CRX/VIPER 4(+) ROS + RS1

RAVEN EUROPE GENERIC

016-8000-028EN REV. B

Installation manual

(English) (Original)

RAVEN

PREFACE

This installation manual is intended for persons responsible for installing a CRx\Viper 4+ ROS kit. The manual contains important instructions that should be complied with when commissioning, operating and servicing the CRx\Viper 4+ ROS kit.

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 CRx\Viper 4+ ROS.

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

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

Hint!:
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 Raven system.
- It is strictly prohibited to use the CRx\Viper 4+ ROS systems on public roads.
- It is strictly prohibited to leave a driving vehicle unattended when the CRx\Viper 4+ ROS 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.
- Raven 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 Raven 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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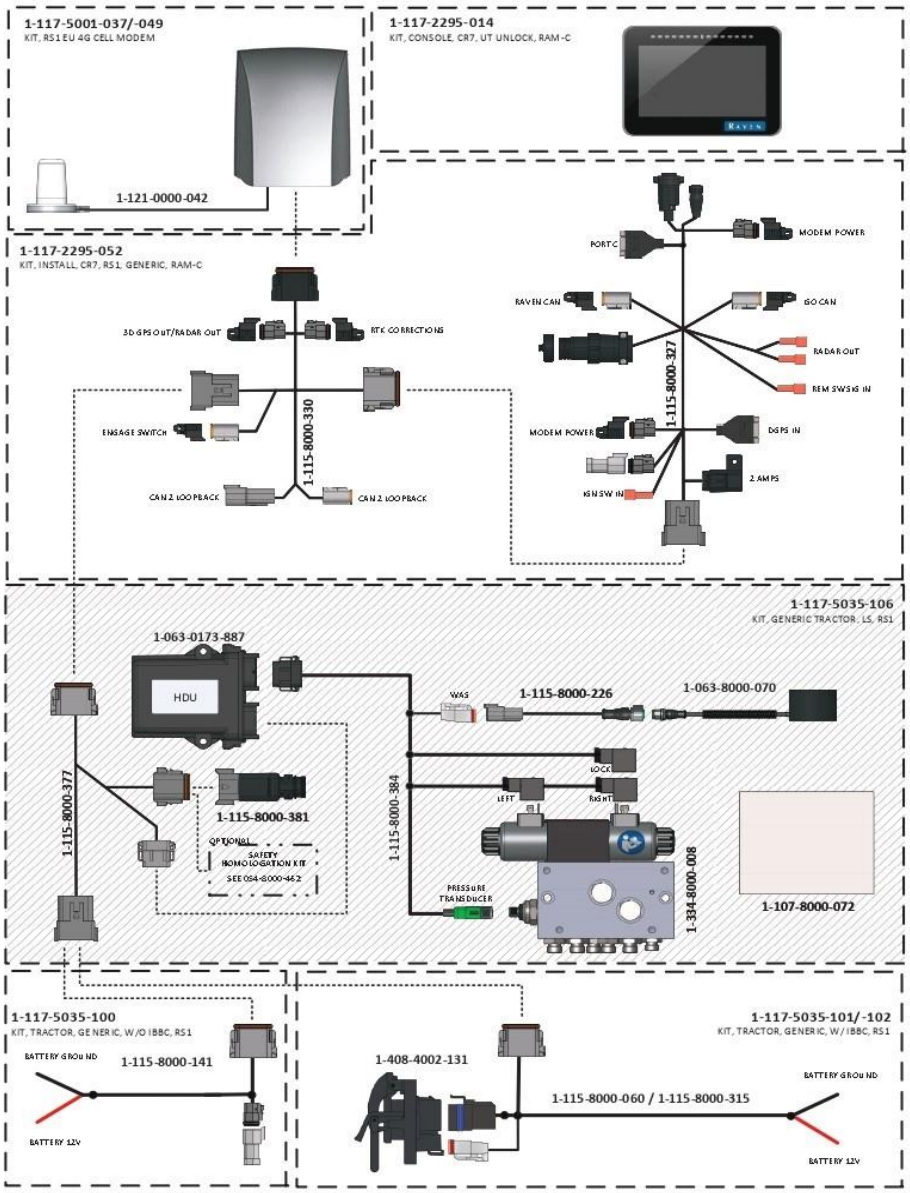
SYSTEM DRAWING, TRACTOR SPECIFIC INSTALLATION, GENERIC TRACTOR, LS, RS1, CR7



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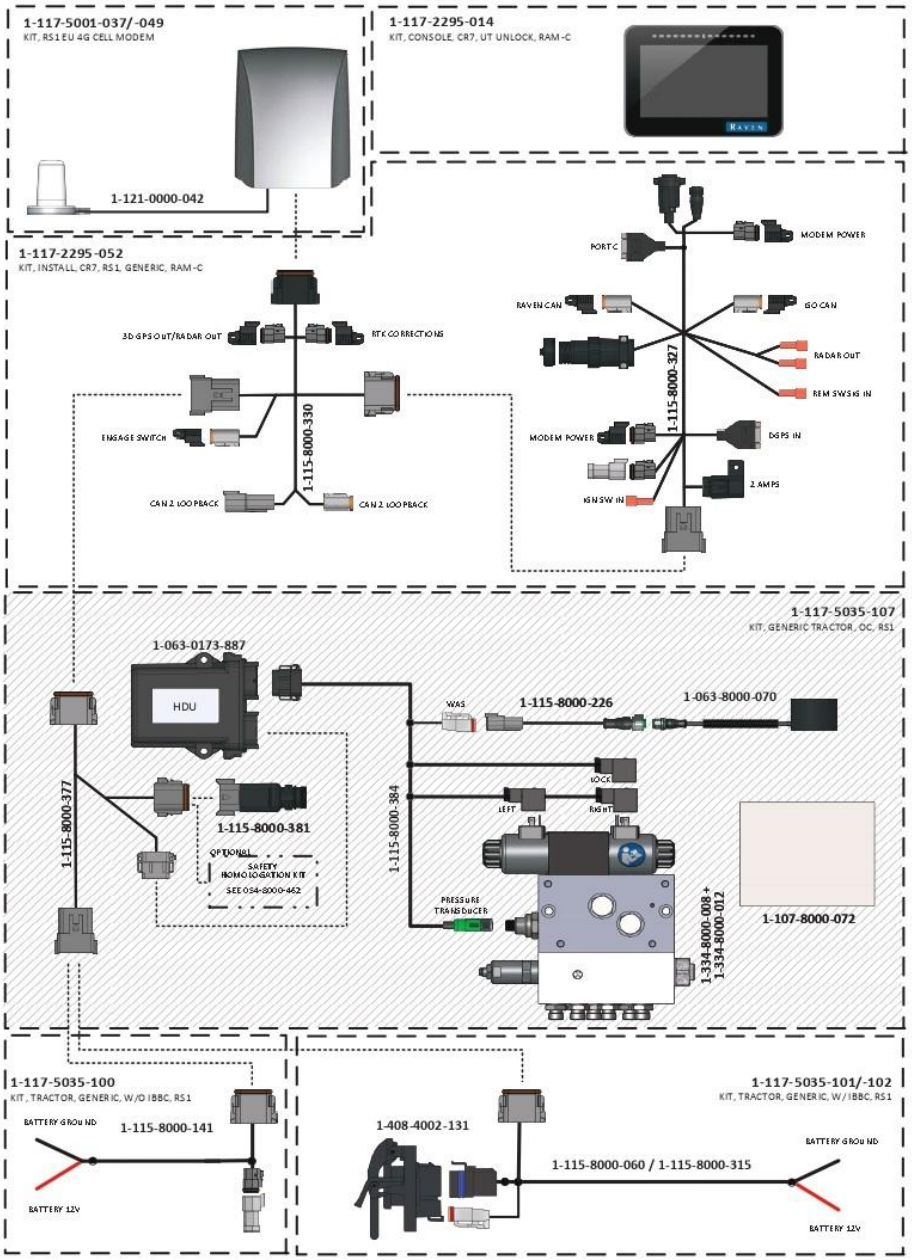
SYSTEM DRAWING, TRACTOR SPECIFIC INSTALLATION, GENERIC TRACTOR, OC, RS1, CR7



