



SBGUIDANCE AUTO

JD 6R, 7R, 8R AUTOTRAC READY

016-8000-090EN REV. A

Installation Manual
(English) (Original)

RAVEN

PREFACE

This installation manual is intended for persons responsible for installing a SBGuidance Auto system. The manual contains important instructions that should be complied with when commissioning, operating and servicing the SBGuidance system.

This manual has been compiled with the utmost care. Raven Europe assumes no responsibility for any errors or omissions in this document.

Any comments or questions can be sent to service-eu@ravenind.com.

Raven Europe or any of its suppliers will accept no liability for physical or material damage caused whilst using the SBGuidance system.

The installed Raven system produces less than 70dB (A) noise.

This user guide uses a number of concepts for extra attention to a few things:



Tip!:

Provides recommendations on how certain activities can be performed much easier.



Please note!:

Indicates certain problems that the user should take note of.



Caution!:

Indicates that the machine can be damaged.



Warning!:

Indicates a risk of injury.

DISCLAIMER

WARNING!

- The safety instructions contained in the manuals of the tractor or implements must be complied with at all times.
- Always switch off the tractor before installing or repairing hydraulic and electrical components of the SBGuidance system.
- It is strictly prohibited to use the SBGuidance system on public roads.
- It is strictly prohibited to leave a driving vehicle unattended when the SBGuidance system is switched on. The driver is always responsible for the direction and course of the vehicle.
- To prevent injury or fire, replace defective fuses only with fuses of the same type and amperage.
- The SBGuidance the operating system is not able to detect and avoid obstacles. If there is an obstacle in your path, you will always need to take action for it to be avoided.
- Only allow authorized/qualified persons to operate the system. Authorized/qualified persons are defined as: persons who have read and understood the manual, have been given instructions by a product specialist, and who are both physically and mentally fit and able to operate the system.
- The system contains moving parts! Make sure the immediate environment is clear of people before operating the system.
- In case of system failure or breakdown switch of the tractor and disconnect the electrical power source to avoid further damage. Contact your dealer for further instructions on how to repair your system.
- Always wear personal protective equipment when operating/adjusting/repairing the system outside of the tractor cab.
- In order to prevent power surges from occurring, always start the machine first, before initiating the SBGuidance control system.

PAY ATTENTION!

- Only touch the touch-screen with your finger or by using a special touch-screen stylus/pen. Operating the touch-screen with sharp objects may cause permanent damage to the screen.
- Always consult your supplier as to which products are best suited first before cleaning the touch-screen with chemicals or alcohol.
- If the terminal is not used for a long period, better remove the terminal from the tractor and store in a heated environment. This will extend the life span of the electronic components.
- To prevent theft, it is better to not let the terminal and GPS-antenna unattended in the tractor on the field.

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1 INSTRUCTIONS FOR INSTALLING THE SBGUIDANCE AUTO ON TRACTORS

This manual is a guide for the John Deere AutoTrac Ready CAN tractors. This chapter provides overviews of the components that can be supplied with this tractor sets. A difference in the kit is made for Tier 4 and not Tier 4 tractors, also the installation is a little different.

At a John Deere AutoTrac Ready there is a possibility to use the John Deere GPS system also. You will find more information about this in Chapter 4.

All necessary parts are supplied, including this manual. Verify that all items listed on the packing list are actually present.

i Please note!:
John Deere 6R, 7R and 8R tractors need a specific installation for some parts.

