. Remove the cover (B).
6. Disconnect the electrical connector (C) by disengaging the fastener on the lower side.
7. Remove the forward/reverse gear pedal (D).
8. Loosen the dowel (E) at the workbench.
9. Remove the connecting rod (F) from the pin (G).
10. Remove the screws (H).
11. Remove the board assembly (I).
12. Remove the shims (J).
13. Assemble the components in the reverse order of disassembly, and pay special attention to the following:
    - Usually, it is not necessary to adjust the tie rod (K); anyway, after installing both the board (I) and the connecting rod (F), check the tie rod (K) for proper adjustment by proceeding as follows:
      - Unscrew the terminal (M) from the connecting rod (L);
      - When the connecting is released, check that the terminal (M) is aligned with the connecting rod hole (N) (as shown in the figure). If necessary, perform the alignment by adjusting the nuts (O) and the tie rod (K); then, tighten the nuts;
      - Screw the terminal (M) to the connecting rod (L).
14. Carry out some operation tests on the forward/reverse gear pedal (20) and check the following conditions with the ignition switch (18) in “I” position:
    - When the pedal (20) is released the machine should not move;
    - When the pedal (20) is lightly pressed forward or backward, the machine should start moving slowly.

NOTE
The gear pedal control board does not need the electrical check and adjustment.



S300596

FORWARD/REVERSE GEAR PEDAL CONTROL BOARD REPLACEMENT (continues)



S300597

TROUBLESHOOTING

THE MACHINE DOES NOT MOVE

Possible causes:

1. The motor brushes are worn (replace).
2. The motor is malfunctioning (repair or replace).
3. Foreign materials obstruct the gearing chain (remove).
4. The running consent under-seat switch is broken (replace).
5. The potentiometric accelerator is broken (replace).
6. The brake is activated (deactivate).
7. The drive system has been deactivated with the machine pushing/towing switch (60) (if equipped) (activate).
8. The drive electronic board is broken (replace).

OTHER SYSTEM

SCREW AND NUT TIGHTENING CHECK

1. Drive the machine on a level ground.
2. Engage the parking brake with the pedal and the lever (26 and 19).
3. Turn the ignition switch (18) to “0” position.
4. Open the hood (48) and secure it with the support rod (67).
5. Disconnect the battery connector (51)
6. Check the following:
   - Accessible mounting screw and nut tightening;
   - Mounting component position;
   - Part and component visible faults.
7. Carry out steps from 3 to 4 in the reverse order.

WASTE CONTAINER HYDRAULIC LIFTING SYSTEM

OIL CHANGE

CAUTION!
Replacement to be performed with the waste container (31) fully retracted (as shown in the figure).

1. Drive the machine on a level ground and activate the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. Open the hood (48) and secure it with the support rod (67).
4. Disconnect the battery connector (51).
5. Put a waterproof sheet and absorbing clothes under the oil tank (A) to protect the parts under the tank against oil dripping during the removal.

WARNING!
Oil is highly corrosive.

6. Remove the screws (B), then remove the oil tank (A).
7. Empty the oil tank (A) completely.

WARNING!
The discharged oil should be disposed of properly according to the environmental Laws in force.

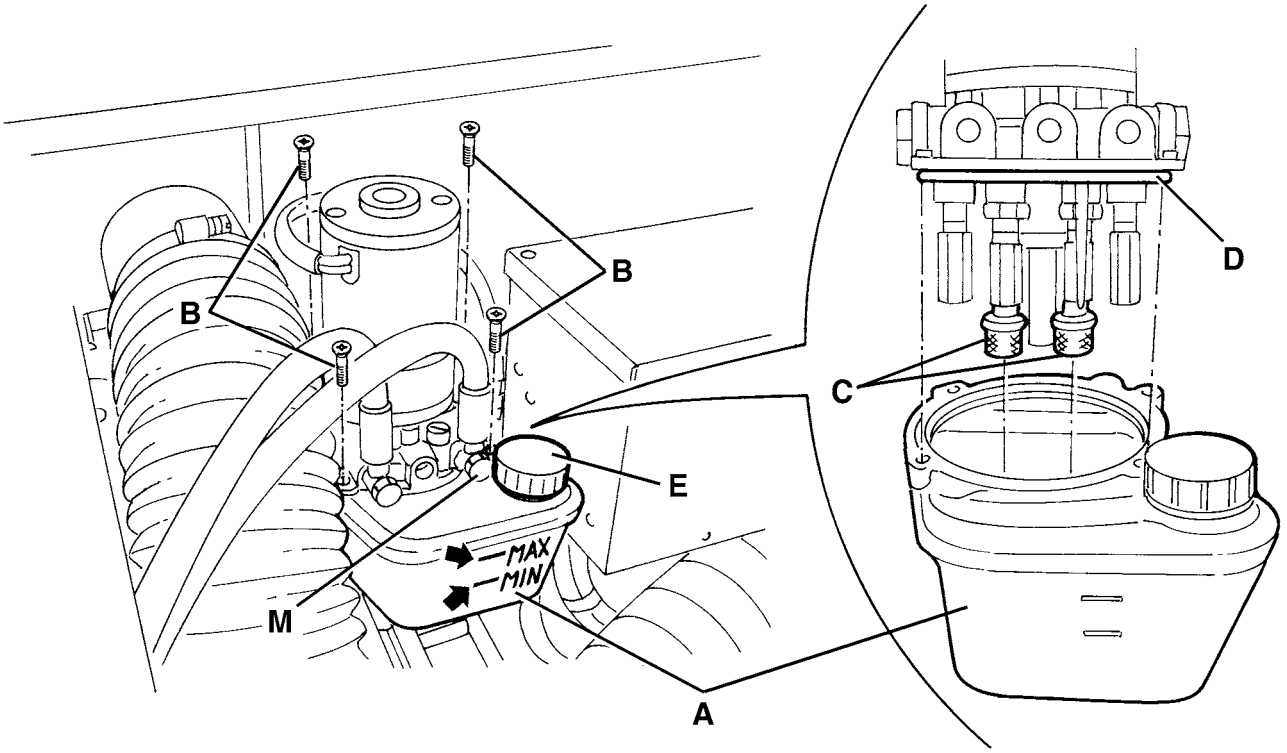
8. Clean the filters (C) with a brush.
9. Remove the mounting screws (G), then remove the right body side (F).
10. Remove the screws (I), then remove the bulkhead (H).
11. Disconnect the hose connection (L) and drain the oil into a container.
12. Connect the connection (L).
13. Reinstall the oil tank (A) and the gasket (D), then fix it with the screws (B).
14. Pour oil (viscosity grade 32 cSt) into the tank (A) through the plug (E) until the oil level reaches the MAX mark (total quantity 1.4 Kg).
15. On the hydraulic unit, disconnect the connection (M) of the hose (N) from the stem side of the hydraulic cylinder and drain the oil into a container.
16. Temporarily connect the battery connector (51).
17. Turn the ignition switch (18) to “I” position.
18. Carefully lift the waste container (31) completely (for the related instructions, see the User Manual) and, at the same time, drain the oil from the hose end (M) into a container.
19. Turn the ignition switch (18) to “0” position.
20. Connect the hose connection (M) to the hydraulic unit.
21. Turn the ignition switch (18) to “I” position.
22. Lower the waste container (31) completely (for the related instructions, see the User Manual).
23. Pour the oil into the tank (A) through the plug (E), until the oil level is between the MIN and MAX marks.

WARNING!
Oil should not be over the above-mentioned intermediate level, otherwise, during the next operations, the oil may flow out of the tank plug (E).

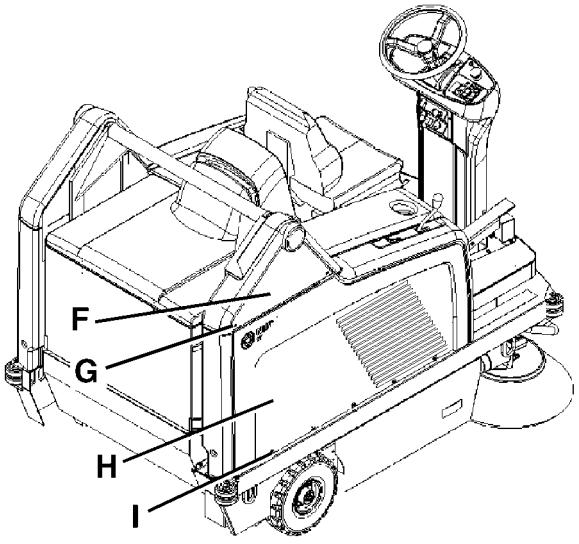
24. Carry out steps from 3 to 5 in the reverse order.
25. Move the waste container (31) to simulate some emptying operations (for the related instructions, see the User Manual).
26. Turn the ignition switch (18) to “0” position.
27. Open the hood (48) and secure it with the support rod (67).
28. Check that the oil level in the tank (A) is between the MIN and MAX marks shown in the figure, otherwise top up, then close the hood (48).

