SB, Auto Mower, Solar Mower, Connectors, 2001-03

1. General

Auto Mower and Solar Mower model 2001 are equipped with a different type of electric connector than the previous model years 1998, 1999 and 2000. This new connector type is part of a program to improve the reliability of the Auto Mower and the Solar Mower.

The new connector type is used between the control box and

- the rectifier
- the battery
- the solar panels.

The transformer and charging station (Auto Mower) use the same connector type as the previous model years.

All spare part batteries, control boxes and solar panels are available with the new connector type only. This means that when a defective model 1998, 1999 or 2000 mower must have any of these parts replaced, an adapter cable must be used.

Eight different adapter cables are available for different applications. When a replacement control box, battery or solar panel is ordered the appropriate adapter cable must be ordered separately. To select the right adapter cable, please refer to tables 1, 2 and in special cases 3.

The old model 1998, 1999 and 2000 connector type has a socket/pin combination which is round. The new model 2001 connector type has a socket/pin combination which is square. See figure 1. The round and the square connectors are not compatible. Therefore a round and a square connector type must never be connected.

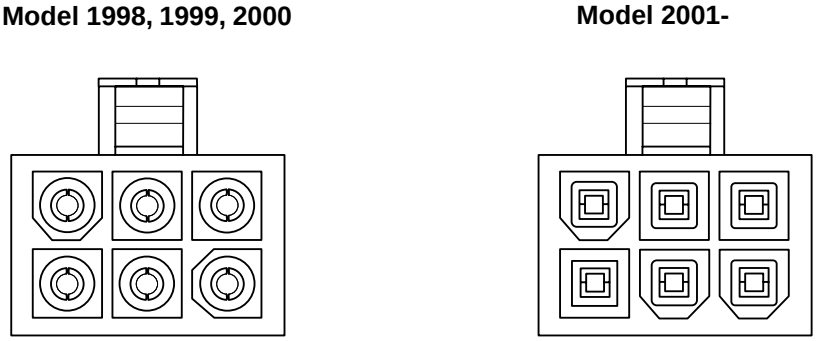


Figure 1. Old and new battery connector

2. Adapter cable selection tables

The below tables 1-3 are applicable for Auto and Solar mower models 1998, 1999 and 2000 only.

Table 1. Adapter cable selection guide — Auto Mower

	Reason for service	Replacement of parts			
		Electric part		Cable 1	Cable 2
		Part number	Description		
1	Replacement of battery because of end of life.	535 09 62-01	AM 2001 battery	535 10 02-01	—
2	Replacement of defective control box. Battery is ok.	535 09 56-01	AM 2001 control box	535 10 03-01	535 09 64-01
3	1-6 battery sockets damaged	—	—	535 09 96-01	—
4	Sockets in rectifier-control box cable damaged	—	—	535 06 80-01	—

Table 2. Adapter cable selection guide — Solar Mower

	Reason for service	Replacement of parts			
		Electric part		Cable 1	Cable 2
		Part number	Description		
1	Replacement of battery because of end of life.	535 0970-01	SM 2001 battery	535 10 02-01	—
2	Replacement of defective control box. Battery is ok.	535 09 55-01	SM 2001 control box	535 10 03-01	535 10 01-01
3	1-6 battery sockets damaged	—	—	535 09 96-01	—
4	Replacement of solar panel because of defective panel	535 09 94-01 535 09 95-01	SM 2001 front panel SM 2001 rear panel	535 10 14-01	—
5	1-2 sockets in solar panel cable damaged	—	—	535 09 99-01	—

Table 3. Adapter cable selection guide — Auto Mower (applicable only if a model 2001 rectifier is used).

	Reason for service	Execution of control box	Replacement of parts			
			Electric part		Cable 1	Cable 2
			Part number	Description		
1	Mounting of model 2001 rectifier	Original	535 09 45-01	AM 2001 rectifier	535 09 64-01	535 09 98-01
2	Mounting of model 2001 rectifier	AM 2001	535 09 45-01	AM 2001 rectifier	535 09 69-01	535 09 98-01

3. Identifying a defective cable connector

A number of the model 2000 Auto and Solar Mower have had problems with some of the electric connectors. These connection problems are usually intermittent, i.e. they appear only periodically, which makes the fault tracing difficult. The problems have been more frequent on the model 2000 than on the previous models 1998 and 1999.