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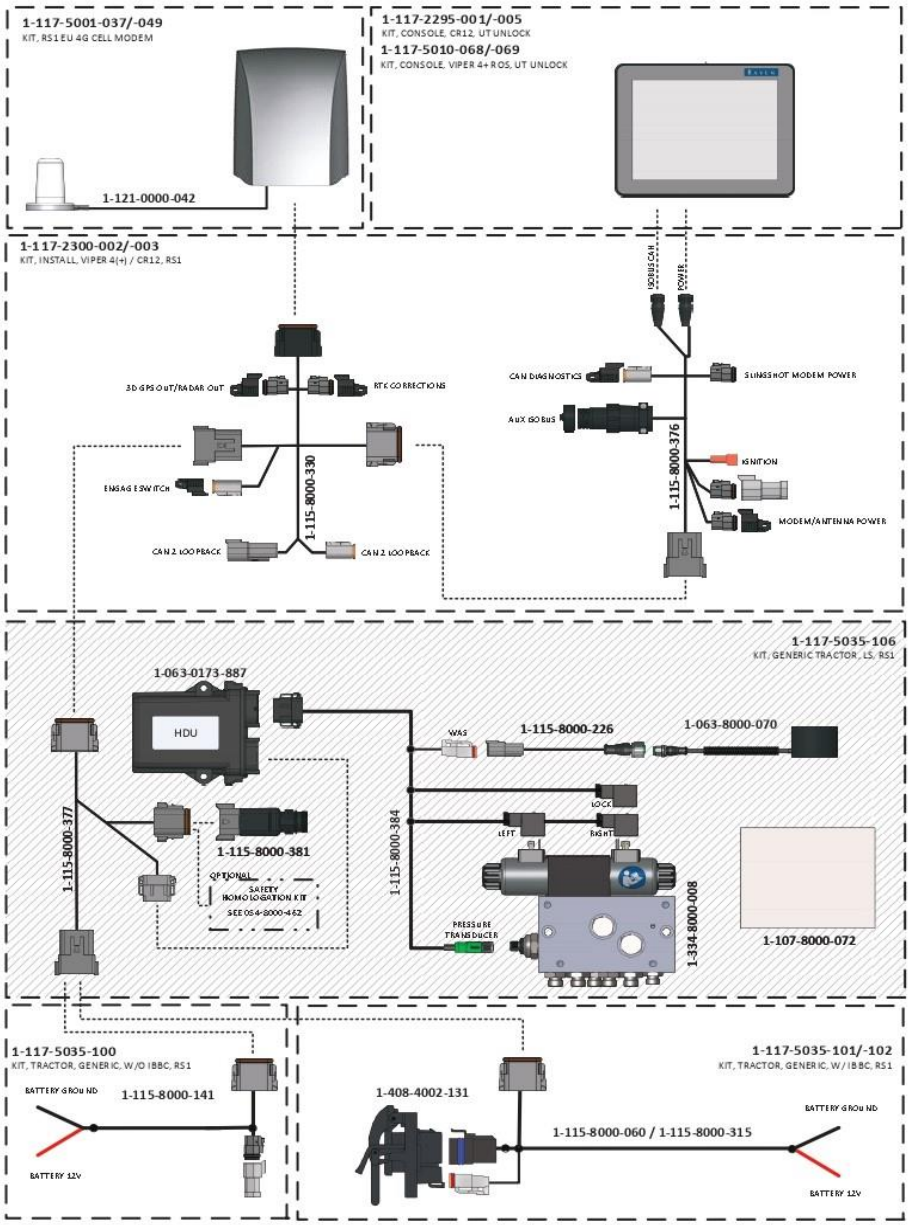
SYSTEM DRAWING, TRACTOR SPECIFIC INSTALLATION, GENERIC TRACTOR, LS, RS1, CR12 / VIPER 4+ ROS



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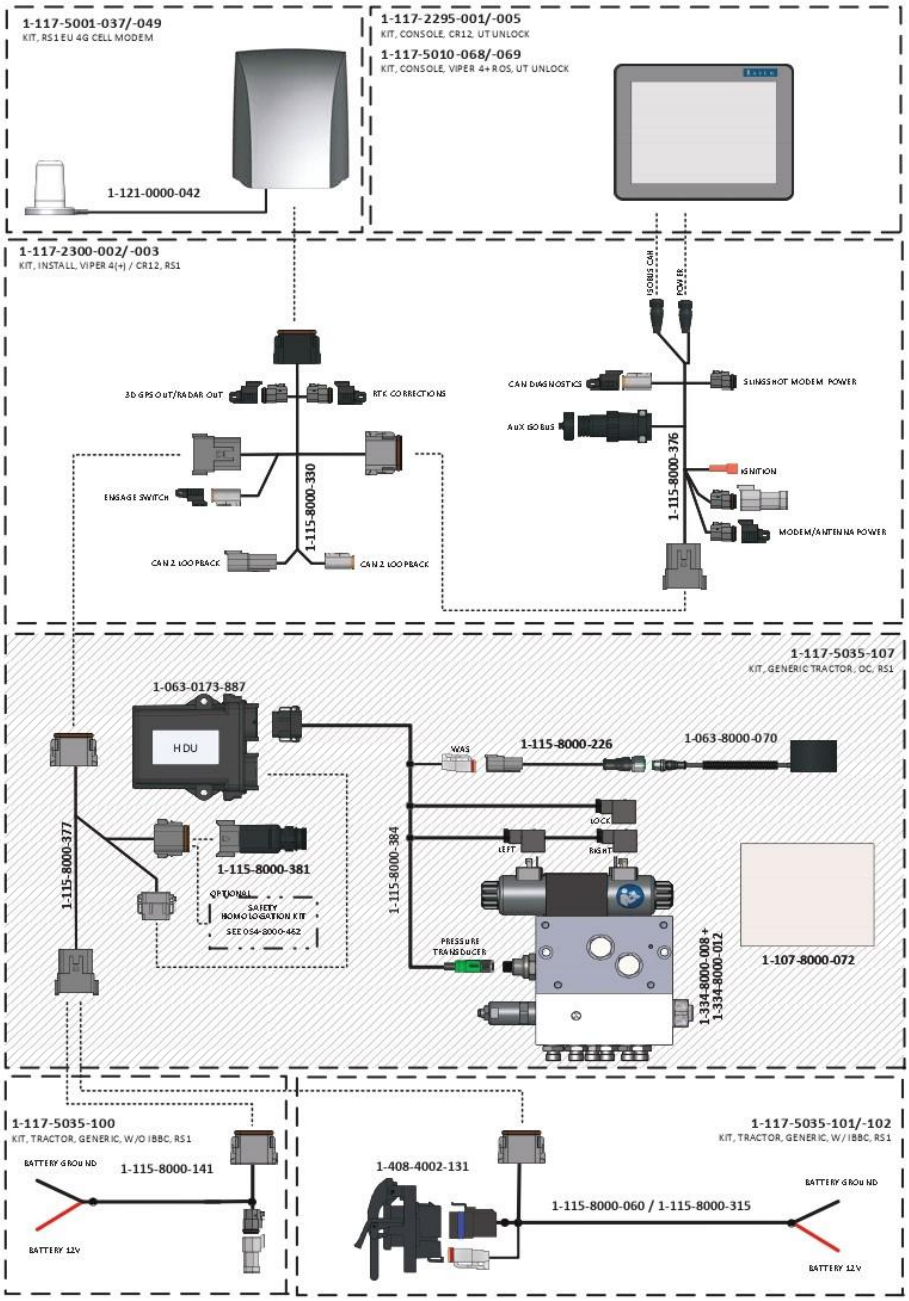
SYSTEM DRAWING, TRACTOR SPECIFIC INSTALLATION, GENERIC TRACTOR, OC, RS1, CR12 / VIPER 4+ ROS



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1 STEERING SYSTEM INSTALLATION

This chapter describes the installation of all the different steering systems, hydraulic and SmarTrax MD. Look carefully at the system overviews to know which parts of the installation are applicable.

1.1 MOUNTING HARNESSES

When installing an autosteer system, the power cables should always be connected to the battery. Two options are possible, a Basic Harness (1-115-8000-141) or an Implement Ready Harness (1-115-8000-060 frontmount or 1-115-8000-315 midmount). The differcence between these harnesses is the IBBC connector, this one is included at an Implement Ready (IR) Harness (Figure 1).

FIGURE 1 IBBC CONNECTOR

Power harness: an Implement Ready power harness is mounted from the battery to the rear of the tractor. A Basic power harness is mounted from the battery to the chassis harness. Make sure that the relays and fuses are mounted in a dry, clean and accessible spot (Figure 2).