WASTE CONTAINER HYDRAULIC LIFTING SYSTEM

OIL CHANGE (continues)



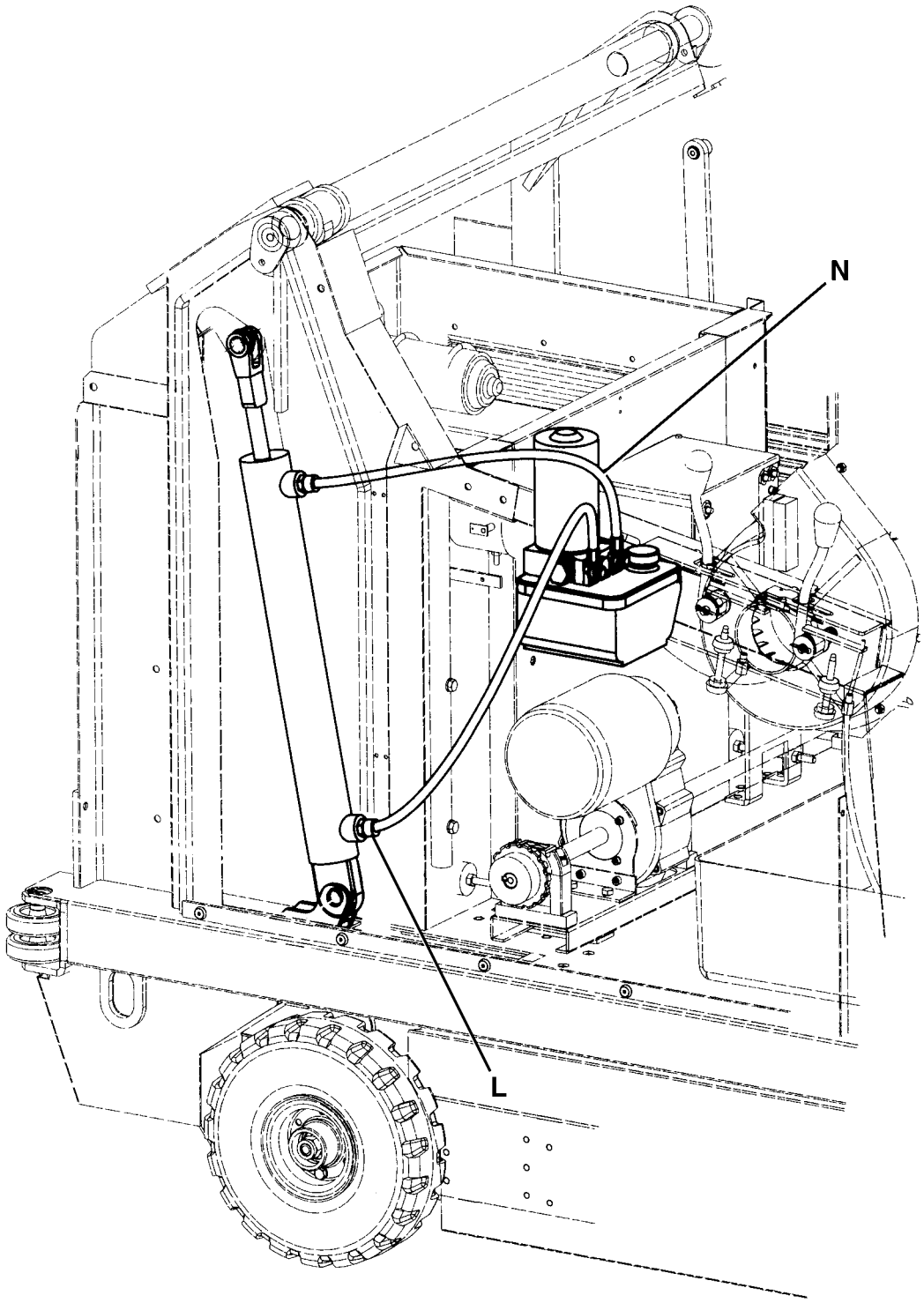
S300598



S300599

WASTE CONTAINER HYDRAULIC LIFTING SYSTEM

OIL CHANGE (continues)



S300600

WASTE CONTAINER HYDRAULIC LIFTING SYSTEM

WASTE CONTAINER LIFTING SYSTEM PUMP REMOVAL

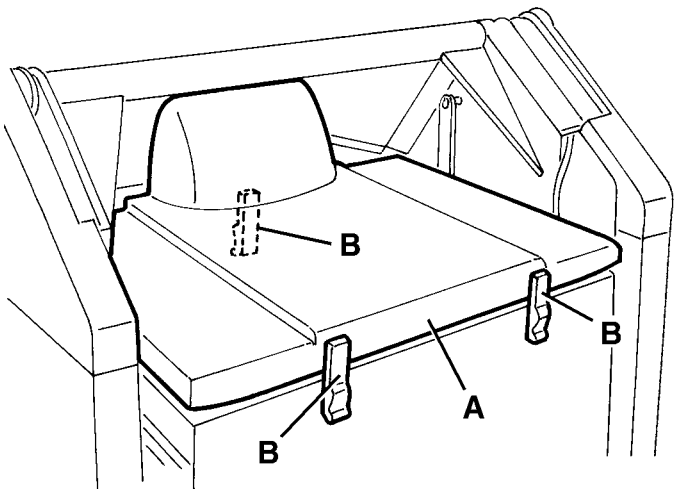
1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Ensure that the waste container (31) is fully retracted.

WARNING!
While removing the pump, the waste container (31) should not be in the lifted position or in intermediate positions, even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks

3. Turn the ignition switch (18) to “0” position.
4. Open the hood (48) and secure it with the support rod (67).
5. Disconnect the battery connector (51).
6. Release the fasteners (B) and remove the dust filter cover (A).
7. Disconnect the electrical connector (C) from the pump.
8. Put a waterproof sheet and absorbing clothes under the pump (D) to protect the parts under the pump from oil dripping during removal.

WARNING!
Oil is highly corrosive.