Typical fault symptoms of the Auto Mower have been the fault message “trapped” although the mower was not trapped and of the Solar Mower “night mode” despite good light conditions. The symptom of the problem will be different depending on which of the sockets that is defective. The complete table of symptoms and their cause is shown in table 4 below.

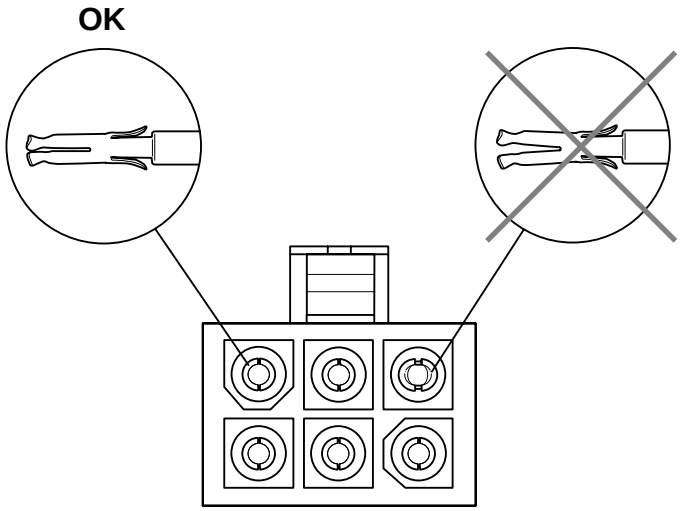


Figure 2. Damaged socket in the battery connector

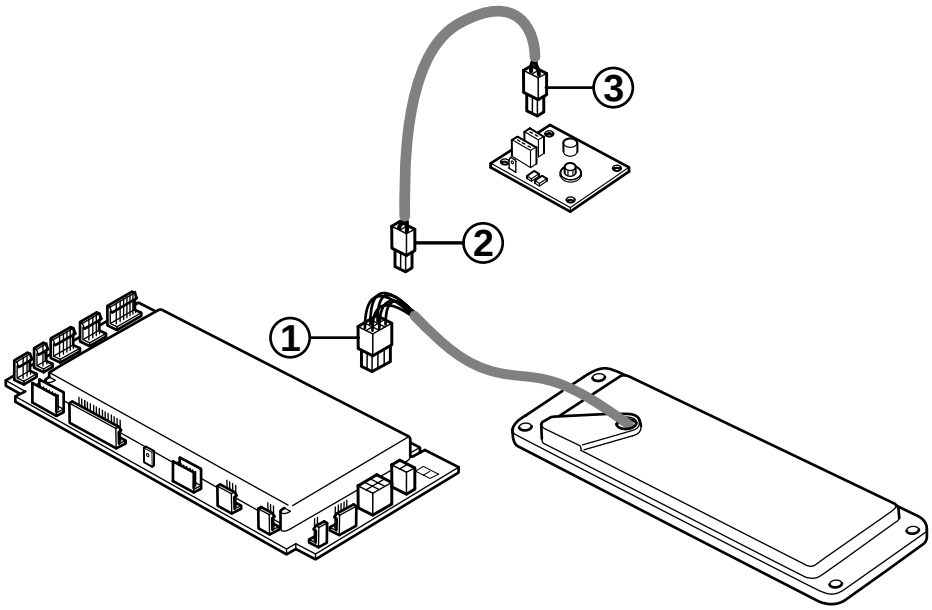


Figure 3. Auto Mower sockets with known problems. Mainly 1 but occasionally also 2 and 3.