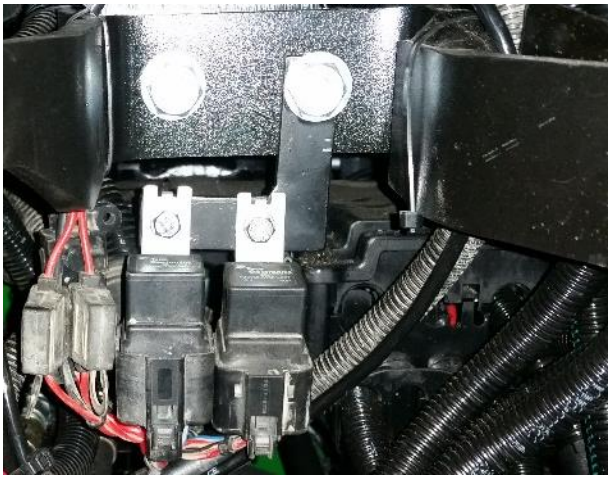


FIGURE 2 CORRECT MOUNTED RELAYS AND FUSES

The harness that is connected to the Power Harness depends on the steering type that will be installed. For system overviews, see pages 6 - 13. All the harnesses with a hard casing should be mounted outside the cabin, all the harnesses with a braided sleeve should be mounted inside the cabin. At all time, find a good location where the cabling can enter the cabin.

In addition, several guidelines have been established for the assembly of all types of cable harnesses:

- Mount the relays fixed and in a dry, clean and accessible spot (Figure 2).
- The red wire is + (12V). The black wire is minus (ground). Make sure that the first part of the red wire (part in between battery and fuses) cannot damage during operation.

- If necessary the positive and negative wires, in between the battery and the fuses, can be shortened. Be sure to use cable sockets with the correct size for proper connection.
- If a ground switch is used in the tractor, connect the wiring harness behind the ground switch (not at the battery side of the ground switch!).
- If a main (12V) switch is used in the tractor, the red wire connect the wiring harness behind the main switch (not at the battery side of the main switch!).
- If no main switch is used, always connect the wiring harness directly to the battery.
- If the system is connected to a 24 Volt machine, always use a 24V to 12V converter. Never connect between the two batteries of a 24V machine!
- Lead the terminal harness along with the GPS and radio/GSM antenna cables through one pillar of the cab.
- Tie-wrap the harnesses so they are attached free from vibration and friction.

Caution!:
It is important to ensure that the wiring harness is always connected to the battery AFTER installing all wires and controllers!

1.2 HYDRAULICS

In this chapter a short overview of the hydraulic system that needs te be installed on a tractor will be given.

1.2.1 HYDRAULIC VALVE

Figure 3 shows the manifold mounted onto a manifold bracket with four M8 bolts. The manifold bracket is preferably mounted at the right hand side of the tractor (Figure 4) because this is usually the side of the tractor with the most space.

Please note!:
Make sure the connectors of the valves and the pressure sensor can still be connected after mounting the manifold.

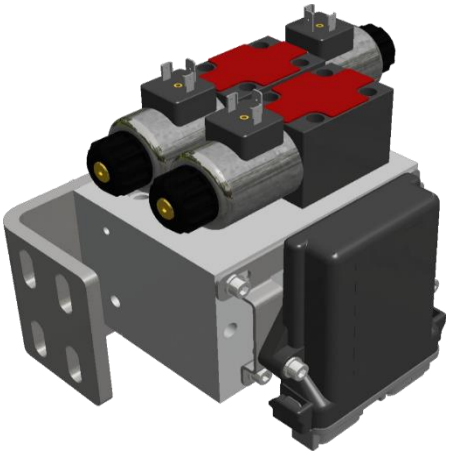


FIGURE 3 MANIFOLD BRACKET WITH A MANIFOLD AND STEERING CONTROLLER MOUNTED

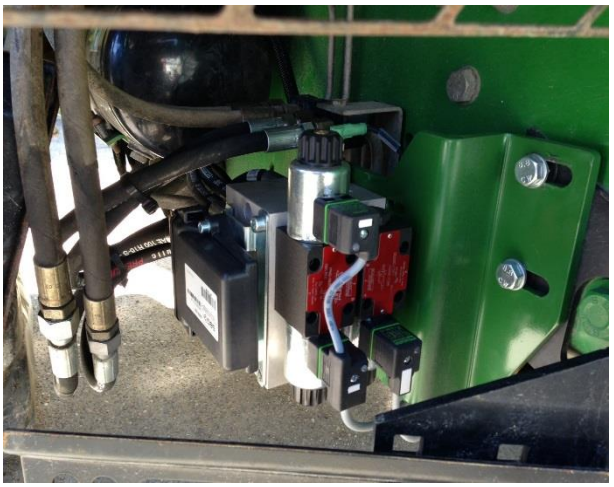


FIGURE 4 MOUNTED MANIFOLD AND HYDRAULIC DRIVE UNIT

1.2.2 HYDRAULIC INSTALLATION LOAD SENSE

The manifold should be connected between the hoses leading from the steering orbitrol to the steering cylinder(s). To do so, the hoses should be disconnected, preferably on an existing connection between a pipe line and a hose.

Connect the hoses from the steering orbitrol to **A1** and **B1** on the manifold. Connect the hoses to the steering cylinders to **A** and **B** on the manifold (Figure 5 and Figure 6).

Connect the pressure line, return line and the LS line of the hydraulic pump to the **P**, **T** and **LS** of the manifold. When needed refer to the hydraulic diagram of the tractor to find the correct connections on the tractor.

Caution!:
If there are separate hydraulic systems with separate oil tanks on the tractor, the manifold must be connected to the system in which the steering orbitrol and steering cylinder are included in.

Hint!:
Mark the lines twice with 'A' and 'B', before disconnecting them

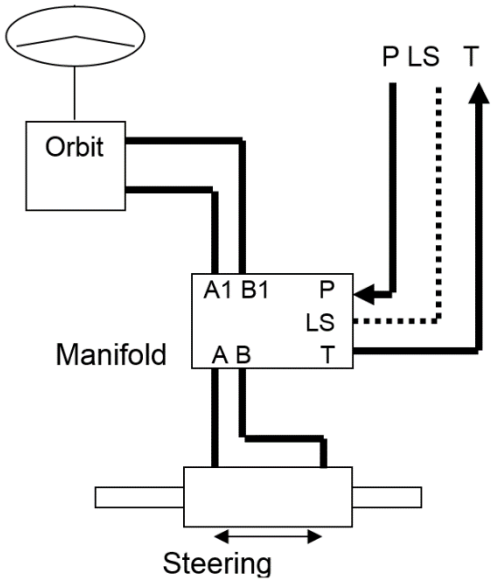


FIGURE 5 LOAD SENSE CONNECTING CIRCUIT

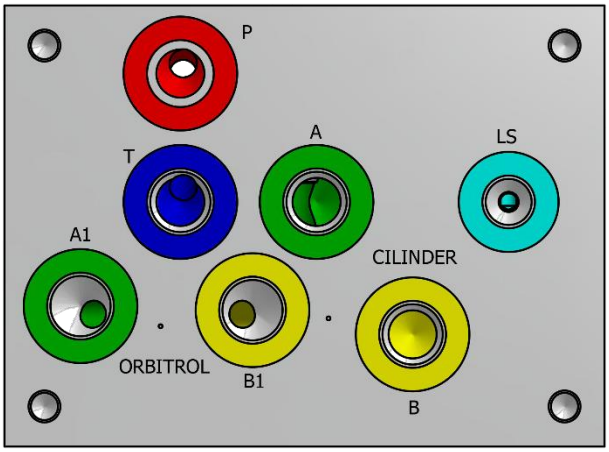


FIGURE 6 CONNECTIONS FOR THE HYDRAULIC LOAD SENSE MANIFOLD

1.2.3 CONNECTING THE SHUTTLE VALVE

A shuttle valve must be installed in the load sense line. See Figure 7 for proper mounting and orientation of the shuttle valve. This way, when in rest, the ball floats inside the valve, which will benefit the response for the load sense signal. In addition, it is important that the shuttle valve is installed as close to the pump as possible.

FIGURE 7 TOP VIEW OF SHUTTLE VALVE FOR MOUNTING IN THE LOAD SENSE LINE

Hint!:
In case the wheels of the tractor are steering, when the hydraulics of the tractor are operated; a checkvalve should be mounted in the load sense line from the manifold. The non-return valve should let oil pass from the manifold to the check valve/pump and should block in opposite direction.

Hint!:
A shuttle valve for CNH tractors can be provided by Raven Europe (part no. 13348001014) or the local CNH dealer (part no. 82018814).

1.2.4 PRESSURE RELIEF VALVE

Determine the maximum pressure of the steering system before mounting the manifold. The maximum pressure of the additional pressure relief valve should be set equal to the maximum pressure of the steering system, before mounting the manifold.

A pressure relief valve is mounted to the add-on part of the open center manifold (Figure 8). This pressure relief valve must be set to the maximum allowable control pressure of the steering system. The default setting of the pressure relief valve is about 180 bar. Determine the maximum pressure of the steering system before mounting the manifold. Follow the next steps:

- Mount a pressure gauge, by making use of a t-piece in the pressure line between the hydraulic pump and the steering orbitrol.
- Steer the front wheels to one side and keep steering until the maximum pressure is reached.
- Read out the value on the pressure gauge.