1.1 OVERVIEW OF STANDARD ELECTRONIC COMPONENTS

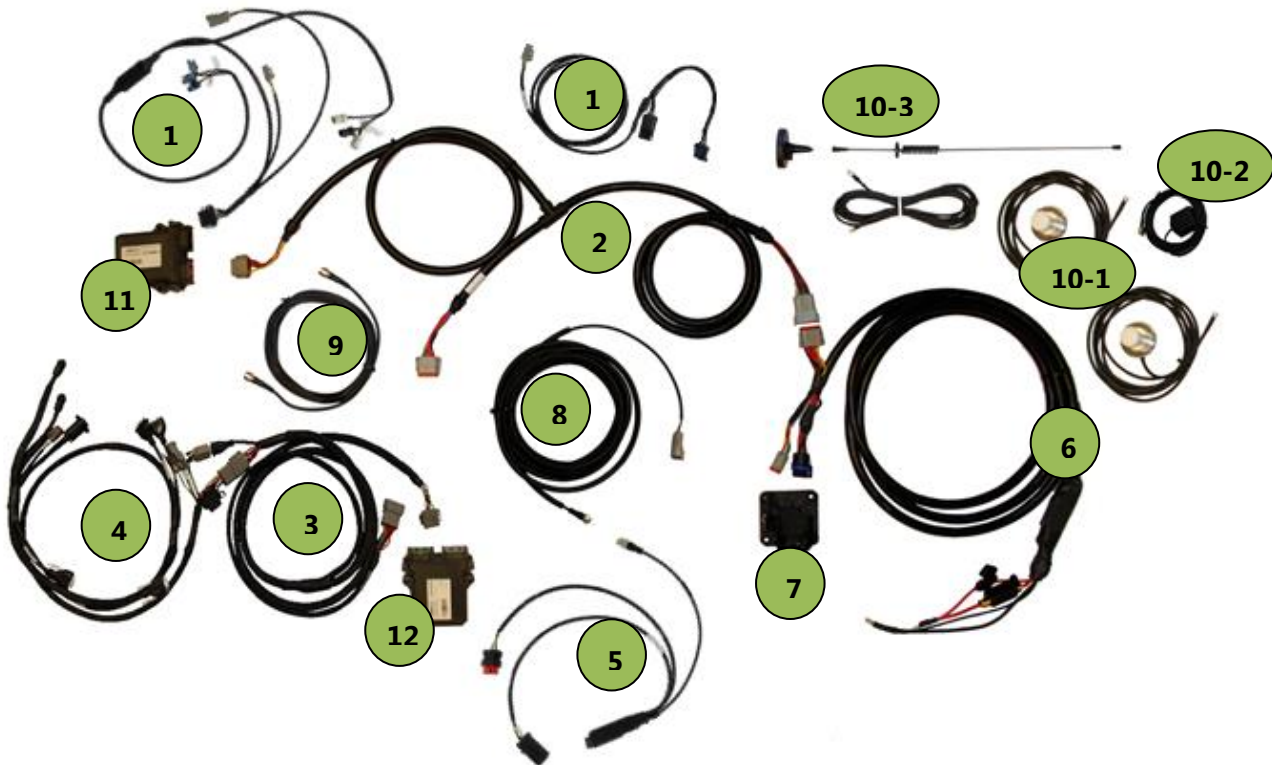


TABLE 1 OVERVIEW OF STANDARD ELECTRONICAL COMPONENTS

#	PART NUMBER	ITEM DESCRIPTION	QTY
1-1	115-8000-037+115-8000-254	HARNESS STU JD 6R AR INTERIM TIER4 and FINAL TIER4 MY18	1
1-2	115-8000-037+115-8000-294	HARNESS STU JD 6R AR FINAL TIER4	1
1-3	115-8000-037+115-8000-246	HARNESS STU JD 6R AR LARGE FRAME MY18	1
1-4	115-8000-037+115-8000-246	HARNESS STU JD 7R 8R AR	1
2	11158000138	HARNESS CHASSIS (HYDRAULICS)	1
3	11158000063	HARNESS IN-CAB SGC	1
4	11158000064	HARNESS IN-CAB VPR4 ISO	1
5-1	11158000035	HARNESS, WAS SPY JD STR 6R TIER4	1
5-2	11158000135	HARNESS, WAS SPY, JD STR 6R	1
6	11158000060	HARNESS, POWER, IMPLEMENT READY	1
7	14084002131	IMPLEMENT SOCKET ISOBUS (IBBC)	1
8	11158000226	HARNESS, WAS, 5M	1
9	1115800011(1,2,3)	GPS ANTENNA CABLE (3 / 4,5 / 6 M)	1
10-1	11218000025	ANTENNA, 4G/3G LAIRD, 3,5M	2
10-2	10638000015	FIELD HUB GPS PATCH ANTENNA 4,5m	1
10-3	11178000313	KIT, RADIO ANTENNA TRC, MAGNET	1
11	10638000087	STU TRACTOR	1
12	10630173862	ISO STEERING ECU TRACTOR	1

1.2 OVERVIEW OF MECHANICAL COMPONENTS



TABLE 2 OVERVIEW OF STANDARD MECHANICAL COMPONENTS

#	PART NUMBER	ITEM DESCRIPTION	QTY
1	11078000125	BRACKET, DYNAMIQ, V4	1
2	11078000081	BRACKET, GPS/RADIO ANT GENERIC	1
3	11078000082	BRACKET, RAM, CAB NH/JD	1
4	11030001040	MOUNT, 1" RAIL, RAM D	1
5	10638000125	MOUNT PLATE, RADIO GSM ANTENNA	1
6	11178000311	KIT, BOLT + NUT, UNC, ANTENNA	1
7	11078000033	BRACKET, IBBC, IR (only with CAN IR harness)	1
-	11178000341	KIT, MOUNTING, TRACTOR	1

2 TRACTOR KIT BUILD UP

It is recommended to carry out the build up of the tractor in the following order:

1. Mount the wire harness from the battery
2. Mount harness on John Deere AutoTrac valve.
3. Mount spy cable on John Deere steering angle sensor
4. Mount GPS antenna and radio/gsm-antenna(s) + cables
5. Mount ISO Steering Controller in cabin
6. Mount Terminal



FIGURE 1: OVERVIEW JOHN DEER 6R COMPONENTS

3 MOUNTING HARNESS

Two options can be chosen, a CAN Basic harness or a Implement Ready (IR) harness.