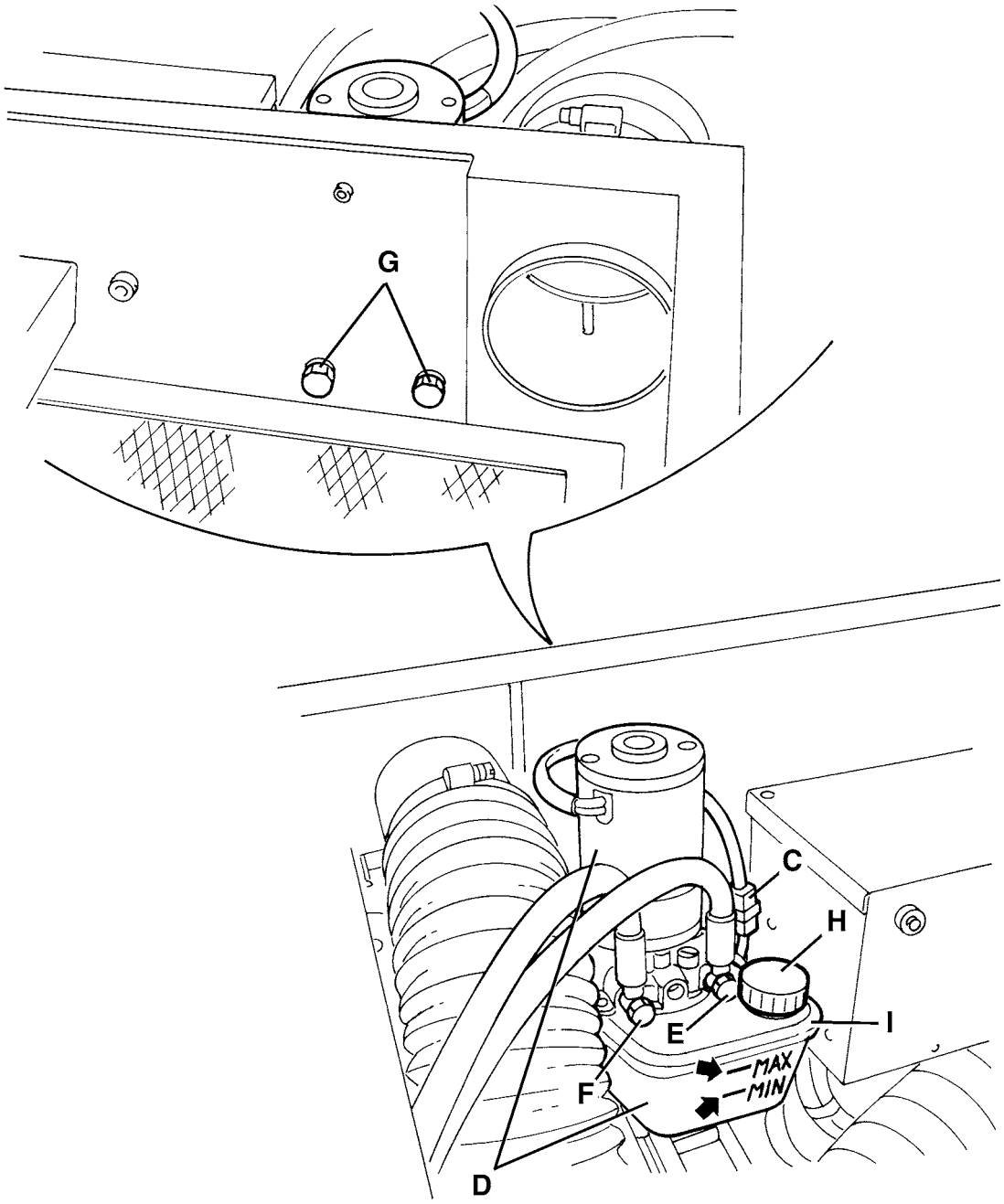
9. Mark the position of the pump fittings (E) and (F) (for a correct assembly), then disconnect them.
10. Operating from the dust filter compartment, remove the screws (G), then remove the pump (D).
11. To assemble, carry out steps from 5 to 10 in the reverse order.
12. Pour the oil in the tank (I) through the plug (H), until the oil level reaches the MAX mark; use oil with 32 cSt viscosity grade only.
13. Disengage the support rod (67) and close the hood (48).
14. Move the waste container (31) to simulate some emptying operations (for the related instructions, see the User Manual).
15. Turn the ignition switch (18) to “0” position.
16. Open the hood (48) and secure it with the support rod (67).
17. Check the pump fittings (E) and (F) for oil leaks.
18. Check that the oil level in the tank (A) is between the MIN and MAX marks shown in the figure, otherwise top up; then disengage the support rod (67) and close the hood (48).



S300601

WASTE CONTAINER HYDRAULIC LIFTING SYSTEM

WASTE CONTAINER LIFTING SYSTEM PUMP REMOVAL (continues)



S300602

WASTE CONTAINER HYDRAULIC LIFTING SYSTEM

WASTE CONTAINER LIFTING HYDRAULIC CYLINDER REMOVAL

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Lift the waste container (A) partially, as shown in the figure, until the hydraulic cylinder upper fork (B) is accessible (for the related instructions, see the User Manual).
   Put a proper stand (C) under the waste container (A).
   Lower the waste container (A) and lay it on the stand (C), so that the pin (D) is free from any load and, therefore, extractible.

WARNING!
While removing the hydraulic cylinder, the waste container (31) will lean completely on the stand (C).

3. Remove the mounting screws (F), then remove the right body side (E).
4. Remove the mounting screws (H), then remove the right bulkhead (G).
5. Remove the snap ring (G).
6. Remove the pin (D) by pushing it inward.
7. Retract the cylinder stem (H) completely by operating the waste container lowering controls (for the related instructions, see the User Manual).

WARNING!
Some protection bulkheads have been removed from the machine, therefore some moving parts are not protected.

8. Mark the position of the cylinder body fittings (I) and (J) (for a correct assembly), then remove them. With absorbing clothes, recover the oil which has flown out.

WARNING!
Oil is highly corrosive.

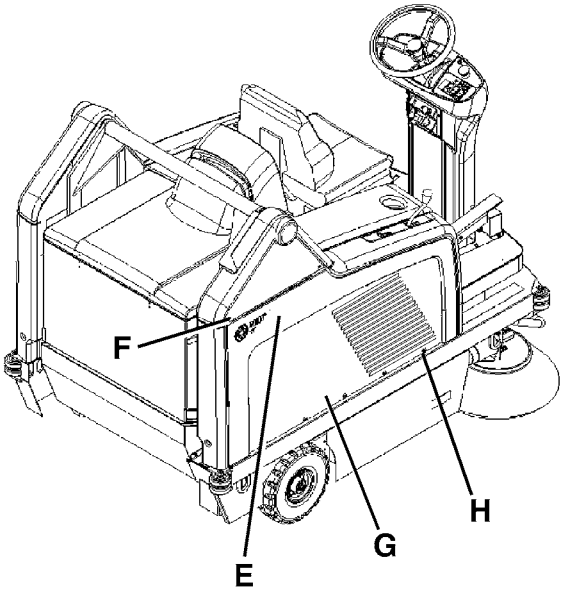
9. Remove the hydraulic cylinder lower mounting screw (K). Recover the shims (L).
10. Remove the hydraulic cylinder (M).
11. Assemble the hydraulic cylinder by carrying out the steps from 5 to 10 in the reverse order.
12. Pour the oil in the tank (N) through the plug (O), until the oil level reaches the MAX mark; use oil with 32 cSt viscosity grade only.
13. Disengage the support rod (67) and close the hood (48).
14. Move the waste container (31) to simulate some emptying operations, then retract it (for the related instructions, see the User Manual).

WARNING!
Some protection bulkheads have been removed from the machine, therefore some moving parts are not protected.

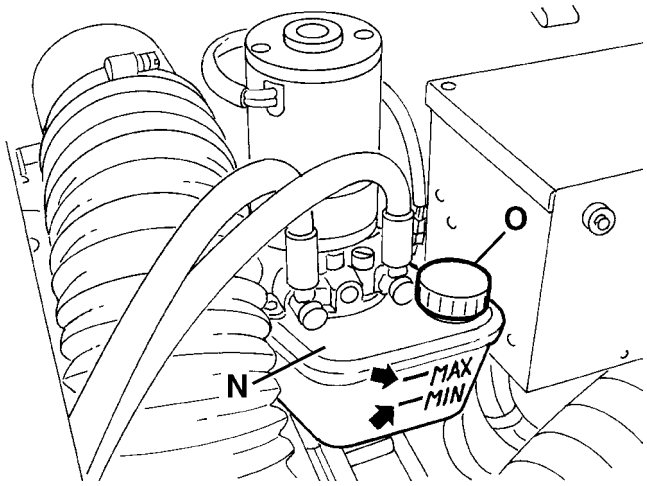
15. Turn the ignition switch (18) to “0” position.
16. Open the hood (48) and secure it with the support rod (67).
17. Check the hydraulic cylinder fittings (I) and (J) for oil leaks.
18. Check that the oil level in the tank (N) is between the MIN and MAX marks shown in the figure, otherwise top up; then disengage the support rod (67) and close the hood (48).
19. Assemble the right bulkhead (G) and fix it with the related mounting screws (H).
20. Assemble the right body side (E) and fix it with the related mounting screws (F).