After mounting the manifold. Set the maximum pressure of the pressure relief valve, equal to the maximum pressure of the steering system. Follow the next steps:

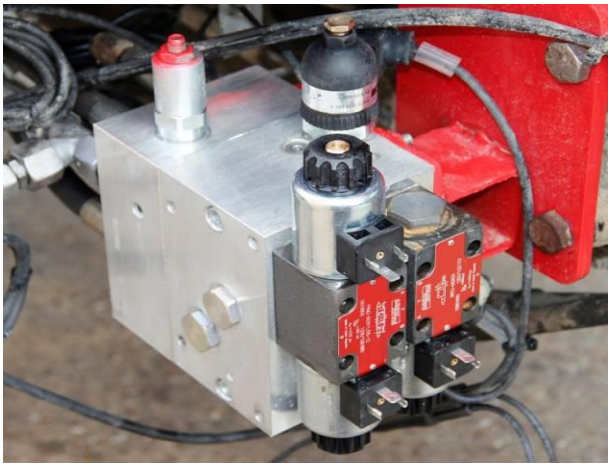


FIGURE 8 OPEN CENTER MANIFOLD

- Mount a pressure gauge, by making use of a t-piece in the pressure line between the hydraulic pump and the manifold.
- Loosen the locking nut of the pressure relief valve.
- Loosen the pressure relief valve two turns counter clockwise.
- Steer the front wheels to one side, using the Left/Right buttons of the CRx/Viper4+ ROS. Keep steering until the maximum pressure is reached.
- Read out the value on the pressure gauge.
- Adjust the pressure relief valve until the pressure is equal to the pressure it was before mounting the manifold.
- Secure the pressure relief valve with the locking nut.

1.2.5 HYDRAULIC INSTALLATION OPEN CENTER

The manifold v3 open center consists of the standard load sense manifold v3 with an add-on open center part (Figure 9). Ensure the add-on is mounted the correct way.

The pressure line that normally runs from the hydraulic pump to the steering orbitrol, should be connected to the **P** of the add-on open center part. Then connect a line between **P1** of the manifold and the pressure line of the orbitrol. Connect the **T** of the manifold to a tank inlet (Figure 10 and Figure 11).

Connect the hoses leading from the orbitrol to **A1** and **B1** on the manifold. Connect the hoses to the steering cylinders to **A** and **B** of the manifold (Figure 10 and Figure 11).

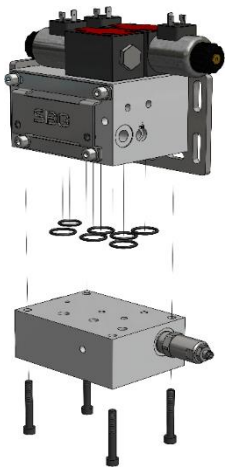


FIGURE 9 ADD-ON PART OF THE OPEN CENTER MANIFOLD

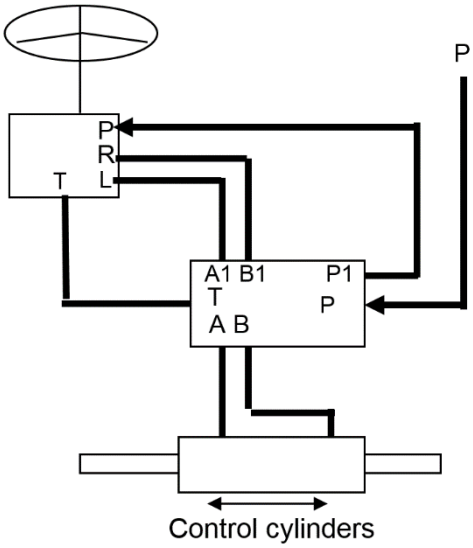


FIGURE 10 OPEN CENTER CONNECTION CIRCUIT

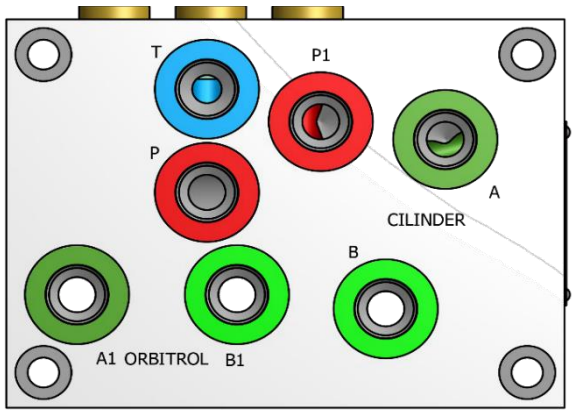


FIGURE 11 CONNECTIONS OF THE HYDRAULIC OPEN CENTER MANIFOLD

1.2.6 HYDRAULIC SYSTEM ON TRACTORS WITH GEAR PUMP AND LOAD SENSE ORBITROL CONNECTION

Tractors with a gear-type pump and equipped with an orbitrol with load sense connection fitted with a load sense priority valve. This concerns most Valtra models (Advanced, Versu and Direct) and some Deutz-Fahr models.

This enables the use of a standard load sense manifold with a shuttle valve. Because the maximum pressure is normally limited by the steering orbitrol, an additional pressure relief valve needs to be installed in the pressure line to the manifold.

The load sense signal should be connected to the existing load sense line from the steering orbitrol by using the shuttle valve supplied. Preferably mount the shuttle valve horizontally. Connect the hydraulic hoses as indicated in Figure 12.

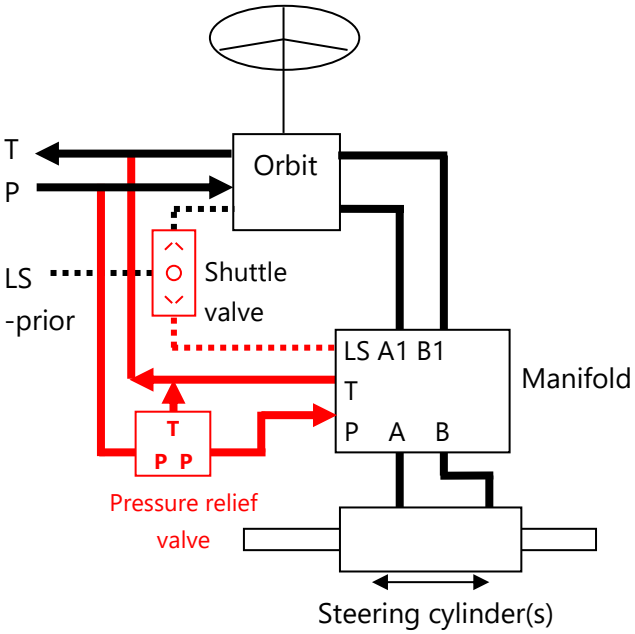


FIGURE 12 PRESSURE RELIEF VALVE CONNECTION

1.2.7 MOUNTING AND CONNECTING THE HYDRAULIC DRIVE UNIT.

The Hydraulic Drive Unit bracket can be mounted to the manifold. The Hydraulic Drive Unit can then be fitted to the manifold bracket (Figure 13).

Important notes when mounting the Unit:

- Mount the Hydraulic Drive Unit with connectors directed downwards to prevent the ingress of water!
- Do not mount the Hydraulic Drive Unit too close to parts which have a high temperature (for example, the exhaust system of the tractor)!

Connect the DIN connectors marked "Left" and “Right” to the proportional valve. Connect the DIN connector marked "Lock" to the shut-off valve. Connect the 4-pin Phoenix M12 connector to the pressure sensor of the manifold.

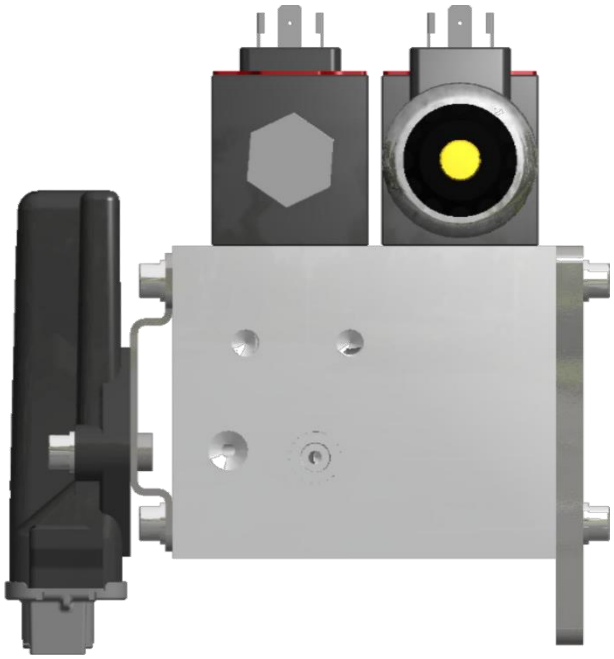


FIGURE 13 SIDE VIEW OF THE HYDRAULIC DRIVE UNIT FITTED TO THE MANIFOLD

Please note!:
The torque of the pressure sensor in the manifold V3 is 30 Nm. It is not necessary to check this at delivery of an assembled manifold. However, make sure, when replacing the pressure sensor, that it is tightened with the correct torque.

