

**DRAWBAR / STEERING AXLE  
MANAGEMENT KIT**





**4679003.602**

*Object Pool rel. 1.4.x*

---

**INSTALLATION, USE AND MAINTENANCE**

|  |                              |
|--|------------------------------|
|  | = Generic danger             |
|  | = Warning                    |
| <b>ECU</b>   | = IBX100 remote control unit |
| <b>VT</b>  | = Virtual Terminal           |
| <b>OP</b>  | = Object Pool                |

**WARNING:**  
**THE NATIVE CONTROLS INSIDE YOUR VIRTUAL TERMINAL HAVE THE PRIORITY ON ALL THE CONTROLS DERIVING FROM THE IBX100. PLEASE, KEEP THIS IN MIND WHEN PROGRAMMING AND USING THE PRODUCT.**

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## • MANUAL USE MODES

The section of this manual dedicated to the installation contains information for installers. For this reason we have used technical terms without providing explanations.

**THE INSTALLATION MUST BE CARRIED OUT BY AUTHORIZED AND SKILLED PERSONNEL ONLY. ARAG IS NOT RESPONSIBLE FOR ANY INSTALLATION CARRIED OUT BY UNAUTHORIZED OR UNSKILLED PERSONNEL.**

## • LIMITATIONS

The descriptions of the assembly phases refer to a "general" Virtual Terminal, so specific models will not be mentioned, unless a certain installation procedure concerns exclusively one VT type.

## • RESPONSIBILITIES

The installer must carry out "workmanlike" installations and ensure to the end user the perfect operation of the whole system both with ARAG components only and other brands' components.

ARAG always recommends using its components to install control systems.

The installer will be held responsible for any malfunction if he decides to use other brands' components even without actually changing the system parts or harness.

The compatibility check with components and accessories of other manufacturers shall be carried out by the installer.

If the ARAG components installed together with other brands' components get damaged because of what stated above, no direct or indirect warranty will be provided.

## 1 RISKS AND PROTECTIONS BEFORE ASSEMBLY

**The ECU IBX100 installation works, except the main connection (Consult the manual supplied with *ibx100 isobus hydraulic*), must be done with battery disconnected, using suitable tools and any individual protection equipment deemed necessary.**



**Use ONLY clean water for treatment tests and simulations: using chemicals during simulated treatment runs can seriously injure persons in the vicinity.**

**KEEP A SAFE DISTANCE FROM THE STEERING SYSTEM / TRAILED IMPLEMENT WHILE THE TTC CONTROL SYSTEM IS WORKING.**

**BEFORE CARRYING OUT ANY MAINTENANCE / SERVICE OPERATION ON THE STEERING SYSTEM OR TRAILED IMPLEMENT, MAKE SURE THAT THE TTC AUTOMATIC CONTROL HAS BEEN DISABLED.**

**MECHANICALLY BLOCK THE STEERING MECHANISM WITH THE APPROPRIATE PIN AND MAKE SURE YOU DEACTIVATED THE TTC CHECK BEFORE MOVING ON PUBLIC ROADS.**

## 2 PRODUCT DESCRIPTION

The system to control the drawbar / axle (TTC) through the dedicated control unit - IBX 100 Hydraulic Isobus - allows the VT to manage the trailed implement by following the steering direction of the tractor and to guide the trailer wheels in order to perfectly overlap tractor tracks, so as to minimize crop squashing.

Since the TTC control is a hydraulic function of the machine, an IBX 100 Hydraulic ISOBUS control unit is required.

The control unit could be already available on the machine, previously installed to control other hydraulic functions.

If you do not have any control unit, order separately an IBX 100 Hydraulic Isobus control unit and the relevant connection cable.

To enable IBX100 Hydraulic ISOBUS for the use of TTC, ask for the activation code to ARAG ("*9.1.1 Activation procedure*" on page 11).

## 3 INTENDED USE

The equipment you have purchased is a standard ISOBUS system compliant with ISO11783 to be applied to a crop spraying boom.

**This device is designed to work on agricultural machinery for spraying and crop spraying applications.**

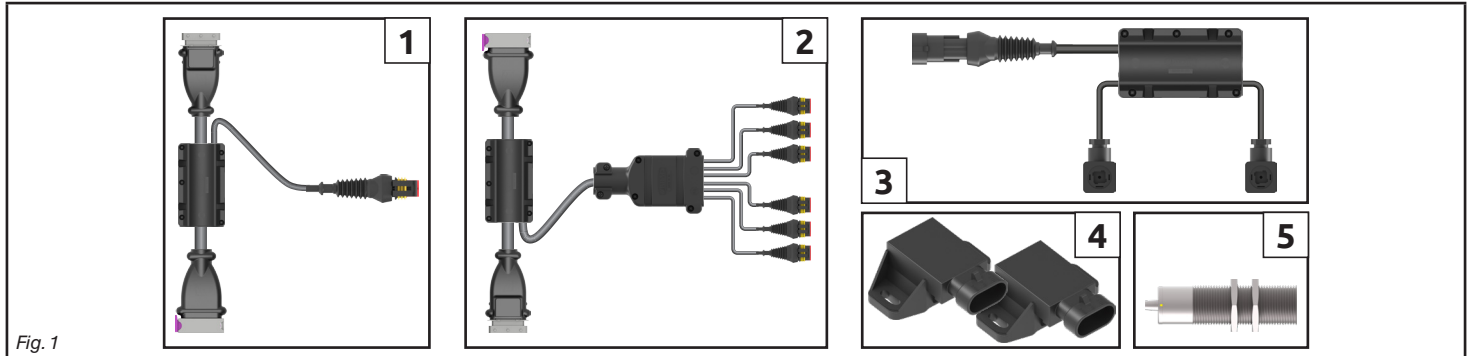
**The machine is designed and built in compliance with ISO 14982 standard (Electromagnetic compatibility - Forestry and farming machines), harmonized with 2014/30/EU Directive.**

## 4 PRECAUTIONS



- Do not aim water jets at the equipment.
- Do not use solvents or fuel to clean the case outer surface.
- Do not clean equipment with direct water jets.
- Comply with the specified power voltage (12 VDC).
- In case of voltaic arc welding, remove connectors from the device and disconnect the power cables.
- Only use ARAG genuine spare parts and accessories.

**5 PACKAGE CONTENT**




- 1 Connection cable for steering hydraulic valves
- 2 Sensor connection cable
- 3 Valve connection cable adapter
- 4 Angle sensors (qty 2)
- 5 Connection cable for steering hydraulic valves
- 6 Purchase certification code

**TO BE PURCHASED SEPARATELY:**

- connection cable for IBX 100 Hydraulic Isobus

**TO BE PURCHASED SEPARATELY if not yet available on the existing system:**

- IBX100 Hydraulic Isobus
- connection cable for hydraulic valves
- connection cable for IBX100 Hydraulic (Y shape)
- hydraulic valves

 The kit supplied enables the TTC control function on an already existing system: therefore, the mechanical and hydraulic components are supplied by the machine manufacturer.

**6 POSITION ON FARMING MACHINE**

**6.1 Installation of angle sensors S1 and S2**



**It is the installer responsibility to check that all indications described are complied with.**

The supplied angle sensors are used to measure both the steering angle of the tractor (**S1**) and the direction of the drawbar / steering axle (**S2**).

**For the installation of the sensor S1 (tractor side) the use of the special support "Fig. 2" on page 5 is foreseen, designed to avoid that the mechanical stress is transferred on the sensor shaft, causing an undesired wear and consequent possible breakage over time, reducing the useful life of the sensor.**

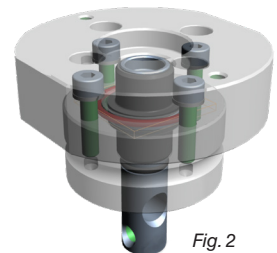


Fig. 2

**6.1.1 Mounting the sensor on the holder**

- 1 Support (qty 1)
- 2 U-bolt clamp (qty 1)
- 3 Clamping bracket (qty 1)
- 4 Locking nut (qty 2)
- 5 OR (qty 1)
- 6 Washer (qty 2)
- 7 Screw (qty 2)
- 8 Sensor

The OR (5) serves to increase the seal of the rubber on the sensor. It must be positioned at the bottom before the sensor is inserted.

The screws (7) that allow the sensor to be fixed to the support are included in the package.

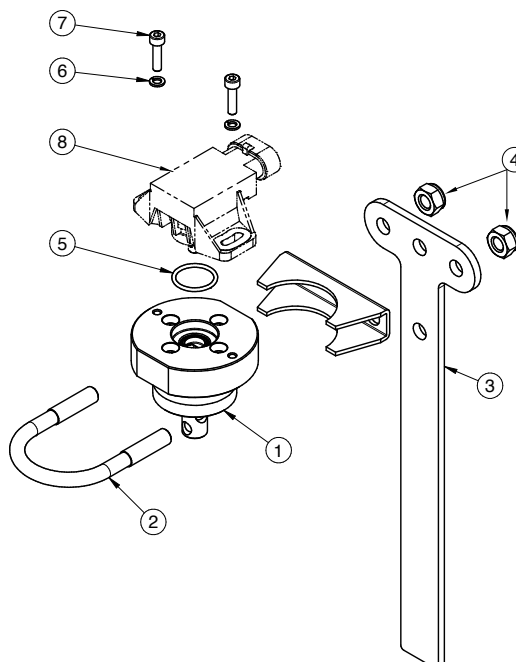
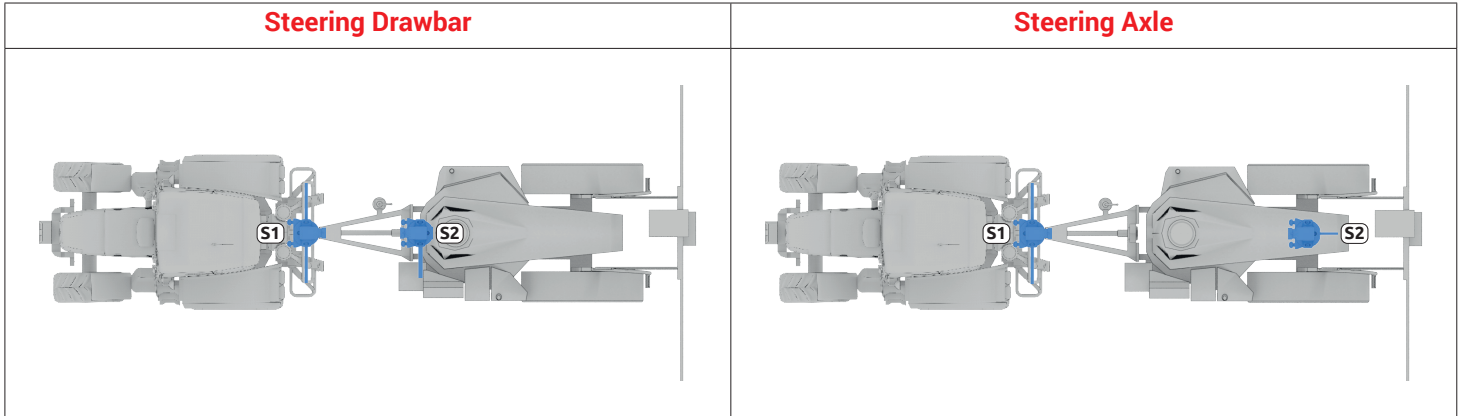
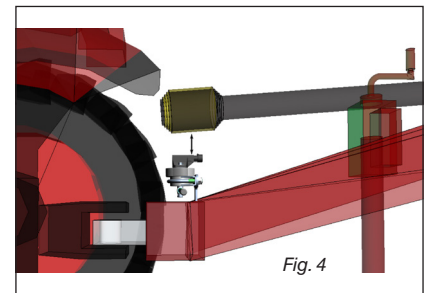


Fig. 3

6.1.2 Positioning the sensor S2 on the tractor



Position the sensor holder at the front of the drawbar  
(Keep a safe distance from the power take-off (PTO) to avoid damage).



Identify possible hooking points at the rear of the tractor "12.2 Types of machine" on page 13, so that a parallelogram is always kept as close as possible to a perfect rectangle."Fig. 6"



Fig. 5

6.1.3 Ideal parallelogram

To obtain an ideal parallelogram, the rotation angle of the tractor and the rotation angle of the implement side (segment "B") must have the same width "Fig. 6". If the width of segment A is different from the width of segment B, the two angles will be different and this may lead to a non-proportional angle being measured "Fig. 7".

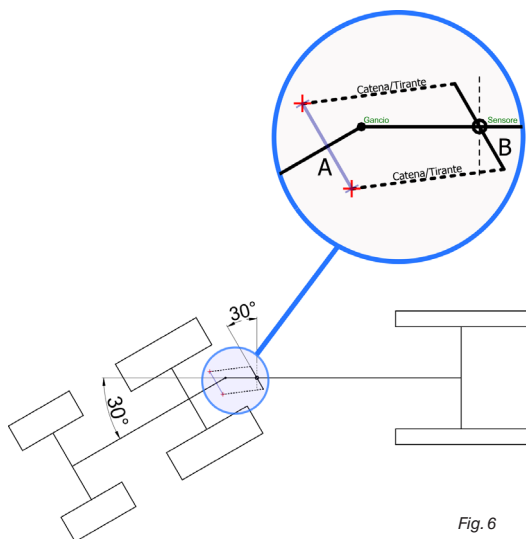


Fig. 6

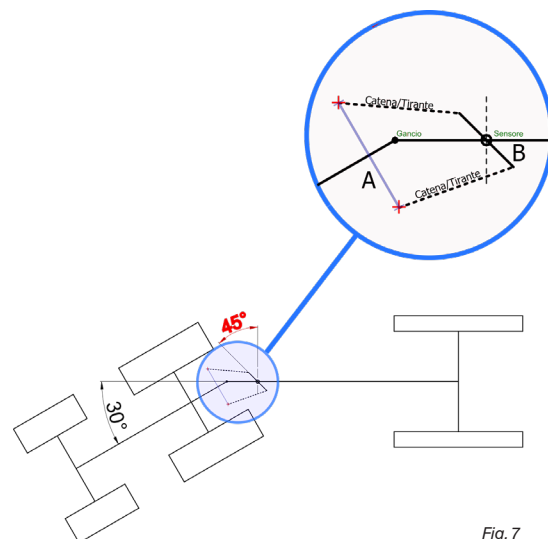


Fig. 7

In the sensor holder shaft, an 8 mm hole has been provided, through which a threaded bar can be passed in order to use it as a lever to transfer the steering movement of the tractor.

 The threaded bar is NOT supplied with the support.