WASTE CONTAINER HYDRAULIC LIFTING SYSTEM

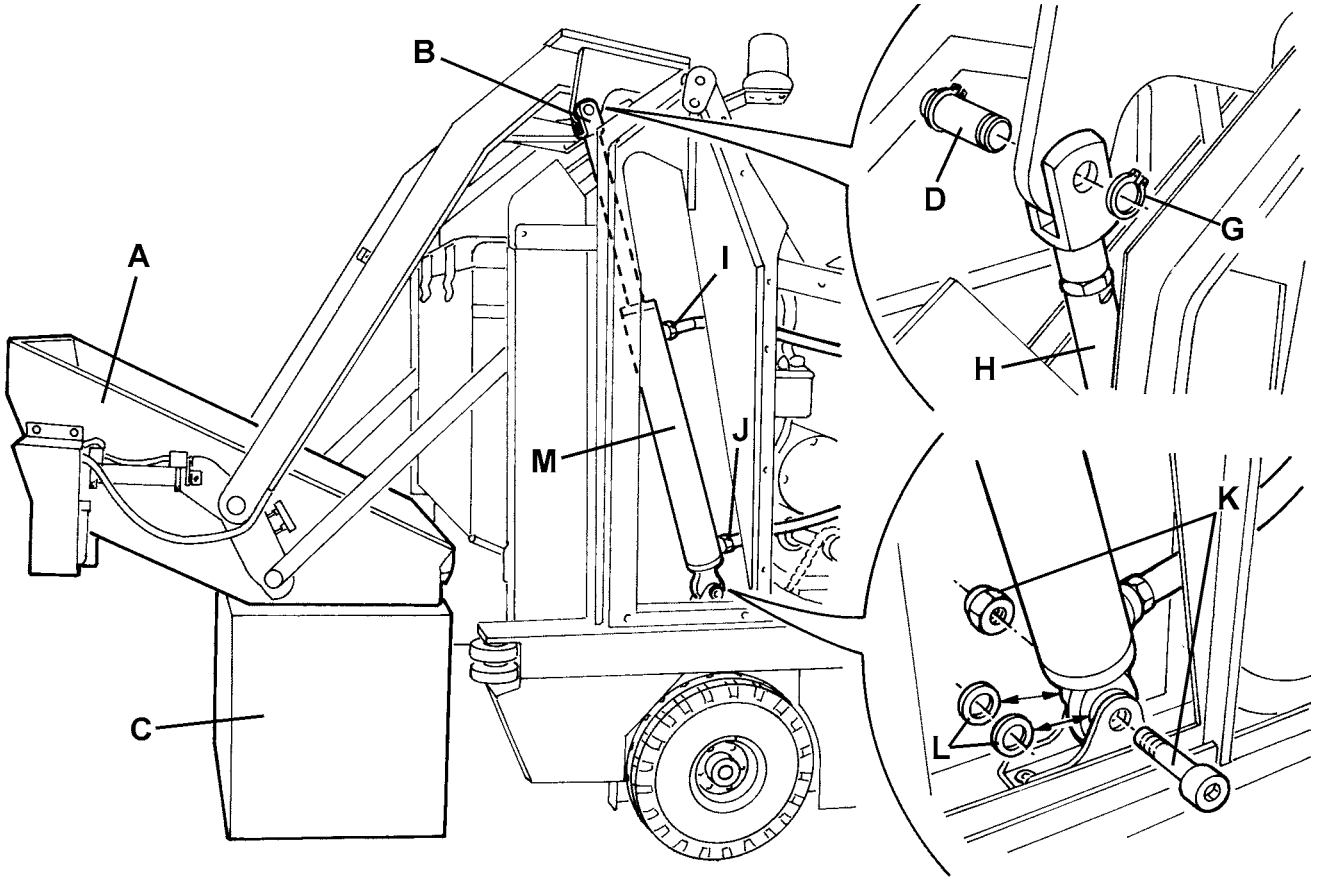
WASTE CONTAINER LIFTING HYDRAULIC CYLINDER REMOVAL (continues)



S300603



S300604



L310010

WASTE CONTAINER HYDRAULIC LIFTING SYSTEM

PUMP-TO-HYDRAULIC CYLINDER FEED AND/OR RETURN HOSES REMOVAL

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Ensure that the waste container (A) is completely retracted.

WARNING!
While removing the pump, the waste container (31) should not be in the lifted position or in intermediate positions, even if the waste container lifting hydraulic cylinder is equipped with a parachute valve which prevents the waste container from lowering suddenly in case a hose breaks or leaks

3. Remove the mounting screws (C), then remove the right body side (B).
4. Remove the mounting screws (E), then remove the right bulkhead (D).
5. Mark the position of the cylinder body fittings (F) and/or (G) (for a correct assembly), then remove them. With absorbing clothes, recover the oil which has flown out.

WARNING!
Oil is highly corrosive.

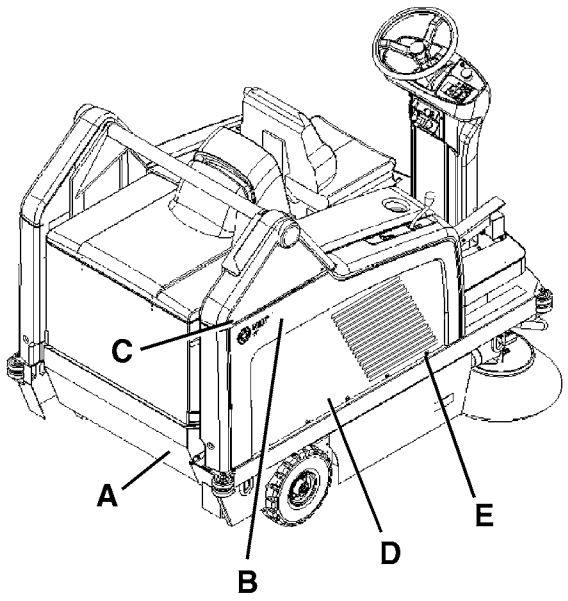
6. Put absorbing clothes under the pump (H) to protect the parts under the pump from oil dripping during hose removal.
7. Mark the position of the cylinder body fittings (I) and/or (J) (for a correct assembly), then remove them.
8. Remove the hoses (K) and/or (L).
9. Assemble the hoses by carrying out the steps from 5 to 8 in the reverse order.
10. Pour the oil in the tank (H) through the plug (M), until the oil level reaches the MAX mark; use oil with 32 cSt viscosity grade only.
11. Disengage and place the support rod (67) in its housing and close the hood (48).
12. Move the waste container (31) to simulate some emptying operations, then retract it (for the related instructions, see the User Manual).

WARNING!
Some protection bulkheads have been removed from the machine, therefore some moving parts are not protected.

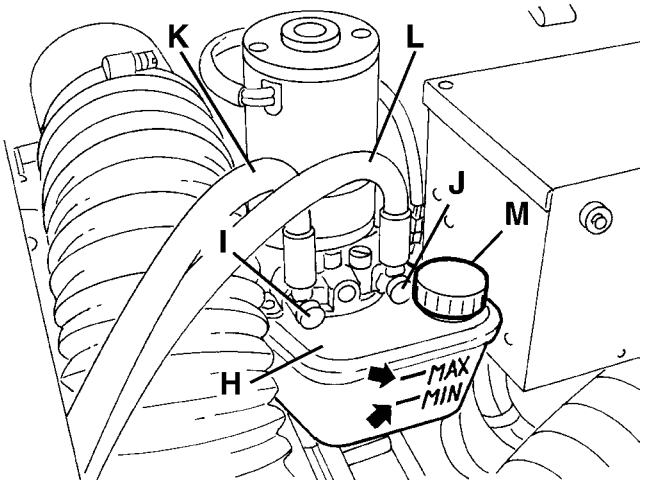
13. Turn the ignition switch (18) to “0” position.
14. Open the hood (48) and secure it with the support rod (67).
15. Check the hydraulic cylinder fittings (F) and/or (G) and the pump fittings (I) and/or (J) for oil leaks.
16. Check that the oil level in the tank (H) is between the MIN and MAX marks shown in the figure, otherwise top up; then disengage the support rod (67) and close the hood (48).
17. Assemble the right bulkhead (B) and fix it with the related mounting screws (C).
18. Assemble the right body side (D) and fix it with the related mounting screws (E).

WASTE CONTAINER HYDRAULIC LIFTING SYSTEM

PUMP-TO-HYDRAULIC CYLINDER FEED AND/OR RETURN HOSES REMOVAL (continues)