1.2.8 WHEEL ANGLE SENSOR

For a correct operation of the Raven system a wheel angle sensor is necessary. In various tractor types a factory fitted wheel angle sensor is already mounted on the front axle. For these tractor types a 'spy cable' is available at Raven to use the factory fitted wheel angle sensor for the Raven system. In this case it is not necessary to install a Raven wheel angle sensor. Ask Raven for more information about the availability for a specific tractor brand or type.

FIGURE 14 SPY CABLE MOUNTED ON A CNH TRACTOR

1.2.9 MOUNTING SPY-CABLE

Take the following steps to mount a wheel angle sensor spy-cable:

1. Follow the cable from the wheel angle sensor on the front axle of the tractor to the first connection in this cable.
2. Disconnect the connectors.
3. Connect the spy-cable in between the connectors.
4. Connect the wheel angle sensor 5M cable to the M12 connector of the spy-cable.
5. Mount the spy-cable in a clean and dry position (Figure 14).

1.2.10 MOUNTING THE WHEEL ANGLE SENSOR

Figure 15 and Figure 16 show a detailed view of the structure of a wheel angle sensor assembly. Table 1 also lists the components shown in Figure 15.

TABLE 1 WHEEL ANGLE SENSOR COMPONENTS.

Symbol	Description
1	Sensor housing
2	Sensor disc
3	Mounting bracket 3mm
4	Mounting strip 20x 3mm
5	2 x M5 x 16mm (countersunk head)
6	2 x M5 x 30mm

1. When the front wheels are in straight position, the screws of the sensor housing and sensor disc should be aligned with the front axle. It is also important that the sensor disc is rotated in such a way that the triangles in the disc and the sensor housing (Figure 17) are properly aligned. Only then will the wheel angle sensor produce a voltage reading.

2. The sensor housing and sensor disc should be aligned EXACTLY on the pivot point of the stub axle. The centre-to-centre distance of the mounting holes is 28 mm.

Please note!:
At all times the triangles on the sensor housing and sensor disc must be pointing in the same direction!

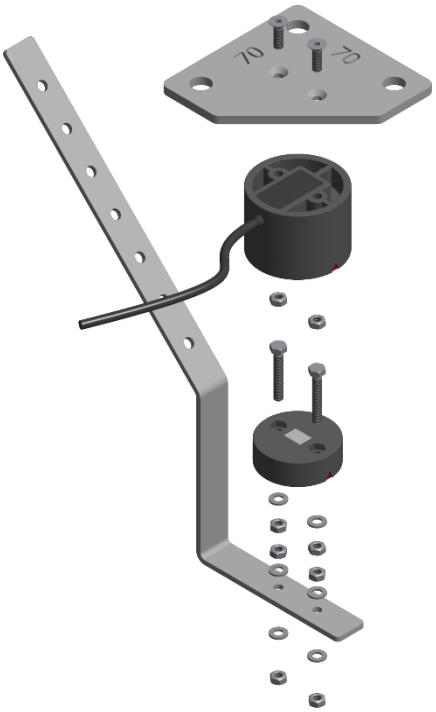


FIGURE 15 SCHEMATIC OVERVIEW OF WHEEL ANGLE SENSOR WITH MOUNTING BRACKET AND STRIP

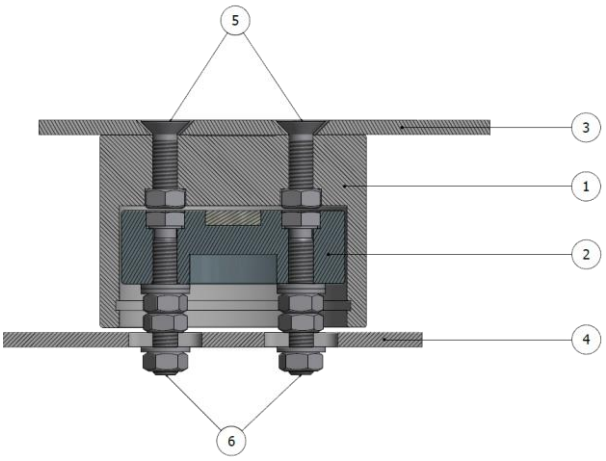


FIGURE 16 SCHEMATIC DRAWING OF WHEEL ANGLE SENSOR WHEN MOUNTED

1. In case the grease nipple at the bottom of the stub axle (stub axle with triangle), then a special U-shaped bracket is to be used for the wheel angle sensor housing (Figure 19).

2. It is recommended to assemble the sensor housing on the bottom side of the axle stub. Install the sensor housing with the wire pointing backwards.

Caution!:
Sensor housing should always be mounted above the disk to prevent the accumulation of dirt.

3. Mount the sensor housing with the M5X16 bolts (allen bolt, countersunk head). Countersink the drill holes in the wheel angle sensor mounting bracket beforehand, so the heads of the M5 bolts are fully countersunk in the mounting bracket when tightened (Figure 16). To prevent damage to the inside of the the sensor housing, make sure the M5 bolts are not too long.

4. The connecting cable can be provided with a protective sleeve for longer life. Feed the cable via the stub axle and direct it over the top (stub axle/pivot point) of the front axle so that the wire is not pinched or constricted.

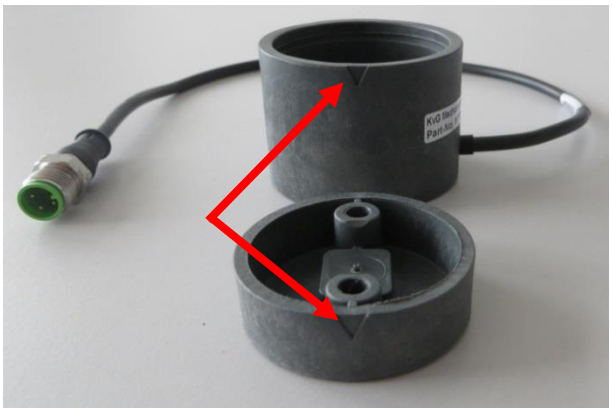


FIGURE 17 TRIANGULAR MARKINGS ON THE 12V WHEEL SENSOR

FIGURE 18 STEERING ANGLE SENSOR ON NEW HOLLAND

FIGURE 19 STUB AXLE WITH GREASE NIPPLE

1.2.11 MOUNTING THE SENSOR DISC

1. Mount the sensor disc without spacers on the provided 20x3 strip (Figure 20).

2. Mount the sensor disc in the sensor housing and mark where the first bend should be made (about 10 cm from the beginning). The first bend should be as close as possible to the sensor disc and be positioned as tight as possible against the stub axle housing to prevent damage by crops or soil (Figure 20 and Figure 21). The most extreme wheel position is usually the tightest position of the strip. Do not bend the strip too sharply.

3. Mark the position of the second bend in the strip until the sensor disc fits nice and flat in the sensor housing. On the other side, the strip must rest just underneath and against the front axle. The strip should rest on the sensor housing. Cut the strip to the correct length.

4. The wheel angle sensor strip should now be mounted to the bottom of the front axle (Figure 21). Mark the location of the holes on the strip and drill two 5 mm holes in the strip at approximately 30 mm apart.

5. Hold the strip with disc in the correct position and drill the first hole in the front axle with a 5 mm drill bit (about 10-15 mm deep). Drill into the thickest part of the front axle on a thickness equal to the length of the bolt used for fastening.

Caution!:
Ensure that the hole does not wear out when drilling (drill clean and straight). When drilling, ensure that the strip is under tension when positioned against the sensor housing to prevent the strip from vibrating.

FIGURE 20 DISC ON THE STRIP WITHOUT SPACERS

FIGURE 21 STRIP WITH SECOND BEND AND SHORTENED

6. Tap the first thread in the hole drilled into the front axle using a M6 screw-thread tapping attachment. Now fasten the strip with one M6 bolt (Figure 22).

7. Drill the second hole in the front axle with a 5 mm drill bit. Remove the strip again and tap the second screw thread in the hole in the front axle.