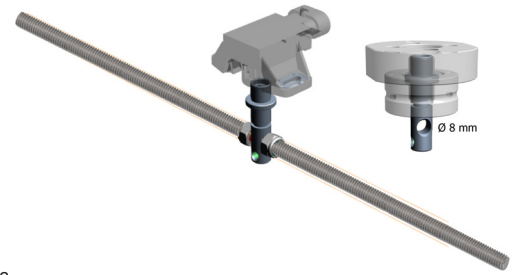


Fig. 8

The choice of accessories for mounting the tie rods that will be placed at the rear of the tractor and at the ends of the threaded bar is the responsibility of the end user. Example of accessories that are available on the market:

 These accessories are NOT included in the sensor holder package.



Fig. 9

### 6.1.4 Positioning the sensor S2 on the implement

The 6mm threaded hole on the holder shaft "Fig. 10" can be used to verify the sensor position (feedback) required by the system when the drawbar or steering axle is in motion. The sensor is mounted by matching the center of the axis of the holder shaft with the center of the axis on which the drawbar rotates, without the need for contact between them "Fig. 12". Only the support clamping bracket will be provided **Ref. 1** "Fig. 11". We recommend finding another bracket **Ref. 3** "Fig. 11" with slot or hole for the support rod of the threaded bar **Ref. 2** "Fig. 11".

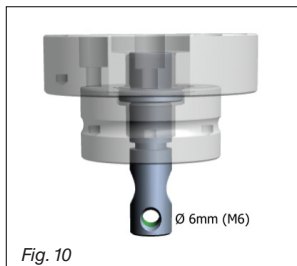


Fig. 10

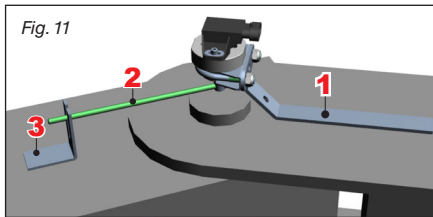
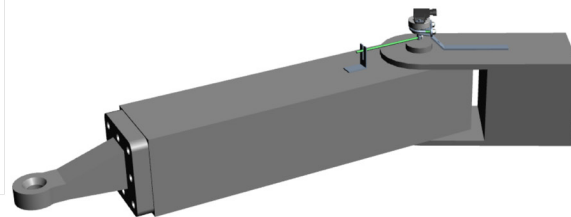


Fig. 11

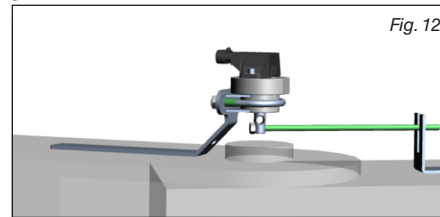


Fig. 12

**7 WIRING CONNECTIONS**



- Use original ARAG harnesses only.
- Take care not to break, pull, tear or cut the cables.
- Use of unsuitable cables not provided by ARAG automatically voids the warranty.
- ARAG is not liable for any damage to the equipment, persons or animals caused by failure to observe the above instructions.

**7.1 General precautions for a correct harness position**

• **Securing the cables:**

- secure the harness so that it does not interfere with moving parts;
- route the harnesses so that they cannot be damaged or broken by machine movements or twisting.

• **Routing the cables to protect against water infiltrations:**

- the cable branches must ALWAYS be facing down.

• **Fitting the cables to the connection points:**

- Do not force the connectors by pushing too hard or bending them: the contacts may be damaged and system operation may be compromised.



Use **ONLY** the cables and accessories indicated in the ARAG catalog, having technical features suitable for the use to be made of them.



**WARNING: DO NOT CONNECT ISOBUS CONNECTOR.**

**THIS CONNECTION MUST BE CARRIED OUT LATER, ONLY AFTER INSTALLING ALL THE COMPONENTS**

(Consult the manual supplied with *ibx100 isobus hydraulic*).



To connect all parts of the system correctly, make sure to use the proper connection cables.

Consider any variants depending on system type.

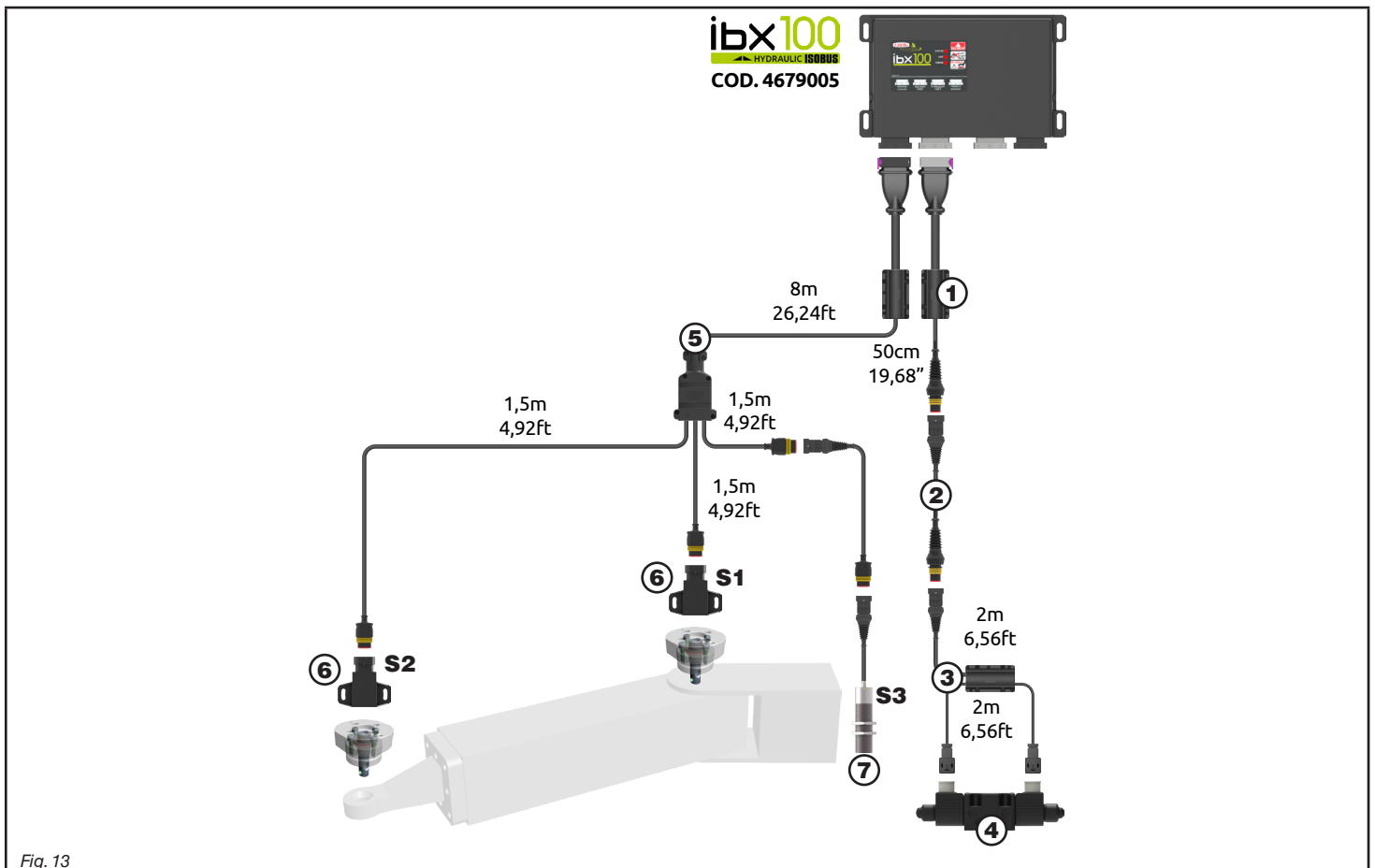


Fig. 13

**Legend:**

- 1 Extension cable for connection of hydraulic valves
- 2 Extension for actuators
- 3 Hydraulic valve connection cable
- 4 Steering hydraulic valves
- 5 Sensor connection cable
- 6 Angle sensors to measure the steering angle of the tractor (**S1**) and the direction of the drawbar / steering axle (**S2**)
- 7 Inductive sensor **S3** for the detection of the safety mechanical lock (ON / OFF)

7.2 IBX100 Hydraulic ISOBUS harness connection

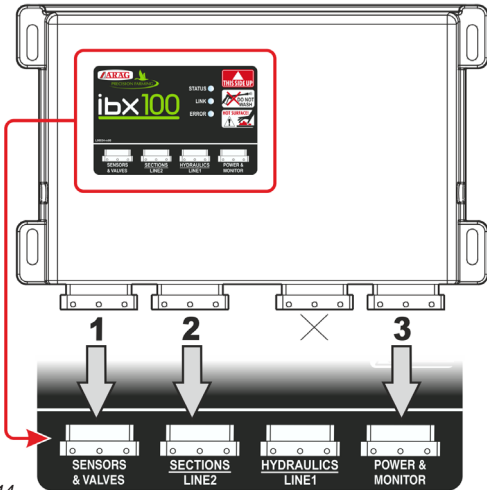


Fig. 14

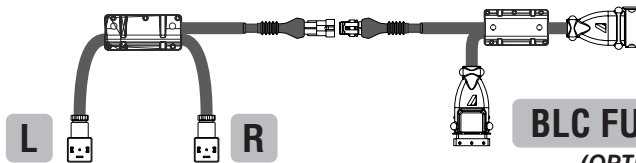
| CONNECTOR | CONNECTION                 | REF. CABLE - "Fig. 13" |
|-----------|----------------------------|------------------------|
| 1         | Sensors                    | 5                      |
| 2         | Steering hydraulic valves  | 1 - 2 - 3              |
| 3         | VT / IBX100 Sprayer ISOBUS | -                      |

Connect harnesses as specified in the table; each one of them shall be connected to the corresponding socket on the remote control unit.

7.3 Steering hydraulic valve connection

REF. CABLE 3 par. 7.1

REF. CABLE 1 par. 7.1

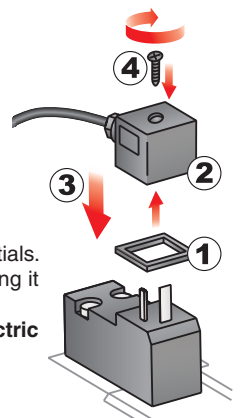


**IBX 100 HYDRAULIC ISOBUS**

**BLC FUNCTION**  
(OPTIONAL)

| CONNECTOR | MOVEMENT              | CONTROL               |
|-----------|-----------------------|-----------------------|
| L         | Steering to the LEFT  | ON / OFF Proportional |
| R         | Steering to the RIGHT | ON / OFF Proportional |

Fix the connectors to the relevant valves according to the indicated initials.  
 • Position seal (1) onto connector (2), then connect the latter pressing it fully home (3):  
**during this operation, take special care not to bend valve electric contacts.**  
 • Insert screw inside connector, and screw it (4) until it is tightened.



7.4 Sensor connection

| CONNECTOR | PRIORITY CONNECTION                                  | ALTERNATIVE CONNECTION                                      |
|-----------|--|---|
| SPEED     | Speed sensor   | --  |
| LOCK      | Inductive sensor <b>S3</b> - BLOCK (Optional)        | --  |
| ANGLE     | Angle sensor <b>S2</b> - TRAILED IMPLEMENT           | --  |
| LEFT      | Angle sensor <b>S1</b> - TRACTOR included in the kit | Digital sensor <b>S1L</b><br>LH SIDE TRACTOR - not included |
| RIGHT     | --   | Digital sensor <b>S1R</b><br>RH SIDE TRACTOR - not included |
| TILT      | Do not use   | --  |

REF. CABLE 5 - par. 7.1

Close the unused connectors with the relevant caps supplied in the package.

**8 MENU STRUCTURE**

|   |  |                                |  |
|---|--|--------------------------------|--|
| <b>Hydraulic controls</b>   |  |                                |  |
| <b>User level</b>   |  | Operator                       |  |
|   |  | Manager                        |  |
|   |  | Technician                     |  |
|   |  | ARAG-Tech                      |  |
| <b>System status</b>  |  | License Registration           |  |
|   |  | Add license key                |  |
|   |  | Active features                |  |
|   |  | Restart ECU                    |  |
|   |  | Delete OP                      |  |
|   |  | Backup management              |  |
|   |  | Create Backup                  |  |
|   |  | Restore backup                 |  |
|   |  | Reset to Arag factory defaults |  |
| <b>Settings</b>   |  | Auxiliaries configuration      |  |
|   |  | Enable Arag assignments        | <input type="checkbox"/> / <input checked="" type="checkbox"/>           |
|   |  | Limit to 7 hydraul. sect.      | <input type="checkbox"/> / <input checked="" type="checkbox"/>           |
|   |  | ARAG preferred assignment      |  |
| <i>Active menu only if is selected <input checked="" type="checkbox"/> the item Enable Arag assignments</i> |  | Hyd.basic settings             |  |
|   |  | Drain valve                    |  |
|   |  | Block                          |  |
|   |  | Tilt                           |  |
|   |  | Height                         |  |
|   |  | Section 1                      |  |
|   |  | Section 2                      |  |
|   |  | Section 3                      | <input type="checkbox"/> / <input checked="" type="checkbox"/>           |
|   |  | Section 4                      |  |
|   |  | Section 5                      |  |
|   |  | Section 6                      |  |
|   |  | TTC                            |  |
|   |  | Lock sens. setting             |  |
|   |  | BLC                            |  |
|   |  | Tilt                           |  |
|   |  | Section 1                      |  |
|   |  | Section 2                      |  |
|   |  | Section 3                      |  |
|   |  | Section 4                      |  |
|   |  | Section 5                      | <input type="checkbox"/> / <input checked="" type="checkbox"/>           |
|   |  | Section 6                      |  |
|   |  | TTC                            |  |
|   |  | Basic settings                 |  |
|   |  | Trailed implement type         |  |
|   |  | Drawbar                        |  |
|   |  | Axle                           |  |
|   |  | Control mode                   |  |
|   |  | ON/OFF                         |  |
|   |  | Proportional                   |  |
|   |  | Tractor sensor type            |  |
|   |  | Angle                          |  |
|   |  | Digital                        |  |
|   |  | Sensors settings               |  |
|   |  | Tractor sensor inversion       | <input type="checkbox"/> / <input checked="" type="checkbox"/>           |
|   |  | Slip correction factor         | 0,100 ÷ 10,000 Default: 1000   |
|   |  | Implement geometry             |  |
|   |  | Axle (T) / Hitch point         | 0,00 ÷ 20,00 m Default:0,50  |
|   |  | Hitch point / Axle (A)         | 0,00 ÷ 20,00 mt Default:5,00   |
|   |  | Hitch point (A) / Pivot        | 0,00 ÷ 20,00 mt Default:1,6  |
| <i>Active menu only if Trailed implement type &gt; Drawbar is selected</i>                                  |  | Angles settings                |  |
|   |  | Angle tolerance working        | 0,0 ÷ 90,0 Deg Default:1   |
|   |  | Speed settings                 |  |
|   |  | Source                         |  |
|   |  | Tractor wheel                  |  |
|   |  | Tractor radar                  |  |
|   |  | Wheel sensor (ECU)             |  |
|   |  | Minimum speed limit            | 0,6 ÷ 10,0 km/h Default: 1.0   |
|   |  | Maximum speed limit            | 1.0 ÷ 20.0 km/h Default: 15.0  |
| <i>Active menu only if Control mode &gt; Proportional is selected</i>                                       |  | Valves settings                |  |
|   |  | Min actuation                  | 0 ÷ 100 % Default: 28  |
|   |  | Balance R / L                  | 0.50 ÷ 2.00 Default: 1.00  |
|   |  | Gain during work               | 0.1 ÷ 9999.9 Default: 400  |
| <b>Alarms</b>   |  |                                |  |
| <b>Device calibrations</b>  |  | Tractor sensor zero value      | <i>Active menu only if Tractor sensor type: &gt; Angular is selected</i> |
|   |  | Implement sensor zero value    |  |
|   |  | TTC angle limits               |  |
| <b>Device status</b>  |  | TTC sens. data                 |  |
|   |  | Tractor angle                  |  |
|   |  | Trailed implement angle        |  |
|   |  | Speed                          |  |
|   |  | Lock status                    |  |

## 9 REQUEST OF THE TTC FUNCTION ACTIVATION CODE

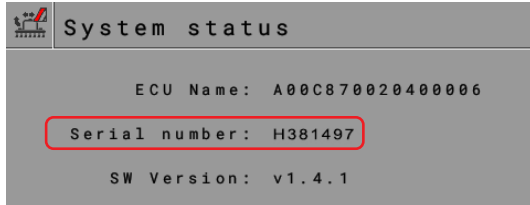
### 9.1 Menu > System status > Registration license

To activate the TTC function on the control unit, AN ACTIVATION CODE IS REQUIRED.