3.1 CAN BASIC HARNESS

The Basic harness can only be used for tractor steering. If the tractor is mounted with this harness there is no possibility to use the tractor for implement steering (TWIN, plough).

3.2 CAN IMPLEMENT READY (IR) HARNESS

The Implement Ready harness ensures that the tractor can be used for tractor and implement steering. Mounting the implement is possible through the IBBC-connector. The harness is mounted from the battery to the IBBC-connector at the back side of the tractor (Figure 2)

3.3 MOUNT HARNESSES ON JOHN DEERE 6R

The steering valve, and battery are located at the right side of the tractor. Disassembling the stepladder and some covers will give you some space to mount the parts (Figure 3)

The CAN basic harness and the CAN Implement harness are divided in the following harnesses (ranked in order from the battery):

1. Power harness: This harness starts at the battery and goes to the rear axle along the chassis, wrapped in a hard casing. A Basic harness goes from the battery directly to the chassis harness (and not to the rear axle of the tractor). Mount the relays and fuses well nearby the battery. Find a place where they can be well fastened and vibration free. (Figure 4)



FIGURE 2: IBBC BRACKET WITH CONNECTOR.



FIGURE 3: JD 6R COVERS DISSAMBLED, STEERING VALVE AT RED CIRCLE

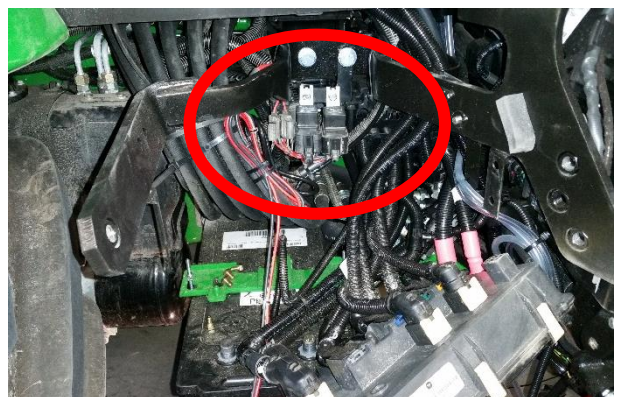


FIGURE 4: GOOD LOCATION FOR RELAYS AND FUSES

2. Chassis harness: is a branch to the Steering Controller (STU). Mount the Steering Controller somewhere nearby the John Deere steering valve. If it is possible, mount the Steering Controller with the connectors to the bottom. Figure 5 gives a good example of a well mounted STU.



FIGURE 5: WELL MOUNTED STEERING CONTROLLER

3. In-Cab harness (ISO Steering Controller): This harness starts at the chassis harness and goes inside the cabin, wrapped in a braided sleeve casing. A branch is made to the ISO Steering Controller.

4. Harness in-cab (Terminal): This harness starts at the In-Cab harness (ISO Steering Controller) and goes to the terminal.



FIGURE 6: ORIGINAL SITUATION AT STEERING VALVE

5. Harness STU JD STR 6R (TIER 4): This harness consists two cables. First find the John Deere steering valve for mounting this harness. The steering valve is at the right side of the tractor. Behind a black metal plate (see red circle in Figure 3). Three connectors of John Deere are connected on the valve. (Figure 6) Disconnect these John Deere connectors. Connect the connectors of the Harness STU on the steering valve. The disconnected John Deere connectors must be connected on the Harness STU connectors. (Figure 7) Look at the inscriptions "left" and "right". The black connectors are connected on the lock valve.



FIGURE 7: NEW SITUATION STEERING VALVE

The second cable must be connected between two connections also. First find the existing connection, it is located nearby the fuse box. (Figure 8) Disconnect this connection and connect the cable between this connection. (Figure 9)

At last connect the two cables by connecting the two DTM connectors.