S300606



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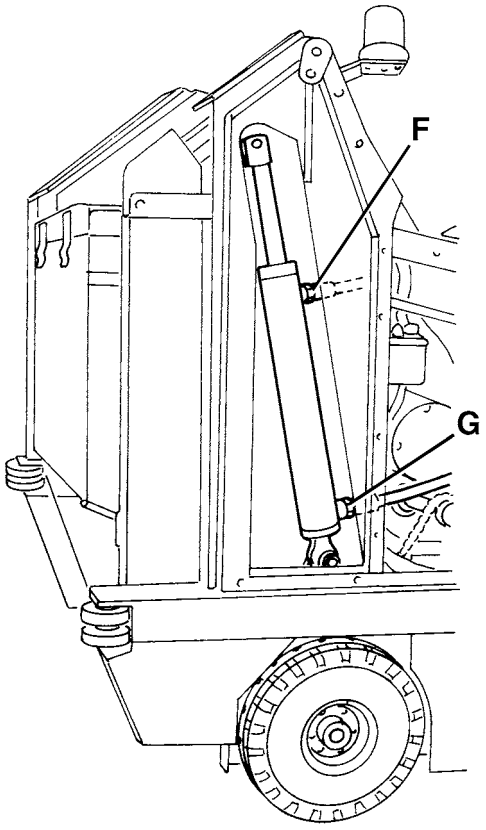
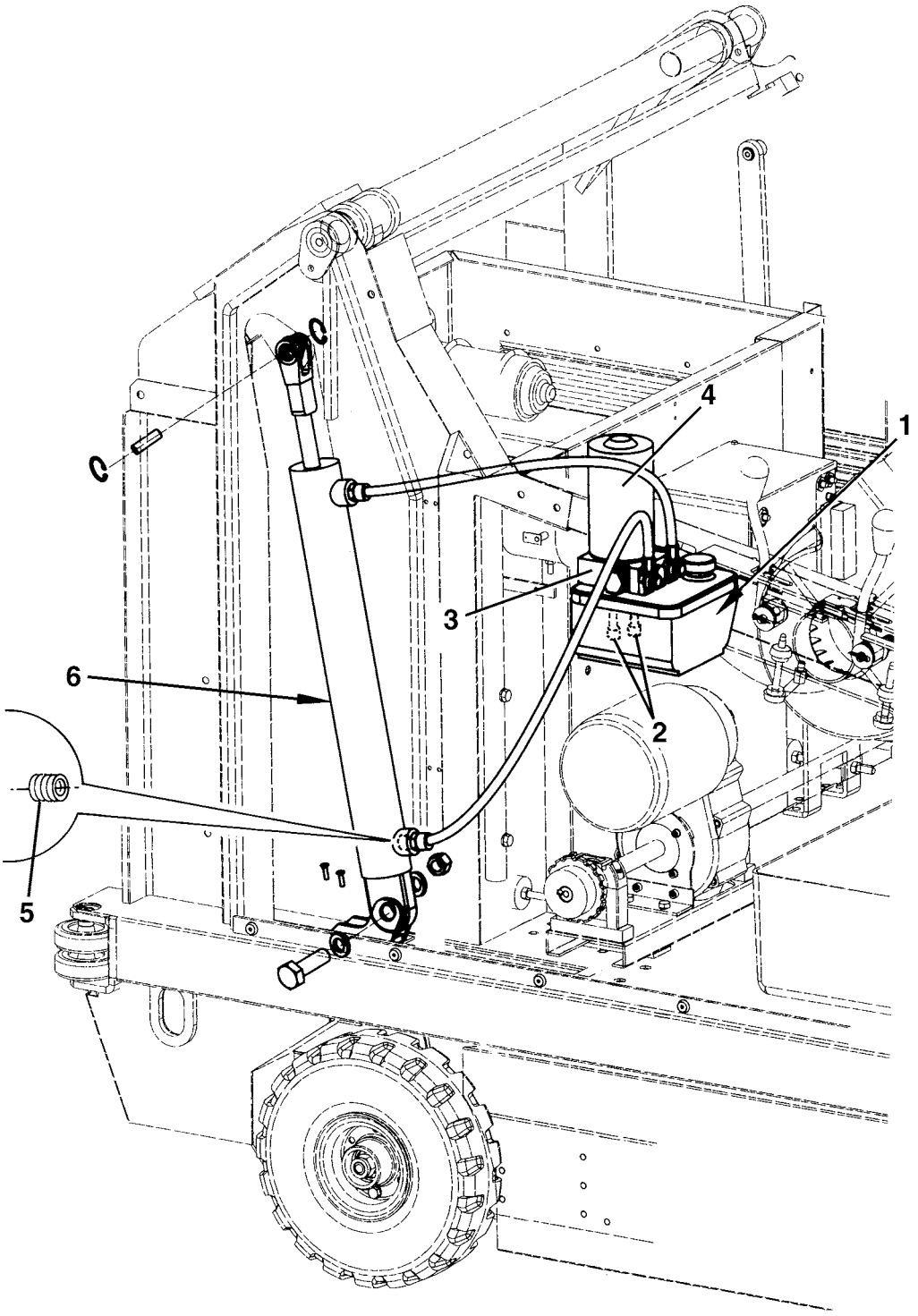


S300608

WASTE CONTAINER HYDRAULIC LIFTING SYSTEM

COMPONENT LAYOUT

1. Oil tank
2. Oil filter
3. Pump
4. Propulsion motor
5. Parachute valve
6. Waste container lifting hydraulic cylinder



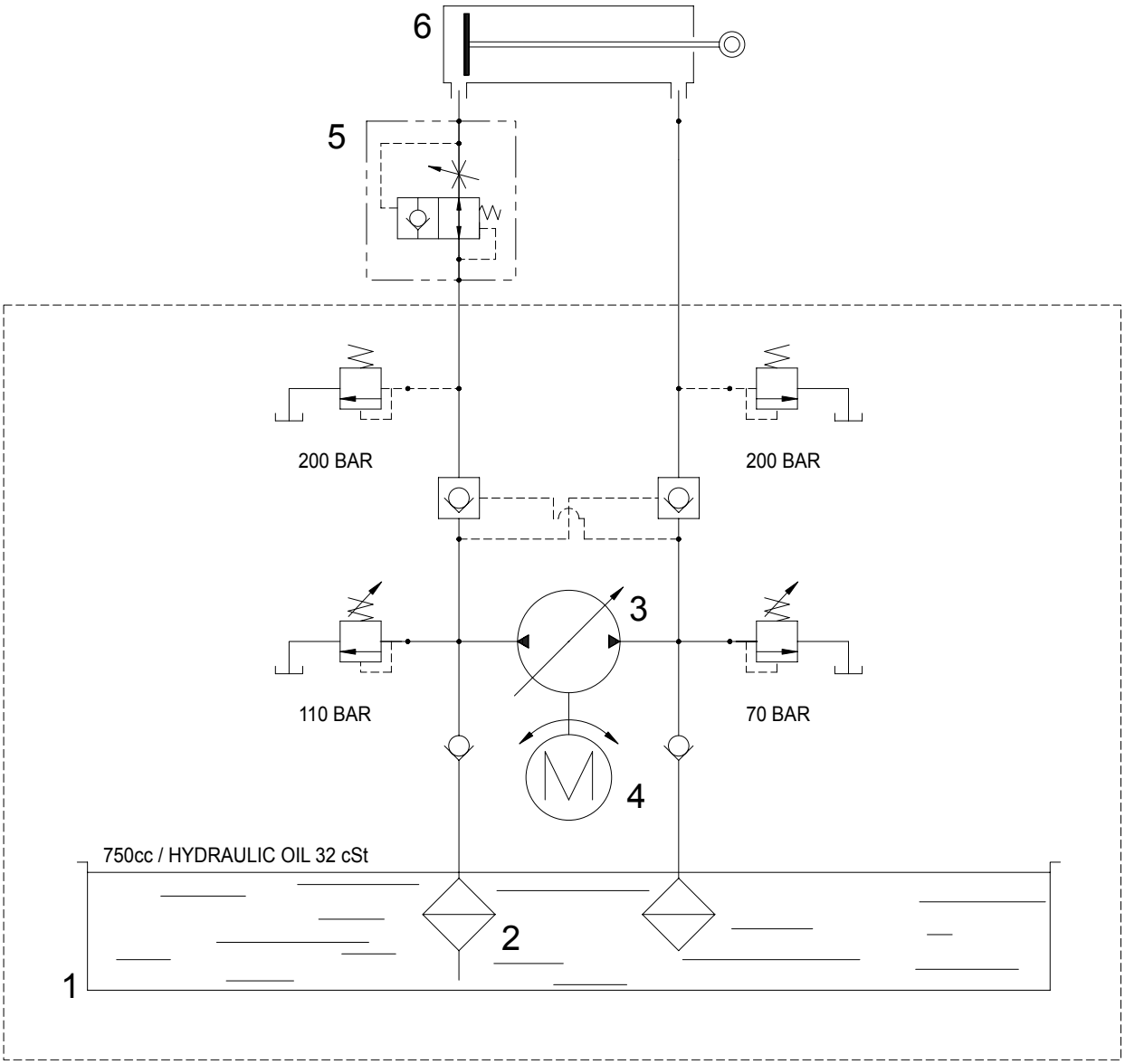
S300609

WASTE CONTAINER HYDRAULIC LIFTING SYSTEM

HYDRAULIC DIAGRAM

KEY

1. Oil tank
2. Oil filter
3. Pump
4. Propulsion motor
5. Parachute valve
6. Waste container lifting hydraulic cylinder



S300610

ELECTRICAL SYSTEM

BATTERY REMOVAL, INSTALLATION, MAINTENANCE AND CHARGING

See the User Manual

FUSE REPLACEMENT

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. Open the hood (48) and secure it with the support rod (67).
4. Disconnect the battery connector (51).