Ask the code to ARAG, by providing the following information:

- purchase identification code, received with the kit.
- hydraulic control unit serial number ("SERIAL NO." label on control unit rear side) that can be viewed also from the Device status menu of the monitor in the example:

Menu > System status



#### 9.1.1 Activation procedure

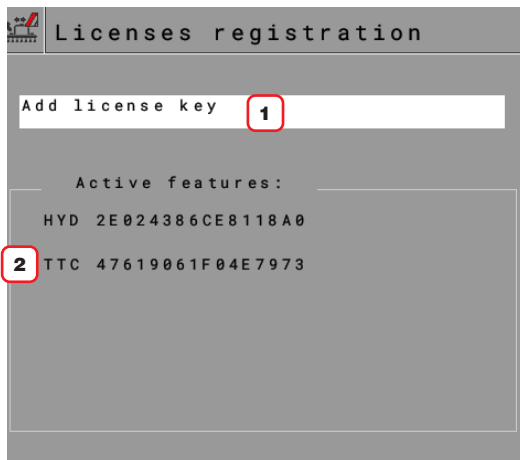


Fig. 15

**1** Enter the supplied code and confirm.

The IBX100 will restart.

- Once finished, the activated function will be displayed by the system.

- Now the control unit is active: monitor shows all the menus for TTC control setup and use

**2** Active functions.



Fig. 16

If, upon switching on, the screen shows "UNREG", it is necessary to go to the "System status > Licenses registration" menu and enter the license number (to be asked to Arag) in order to activate the hydraulic controls.



#### WARNING

AFTER CONTROL UNIT ACTIVATION, PROGRAM THE NECESSARY PARAMETERS.

**10 HOME**

The main screen varies based on the active functions.

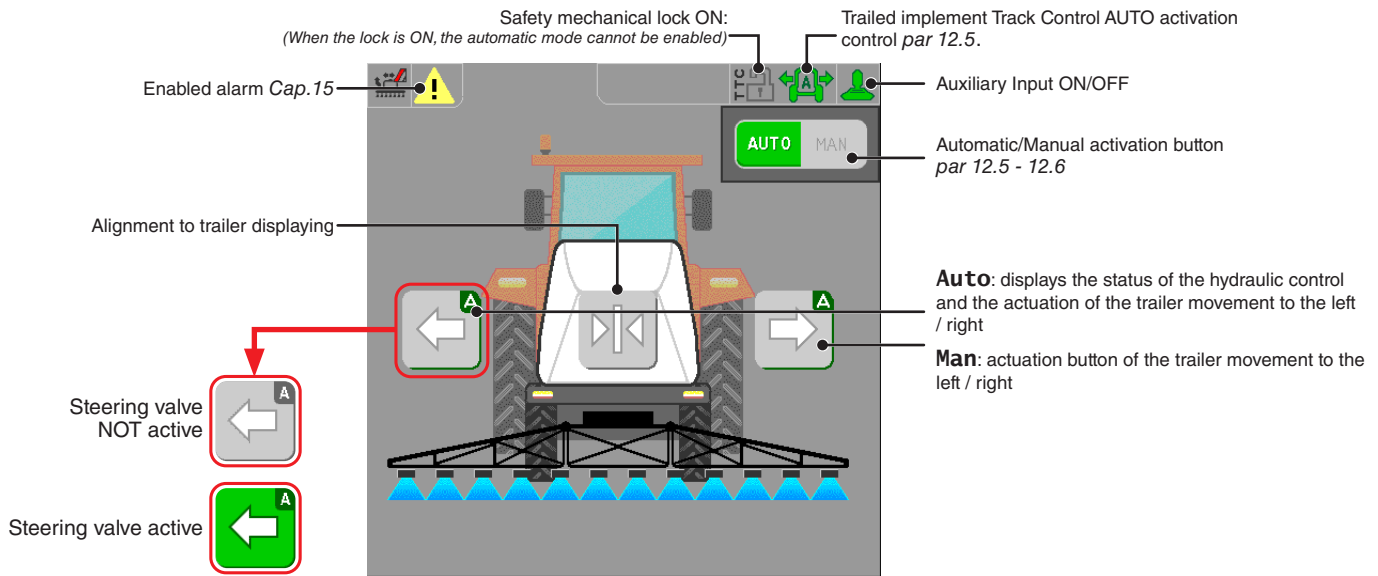


Fig. 17

**11 CONTROL LAYOUT**

|  |                                |  |                                     |
|--|--------------------------------|--|-------------------------------------|
|  | Goes to menu screen            |  | Goes to the hydraulic controls menu |
|  | Goes back by one screen        |  | Goes to the active alarms menu      |
|  | Goes back to HOME              |  |                                     |
|  | Goes to the following page     |  |                                     |
|  | Goes back to the previous page |  |                                     |

**ENTERING A NUMERICAL VALUE**

Icons are given as a reference as they can vary depending on the *Virtual Terminal* used:

- Cancel
- Exits
- Confirm

**Before system setup, check:**

- that all components are correctly installed;
- the correct connection to the power source;
- the component connection.

Failure to correctly connect system components or to use specified components might damage the device or its components.

Upon first switching on, enter the device basic settings.

ONCE ALL MODIFICATIONS HAVE BEEN COMPLETED, UPON QUITTING THE CURRENT PAGE, THE SYSTEM WILL PERFORM AN AUTOMATIC SAVING.

**12 USE**

**12.1 TTC - OPERATION**

**12.2 Types of machine**

The components for the TTC control can be installed on two types of machines, differing in the geometry and the mechanical activation of the path control:

- **Steering Drawbar:** by measuring drawbar angle, IBX100 can control the drawbar hydraulic cylinder and change the trailer steering angle.
- **Steering Axle:** by measuring axle angle, IBX100 can control the hydraulic cylinder connected to the steering axle and change the direction of trailer wheels.

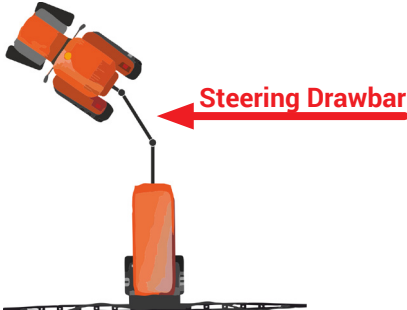


Fig. 18

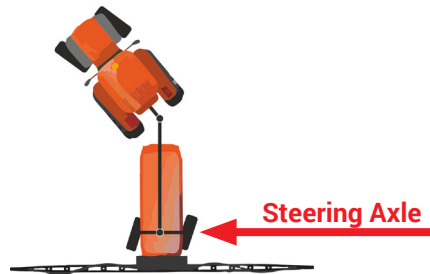


Fig. 19

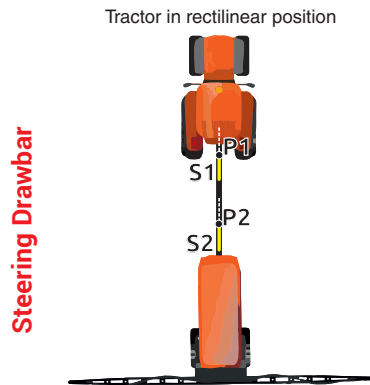


Fig. 20

Tractor moving (for example turning to the left)

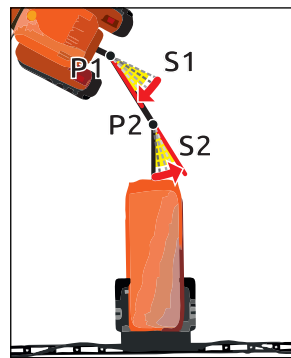


Fig. 21

**P1:** Tractor hitch point  
**P2:** Implement hitch point  
**S1/S2:** Maneuver angles

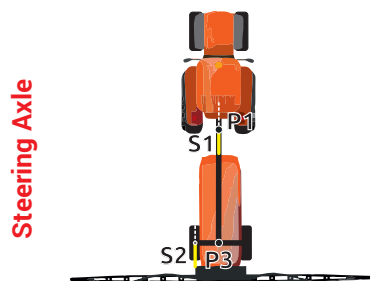


Fig. 22

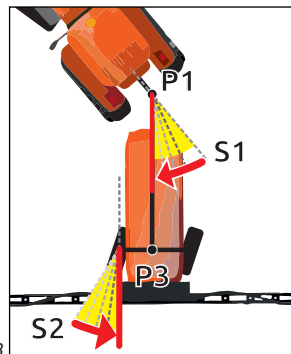


Fig. 23

**P1:** Tractor hitch point  
**P3:** Implement axle point  
**S1/S2:** Maneuver angles

**12.3 Hydraulic control**

Thanks to the IBX 100 Hydraulic Isobus ECU the TTC control automatically activates:

- steering hydraulic valves
- system hydraulic drain valve (pilot valve)

**Check that the hydraulic system and the valves are connected to the IBX 100 Hydraulic Isobus control unit.**



**WARNING: DURING AUTOMATIC OPERATION, THE SYSTEM ACTIVATES THE PILOT VALVE, HENCE THE HYDRAULIC CIRCUIT IS PRESSURIZED.**

**OTHER HYDRAULIC FUNCTIONS (MOVEMENTS, DRIVES, ETC...) CONNECTED TO THE SAME SYSTEM CAN BE ACTIVATED BY SENDING THE COMMAND ONLY TO THE SUITABLE VALVE, SINCE THE PILOT VALVE IS ALREADY ACTIVATED BY THE TTC. MAKE SURE THAT THIS DOES NOT JEOPARDIZE MACHINE SAFETY.**

**12.4 Start-up**

**Before starting the TTC system, configure the settings ("13 MENU > Settings" on page 15) and calibrate the device ("16 MENU > Device calibration" on page 27).**



**WARNING**  
**For safety reasons, immediately after control unit activation, the TTC system will be disabled.**

- To activate the TTC control, set the control mode to AUTOMATIC (AUTO).
- To deactivate the TTC control, set the control mode to MANUAL (MAN) or press the trailer movement or alignment buttons.

12.5 AUTOMATIC Mode

In this mode, the TTC control AUTOMATICALLY ACTIVATES the hydraulic valves, by duly controlling the trailer steering angle (steering drawbar) or the wheel direction (steering axle) based on tractor speed.

- To activate the TTC control, set the control mode to AUTOMATIC A (press **AUTO** to activate it) 

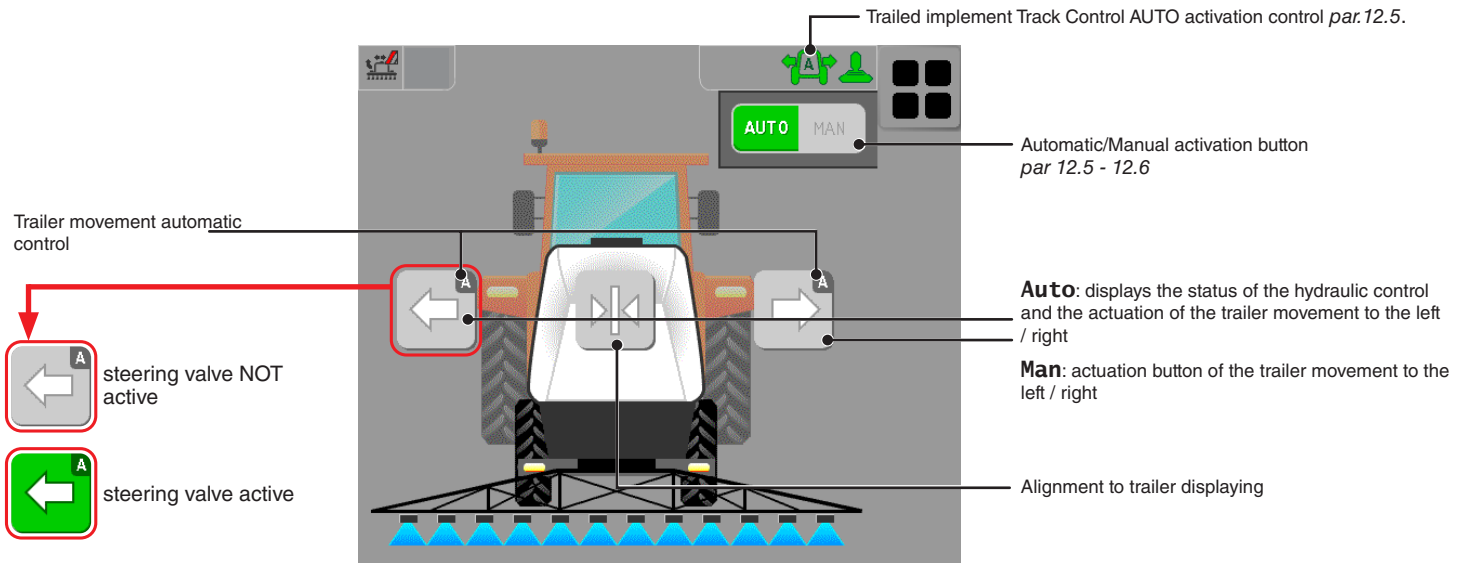





Fig. 24

During spraying, trailed implement positioning (estimated) is displayed on the monitor: **MENU > Device status - "Fig. 69"**.