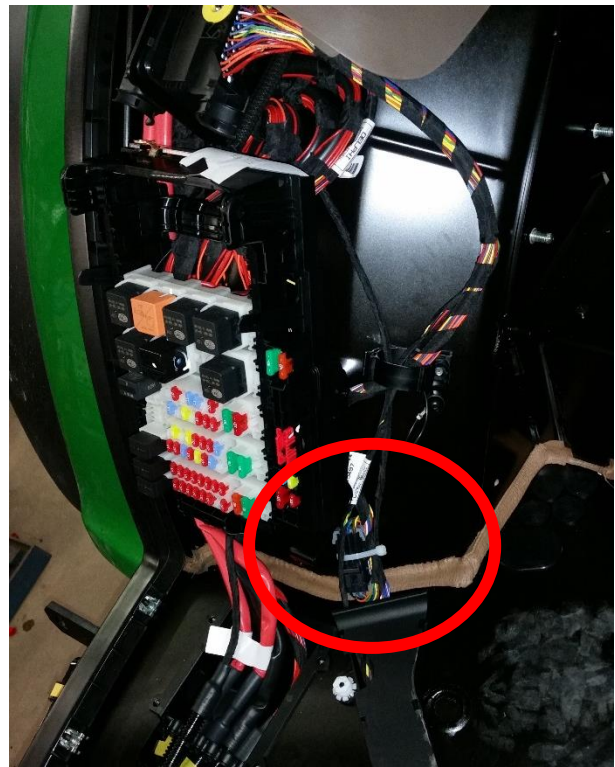


FIGURE 8: LOCATION EXCISING CONNECTION

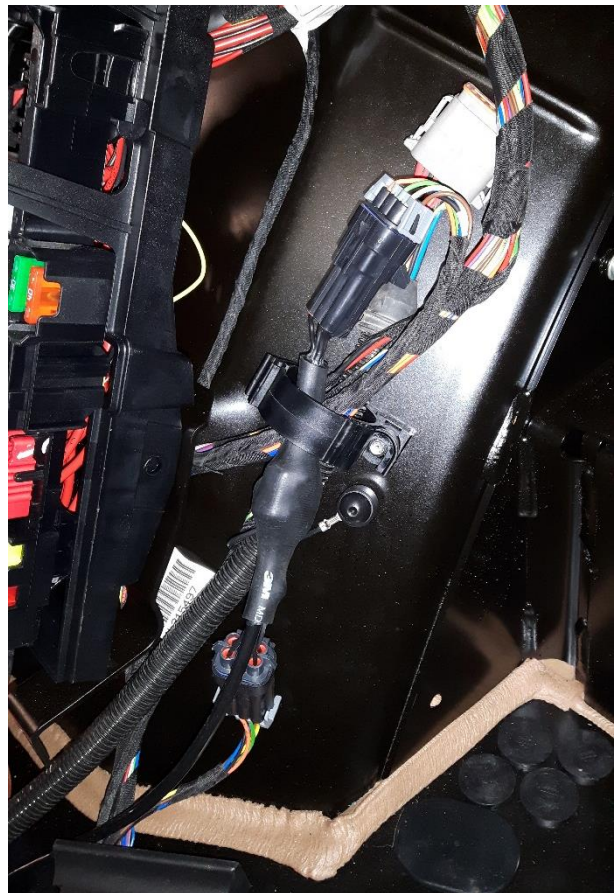


FIGURE 9: CABLE CONNECTED BETWEEN EXCISING CONNECTORS

6. Harness JD STR6R (Tier4) WHS spy: first disconnect the existing connection of the John Deere steer angle sensor. This connection is located above the front axle and underneath the engine (red circle in Figure 10). A picture of a closer look is shown in Figure 11. Now connect the spy cable between the connection. (Figure 12). It is recommended to mount the cabling and connectors well. Use tie wraps to be sure it is mounted vibration free. The spy print on the spy cable should be located next to the radiator like it is shown in Figure 13.

The pictures are taken on a Tier 4 model, the differences with an older model are only another type of connectors.



Warning!:

Watch the locking on the existing John Deere connector.



Please note!:

Important to locate the connectors and cabling on a save place where they can't be damaged.

7. Wheel sensor cable: The next step is to connect the wheel angle sensor cable (5m) (11158000226) to the JD STR6R (Tier 4) WHS spy harness with the wheel sensor connector of the STU – JD STR 6R (Tier 4) connector.



Tip!:

A schematic overview of the Raven CAN-harness on a John Deere 6R AutoTrac Ready tractor is shown in Figure 24.