8. Drill the second hole in the wheel angle sensor strip with 6 mm drill bit. Fasten the strip with two M6 bolts.

9. Make sure the sensor disc falls nice and flat into the sensor housing and the strip also lies flat and under tension on both sides of the disc positioned against the sensor housing. Press with your thumb against the end of the strip and check if the strip bounces back easily without friction (Figure 28 and Figure 29). The sensor disc may only have a little bit of friction in the sensor housing.

10. If necessary, bend the strip a little bit. Two adjustable wrenches are useful tools to do this (Figure 23).

11. Remove the strip again and mount the sensor disc on the bottom of the strip (Figure 24).
12. Mount the strip again with two M6 bolts on the front axle.

13. Check if the sensor disc is properly centered with the sensor housing. The strip has to lie flat under slight pretention against the sensor housing (Figure 24). Also turn the wheels to make sure the sensor housing remains properly centered in various wheel positions.

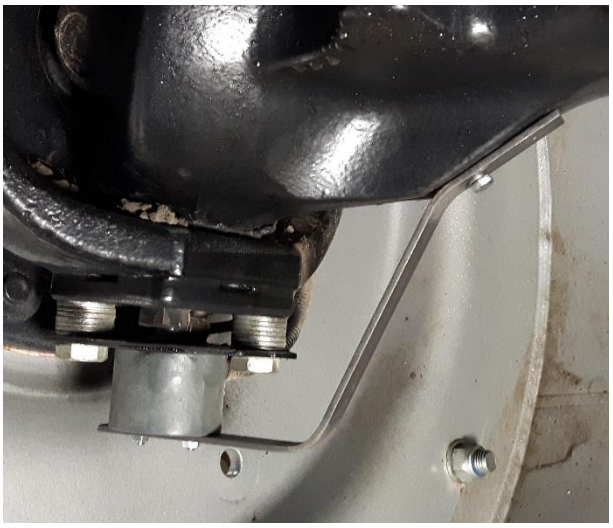


FIGURE 22 STRIP ON THE FRONT AXLE WITH ONE BOLT

FIGURE 23 BEND THE STRIP WITH THE HELP OF TWO BAHCO'S

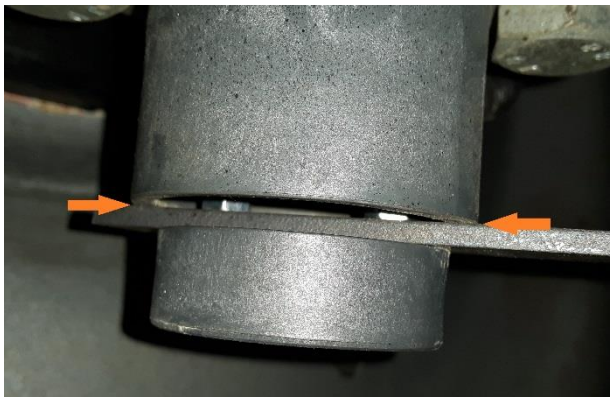


FIGURE 24 DISC AT THE OTHER SIDE OF THE STRIP

14. Remove the sensor disc from the strip. Then mount the sensor disc again to the strip with the aid of M5 X 30 bolts, raised with two nuts and two washers on each side. Mount on the correct side of the strip (Figure 25) and pay attention to the orientation of the disc (Figure 26). The triangular marker must be on the correct side. **Make sure the the two nuts and washer are installed underneath the disc.**

15. Make sure the sensor magnet (Figure 26) in the sensor disc is completely clean (no iron fillings) before being mounted. Clean the sensor magnet with compressed air if necessary (Figure 27). Mount the strip back on the front axle.

16. Check again if the sensor disc lies under slight pretention against the sensor housing (Figure 28). Push with your thumb to the end of the wheel angle sensor strip to check this. The sensor disc may only have a little bit of friction in the sensor housing. The sensor disc should bounce back easily and without friction (Figure 29).

Caution!:
The sensor disc should be in a fully centered position within the sensor housing. The strip should be able to flex in a downward direction.

FIGURE 25 WHEEL ANGLE SENSOR DISC MOUNTED WITH SPACERS

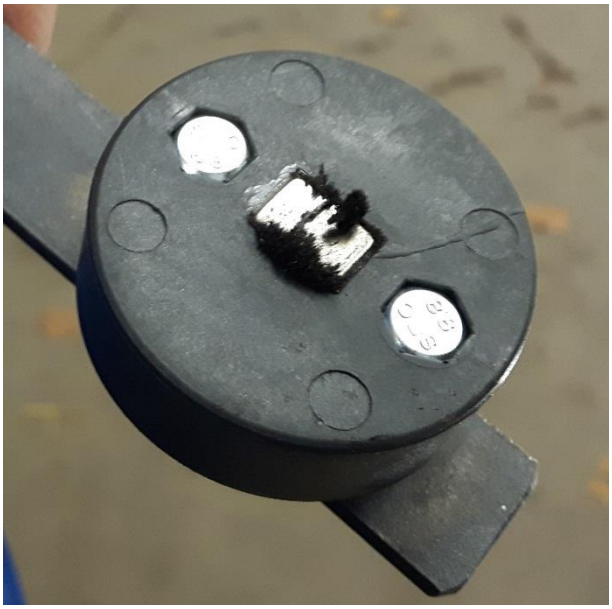


FIGURE 26 DIRTY WHEEL ANGLE SENSOR MAGNET

FIGURE 27 CLEANING WHEEL ANGLE SENSOR

Hint!:
It is often useful to drill bigger holes (slots) in the wheel angle sensor strip for the sensor disc. Allow the nuts to be loose-fit when mounting the strip. The disc then centers itself automatically. Do not forget to tighten the nuts again.

Caution!:
Make sure the magnet of the wheel angle sensor is completely clean (no iron filings) before mounting it. Cleaning the wheel angle sensor magnet with compressed air will prevent *problems.*

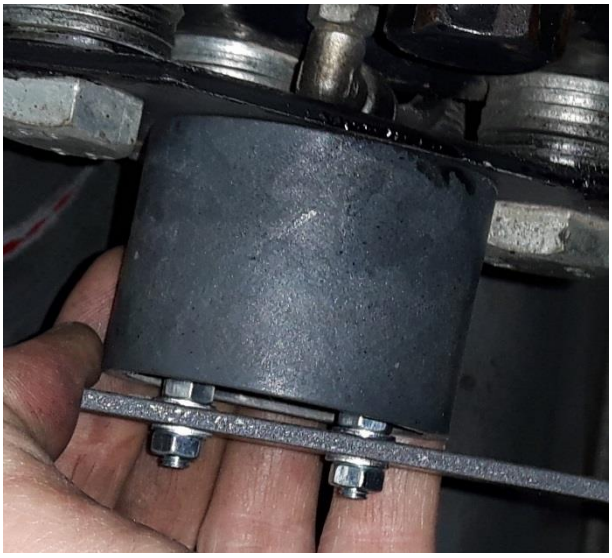


FIGURE 28 CENTRE AND FRICTION CHECK OF WHEEL ANGLE SENSOR

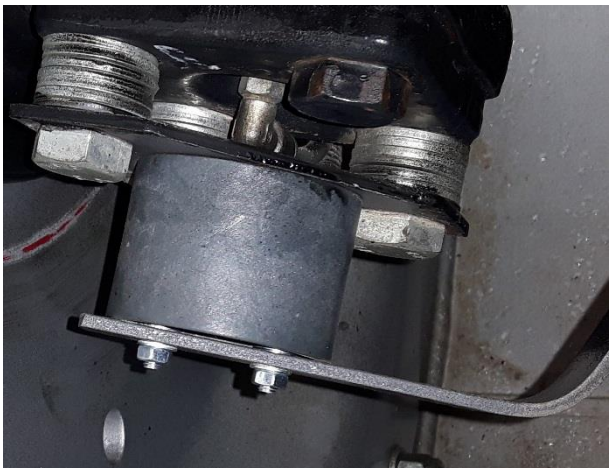


FIGURE 29 CORRECT MOUNTED WHEEL ANGLE SENSOR

1.2.12 HEAVY-DUTY CARRARO FRONT AXLE WITH INDEPENDENT SUSPENSION

Tractors with independent suspension (e.g. Carraro front axle) a special wheel angle sensor bracket must be fitted (Figure 30). This assembly requires a wheel angle sensor with a much wider range (180°) in connection with the larger wheel turn (blue coloured wheel angle sensor). The wheel angle sensor should be mounted at the right side behind the front axle of the tractor (Figure 30).