When the TTC system works in automatic mode, the IBX100 hydraulic unit:


- measures angle position **S1** (Fig. 21 - Fig. 23);
- calculates optimal angle position **S2**;
- operates the hydraulic steering valves and cylinder in order to correct angle position **S2**;
- tries to reach the envisaged position, within a specified tolerance.

The TTC control is affected by tractor speed, therefore:

- **Low speed threshold: the detected speed is lower than the speed minimum limit (par. 13.1.5.2)**
  - The TTC control is still enabled (  ).
  - The automatic controls are locked: take the vehicle back to a suitable speed, ranging between the maximum and minimum limits.
- **Speed within the job interval: the detected speed is between the minimum and maximum speed limits (par. 13.1.5.2 / par. 13.1.5.3)**
  - The TTC control is still enabled (  ).
  - The automatic controls are activated.
- **High speed threshold: the detected speed is higher than the speed maximum limit (par. 13.1.5.3)**
  - An automatic alignment control is immediately carried out.
  - The TTC control actuates the hydraulic steering valves until trailed implement is aligned, then the system shifts to MANUAL mode (  ) and the automatic controls are locked:
    - take the vehicle back to a suitable speed, ranging between the maximum and minimum limits;
    - restart the automatic control by pressing **AUTO** to enable it again.

If necessary, during work, it is possible to press buttons  /  /  for an instant variation of the movement values.

The TTC Control is disabled and shifts to manual mode.

Use the joystick to activate the automatic **AUTO/MAN** manual mode by pressing the button this function has been assigned to 

12.6 MANUAL Mode

- To activate the MANUAL mode, press button **MAN** (button is gray).

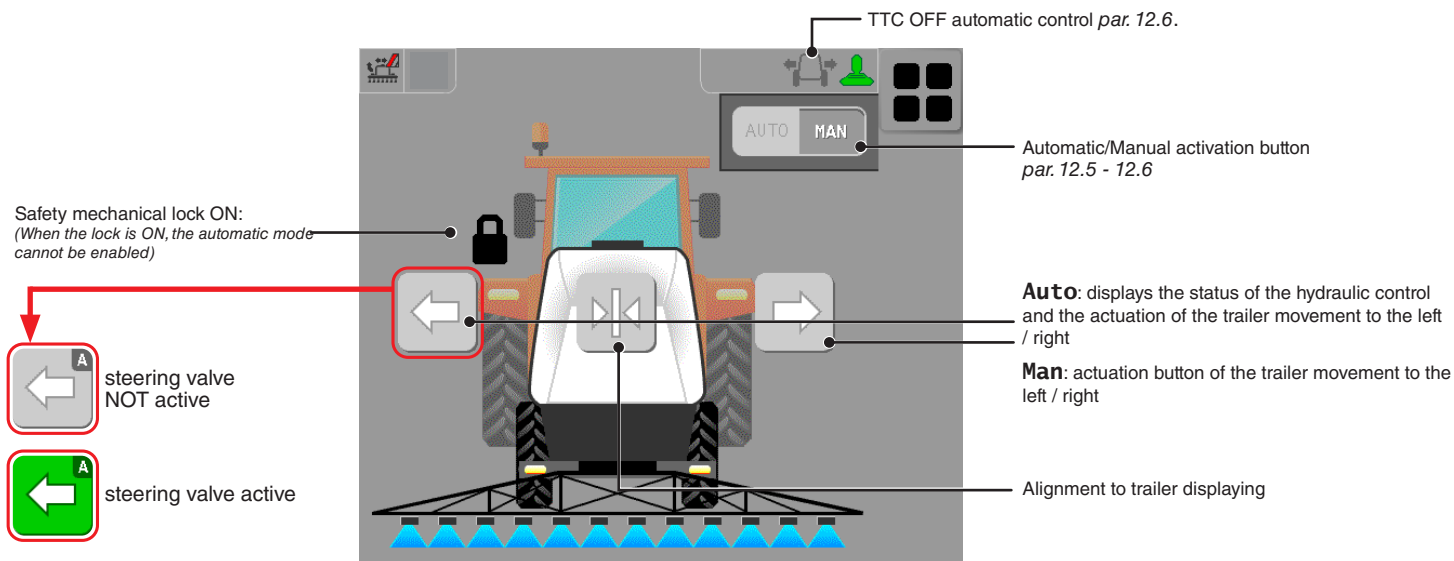


Fig. 25

In this mode, the TTC control **DOES NOT PERFORM ANY ADJUSTMENT** the steering hydraulic valves are operated by the operator through the buttons **DISABLING** the automatic control, if active.  
Available controls:



**Trailer alignment**

Trailed implement is automatically guided to the left or to the right, in order to reduce angle **S2** and to bring it to zero.



**Movement to the left**

It moves the trailer towards tractor left side.  
The command is performed in any case, independent of the actual position **S2** of the trailed implement.



**Movement to the right**

It moves the trailer towards tractor right side.  
The command is performed in any case, independent of the actual position **S2** of the trailed implement.

13 MENU > SETTINGS

Allows setting the TTC parameters



Fig. 26

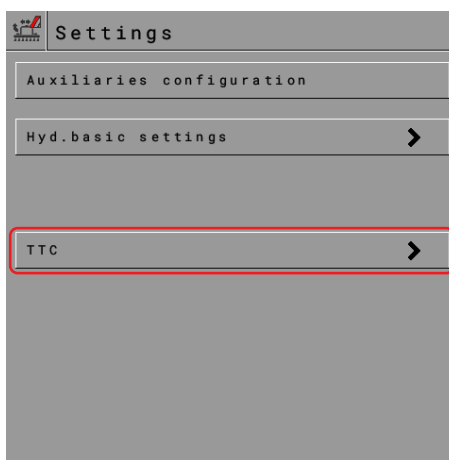
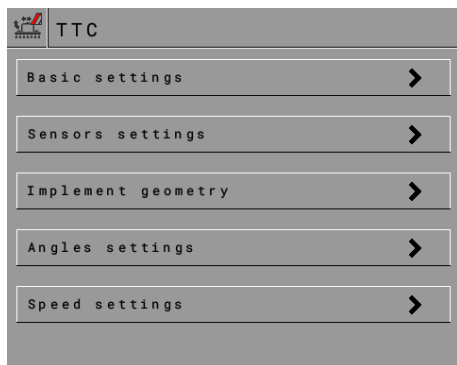


Fig. 27

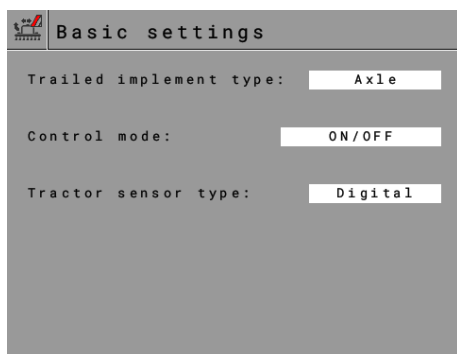
13.1 Menu > Settings > TTC



Allows accessing the TTC setup pages.

Fig. 28

13.1.1 Menu > Settings > TTC > Basic settings



Allows accessing the configuration pages of the basic settings.

Fig. 29

13.1.1.1 Menu > Settings > TTC > Basic settings > Trailed implement type

Steering system type.

Steering Drawbar

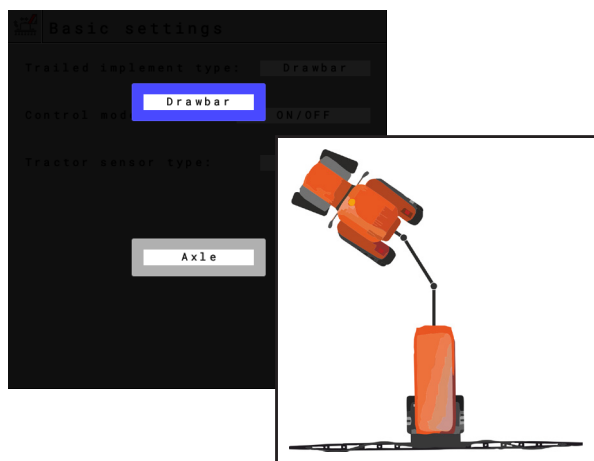


Fig. 30

Steering Axle

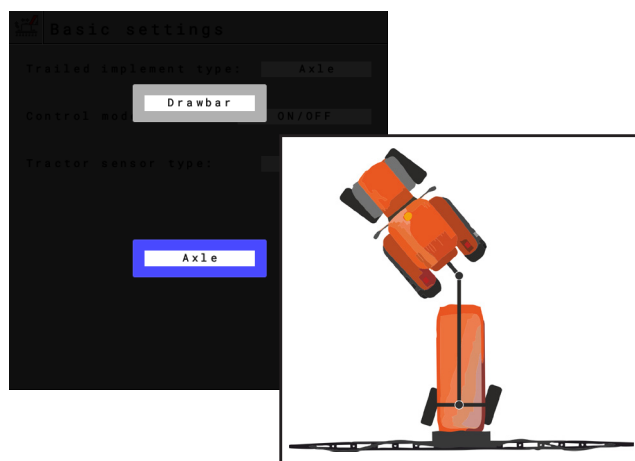


Fig. 31

13.1.1.2 Menu > Settings > TTC > Basic settings > Control modes

Type of hydraulic steering valves.

The hydraulic steering valves can be both of the **ON/OFF** and of the **Proportional** type. Steering activation through the proportional hydraulic valves offers a better performance in terms of sliding and control accuracy.

13.1.1.3 Menu > Settings > TTC > Basic settings > Tractor sensor type

Type of sensor **S1**, to measure tractor steering angle:

**Angle**: an angle sensor is installed (**S1**).

**Digital**: two digital sensors are installed (**S1L + S1R**, ref. par. 7.4).

13.1.2 Menu > Settings > TTC > Sensors settings

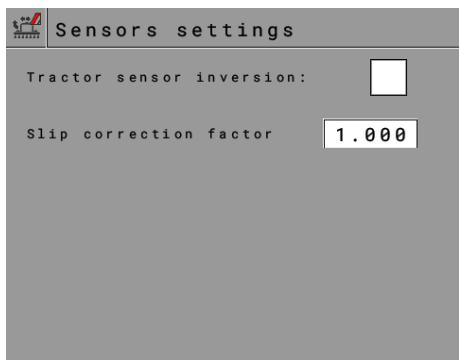


Fig. 32

Allows accessing the sensor setup pages.

13.1.2.1 Menu > Settings > TTC > Sensors settings > Tractor sensor inversion:

Reversal of the output signal of sensor **S1**.

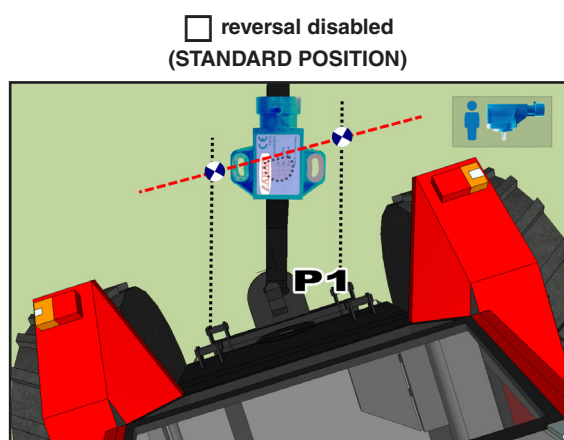


Fig. 33

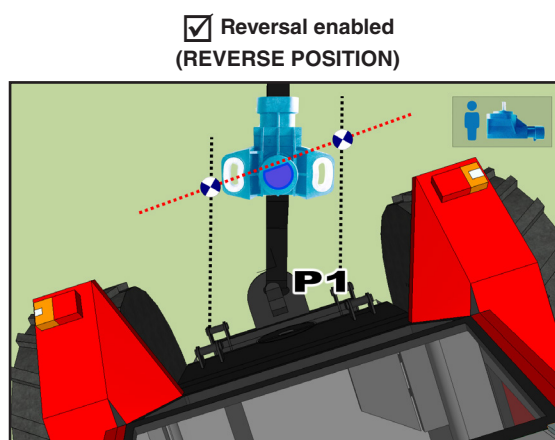


Fig. 34



Refer to par. "6.1 Installation of angle sensors S1 and S2" to check standard conditions.

13.1.2.2 Menu > Settings > TTC > Sensors settings > Slip correction factor

It compensates for any wheel slipping, due to geometrical errors of the trailed machine during cornering. A value below 1,000 leads to understeering; a value above 1,000 leads to oversteering.

Menu visible ONLY if Axle has been set in Menu > Settings > TTC > Basic settings > Trailed implement type > Axle (par. 13.1.1.1)



The value will have to be directly detected on the field, since it is strictly linked to ground conditions.

13.1.3 Menu > Settings > TTC > Implement geometry

13.1.3.1 Menu > Settings > TTC > Implement geometry > Axle (T) / Hitch point

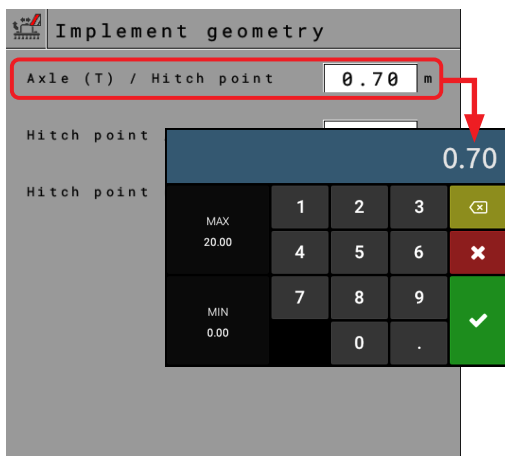


Fig. 35

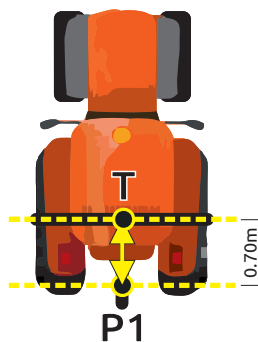


Fig. 36

Distance between tractor rear axle **T** and machine **P1** connection point (Fig. 36).

NB. The measures are purely indicative.

13.13.2 Menu > Settings > TTC > Implement geometry > Hitch point / Axle (A)

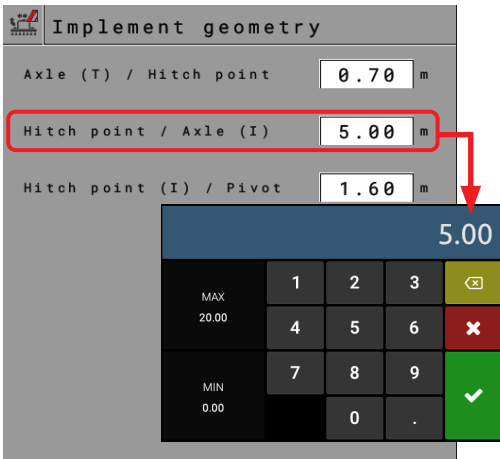


Fig. 37

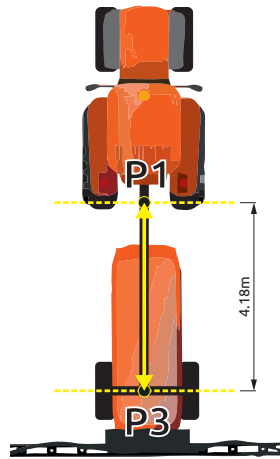


Fig. 38

Distance between tractor **P1** connection point and trailed implement **P3** axle (Fig. 38).