FIGURE 10: LOCATION CONNECTION JOHN DEERE STEER ANGLE SENSOR

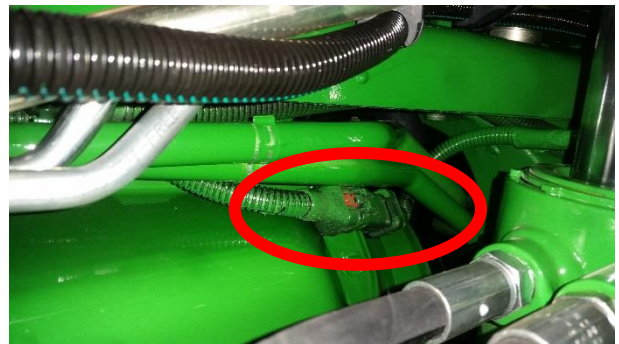


FIGURE 11: CLOSER LOOK TO THE CONNECTION

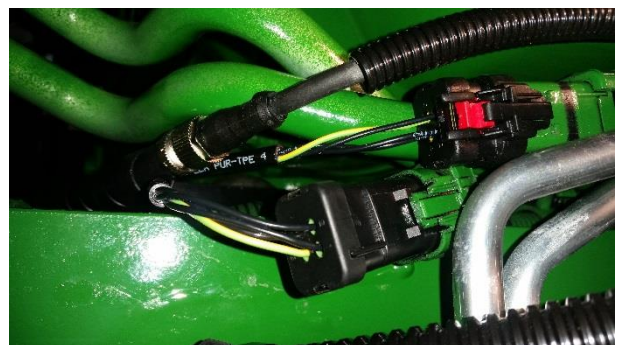


FIGURE 12: CONNECTED SPY CABLE



FIGURE 13: SPY PRINT LOCATION

3.4 MOUNT HARNESSES ON JOHN DEERE 7R & 8R

The CAN basic harness and the CAN Implement harness are divided in the following harnesses (ranked in order from the battery):

1. Power harness: This harness starts at the battery and goes to the rear axle along the chassis, wrapped in a hard casing. The battery is located at the left side of the tractor. Disassembling some covers will give you some space to mount the parts. A Basic harness goes from the battery directly to the chassis harness (and not to the rear axle of the tractor). Mount the relays and fuses well nearby the battery. Find a place where they can be well fastened and vibration free. (Figure 14)
2. Chassis harness: is a branch to the Steering Controller (STU). Mount the Steering Controller somewhere nearby the John Deere steering valve. If it is possible, mount the Steering Controller with the connectors to the bottom. Figure 5 gives a good example of a well mounted STU.
3. In-Cab harness (ISO Steering Controller): This harness starts at the chassis harness and goes inside the cabin, wrapped in a braided sleeve casing. A branch is made to the ISO Steering Controller.
4. Harness in-cab (Terminal): This harness starts at the In-Cab harness (ISO Steering Controller) and goes to the terminal.
5. Harness STU JD STR 8R: This harness consists two cables. First find the John Deere steering valve for mounting this harness. The steering valve is at the right side of the tractor. Three connectors of John Deere are connected on the valve. (Figure 6) Disconnect these John Deere connectors.

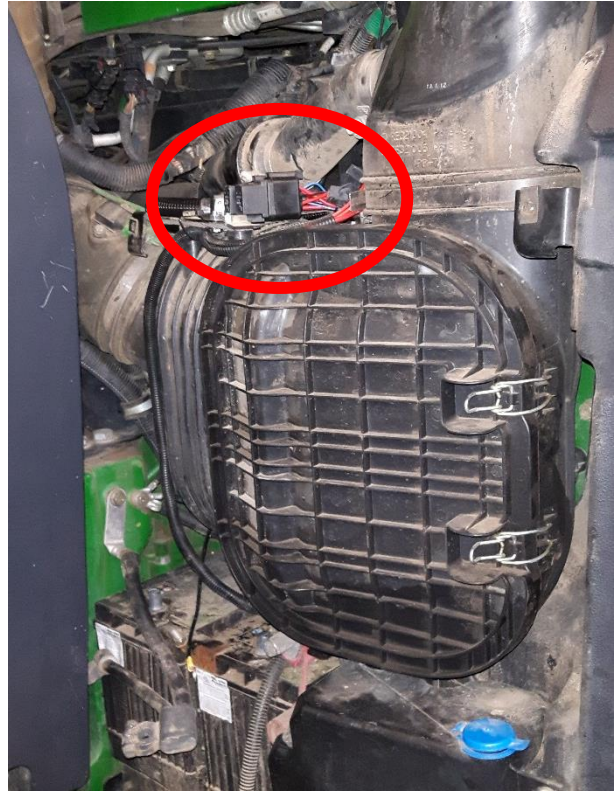


FIGURE 14: GOOD LOCATION FOR RELAYS AND FUSES

Connect the connectors of the Harness STU on the steering valve. The disconnected John Deere connectors must be connected on the Harness STU connectors. (Figure 7) Look at the inscriptions "left" and "right".

The second cable must be connected between two connections also. First find the existing connection, it is located nearby the steering wheel. Disconnect this connection and connect the cable between this connection.

At last connect the two cables by connecting the two DTM connectors.