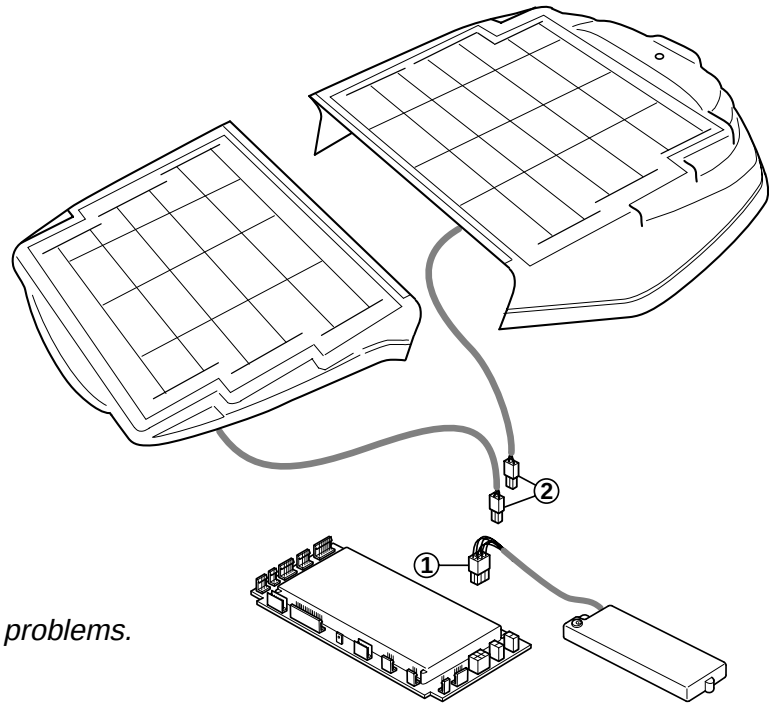


Figure 4. Solar Mower sockets with known problems.

4. General Inspection

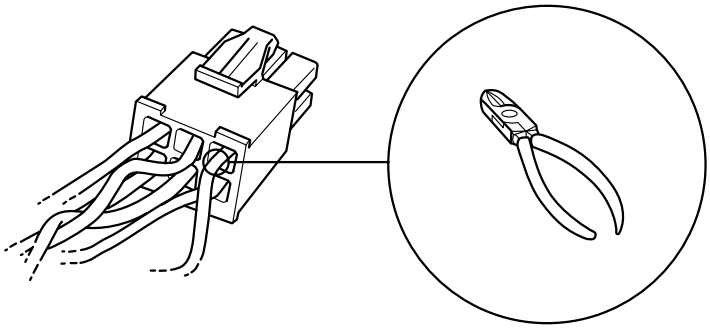
When a model 2000 Auto or Solar Mower comes in for service it must be inspected regarding all the potentially damaged connector sockets shown in figures 3 and 4. Faulty connectors must be replaced using the cable repair kits 535 09 96-01 and 535 09 99-01 or rectifier-to-control box cable 535 09 64-01.

5. Instruction for mounting the socket repair cables 535 09 96-01 and 535 09 99-01

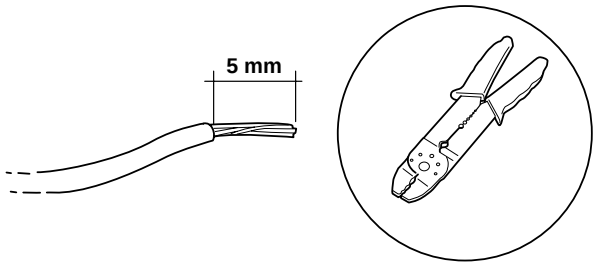
The below instruction is written for the six-pole battery connector 535 09 96-01. The instruction applies to the two-pole solar panel cable 535 09 99-01 also, except there is no risk for short circuit in the solar panels. However, the polarity of the two panel wires must not be changed in the connector.

1. Disconnect and remove the battery from the mower (2,5 mm Allen key).

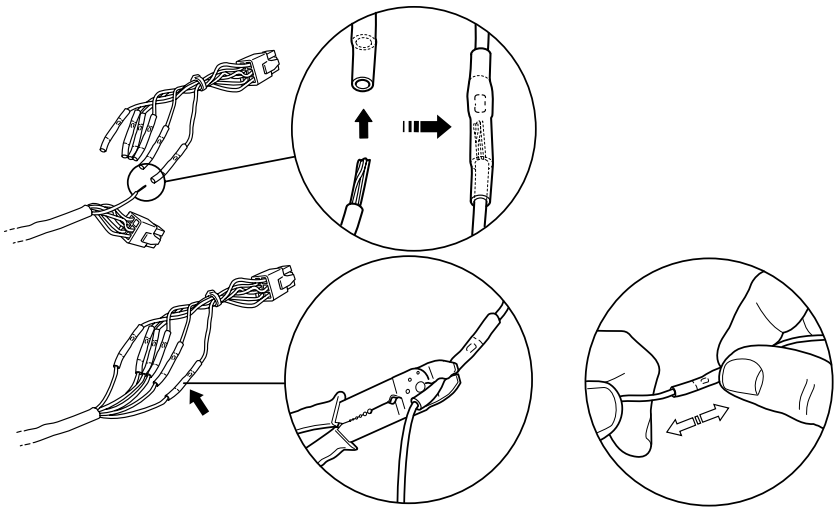
2. Cut off one (any) of the six wires as close to the white connector as possible (side cutter). Do not cut more than one wire at the time. Should two wires be short circuited the battery may be destroyed!