NB. The measures are purely indicative.

13.13.3 Menu > Settings > TTC > Implement geometry > Hitch point / Pin

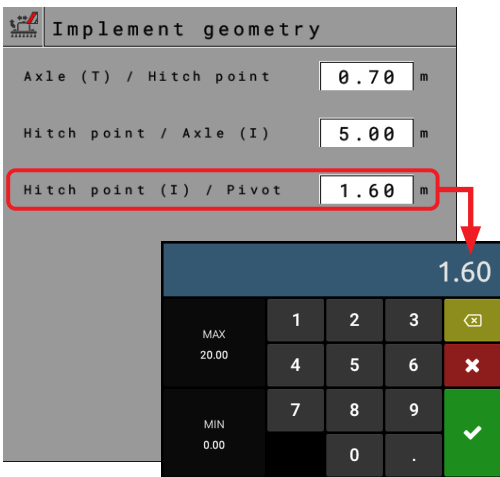


Fig. 39

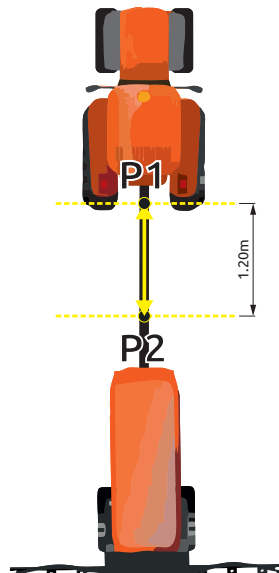


Fig. 40

Menu active **ONLY** with programming  
**Menu > Settings > TTC > Basic settings > Trailed implement type > Drawbar**

Distance between **P1** connection point and trailed implement **P2** steering point (Fig. 40).

NB. The measures are purely indicative.

13.14 Menu > Settings > TTC > Angles settings

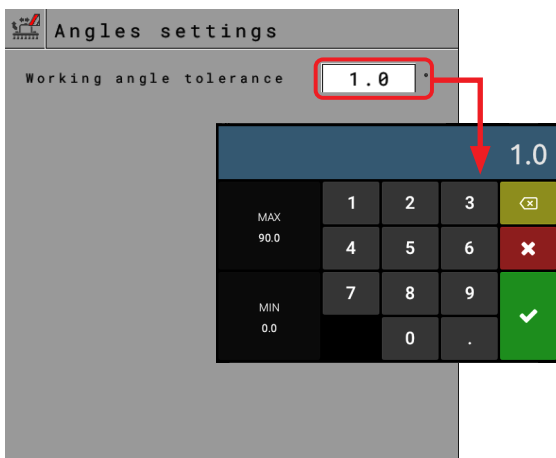


Fig. 41

Default value 1°.

Set a value that is not too different from the default value. Setting a tolerance higher than  $\pm 2^\circ$ , the implement might have unintended deviations.

**Angle tolerance working**

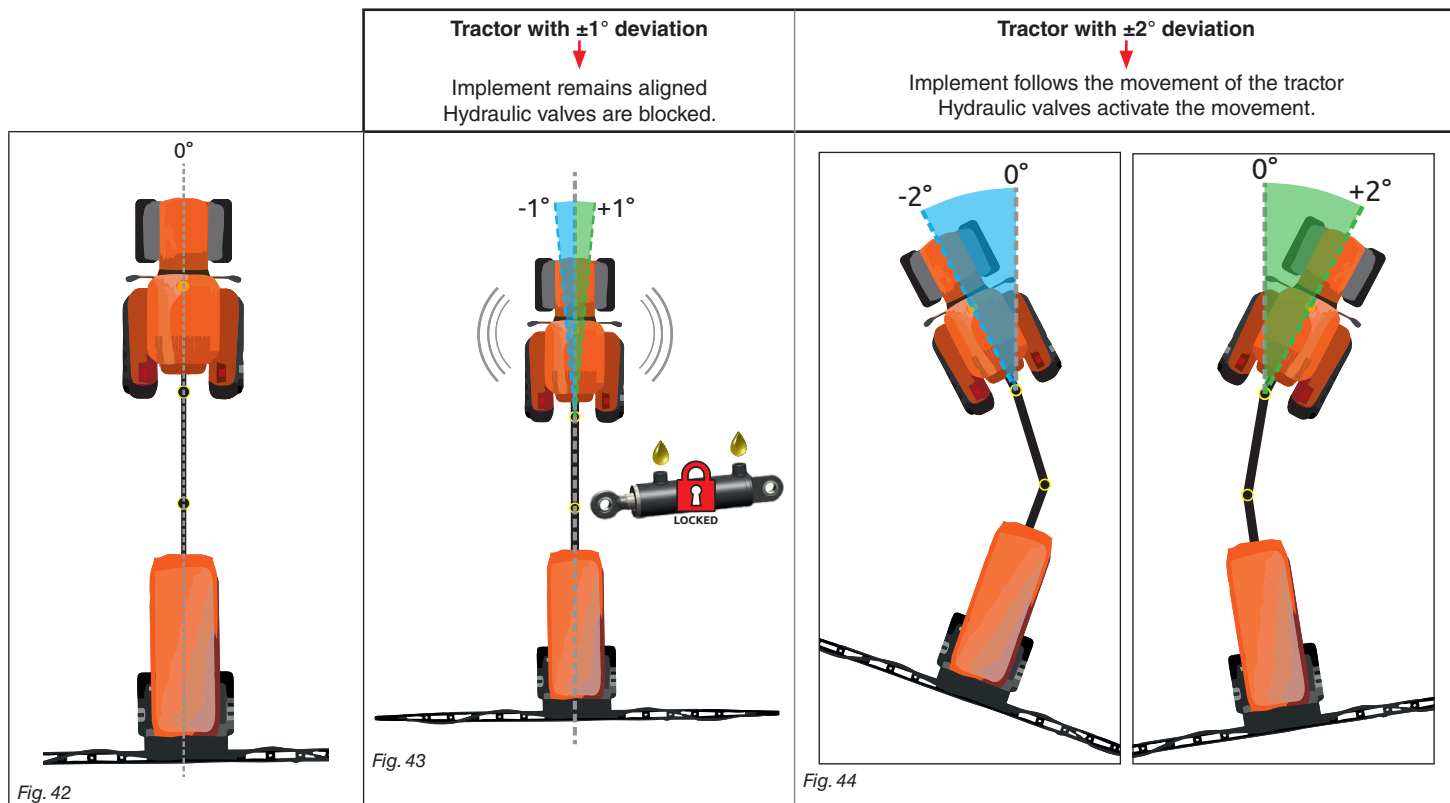
Tolerance angle compared to the envisaged maneuver angle **S2** (par. "12.2 Types of machine" on page 13).

Until the trailer position is within the set angle **S2**, the system **will not** adjust the steering hydraulic valves ("Fig. 40") (angle difference lower than the specified tolerance).

Too a low value requests a constant correction by the TTC control; in addition, a low tolerance is hard to be complied with even when the system allows very high minimum actuation and gain values of the hydraulic valves.

During treatment, the tractor sensor (**S1**) may detect small deviations of the measurement (angle) because of normal differences in ground level, causing unintended actuations (preventing the durability of mechanical and hydraulic components). We recommend setting the value after multiple tests during processing.

The following images are only illustrative.



**13.1.5 Menu > Settings > TTC > Settings speed**

**13.1.5.1 Speed source:**

Allows to select the source for speed calculation.

Available options:

**Tractor wheel:** When this option is enabled, speed is calculated through the pulses coming from the speed sensor, installed on the wheel **and directly connected to the VT**. The wheel constant must be entered during the setup procedure.

**Tractor radar:** Information concerning speed is received by the GPS, which is connected directly to the VT.

**Wheel sensor (ECU):** When this option is enabled, speed is calculated through the pulses coming from the speed sensor, installed on the wheel **and connected to the ECU through proper harness**. The wheel constant must be entered during the setup procedure.

If speed is not provided by the GPS signal, connect an external speed sensor (**SPEED** "74 Sensor connection" on page 9) to the IBX100 Hydraulic Isobus control unit. Sensor does not come with the kit.



Connect sensor as specified in par. "74 Sensor connection".

**13.1.5.2 Minimum speed limit:**

Tractor minimum speed threshold under which the TTC system interrupts the actuation of steering hydraulic valves / drawbar and stays in AUTOMATIC mode.

If the speed falls under the minimum set value, the TTC system displays an error message **Speed too low!** "20.1 Error messages - Troubleshooting" on page 30


**13.1.5.3 Maximum speed limit:**

Tractor maximum speed threshold above which the TTC system actuates the steering hydraulic valves / drawbar, thus taking automatically the trailed implement in alignment position.

Once the trailed implement is aligned, the system stops the actuation of the steering hydraulic valves / drawbar and sets to MANUAL mode.

If the speed is above the maximum set value, the TTC system displays an error message **Speed too high!** "20.1 Error messages - Troubleshooting" on page 30.

## 13.1.6 Menu &gt; Settings &gt; TTC &gt; Valves settings

 **This menu is active ONLY IF the item Control mode is set to Proportional (Menu > Settings > TTC > Basic settings > Control mode > Proportional par. 13.1.1.2).**

## 13.1.6.1 Min actuation:


Minimum activation applied to the coil of proportional steering valves.

In steering curve management, **the minimum correction set is constant**, independent of the detected error.

Too low or too high values prevent an efficient correction:

- in case of too low values, the hydraulic system (cylinder or steering valves) does not move;
- too a high value does not allow a fine correction on small position errors.


 **The value is a characteristic parameter of all trailed implements: the steering geometry and the hydraulic components are strictly connected to the model.**

 **Follow this procedure to define the correct value.**  
**This menu is active ONLY IF the item Control mode is set to Proportional (Menu > Settings > TTC > Basic settings > Control mode > Proportional par. 13.1.1.2).**

- 1 Bring the rotation speed of the power take-off to the typical operating value.
- 2 Enable the TTC control: activate the AUTOMATIC mode (par. 12.5).
- 3 Drive the vehicle until the trailer is aligned with the tractor (angle **S2** becomes equal to zero).
- 4 Enter a minimum value for the menu **Gain during work**:
- 5 Enter a minimum activation value of the hydraulic valves.
- 6 Try to move to the left or to the right of the alignment line, checking that the TTC system corrects the steering angle **S2**, at least on one of the two sides:
  - if the correction is correct, lower the value again;
  - if that is not so (**S2** stays equal to zero), increase the value.
- 7 Repeat the procedure from point 4, adjusting the value until the minimum (correct) possible value: this will be the final value to be set.

## 13.1.6.2 Balance R / L

It balances the intensity of the corrections, by comparing the RH side with the LH side.


 **Follow this procedure to define the correct value.**  
**This menu is active ONLY IF the item Control mode is set to Proportional (Menu > Settings > TTC > Basic settings > Control mode > Proportional par. 13.1.1.2).**

To set the correct value, proceed as follows:

- move to the alignment position;
- use manual controls (par. 12.6) to take the trailed implement to the extreme right and left positions;
- measure the required maneuver times.

The highest time indicates the side with a lower control intensity.


Set value 1 if the time required for the two controls is the same (intensity is the same as well).

 **The set value ALWAYS refers to the right side:**

- lower the value to reduce the intensity of the control to the right;
- increase the value to increase it.

## 13.1.6.3 Gain during work:


It adjusts the intensity of the corrections made by the TTC control:


 **Follow this procedure to define the correct value.**  
**This menu is active ONLY IF the item Control mode is set to Proportional (Menu > Settings > TTC > Basic settings > Control mode > Proportional par. 13.1.1.2).**

- set a low value for a soft and slow correction;
- set a high value for a reactive and quick correction.

Too high or too low values make the control unstable and cause vibration.

This type of correction is **proportional** to the detected error.

 **This adjustment works in combination with the minimum activation value of hydraulic valves (par. 13.1.6.1).**

 **The value will have to be directly detected on the machine: the steering geometry and the hydraulic components are strictly connected to the model.**

13.2 Menu > Settings > Auxiliaries configuration

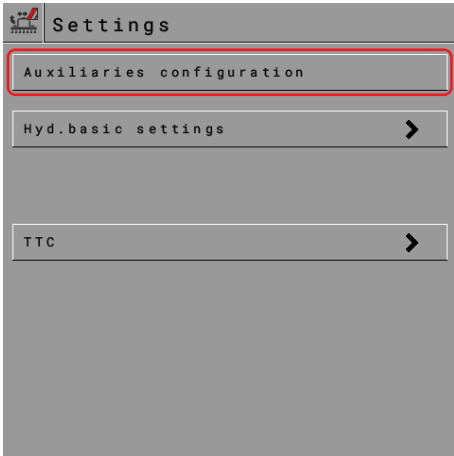


Fig. 45

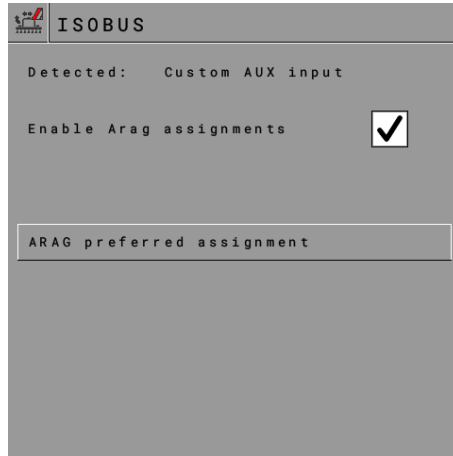



Fig. 46

 If, upon switching on, the VT detects: **Custom AUX input** the reasons might be:

- There is no auxiliary device associated
  - There is no ARAG device associated
  - Despite the joystick was detected, the buttons configuration is for single mode in the settings.
- Set double configuration.