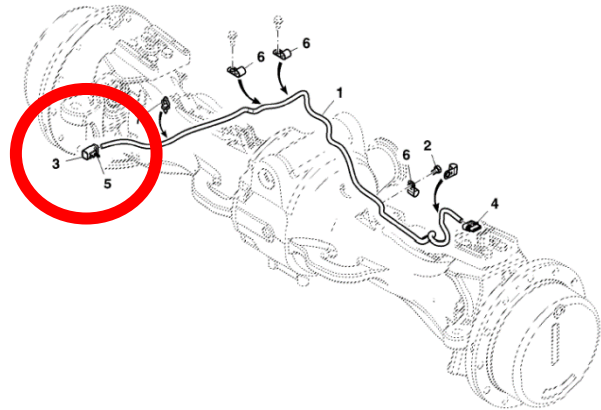


FIGURE 15: CONNECTION SPY CABLE JOHN DEERE 7R

6. Harness JD STR 8R WHS spy: first disconnect the existing connection of the John Deere steer angle sensor. This connection is located above the front axle and underneath the engine (red circles in Figure 15 & Figure 16). Now connect the spy cable between the connection. On a John Deere 8r are two steering angle sensors mounted. Use the left steer angle sensor. It is recommended to mount the cabling and connectors well. Use tie wraps to be sure it is mounted vibration free.

Furthermore there are some general instructions for mounting an SBG harness:

- Mount the harness, if there is no battery switch installed, always directly on the battery. That means the positive (red) and the negative (black).
- If a battery switch is used, the harness has to be mounted after the battery switch.
- Mount the terminal harness together with the GPS- and radio/GSM-cable in one jamb.
- Use tie-wraps to mount all the cables vibration and scrape free.

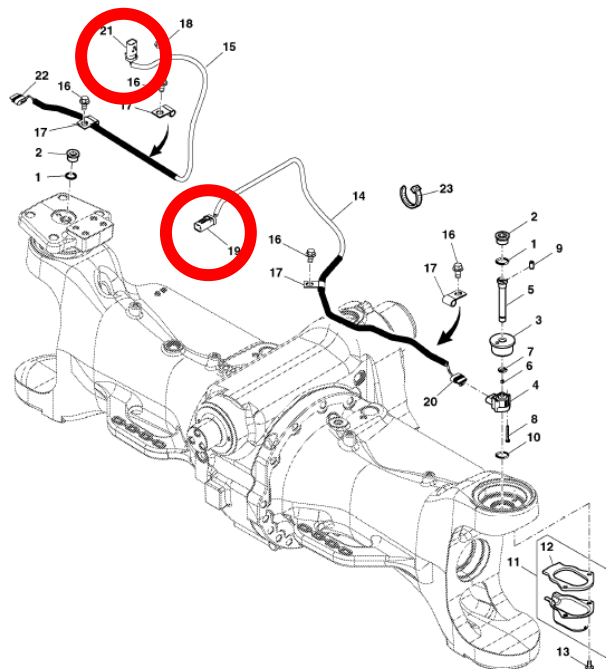


FIGURE 16: CONNECTION SPY CABLE JOHN DEERE 8R



Warning!

Important to mount the harness at all times at last on the battery after mounting all the cables and controllers!



Warning!

Be sure the cables will not damage during the installation!



Please note!

Push all connectors until they snap to be sure the connectors are properly connected!

4 MOUNTING GPS- AND RADIO/GSM- ANTENNA

A standard GPS bracket can be mounted on a John Deere 6R tractor.

4.1 MOUNTING THE STANDARD GPS ANTENNA BRACKET

Figure 17 shows an example of a standard GPS-antenna (with a radio-antenna in this case) mounted on a standard GPS-antenna bracket. A GPS-dummy and a UNC bolt + nut are also mounted. The standard GPS-antenna bracketed can be mounted with double sided tape on the cabinroof.

Mount the antennabacket a little behind the John Deere antenna bracket so the customer can still use the John Deere GPS system.

For mounting a GPS-antenna a few general instructions are applicable:

- Mount the GPS-antenna at least 60 cm in front of the rear axle.
- Mount the GPS-antenna in the middle of the tractor.
- Mount the GPS-antenna on the supplied UNC bolt.
- Mount the TNC-dummy on the GPS-antenna bracket (Figure 17)
- When a GeoStar terminal is used, the side of the biggest connector (N-connector) has to go inside the cabin. At Viper 4 terminals there is no difference between the connectors of the antenna cable. At the red circle in Figure 18 is a place shown where the all the antenna cables can go inside the cabin.
- Mount the GPS-antenna cable properly so it can't be damaged. Hide the cables in the cabin lining.

Mount the GPS antenna cables in a way water cannot flow down into the cabin.



FIGURE 17: STANDAARD GPS-ANTENNE BRACKET + UNC BOLT AND NUT.



FIGURE 18: CABIN ROOF, PLACE TO GO INSIDE THE CABIN AT THE RED CIRCLE

- Fasten the antenna lead so that it cannot become pinched anywhere and conceal inside the cabin upholstery, together with the radio antenna lead or UMTS antenna lead.
- Mount the antenna lead in such a way that no water is allowed to flow along the cable into the cabin.



Please note!