3. Remove 5 mm of the insulation. Make sure not to cut any of the copper strands. (side cutter or isolation removal pliers).



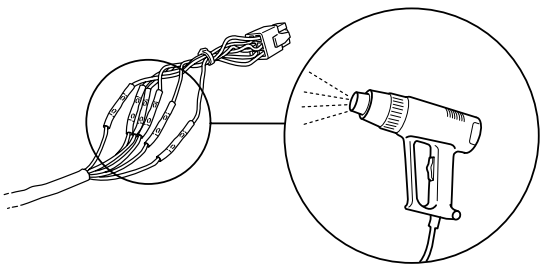
4. Insert the wire with the 5 mm of bare copper in the round connector with the same wire colour and crimp it (crimping pliers). Test the crimping by pulling the wire back out from the round connector.



5. Repeat points 2-4 until all six wires have been crimped.

6. Carefully heat the six round crimped connectors (heat gun). The connectors contain glue which will melt from the heat and help to provide an electrically and mechanically stable connection.

   Warning! Overheating will damage the wire insulation which may damage the battery and cause functional problems in the mower.



7. Connect and mount the battery again (2,5 mm Allen key).

6. Fault symptoms of damaged connectors

Not all of the symptoms listed in table 4 are caused by a defective connection. While fault tracing this table of symptoms and their causes must be combined with the general fault tracing tables in the dealer handbook 2000 (part number 101 91 08-nn).

Table 4. Fault symptoms, faulty battery connector, Auto Mower model 1999B and 2000

Fault symptom	***When does problem occur?***	***Which battery wire is causing the problem?***		***What happens when the connection comes back?***
		Colour	***Function***	
The mower signals ”trapped”	During running	Red	12 V +	Nothing. When the fault message is reset by operating the rear panel the mower will start running normally.
The mower is ”dead”	During running or charging	Black	12 V earth	Running: Starts up again Charging: Resumes charging
		Yellow	Mikroproc. +	
A relay is oscillating at high frequency. It sounds like a buzzer.	During charging	Red	12 V +	The relay stops oscillating and the mower resumes charging.
A relay is oscillating at low frequency. “click-click-click”, like a clock.	During charging	Black	12 V earth	The relay stops oscillating and the mower resumes charging.
The mower stays in the charging station for several hours, even with a well charged battery..	During charging	Yellow	Mikroproc. +	The mower will resume charging and leave the charging station when the battery is charged.
The mower signals “Cannot find charging station” 1)	During running	Brown	Mikroprocessor earth	Nothing. When the fault message is reset by operating the rear panel the mower will start running normally.
		Green	Temperature measurement –	The temperature measurement will start functioning again and the mower will be able to stay in the charging station until the battery is fully charged.
		Blue	Temperature measurement +	
The mower is stationary and the blade disc is spinning very slowly	During start-up	Brown	Mikroprocessor earth	The mower will start normally.
The mower signals ”wheel motor blocked” 2)	During running	Red	12 V +	Nothing. When the fault message is reset by operating the rear panel, the mower will start running normally.
The mower signals ”cannot detect loop signal” 2)	During start-up	Red	12 V +	Nothing. When the fault message is reset by operating the rear panel, the mower will start running normally.

1) This fault message is more likely caused by other problems. Please refer to chapter 12.4.1 of the dealer handbook 2000.
2) Valid only for Auto Mower model -98 or -99 without tilt sensor and equipped with control box 535 0882-02 or 535 0801-02 (1999B).

Table 5. Fault symptoms, defective solar panel or rectifier cable connector, all models.

Fault symptom	When does problem occur?	Which connector is causing the problem?	What happens when the connection comes back?
The Solar Mower signals ”night mode” despite good light conditions	During running or charging	Any of the two sockets in the solar panel connectors X15 or X16 (2 in figure 4)	The mowers resumes mowing or charging
The Auto Mower leaves the charging station before the battery is fully charged	During charging	Any of the sockets in the cable between the rectifier and the control box (2 or 3 in figure 3)	The Auto Mower will be properly charged next time it enters the charging station
The Auto Mower bounces against the charging station instead of staying there to charge	During searching	Any of the sockets in the cable between the rectifier and the control box (2 or 3 in figure 3)	The Auto Mower will stay in the charging station next time it enters to charge.