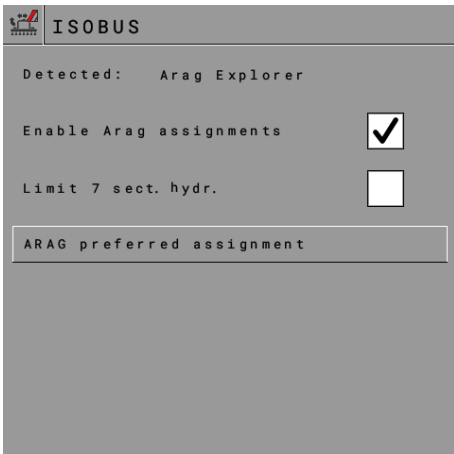





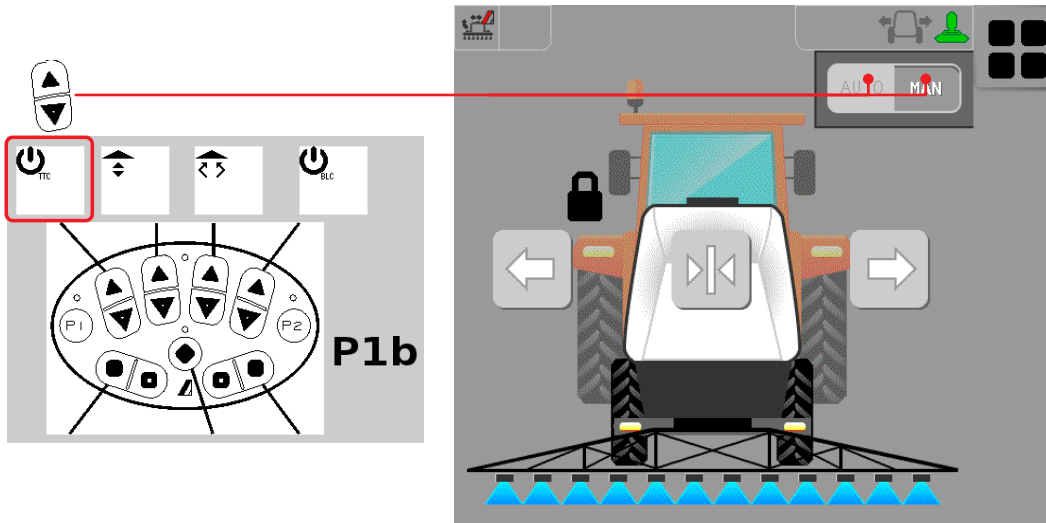
Fig. 47

Once the joystick connection is correct, its status can be verified looking at the color of the icon in HOME:

-  All the IBX100 functions are associated to a key
-  No function associated
-  **Not** all the IBX100 functions are associated to a key.

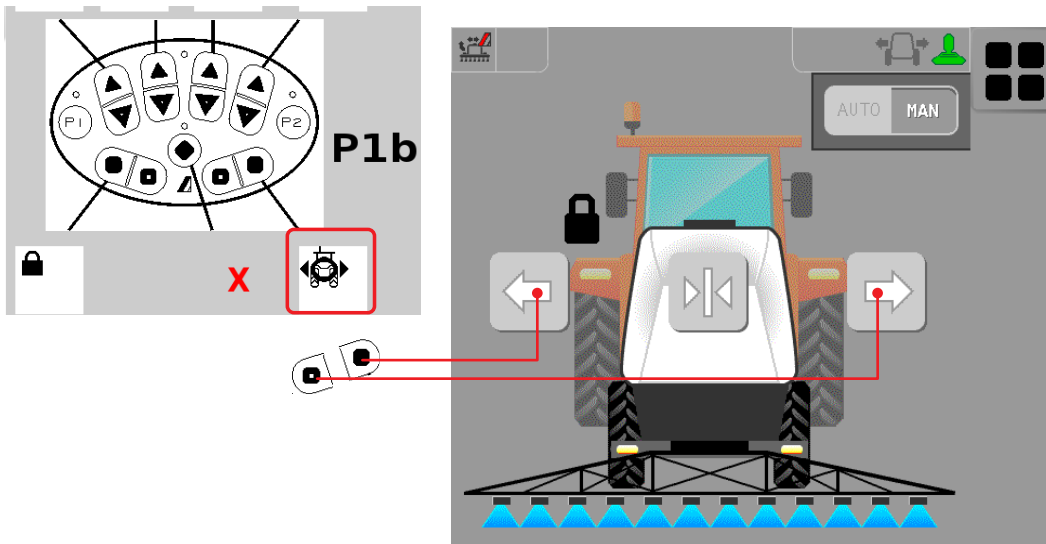
13.3 Control through ARAG Explorer Joystick

The positions of the functions on the Explorer are assigned by IBX 100 Hydraulic Isobus in menu: **Settings > AUX configuration > Assign ARAG Auxiliaries.**



It allows shifting from the Automatic to the Manual TTC control mode, and vice versa.

Fig. 48

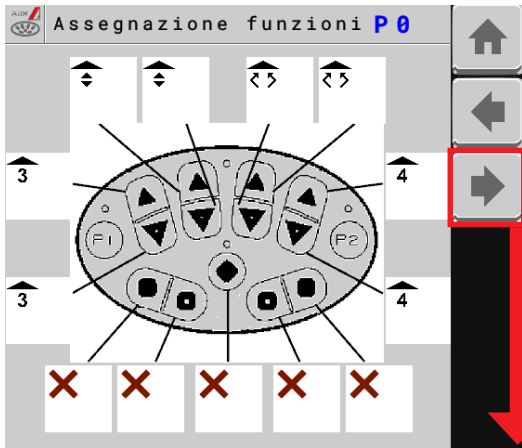


It allows moving the trailer to the left or to the right, based on the pressed button.

Fig. 49

13.3.1 Explorer Joystick

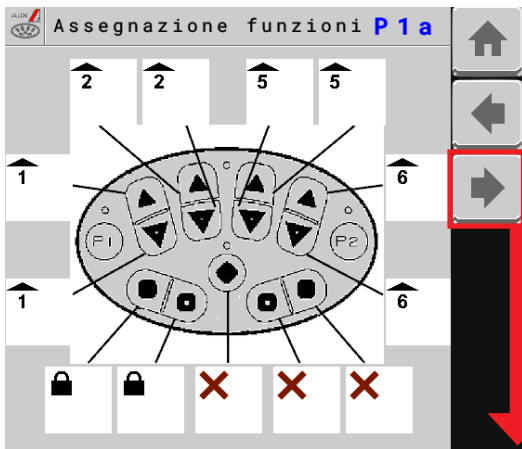
Press the keys to scroll the pages.



**PAGE 0**

A = opens the hydraulic valve - C = closes the hydraulic valve

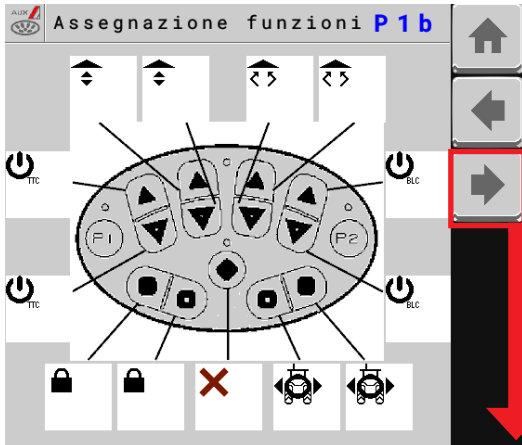
|                                      |                          |                                |                                      |
|--------------------------------------|--------------------------|--------------------------------|--------------------------------------|
| 3                                    | 4                        | 3                              | 4                                    |
| Var. geom. L (A)<br>Var. geom. L (C) | Height (A)<br>Height (C) | Boom tilt (A)<br>Boom tilt (C) | Var. geom. R (A)<br>Var. geom. R (C) |
| Not assigned                         | Not assigned             | Not assigned                   | Not assigned                         |



**PAGE 1a**

A = opens the hydraulic valve - C = closes the hydraulic valve

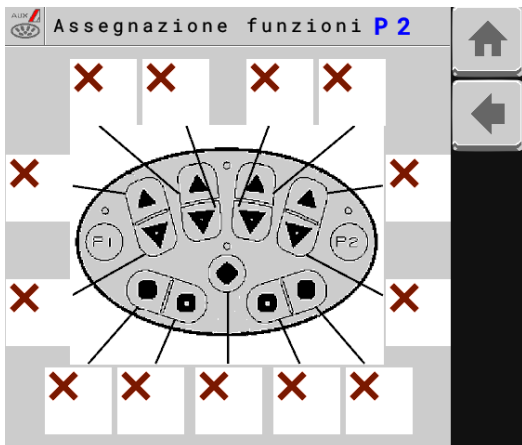
|                                    |                                    |                                    |                                    |
|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| 1                                  | 2                                  | 5                                  | 6                                  |
| Arm no. 2 L (A)<br>Arm no. 2 L (C) | Arm no. 1 L (A)<br>Arm no. 1 L (C) | Arm no. 1 R (A)<br>Arm no. 1 R (C) | Arm no. 2 R (A)<br>Arm no. 2 R (C) |
| Boom lock (A)<br>Boom lock (C)     | Not assigned                       | Not assigned                       | Not assigned                       |



**PAGE 1b**

A = opens the hydraulic valve - C = closes the hydraulic valve

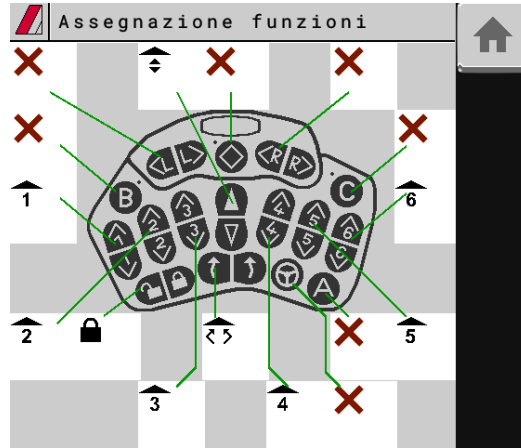
|                                       |                          |   |   |
|---------------------------------------|--------------------------|---|---|
| TTC                                   | 4                        | 5   | BLC   |
| Drawbar/Steering axle AUTO/MAN switch | Height (A)<br>Height (C) | Boom tilt (A)<br>Boom tilt (C)                              | Boom leveling AUTO/MAN switch                               |
| Boom lock (A)<br>Boom lock (C)        | Not assigned             | Manual mov. TTC to the LEFT<br>Manual mov. TTC to the RIGHT | Manual mov. TTC to the LEFT<br>Manual mov. TTC to the RIGHT |



**PAGE 2**

|              |              |              |              |
|--------------|--------------|--------------|--------------|
| Not assigned | Not assigned | Not assigned | Not assigned |
| Not assigned | Not assigned | Not assigned | Not assigned |

13.3.2 Explorer 2 Joystick



| PAGE 1   |   |   |  |   |   |   |
|--|---|---|--|---|---|---|
| A = opens the hydraulic valve - C = closes the hydraulic valve |   |   |  |   |   |   |
| <br><b>B</b><br>Not assigned                                   | <br><b>&lt;L L&gt;</b><br>Not assigned      | <br><b>◇</b><br>Not assigned                  | <br><b>&lt;R R&gt;</b><br>Not assigned | <br><b>C</b><br>Not assigned                  |   |   |
| <br>1<br>Arm no. 2 L (A)<br>Arm no. 2 L (C)                    | <br>2<br>Arm no. 1 L (A)<br>Arm no. 1 L (C) | <br>3<br>Var. geom. L (A)<br>Var. geom. L (C) | <br><br>Height (A)<br>Height (C)       | <br>4<br>Var. geom. R (A)<br>Var. geom. R (C) | <br>5<br>Arm no. 1 R (A)<br>Arm no. 1 R (C) | <br>6<br>Arm no. 2 R (A)<br>Arm no. 2 R (C) |
| <br>Boom lock (A)<br>Boom lock (C)                             | <br><br>Boom tilt (A)<br>Boom tilt (C)      |   | <br><b>⊙</b><br>Not assigned           | <br><b>A</b><br>Not assigned                  |   |   |

13.4 Menu > Settings > Hyd.basic settings

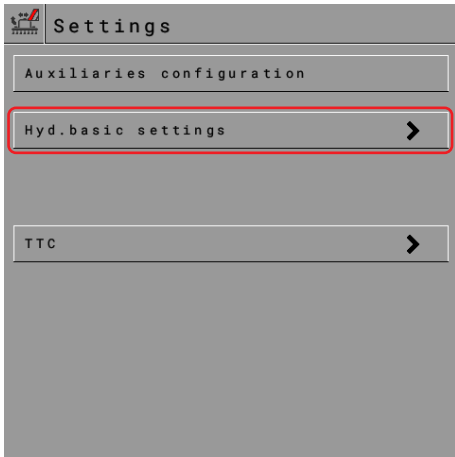


Fig. 50

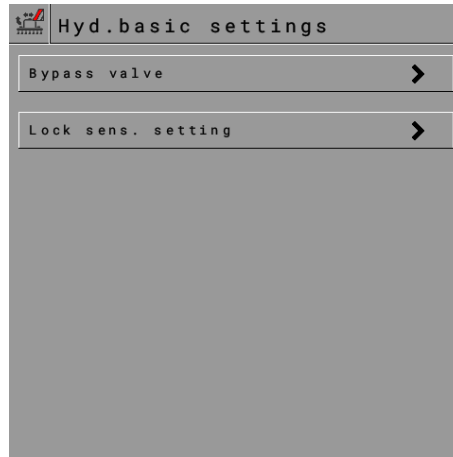


Fig. 51

13.4.1 Menu > Settings > Hyd.basic settings > Bypass valve

Allows selecting the hydraulic outlets that automatically activate the drain valve (DD) when operated:  
**Enables / Disables** the bypass valve. Fig. 52

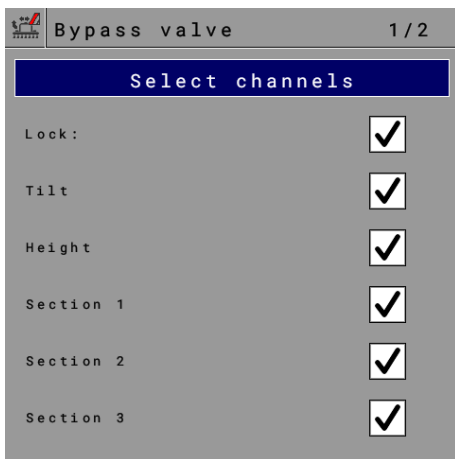


Fig. 52

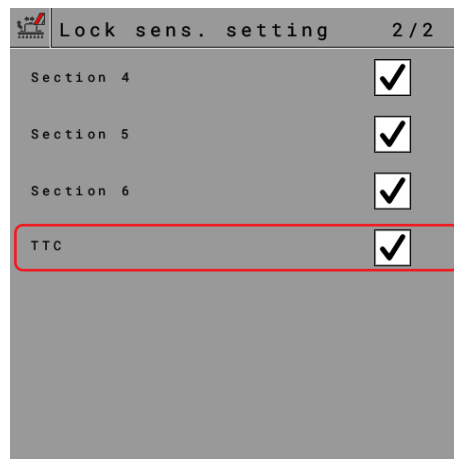


Fig. 53

If the installed hydraulic unit does not require the drain valve DD, its function may be disabled in this menu.

