# STAR COMFORT

## CONTENT




***MANUAL REPAIR***

# 1 INTRODUCTION

Star Comfort has been designed to adapt the air inside the vehicle, to create a comfortable environment in the driver-guide and passenger zone and at the same time to ensure a perfect visibility through windscreen for driving.

The system automatically maintains selected temperature inside the coach. Therefore the following functions actuate automatically:

- Incoming air for a driver area (outside or recycled air)
- Fan speed (air flow) for a driver area
- Preheater operation
- Switching on/off of air conditioning for a driver area
- Water flow rate passing through convectors in passenger zone and defroster heater exchange

The Star Comfort has a diagnosis system able to detect if one or several components fail individually or simultaneously.

If this icon appears on the screen Fig1, all settings can be realized manually until the system will be checked.


Fig.1

# 2 ACCESS TO THE FAILS CODE

To access the fail menu the ignition must be switched off and touching either ⊖ or ⊕ key on the left two times, the keys and the screen will display as on the screen Fig 2.


Fig.2

The keys ⊖ or ⊕ on the left permit you to move up and down through the menu.

When the bar is on self test option, press the key ⊖ or ⊕ on the right and the screen will show you the statement of all electric components except air blowers.


Fig.3

If any component is failing, the fail code will appear on the right side of the screen.

When you are in the functions menu and no key is pressed the screen will return to the previous display.

# 3 MEANING OF CODES AND PROCEDURE

## 3.1 TEMPERATURE SENSORS

The system has installed different air sensors:

- Inside temperature sensor at driver area
- Inside temperature sensor at the passenger area. (Only in two areas control device model)
- Outside temperature sensor.
- Blown temperature sensor.
- Ice sensor

When one or several temperature sensors are failing a code will be displayed on the screen. To use the following table to determinate what sensor or sensors are damaged.

| Errors in air sensor | | (4 dígits code) |
|---|---|---|
| Code | Error | Explanation |
| 0000 | All sensor are OK | |
| 0001 | Failure sensor Outside | At J4 connector (See electrical drawing),verify as follow:<br>- Check the connecting leads between pins 5-15 Reference NTC impedance values: 9 KΩ to 0º , 5,5 KΩ to 10ºC , 3,5 KΩ to 20ºC<br>If impedance value is within the range, please replace the Star Comfort controller unit.<br>If the impedance value is out of range , replace the air sensor |

| Errors in air sensor | | (4 dígits code) |
|---|---|---|
| Code | Error | Explanation |
| 0002 | Failure sensor Evaporator | At J4 connector (See electrical drawing),verify as follow:<br>- Check the connecting leads between pins 4-14 Reference NTC impedance values: 9 KΩ to 0º , 5,5 KΩ to 10ºC , 3,5 KΩ to 20ºC<br>If impedance value is within the range, please replace the Star Comfort controller unit.<br>If the impedance value is out of range , replace the air sensor |
| 0003 | Failure sensors Outside & Evaporator | Check codes 0001 & 0002 |
| 0004 | Failure sensor Air blown | At J4 connector (See electrical drawing),verify as follow:<br>- Check the connecting leads between pins 3-13 Reference NTC impedance values: 9 KΩ to 0º , 5,5 KΩ to 10ºC , 3,5 KΩ to 20ºC<br>If impedance value is within the range, please replace the Star Comfort controller unit.<br>If the impedance value is out of range , replace the air sensor |
| 0005 | Failure sensors Outside & Air blown | Check codes 0001 & 0004 |
| 0006 | Failure sensors Ice & Air blown | Check codes 0002 & 0004 |
| 0007 | Failure sensors Outside, Ice & Air Blown | Check codes 0001, 0002 & 0004 |
| 0008 | Failure sensor Driver | At J4 connector (See electrical drawing),verify as follow:<br>- Check the connecting leads between pins 2-12 Reference NTC impedance values: 9 KΩ to 0º , 5,5 KΩ to 10ºC , 3,5 KΩ to 20ºC<br>If impedance value is within the range, please replaces the Star Comfort controller unit.<br>If the impedance value is out of range, replaces the air sensor |
| 0009 | Failure sensors Outside & Driver | Check codes 0001 & 0008 |
| 000A | Failure sensors Ice & Driver | Check codes 0002 & 0008 |
| 000B | Failure sensors Outside, Ice & Driver | Check codes 0001, 0002 & 0008 |
| 000C | Failure sensors Air blown & Driver | Check codes 0004 & 0008 |
| 000D | Failure sensors Outside, Blown & Driver | Check codes 0001, 0004 & 0008 |
| 000E | Failure sensors Ice, Air blown & Driver | Check codes 0002, 0004 & 0008 |

| Errors in air sensor | | (4 dígits code) |
|---|---|---|
| Code | Error | Explanation |
| 000F | Failure sensors | Check codes0001, 0002, 0004 & 0008 |
| 00 20 | Failure sensor Passengers | At J4 connector (See electrical drawing),verify as follow:<br>- Check the connecting leads between pins 1-11 Reference NTC impedance values: 9 KΩ to 0º , 5,5 KΩ to 10ºC , 3,5 KΩ to 20ºC<br>If impedance value is within the range, please replace the Star Comfort controller unit.<br>If the impedance value is out of range, replace the air sensor |
| 0021 | | Check codes 0001 & 0020 |
| 0022 | Failure sensors Ice & Passenger | Check codes 0002 & 0020 |
| 0023 | Failure sensors Outside, Ice & Passenger | Check codes 0003 & 0020 |
| 0024 | Failure sensors Air blown & Passenger | Check codes 0004 & 0020 |
| 0025 | Failure sensors Outside, Air blown & Passenger | Check codes 0005 & 0020 |
| 0026 | Failure sensors Ice, Air blown & Passenger | Check codes 0006 & 0020 |
| 0027 | Failure sensors Outside, Ice, Air blown & Passenger | Check codes 0007 & 0020 |
| 0028 | Failure sensors Driver & Passenger | Check codes 0008 & 0020 |
| 0029 | Failure sensors Outside, Driver & Passenger | Check codes 0009 & 0020 |
| 002A | Failure sensors Ice, Driver & Passenger | Check codes 000A & 0020 |
| 002B | Failure sensors Outside, Ice, Driver & Passenger | Check codes 000B & 0020 |
| 002C | Failure sensors Air blown, Driver & Passenger | Check codes 000C & 0020 |
| 002D | Failure sensors Outside, Air blown, Driver & Passengers | Check codes 000D & 0020 |
| 002E | Failure sensors Ice, Air blown, Driver & Passengers | Check codes 000E & 0020 |
| 002E | Failure sensors Outside, Ice, Air blown, Driver & Passengers | Check codes 0001,0002,0004,0008 & 0020 |