With a John Deere tractor it is not necessary to remove the standard John Deere GPS-antenna bracket and replacing it with the standard GPS-antenna bracket. But when you remove the John Deere bracket do not forget to mount the screws back in the roof!

4.2 MOUNTING THE RADIO ANTENNA

Figure 19 shows the standard radio antenna with magnetic base. Preferably, this standard antenna should be used. The components of this standard antenna are shown in Table 3.

TABLE 3 STANDARD PARTS FOR RADIO ANTENNA

Symbol	Description
1	Radio antenna
2	Antenna lead
3	Magnetic base

A number of specific conditions should be met before installing and mounting the radio antenna:

- The TNC-dummy should preferably be mounted to the GPS antenna bracket (Figure 17).
- Do not place the radio antenna next to a steel construction but above it.
- Place magnet base on a sufficiently large steel surface (at least the size of the standard GPS antenna bracket). A larger steel base surface can improve signal strength and prevent problems, especially at greater distances (> 9 km).



FIGURE 19: RADIO ANTENNA COMPONENTS.

4.3 MOUNTING THE 3G/4G LAIRD AND PATCH ANTENNA

The 3G/4G Laird antenna should preferably be mounted to the GPS antenna bracket. Mount the two 3G/4G Laird antennas preferably minimum 1.0 meter from each other. The base of the 3G/4G Laird antennas are magnetic and can be placed in longitudinal (front/rear on the cabin) or transversal direction (left/right on the cabin). The SlingShot GPS patch antenna is also magnetic. The position of the SlingShot GPS patch is not important as long as the antenna is mounted on the roof and with a clear view.

On a universal GPS-antenna bracket, one of the 3G/4G Laird antennas can be mounted behind the GPS-antenna. (Figure 20) Preferably mount the SlingShot GPS patch antenna also on the universal GPS-antenna bracket next to the GSM-antenna. In this way the two 3G/4G Laird antennas has to be mounted also minimum 1.0 meter between each other. For mounting the second 3G/4G Laird antenna an extra metal plate is supplied in a SlingShot tractor kit. (See chapter 1.2)

It is important to meet the following conditions at all times:

- Place the two 3G/4G Laird antennas at least 1.0 meter from each other.
- The 3G/4G Laird antennas and the SlingShot GPS patch antenna are equipped with a magnetic base and has to be mounted on top of the cabin roof.
- Antennas must have a clear view all around.
- Use a metal plate with double sided tape if the GPS-antenna's and 3G/4G Laird antenna will be mounted separately.



FIGURE 20: GPS ANTENNA BRACKET WITH A LAIRD UMTS ANTENNA.

5 MOUNTING ISO STEERING CONTROLLER

The following guidelines have been established for mounting the ISO Steering Controller

- Preferably, place the ISO Steering Controller next to and at the right side of the seat. Use the standard ISO Steering Controller mounting plate (Figure 21Figure 22).
- If it is not possible to attach the ISO Steering Controller to the seat bolts, the ISO Steering Controller should be attached in an appropriate place in the cabin that is free from vibrations.
- An ISO Steering Controller may only be mounted in a horizontal position (with the sticker side up). The connectors may be orientated in four directions (0, 90, 180, 270 degrees).
- By default, the orientation of the ISO Steering Controller is set to: horizontal position with connectors pointing towards the rear (as shown in Figure 22Figure 22. Any other orientation should be set in the software!



FIGURE 21: ISO STEERING CONTROLLER ATTACHED TO MOUNTING PLATE V4.



FIGURE 22: ISO STEERING CONTROLLER ON THE MOUNTING PLATE SEEN FROM THE SIDE

6 INSTALLING THE TERMINAL

For a John Deere 6R tractor is a special terminal bracket available. This bracket can be mounted on the right front side of the cabin with two bolts in the existing holes (Figure 23). If the customer wants another place the terminal can be mounted with an also supplied RAM-D/RAM-C pipe bracket (or possibly a homemade bracket).

The following orders are presented for mounting the Terminal:

- Mount the terminal vibration free with a strong bracket. (preferably with a John Deere 6R bracket)
- Hide all te cables in one jamb.
- Be sure the terminal is focused on the driver.
- Be sure the driver has got a clear view after installing the terminal.

i **Tip!:** *fit the terminal in such a way that it doesn't take away the view of the top of the right fender, but also the inside of the front wheel to the ground is still visible.*