13.4.2 Menu > Settings > Hyd.basic settings > Lock sens. setting

Allows selecting the hydraulic functions to disable when the boom status detected by the IBX100 Sprayer is BLOCKED. Fig. 54  
**These settings are applied only to IBX100 Hydraulics installed with IBX100 Sprayer, with a sensor connected to IBX100 Sprayer detecting the LOCKED / NOT LOCKED status of the boom.**  
**NOTE.** The “boom lock” sensor cannot be directly connected to the IBX100 Hydraulics.

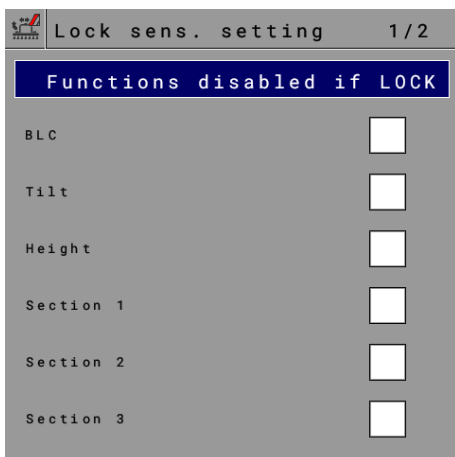


Fig. 54

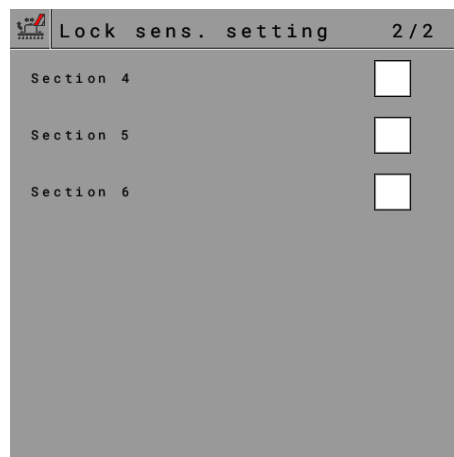


Fig. 55

14 MENU > HYDRAULIC CONTROLS



Allows setting the Hydraulic controls parameters.

Fig. 56

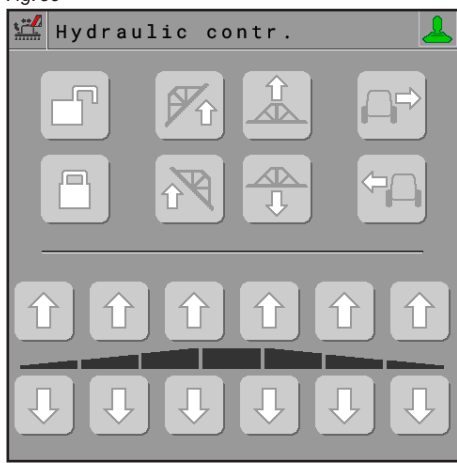
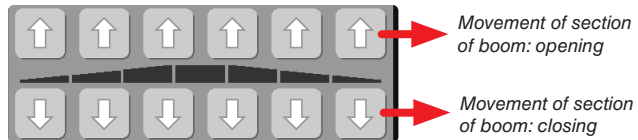
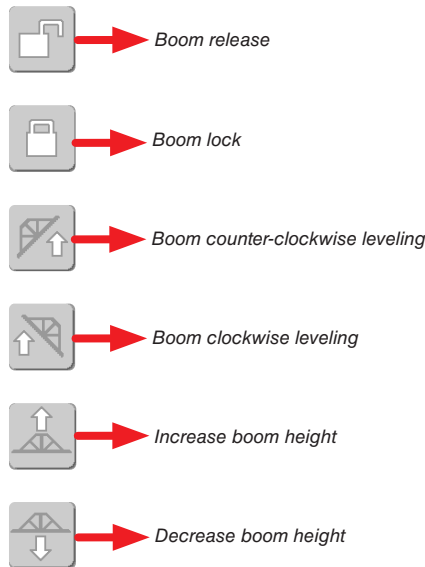


Fig. 57



15 MENU > ALARMS

This screen summarizes the alarm notifications active for the operators.



Fig. 58

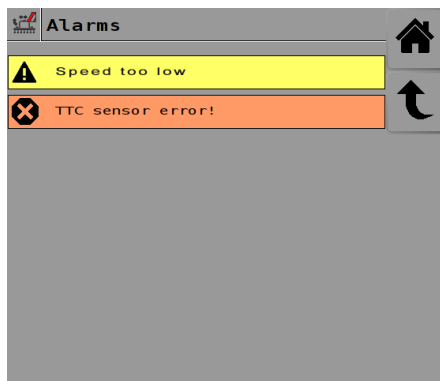



Fig. 59

 For the procedure to be followed when an alarm occurs, please refer to par. "20 MAINTENANCE - DIAGNOSTICS - REPAIRS" on page 30.

**16 MENU > DEVICE CALIBRATION**

This screen allows calibrating sensors:

- **S1** or **S1L / S1R**
- **S2**



Fig. 60

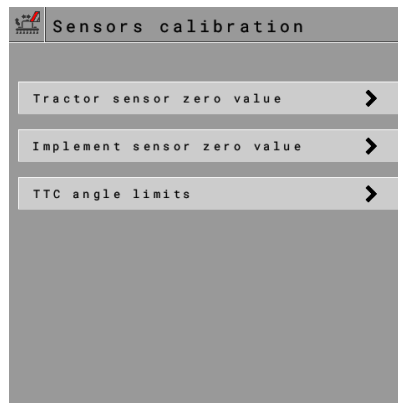


Fig. 61

**16.1 Menu > Device calibration > Sensors calibration**

**BEFORE CARRYING OUT ANY OPERATION, MAKE SURE THAT NO OPERATORS AND/OR HINDERS ARE PRESENT WITHIN MACHINE OPERATING RANGE.**

Calibration procedures must be directly carried out on the machine, in order to optimize TTC system performance. The trailer must be aligned with the tractor, in order to have **S1** and **S2** angles equal to zero (Fig. 20 and Fig. 22).

Carry out the procedure in the following sequence:

- 1 Disable the TTC control: activate the MANUAL mode** (par. 12.6).
- 2 Drive the trailer until it is aligned with the tractor** (Fig. 20 - Fig. 22): **check the movement with short pressures on the keys, in order to avoid machine vibrations and to increase accuracy.**  
Angle **S2** becomes equal to zero. (Fig. 22).
- 3 Lock position S2 of the trailer using the steering locking pin (highly recommended).**
- 4 Cover a straight distance until also tractor steering angle S1 is equal to zero.**
- 5 Stop the tractor.**
- 6 Carry out the calibration procedures described in next paragraphs.**

**For an ideal calibration, it is recommended to perform first the zero calibration of the implement sensor (par. 16.1.1) and then of the tractor sensor (par. 16.1.2).**

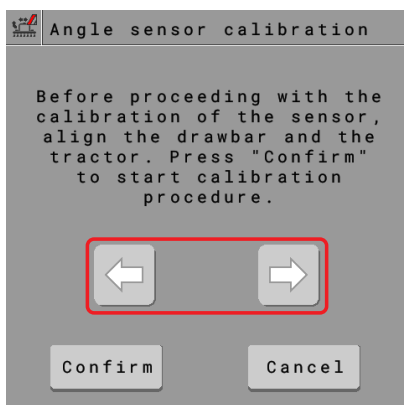


Fig. 62

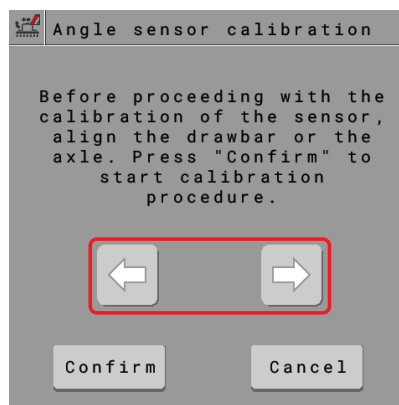


Fig. 63

**16.1.1 Menu > Device calibration > Implement sensor zero value**

- Follow the displayed instructions and press **Confirm** (Fig. 63).
- Press **Confirm** to save the calibration.

**Value not allowed!**  
**If this alarm is displayed, faulty values have been detected: check the sensor operation.**

Implement alignment position can be checked in **Menu > Device status**

**16.1.2 Menu > Device calibration > Tractor sensor zero value**

- Follow the displayed instructions and press **Confirm** (Fig. 62).
- Press **Confirm** to save the calibration.

**Value not allowed!**  
**If this alarm is displayed, faulty values have been detected: check the sensor operation.**

Tractor alignment position can be checked in **Menu > Device status**

16.1.3 Menu > Device calibration > TTC angle limits

Allows setting the maximum opening angle for the drawbar and the axle (left and right angle limits).

**Remove the locking pin to avoid damaging the machine.**

Carry out this procedure in sequence by following the displayed instructions:

- Disable the TTC control: activate the MANUAL mode (par 12.6).
- Make sure that steering locking pin has been removed.
- Move the trailer until reaching the left limit.
- Press **Confirm** to save the value of angle **S2**.
- Move the trailer until reaching the right limit.
- Press **Confirm** to save the value of angle **S2**.
- Press **Confirm** to save the calibration.

Check to be performed before calibration:



Fig. 64

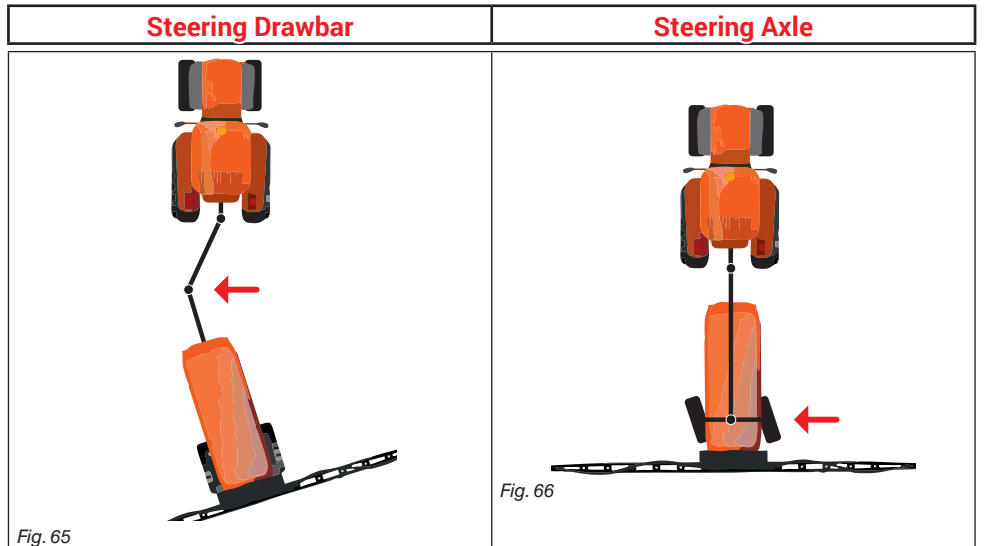


Fig. 65

Fig. 66

If the implement does not move following what represented in figures Fig. 65 and Fig. 66 reverse the connectors to the hydraulic valves (Fig. 67) or rotate the entire valve unit:

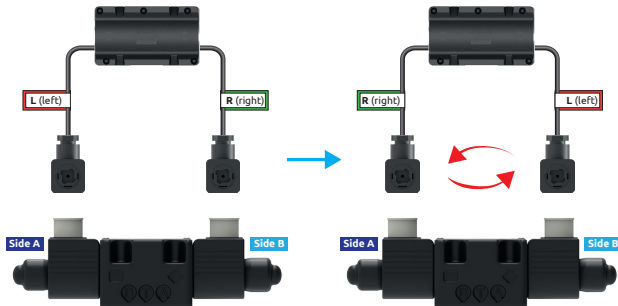


Fig. 67



The colors of the labels (**L** and **R**) are purely indicative. They are not applied to the connectors.



After reversing the connections, it is necessary to perform the calibration again.

17 MENU > DEVICE STATUS

This screen shows the status of the set and installed sensors:

- Status of tractor sensor **S1** or **S1L / S1R**
- Status of implement sensor **S2**
- Status of Speed sensor
- Status of lock sensor **S3**

The display will show the current sensor reading.

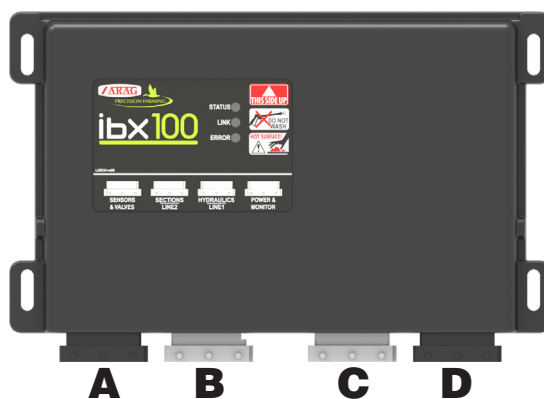


Fig. 68

| TTC sensors data |         |          |
|------------------|---------|----------|
| Tractor angle    | 0.00 mA | 0.0 °    |
| Implement angle  | 3.45 mA | 0.0 °    |
| Speed            | 0 Hz    | 0.0 km/h |
| Lock status      | ON      |          |
|                  |         |          |
|                  |         |          |
|                  |         |          |
|                  |         |          |