FIGURE 30 CARRARO FRONT AXLE

Required parts:

- 180° wheel angle sensor
- Wheel angle sensor bracket
- M8 threaded stub with nuts
- 2x M8 ball joint
- Carraro front axle wheel angle sensor bracket
- Carraro front axle tie rod bracket

Method of mounting:

- Install the wheel angle sensor to the bracket.
- Mount the bracket to the front axle.
- Set the arm of the sensor approximately 20 degrees off center (Figure 31). This means that the ball and socket joint of the wheel angle sensor are flush with the ball joint of the control rod. This in order to prevent, when fully to the left, the arm of the sensor and the threaded rod with the ball joints scissors with each other.
- Cut the threaded rod to measure. The ball joints are center to center 180mm long. Fit the clamp to the tie rod and the threaded rod with ball joints.
- After mounting check the mechanism by steering fully left and right.

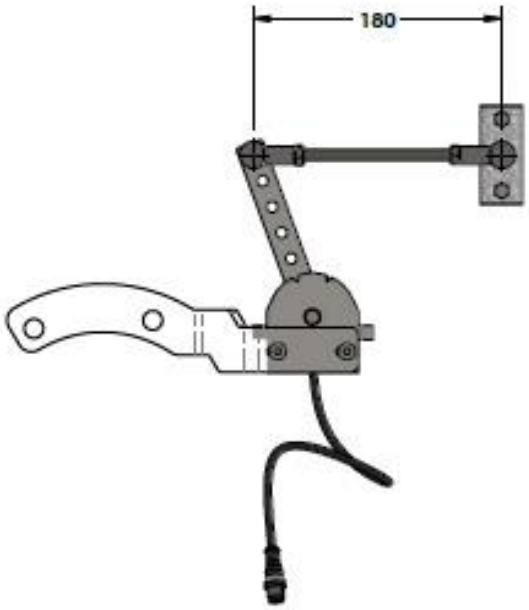


FIGURE 31 SENSOR WITH BRACKETS

2 ROADWAY HOMOLOGATION KIT INSTALLATION

To comply with the rules of the roadway homologation (TÜV) on some of the European countries (Germany, Austria) installation kits and software have been developed.

The Raven RS1/SC1 system is an approved steering system per the requirements of 2009/66/EC, § 38 StVZO (EU) 2015/208 IV and V incl. all amendments up to (EU) 2015/208. By GTÜ No. GTÜ 2015/208/ V-19002.00.

For using homologation terms, the appropriate kit must be used.

TABLE 2 KIT, ROADWAY HOMOLOGATION, CRX, GENERIC.

Part	Description
115-8000-157	HRNS HDU TO MASTER ENGAGE SEAT
115-8000-428	CBL, OPS, W/ HDU, GENERIC
115-8000-411	CABLE 6P TO DT MASTER SWITCH
063-8000-149	MASTER SWITCH AUTO PILOT
013-9000-003	TECH REPORT RS1/SC1 2009/66EC

Connect the 8-pin connector of HARNESS, HDU TO MASTER ENGAGE SWITCH (115-8000-157) to CABLE, CHASSIS, HYDRAULICS, HDU (115-8000-377) (Figure 32).

On the 115-8000-157 cable three connectors are available:

- Engage - push button or foot switch (not obliged to meet the roadway homologation).
- Master switch – Switch on/off high current power to the valve.
- Seat switch – Detects if the driver is on the seat or not.

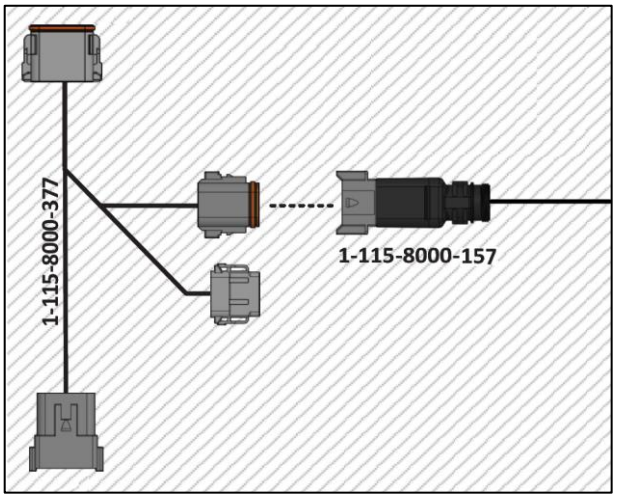
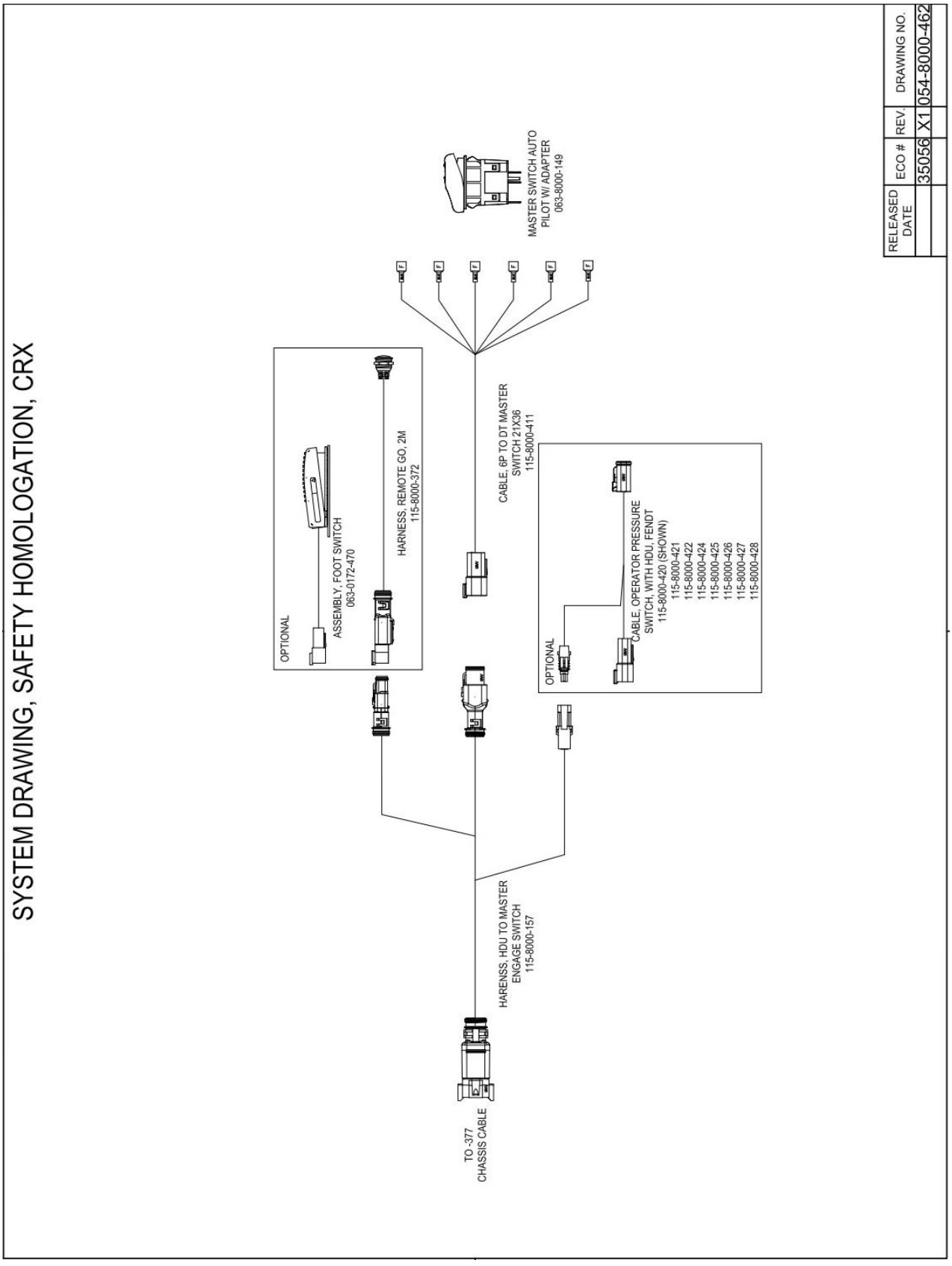


FIGURE 32 CONNECTED 115-8000-157 TO THE 115-8000-377

2.1 ROADWAY HOMOLOGATION APPLICATION DRAWINGS



2.2 MASTER SWITCH

The master switch can be used to switch high current power off during road transport.

Connect the 6-pin connector of the CABLE, 6P TO DT MASTER SWITCH 21X36 (115-8000-411) to the 115-8000-157 cable.

Install the MASTER SWITCH AUTO PILOT switch (063-8000-149) in the armrest or dashboard in a convenient position for the tractor driver (Figure 33).

Connect the 115-8000-411 cable to the 063-8000-149 master switch.

FIGURE 33 MASTER SWITCH AUTO PILOT BUTTON

2.3 ENGAGE

Select a suitable location to install the push button or foot switch.