## 3.2 SERVO MOTOR

Severals servo-motor are used to manage water valves or flaps:

- Frontbox water valve.
- Water valve for passenger heating system.
- Motorized distribution air flap

| Errors in Valves | | (2 dígit code) |
|---|---|---|
| Code | Error | Explanation |
| 00 | All servo-motor are OK | |
| 01 | Failure frontbox water valve | Disconnect J5 connector at rear of controller and check impedance value between pins 11 and 12.<br>If there is not any impedance value:<br>- Check the connection leads to the valve, verifying that any of those wires is not cut off. If it is, fixing it, if not, replace valve.<br>If there is impedance value disconnect J4 connector at rear of controller:<br>- Check if there is impedance value between pins 17 and 20 of J4 connector at rear of controller.<br>If there is not impedance value between pins 17 and 20:<br>- Check the electrical harness to the valve, verifying that any of those wires is not cut off. If it is, fixing it, if not, replace the valve.<br>If there is impedance value between pins 17 and 20:<br>- Check if there is impedance value between pins 7 and 17 and pins 7 and 20 at J4 connector. If in one of these measurements there is not impedance, check the connection leads, if it is ok replace valve, if it is not, fix wiring.<br>If everything above is Ok,<br>- Set the tester to check Ω between pins 7 and 17. Apply +24V in pin 11 and negative in pin 12 of J5 connector at rear controller. If the impedance value does not change, invert polarity in pins 11 and 12 and check. If it still doesn´t change, replace the valve, if it does, replace the Star Comfort controller. |

| | | |
|---|---|---|
| **02** | Failure passenger water valve | Disconnect J5 connector at rear of controller and check impedance value between pins 9 and 10.<br>If there is not any impedance value:<br>- Check the connection leads to the valve, verifying that any of those wires is not cut off. If it is, fixing it, if not, replace valve.<br>If there is impedance value:<br>- Check if there is impedance value between pins 19 and 8 of J4 connector at rear of controller.<br>If there is not impedance value between pins 19 and 8:<br>- Check the electrical harness to the valve, verifying that any of those wires is not cut off. If it is, fixing it, if not, replace the valve.<br>If there is impedance value between pins 19 and 8:<br>- Check if there is impedance value between pins 19 and 18 and pins 18 and 8 at J4 connector. If in one of these measurements there is not impedance, check the connection leads, if it is ok replace valve, if it is not, fix wiring.<br>If everything above is Ok,<br>Set the tester to check Ω between pins 8 and 18. Apply +24V in pin 9 and negative in pin 10 of J5 connector at rear controller. If the impedance value does not change, invert polarity in pins 9 and 10 and check. If it still doesn´t change, replaces the valve, if it does, replaces the Star Comfort controller. |
| 03 | Failure driver and passenger valves 1 & 2 | Check codes 01 & 02 |

# 4 CHEK BLOWER

The blower is one of the few items not checked by the system and therefore if does not work, no symbol of failure appears on the display.

If the speed blower bar, indicates that the blower should be running but no air flow is flowing through the air ducts, please checking as follow:

- Measure voltage at 6 pins connector blower (M) between Pin 1 (cable Black or Red) and Pin 2 (cable Brown). If rated voltage is not OK, verifies for correct routing and damage, if Ok, please check 20A fuse.
  If fuse is not blown and all above points are OK, then verifies for correct routing and damage of cable from connector J5 Pin 5 to Pin 3 connector (M), If OK, measures voltage at pin 3 connector M (cable Yellow) and check the measurement as follow:

| Nº Bars speed lit on Display | Voltage ±0,5 |
|---|---|
| 1 | 0,8 |
| 2 | 1,6 |
| 3 | 2,4 |
| 4 | 3,3 |
| 5 | 4,1 |
| 6 | 5 |

If measurements are OK, replace blower if no replace de controller Star Comfort

# 5 CHEK ADDITIONAL SIGNAL

The controller has some outputs signal to manage other external elements:

- Output 1). - Signal output +24V to manage the pre-heater.
  Switch on the pre-heater pressing buttom till the symbol is displayed, then measure voltage at Pin 1 connector J6, If no OK, replace the controller, if everything is OK, check the connecting leads till pre-heater.
- Output 2). - Signal output +24V to manage optional water pump.
  Set the maximum temperature possible pressing buttom , then measure voltage at Pin 6 connector J6, if there is not a +24V signal, replaces the controller, if the signal is OK, verifies the connecting leads till the water pump.
- Output 3). - Signal output +24V to manage the air conditioning solenoid valve.
  Switch on the air conditioning main unit and set the minimum possible temperature pressing the buttom , then measure voltage at Pin 5 connector J6, if the signal is not OK, replace the controller, if signal value is OK, verifies for correct routing and damage.