Fig. 69

**18 PIN-OUT IBX100 HYDRAULIC ISOBUS**



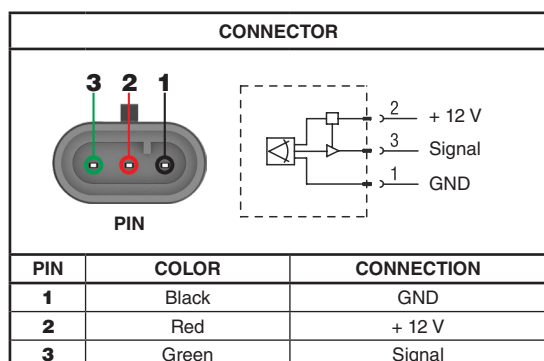
| <b>A</b>            |                               |
|---------------------|-------------------------------|
| <b>SENSOR CABLE</b> |                               |
| <b>PIN</b>          | <b>IBX100 signal</b>          |
| A1                  | 12V sensor power supply       |
| A2                  | -                             |
| A3                  | -                             |
| A4                  | -                             |
| A5                  | -                             |
| A6                  | -                             |
| A7                  | -                             |
| A8                  | GND sensor power supply       |
| B1                  | -                             |
| B2                  | Implement sensor "ANGLE"      |
| B3                  | -                             |
| B4                  | -                             |
| B5                  | Tractor sensor "LEFT"         |
| B6                  | Sensor (not used) "RIGHT"     |
| B7                  | Not used "Tilt"               |
| B8                  | -                             |
| C1                  | -                             |
| C2                  | Speed sensor (S) (Optional)   |
| C3                  | Mechanical lock sensor "Lock" |
| C4                  | -                             |
| C5                  | -                             |
| C6                  | Flashing light (Light)        |
| C7                  | Boom lighting (Light)         |
| C8                  | -                             |

| <b>B</b>            |                        |
|---------------------|------------------------|
| <b>SENSOR CABLE</b> |                        |
| <b>PIN</b>          | <b>IBX100 signal</b>   |
| A1                  | -                      |
| A2                  | -                      |
| A3                  | -                      |
| A4                  | -                      |
| A5                  | -                      |
| A6                  | -                      |
| A7                  | -                      |
| A8                  | -                      |
| B1                  | -                      |
| B2                  | -                      |
| B3                  | -                      |
| B4                  | -                      |
| B5                  | -                      |
| B6                  | -                      |
| B7                  | Steering valve "LEFT"  |
| B8                  | -                      |
| C1                  | -                      |
| C2                  | -                      |
| C3                  | -                      |
| C4                  | -                      |
| C5                  | -                      |
| C6                  | -                      |
| C7                  | Steering valve "RIGHT" |
| C8                  | -                      |

| <b>C</b>            |                      |
|---------------------|----------------------|
| <b>SENSOR CABLE</b> |                      |
| <b>PIN</b>          | <b>IBX100 signal</b> |
| A1                  | -                    |
| A2                  | -                    |
| A3                  | -                    |
| A4                  | -                    |
| A5                  | -                    |
| A6                  | -                    |
| A7                  | -                    |
| A8                  | -                    |
| B1                  | -                    |
| B2                  | -                    |
| B3                  | -                    |
| B4                  | -                    |
| B5                  | -                    |
| B6                  | -                    |
| B7                  | -                    |
| B8                  | -                    |
| C1                  | -                    |
| C2                  | -                    |
| C3                  | -                    |
| C4                  | -                    |
| C5                  | -                    |
| C6                  | -                    |
| C7                  | -                    |
| C8                  | -                    |

| <b>D</b>            |                      |
|---------------------|----------------------|
| <b>SENSOR CABLE</b> |                      |
| <b>PIN</b>          | <b>IBX100 signal</b> |
| A1                  | Pwr                  |
| A2                  | -                    |
| A3                  | -                    |
| A4                  | -                    |
| A5                  | -                    |
| A6                  | -                    |
| A7                  | Pwr                  |
| A8                  | Pwr                  |
| B1                  | Pwr GND              |
| B2                  | -                    |
| B3                  | Can L                |
| B4                  | Can H                |
| B5                  | -                    |
| B6                  | -                    |
| B7                  | Ecu-power            |
| B8                  | Pwr                  |
| C1                  | Pwr GND              |
| C2                  | Pwr GND              |
| C3                  | -                    |
| C4                  | -                    |
| C5                  | Tbc-power            |
| C6                  | Tbc GND              |
| C7                  | Ecu-power GND        |
| C8                  | Pwr GND              |

**19 SENSOR PIN-OUT**



**20 MAINTENANCE - DIAGNOSTICS - REPAIRS**

**20.1 Error messages - Troubleshooting**

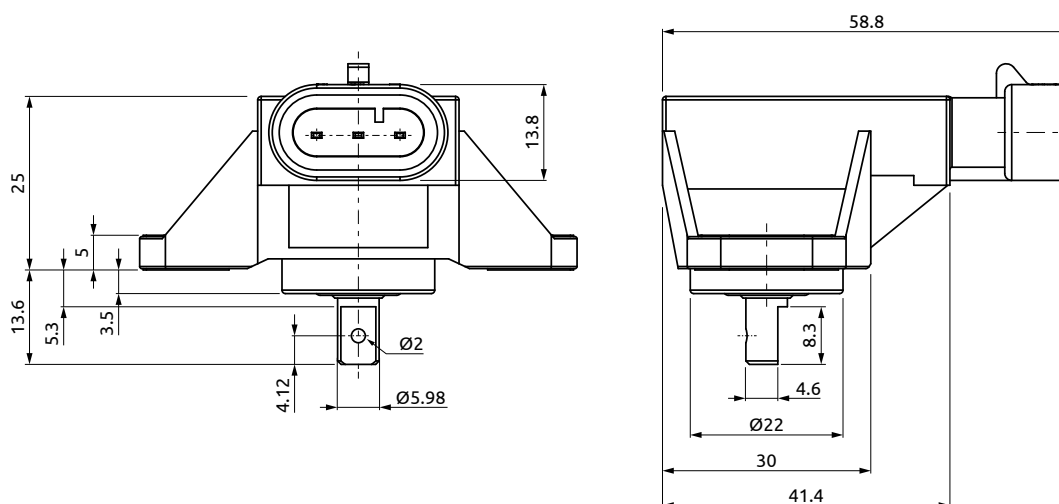
| Displayed error - Detected during operation   | LED status   | Number of blinks | Cause  | Remedy  |
|---|--------------|------------------|--|---|
| The TTC item is not present inside the settings menu  | --           | --               | The TTC activation license key has not been entered  | Request the release code (see <i>par. "Menu &gt; System status &gt; Registration license" on page 11</i> )  |
| TTC sensor error!   | Red Blinking | 8                | Sensors not connected  | Check corresponding power cables connection   |
|   |              |                  | The measured current value (mA) is outside the set operating limits. Possible sensor fault | Check the conditions of the angle sensor  |
|   |              |                  |  | Replace the sensor  |
| TTC error!  | --           | --               | Wrong setup  | Check the setup of the following menus:<br>Tractor sensor type - <i>par. 13.1.1.3</i><br>Axle (T) / Hitch point - <i>par. 13.1.3.1</i><br>Hitch point / Axle (I) - <i>par. 13.1.3.2</i><br>Hitch point / Pivot - <i>par. 13.1.3.3</i> |
| Despite traveling within the preset speed limits, the VT shows the alarm:<br><b>Speed too low!</b><br>(alarm active only if in <b>AUTO</b> control mode)  | --           | --               | Wrong setup  | Check minimum speed programming; if necessary, edit the set value - <i>par. 13.1.5.2</i>  |
|   |              |                  |  | Check the programming of the wheel constant and whether the speed sensor is connected to the SPEED cable - <i>par. 7.4</i>  |
|   |              |                  |  | Check the correct operation of wheel sensor, if necessary replace it  |
|   |              |                  |  | Check Speed Source programming - <i>par. 13.1.5.1</i>   |
| Despite traveling within the preset speed limits, the VT shows the alarm:<br><b>Speed too high!</b><br>(alarm active only if in <b>AUTO</b> control mode) | --           | --               | Wrong setup  | Check wheel constant programming  |
|   |              |                  |  | Check maximum speed programming; if necessary, edit the set value   |
|   |              |                  |  | Check the correct operation of wheel sensor, if necessary replace it  |
| The steering axle does not correctly follow the trailed implement-tractor   | --           | --               | Wrong programming of the "Slip correction factor"<br>Par. <i>13.1.2.2</i>                  | Decrease the value for menu Slip correction factor if you want to generate an understeering condition - <i>par. 13.1.2.2</i>  |
|   |              |                  |  | Increase the value for menu Slip correction factor if you want to generate an oversteering condition - <i>par. 13.1.2.2</i>   |
|   |              |                  |  | Check wheel geometry programming - <i>par. 13.1</i>   |
| The trailed implement, while covering a straight path, is not aligned with tractor even after realignment.  | --           | --               | Wrong programming of menu Angle tolerance working  | Reduce work angle tolerance ( <i>par. 13.1.4</i> )  |
|   |              |                  |  | Repeat sensor calibration - <i>par. 16.1</i>  |
| The TTC system cannot completely align the trailed implement  | --           | --               | Wrong programming of menu Min actuation  | Increase the value of the set value - <i>par. 13.1.6.1</i>  |
|   |              |                  |  | Reduce work angle tolerance - <i>par. 13.1.4</i>  |
| The TTC system has an unstable and/or irregular control   | --           | --               | Wrong programming of menus Hydraulic valve gain during operation and Min actuation         | Check the programming of menu Hydraulic valve gain during operation - <i>par. 13.1.6.3</i>  |
|   |              |                  |  | Check the programming of menu Minimum actuation - <i>par. 13.1.6.1</i>  |
| The implement actuates the steering valves too slowly to reach the extreme right and left positions   | --           | --               | Wrong programming of menu Hydraulic valve balancing Right to the Left                      | Check the programming of menu Hydraulic valve balancing Right to the Left - <i>par. 13.1.6.2</i>  |
|   |              |                  |  | Repeat the procedure described in <i>par. 13.1.6.1</i> to set the correct value   |
| The system shifts to <b>AUTO</b> mode   | --           | --               | The system detects the status of mechanical lock   | Check for the presence of machine mechanical lock   |
|   |              |                  |  | Check that the LOCK sensor sees the mechanical lock status  |
|   |              |                  |  | Check the operation of the LOCK sensor and the relevant connection  |
|   |              |                  |  | Problem on the LOCK sensor, replace it  |
| The system actuates the steering valves in opposite order   | --           | --               | Wrong connection to steering valves  | Check whether the DRAWBAR - HYDRAULIC VALVE CABLE has been reversed   |

20.2 Data and units of measurement shown

|                             | Data                    | Min. | Max.   | UOM  | DEFAULT                  | OTHER VALUES THAT CAN BE SET        | NOTES   |
|-----------------------------|-------------------------|------|--------|------|--------------------------|-------------------------------------|---|
| TTC ><br>Basic settings     | Trailed implement type  | --   | --     | --   | Drawbar                  | Axle                                |   |
|                             | Control mode            | --   | --     | --   | ON-OFF                   | Proportional                        |   |
|                             | Tractor sensor type     | --   | --     | --   | Angle                    | Digital                             |   |
| TTC ><br>Sensors settings   | Reverse Tractor sensor  | --   | --     | --   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |   |
|                             | Slip correction factor  | 0100 | 10000  | --   | 1000                     | --                                  | Active menu only if "Trailed implement type > Axle" is selected |
| TTC ><br>Implement geometry | Axle (T) / Hitch point  | 0.00 | 20.00  | m    | 0.50                     | --                                  |   |
|                             | Hitch point - Axle (A)  | 0.00 | 20.00  | m    | 5.00                     | --                                  |   |
|                             | Hitch point (A) / Pivot | 0.00 | 20.00  | m    | 1.60                     | --                                  |   |
| TTC ><br>Angles settings    | Angle tolerance working | 0.0  | 90.0   | Deg  | 1.0                      | --                                  |   |
| TTC ><br>Speed settings     | Source                  | --   | --     | --   | Tractor wheel            | Tractor radar - Wheel sensor (ECU)  |   |
|                             | Minimum speed limit     | 0.6  | 10.0   | km/h | 1.0                      | --                                  |   |
|                             | Maximum speed limit     | 1.0  | 20.0   | km/h | 15.0                     | --                                  |   |
| TTC ><br>Valves settings    | Min actuation           | 0    | 100    | %    | 28                       | --                                  | Active menu only if "Control mode > Proportional" is selected   |
|                             | Balance R / L           | 0.50 | 2.00   | --   | 1.00                     | --                                  |   |
|                             | Gain during work        | 0.1  | 9999.9 | --   | 400                      | --                                  |   |

21 TECHNICAL DATA

21.1 Sensor technical features



WARNINGS:

- Clean only with a soft wet cloth.
- Do not use aggressive detergents or products.
- Do not clean equipment with direct water jets.

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## 22 END-OF-LIFE DISPOSAL

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### INFORMATION TO USERS OF PROFESSIONAL EQUIPMENT

Pursuant to Art.26 of Italian Legislative Decree 49 of 2014, "Implementation of Directive 2012/19/EU on waste electrical and electronic equipment (WEEE)



The crossed-out wheeled bin symbol on the equipment or on its packaging indicates that the product must be collected separately from other waste to allow proper treatment and recycling at the end of its useful life.

Appropriate separate collection for subsequent recycling, treatment and environmentally compatible disposal of the scrapped equipment helps to avoid possible negative effects on the environment and health, and promotes the reuse and/or recycling of the materials that make up the equipment.

Unauthorized disposal of the product by the user results in the application of the sanctions provided for by current legislation.

**ARAG S.r.l. - WEEE identification no.: IT1108000007284 - has chosen to join a Collective System that guarantees the correct treatment and recovery of WEEE and the promotion of policies for environmental protection.**

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## 23 GUARANTEE TERMS

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1. ARAG s.r.l. guarantees this apparatus for a period of 360 days (1 year) from the date of sale to the client user (date of the goods delivery note).  
The components of the apparatus, that in the unappealable opinion of ARAG are faulty due to an original defect in the material or production process, will be repaired or replaced free of charge at the nearest Assistance Center operating at the moment the request for intervention is made. The following costs are excluded:
  - disassembly and reassembly of the apparatus from the original system;
  - transport of the apparatus to the Assistance Center.
2. The following are not covered by the guarantee:
  - damage caused by transport (scratches, dents and similar);
  - damage due to incorrect installation or to faults originating from insufficient or inadequate characteristics of the electrical system, or to alterations resulting from environmental, climatic or other conditions;
  - damage due to the use of unsuitable chemical products, for spraying, watering, crop sprayer or any other crop treatment, that may damage the apparatus;
  - malfunctioning caused by negligence, mishandling, lack of know how, repairs or modifications carried out by unauthorized personnel;
  - incorrect installation and regulation;
  - damage or malfunction caused by the lack of ordinary maintenance, such as cleaning of filters, nozzles, etc.;
  - anything that can be considered to be normal wear and tear;
3. Repairing the apparatus will be carried out within time limits compatible with the organizational needs of the Assistance Center.  
No guarantee conditions will be recognized for those units or components that have not been previously washed and cleaned to remove residue of the products used;
4. Repairs carried out under guarantee are guaranteed for one year (360 days) from the replacement or repair date.
5. ARAG will not recognize any further expressed or intended guarantees, apart from those listed here.  
No representative or retailer is authorized to take on any other responsibility relative to ARAG products.  
The period of the guarantees recognized by law, including the commercial guarantees and allowances for special purposes are limited, in length of time, to the validities given here.  
In no case will ARAG recognize loss of profits, either direct, indirect, special or subsequent to any damage.
6. The parts replaced under guarantee remain the property of ARAG.
7. All safety information present in the sales documents regarding limits in use, performance and product characteristics must be transferred to the end user as a responsibility of the purchaser.
8. Any controversy must be presented to the Reggio Emilia Law Court.

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## 24 EU DECLARATION OF CONFORMITY

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The declaration of conformity is available at the website [www.aragnet.com](http://www.aragnet.com), in the relevant section.

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Only use genuine ARAG accessories or spare parts to make sure manufacturer guaranteed safety conditions are maintained in time.  
Always refer to the Internet address [www.aragnet.com](http://www.aragnet.com).

D20384\_GB-m02 03/2023

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