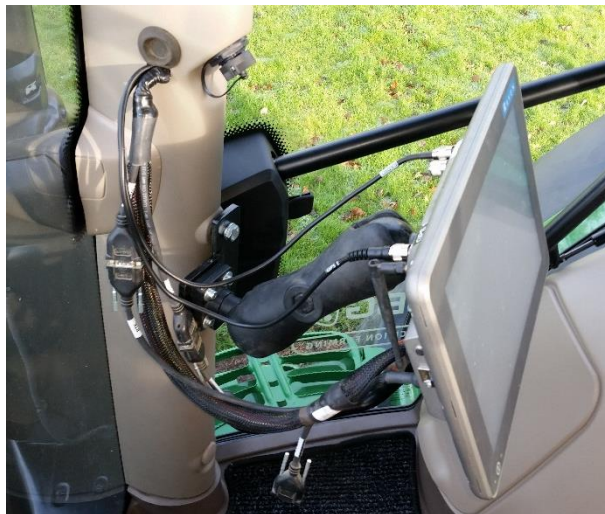


FIGURE 23: TERMINAL MOUNTED ON A-JAMB IN A 6R

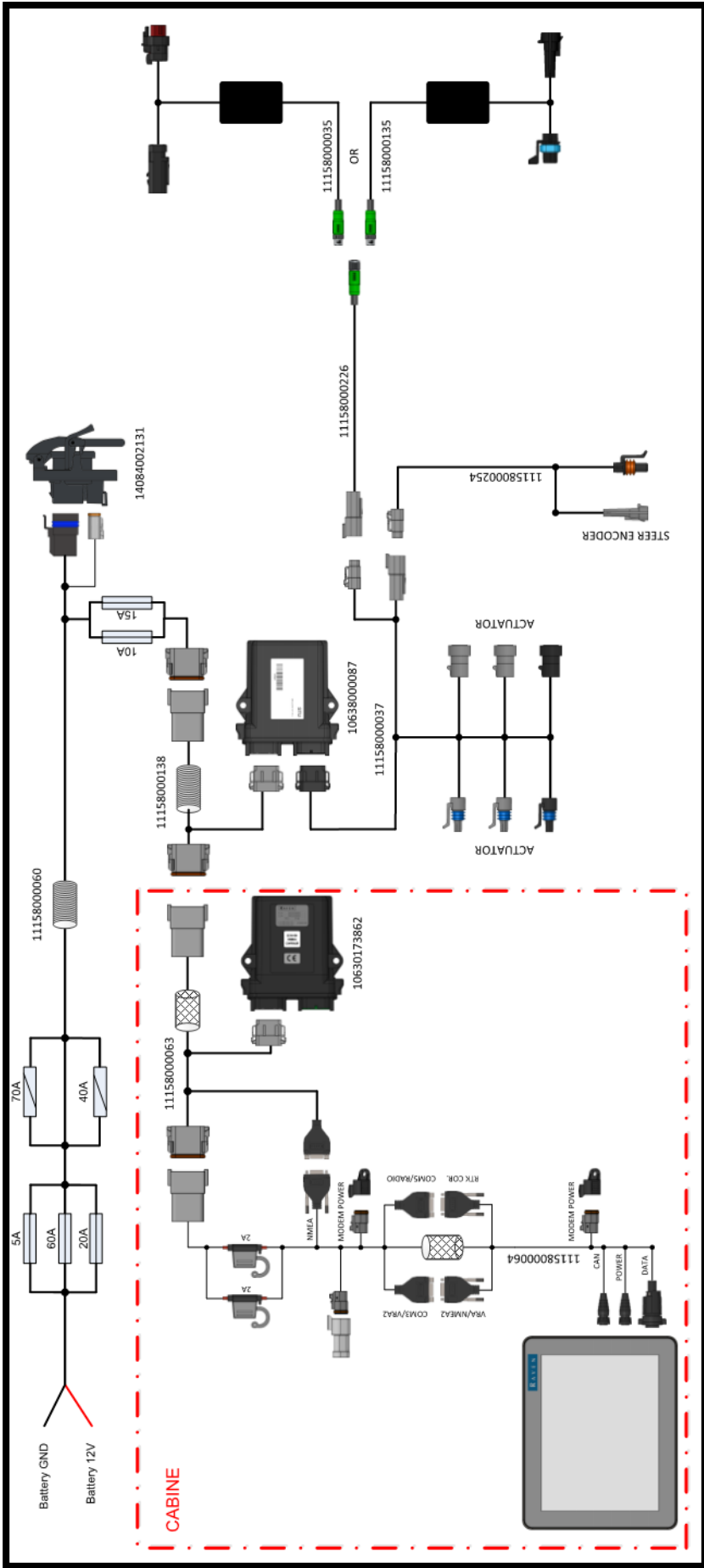


FIGURE 24: SYSTEM OVERVIEW

7 CONFIGURATION JOHN DEERE AUTOTRAC READY

For configuring a John Deere AutoTrac Ready system see *Configuration Manual – SBGuidance Auto – CAN – EN*. This manual is available on the Raven Europe website, www.raveneurope.nl/en.

Use the latest JD 6R firmware version on the steering controller. For example: STU_JD6R_3_0_38.srec

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