LAMELLAR FUSE REPLACEMENT

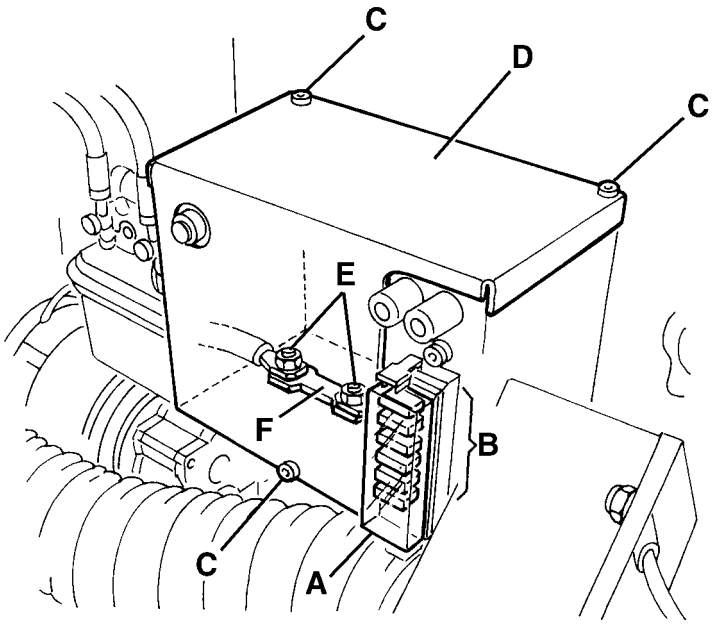
5. Remove the cover (A).
6. Remove the relevant fuse among the following fuses (B):
   - F1 fuse (15A) (the first starting from above): Ignition key
   - F2 fuse (20A): Pump
   - F3 fuse (10A): Waste container actuator
   - F4 fuse (15A): Filter shaker
   - F5 fuse (10A): Services
   - F6 fuse (10A): Working lights (optional)
   - Spare fuse 1 (20A)
   - Spare fuse 2 (15A)

MAIN FUSE REPLACEMENT

7. Remove the screws (C), then remove the cover (D).
8. Remove the nuts (E).
9. Remove the following fuse (F):
   - F0 fuse (150 A): Main

ASSEMBLY

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

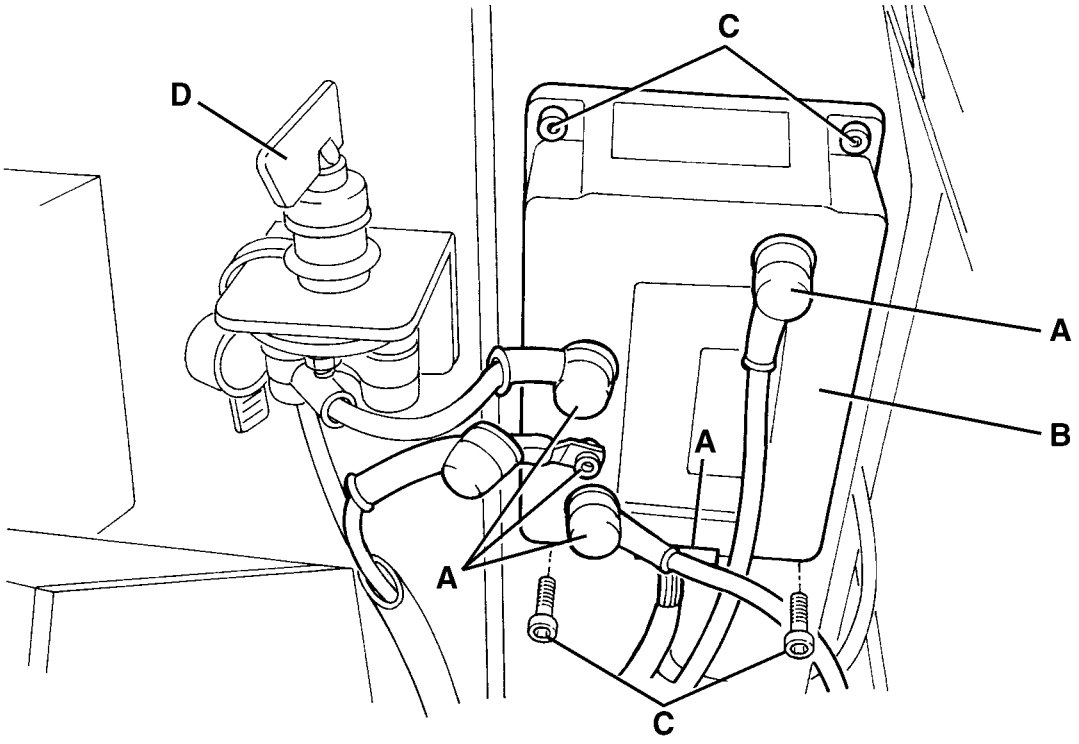


S300611

DRIVE ELECTRONIC BOARD REPLACEMENT

NOTE
After the new drive electronic board installation, neither the machine nor the electronic board should be reprogrammed.

1. Drive the machine on a level ground and engage the parking brake with the pedal and the lever (26 and 19).
2. Turn the ignition switch (18) to “0” position.
3. Open the hood (48) and secure it with the support rod (67).
4. Disconnect the battery connector (51).
5. Disconnect the electrical connections (A) from the drive electronic board (B).
6. Remove the screws (C) and the drive electronic board (B).
7. Assemble the components in the reverse order of disassembly.

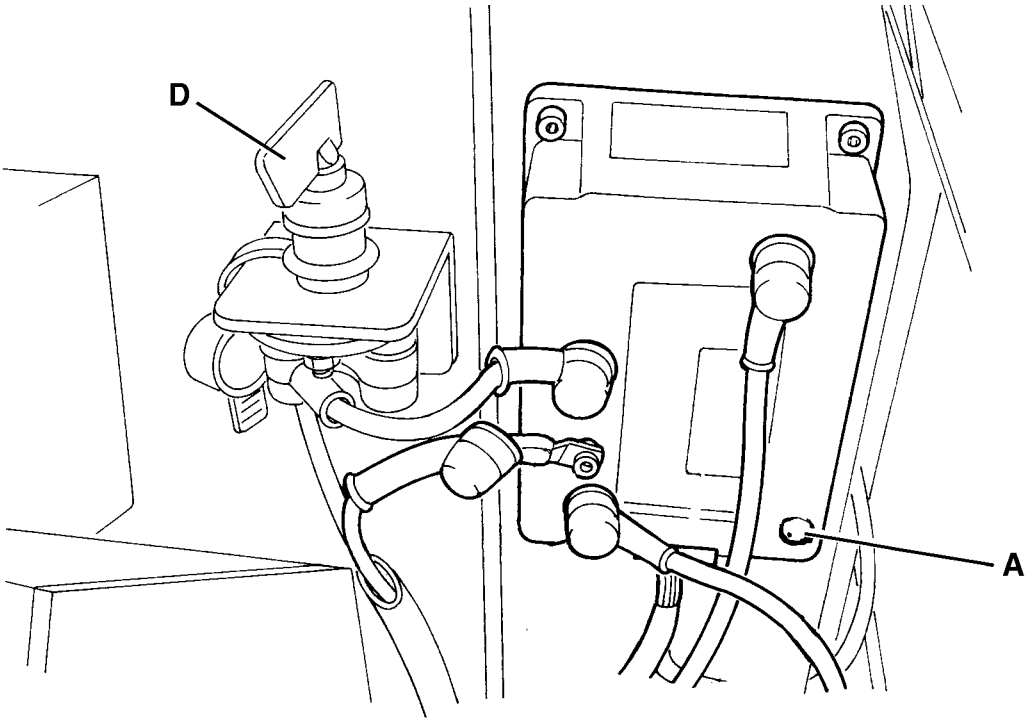


S300612

ELECTRICAL SYSTEM

TROUBLESHOOTING

In case of drive system malfunction, check if the drive system electronic board diagnostic warning light (A) turns on. Check the number of flashes and refer to the following table:



S300613A

TROUBLESHOOTING (continues)

N.° flashes	Description	Causes and solutions
1	The pedal is pressed upon ignition.	Check that the accelerator pedal is in neutral position. Turn off the machine and then turn it on again.
2	The battery voltage is low.	Check that the batteries are charged and not faulty. Charge the batteries, or replace them if necessary.
3	Not used.	
4	Open circuit in the motor.	The connection between the electronic board and the motor is damaged. Replace it.
5	The electronic board is damaged.	Replace it.
6	The accelerator potentiometer is faulty.	Check the wiring harness between the pedal and the electronic board. Replace the pedal electronic board.
7	The temperature is too high	Let the machine cool down and retry. Check the drive system motor electrical input as shown in the relevant paragraph.
8	The machine has been turned on with the ignition key while it was moving	The machine must be turned on and off only when it is stationary.
9	The electronic board is damaged.	Replace it.
10	Overcurrent in the motor.	Check for short-circuits in the wiring harness between the electronic board and the motor; if necessary replace the drive system motor.
11	The electronic board is damaged.	Replace it.
12	The electronic board is damaged.	Replace it.
13	The electronic board is damaged.	Replace it.
14	The electronic board is damaged.	Replace it.

TROUBLESHOOTING

See the previous chapters related to the use of the electrical system.
Other possible causes:

1. Discharged battery or inefficient connections (charge the battery or clean the connections).
2. Blown fuses (replace).
3. Defective battery electrical connector (replace).
4. The wiring harness is cut, squashed or shorted (repair).

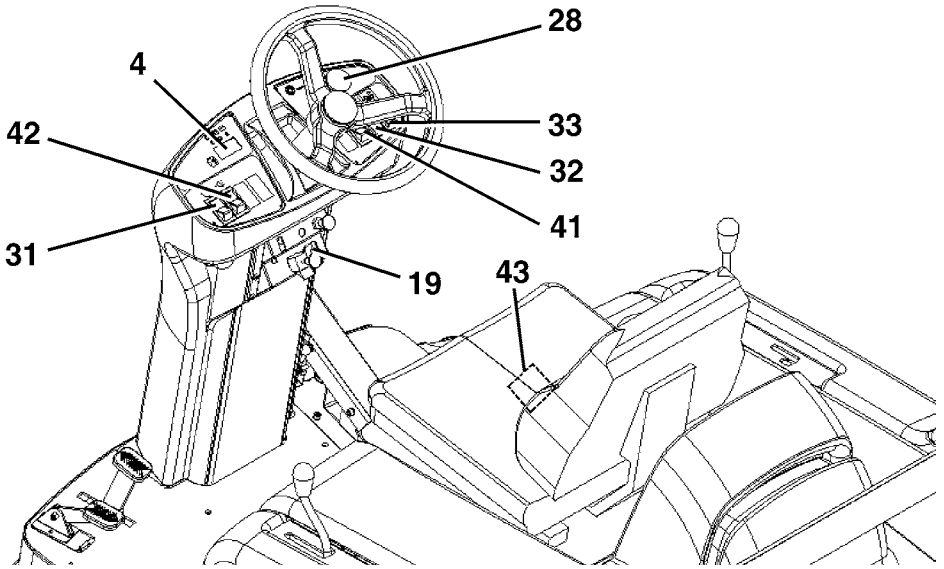
ELECTRICAL SYSTEM

COMPONENT LAYOUT

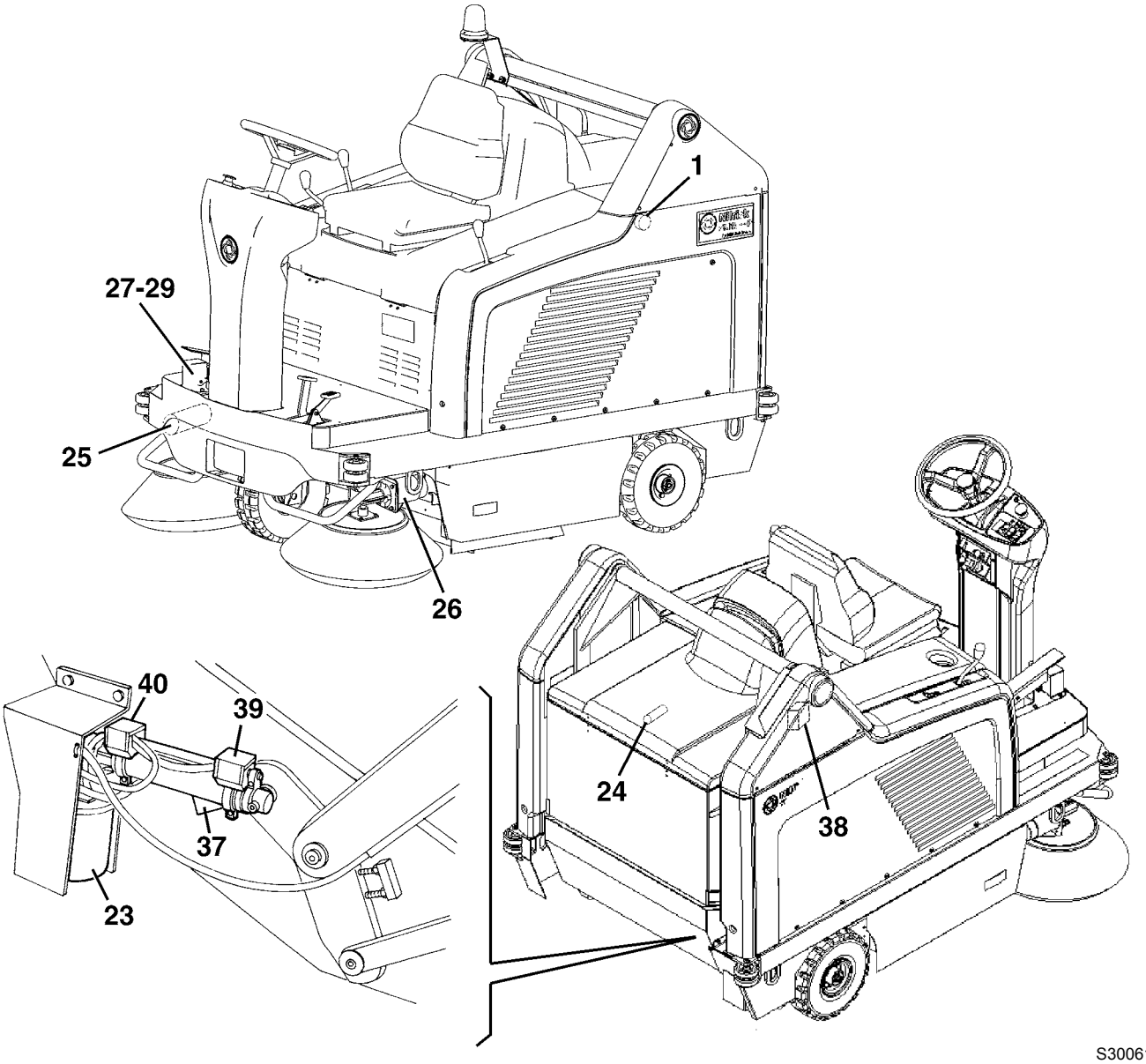
NOTE
The symbol in brackets after the name of the component refers to the wiring diagram (see the following pages).

BZ1: Reverse gear warning buzzer
C1: Battery connector
EB1: Drive electronic board
EB2: Display board
ES1: Line electromagnetic switch
ES2: Main broom electromagnetic switch
ES3: Pump relay
ES4: Pump relay
F0: Main fuse
F1: Key fuse
F2: Pump fuse
F3: Waste container actuator fuse
F4: Filter shaker fuse
F5: Service fuse
F6: Working light fuse (optional)
F7: Right side broom resettable thermal fuse
F8: Left side broom resettable thermal fuse
F9: Main broom resettable thermal fuse
K1: Key switch
M1: Drive motor
M2: Main broom motor - vacuum fan
M3: Pump
M4: Actuator
M5: Filter shaker motor
M7: Right side broom motor
M8: Left side broom motor
R1: Accelerator potentiometer (pedal in-built)
SW0: Emergency push-button
SW1: Forward/reverse gear switch (pedal in-built)
SW2: Main broom microswitch
SW3: Waste container enabling switch
SW4: Waste container lifting/lowering switch
SW5: Waste container overturning switch
SW6: Towing switch
SW6: Right side broom microswitch
SW8: Left side broom microswitch
SW9: Waste container horizontal position microswitch
SW10: Waste container lifted position microswitch
SW11: Waste container opened position microswitch
SW12: Waste container closed position microswitch
SW13: Filter shaker switch
SW15: Horn switch
SW17: Safety microswitch (in the seat)
Batteries
Battery assembly diagram

COMPONENT LAYOUT (continues)



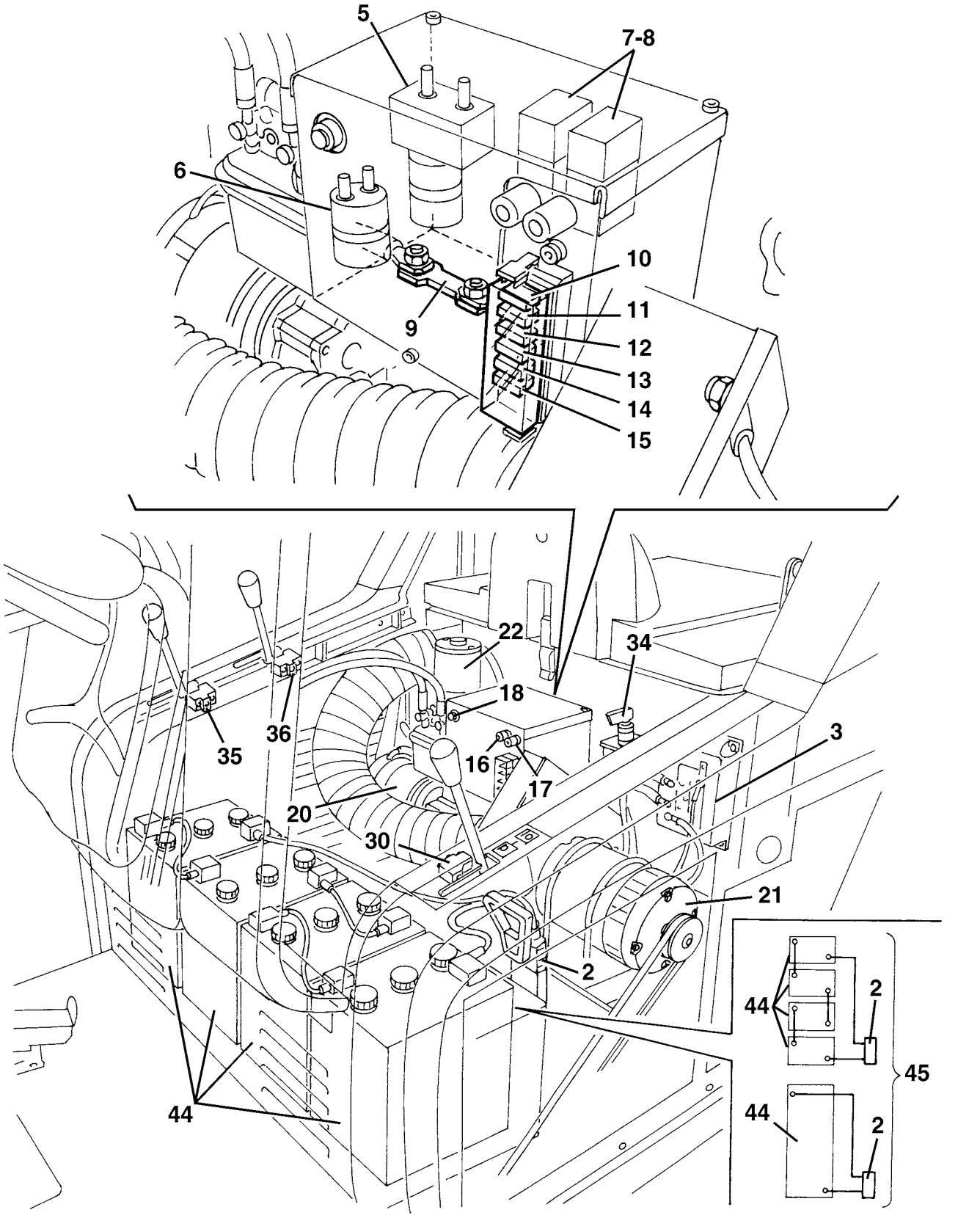
S300613



S300614

ELECTRICAL SYSTEM

COMPONENT LAYOUT (continues)



S300615

WIRING DIAGRAM

KEY:

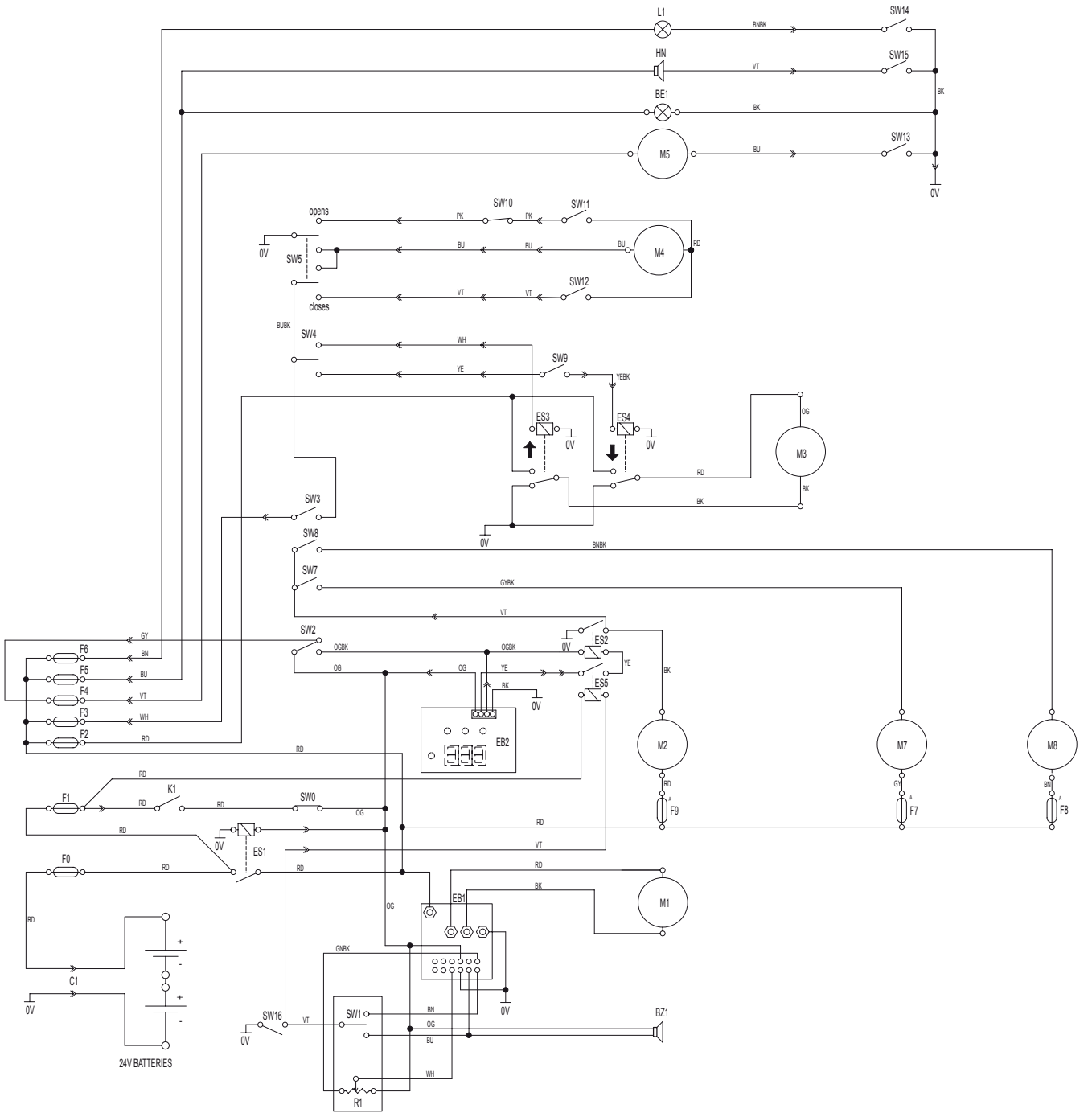
BE1: Beacon (optional)
BZ1: Reverse gear buzzer
C1: Battery connector
EB1: Drive electronic board
EB2: Display board
ES1: Line electromagnetic switch
ES2: Main broom electromagnetic switch
ES3: Pump relay
ES4: Pump relay
ES5: Seat switch
F0: Main fuse
F1: Key fuse
F2: Pump fuse
F3: Waste container actuator fuse
F4: Filter shaker fuse
F5: Service fuse
F6: Working light fuse (optional)
F7: Right side broom resettable thermal fuse
F8: Left side broom resettable thermal fuse
F9: Main broom resettable thermal fuse
K1: Ignition switch
L1: Working light (optional)
M1: Drive motor
M2: Main broom motor
M3: Pump
M4: Actuator
M5: Filter shaker motor
M7: Right side broom motor
M8: Left side broom motor
R1: Accelerator potentiometer (pedal in-built)
SW0: Emergency push-button
SW1: Forward/reverse gear switch (pedal in-built)
SW2: Main broom microswitch
SW3: Waste container switch
SW4: Waste container lifting/lowering switch
SW5: Waste container overturning switch
SW7: Right side broom microswitch
SW8: Left side broom microswitch
SW9: Waste container horizontal position microswitch
SW10: Waste container lifted position microswitch
SW11: Waste container opened position microswitch
SW12: Waste container closed position microswitch
SW13: Filter shaker switch
SW15: Horn switch
SW16: Safety microswitch (in the seat)

COLOUR CODES

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

ELECTRICAL SYSTEM

WIRING DIAGRAM (continues)



S300616

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