Note: the push button or foot switch should be installed in a location where the operator has easy access to it and is able to fully press the button or switch.

Using the holes in the foot switch as a template, drill holes in the floor of the cab. Secure the foot switch to the floor by installing the screws in each of the mounting holes.

In the case of a push button, drill a hole in the panel or armrest and mount the push button (Figure 34).

Route the push button or foot switch connector to the engage connector of the 115-8000-157 cable (Figure 35).

FIGURE 34 PUSH BUTTON MOUNTING

FIGURE 35 RESUME FOOT SWITCH CONNECTION

2.4 SEAT SWITCH

Please note!:
An operator presence switch cable connects the seat switch of the tractor to the HDU. A few seconds after the driver has left the seat, the automatic steering will be deactivated

Disconnect the connectors from the existing seat switch cable of the tractor (Figure 36). Connect the Raven operator presence cable (for claas use the 115-8000-428 for example) between the connectors of the existing seat switch (Figure 37). Cables and safety homologation kits for various types of tractors are available in the pricebook.

Connect the 1-pin operator presence switch connector of the 115-8000-428 cable to the 1-pin seat switch connector of the 115-8000-157 cable.

FIGURE 36 EXISTING TRACTOR OPERATOR PRESENC SWITCH CONNECTOR

FIGURE 37 OPERATOR PRESENCE SWITCH T-CABLE (115-8000-428) CONNECTION

3 RS1 INSTALLATION

The RS1 mounting package comes with 2 metal strips with an adhesive: 107-0172-618. Insert the included screws into the metal strips and screw the fixed mount: 107-0182-531 onto the metal strips (Figure 38). Tape the metal brackets as close to center of the roof as possible. Make sure the roof is clean and dry before mounting the strips. This mount stays permenant on the tractor.

On the bottom of the RS1 there are 4 screws located, unscrew them and insert the SIM into the SIM slot. The SIM must be inserted into the J11 slot or the RS1 will not receive any signal (Figure 39).

Mount the Latch Plate: 116-0159-802 onto the RS1 using the provided screws (Figure 41). This latch plate stays connected to RS1.

Connect the RS1 with latch plate to the fixed plate and secure it with the latch. Connect the connecter.

The LAIRD antenna is the main receiver of the RS1. The RS1 / LAIRD-antennas should be mounted atleast 50 cm apart (Figure 47).

Furthermore, the following guidelines must be observed when installing the GPS antenna:

- Mount the GPS-antenna with the connectors pointing to the backside.
- Mount the GPS-antenna in front of the rear axle.

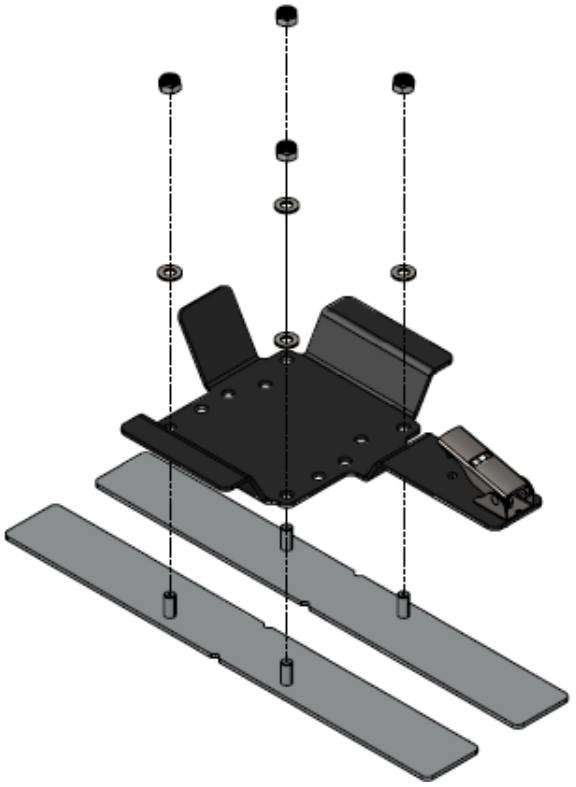


FIGURE 38 BOTTOM ASSEMBLY OF RS1 MOUNT

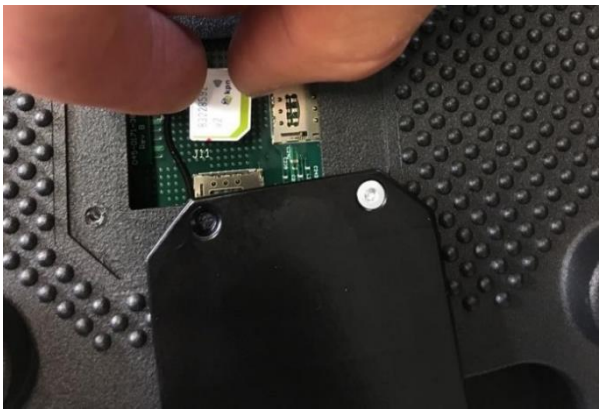


FIGURE 39 INSERT SIM CARD INTO THE J11 SLOT

FIGURE 40 MOUTING THE RS1 ON THE GENERIC BRACKET

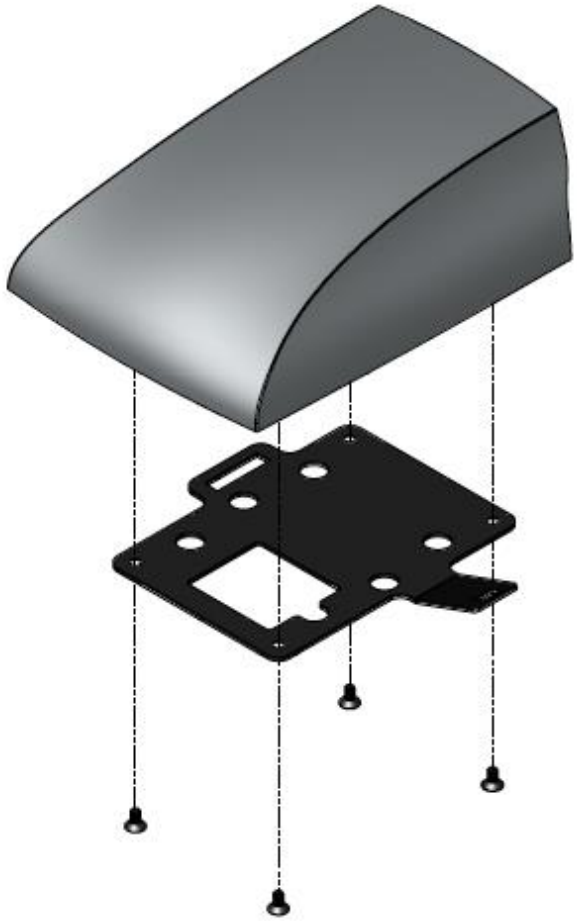


FIGURE 41 TOP ASSEMBLY OF THE RS1

FIGURE 42 RS1 MOUNTED ON TRACTOR

4 CRX/VIPER4+ ROS INSTALLATION

4.1 MOUNTING THE CR7

The following guidelines have been established for mounting the Field Computer (Figure 43):

- Always contact the customer about the terminal position in the cabin.
- Always use a RAM-C ball attachment. (Figure 44 & Figure 45)
- Mount the terminal free of vibrations with a solid bracket. A variety of mounting brackets are available for this purpose.
- Secure all cables in the cabin.
- Mount in such a way that the display is directed straight towards the driver.
- Mount in such a way that driver has a clear view all around.

Hint!:
Mount the terminal in such a way that it does not obstruct the view of the driver over the top of the right-hand fender, but also so that the inside of the front wheel on the ground is still clearly visible.

FIGURE 43 CR7 ON A-PILLAR

FIGURE 44 RAM-C BALL ATTACHEMENT

FIGURE 45 CR7 MOUNTED

4.2 SLINGSHOT INSTALLATION

If a SlingShot modem is used, in addition to the GPS-antenna, two LAIRD antennas and a GPS patch should be mounted.

The LAIRD antennas should be mounted at least 100 cm of each other. If a standard GPS-antenna bracket is mounted, one of the LAIRD-antennas should be mounted on this bracket. The second GPRS / UMTS-antenna should be mounted on a metal bracket on the cabin (Figure 47).

It is important that the following conditions are met at all times:

- The LAIRD antenna is equipped with a magnetic base and must be placed on top of the cabin.
- The antenna should have a clear reception all around.
- Label the antenna cables inside the cabin with labels 'Cellular' and 'Diversity' (Figure 46).
- Mount a grey SMA grip on both connectors.

FIGURE 46 ANTENNA CABLES WITH LABELS AND SMA-GRIP SET

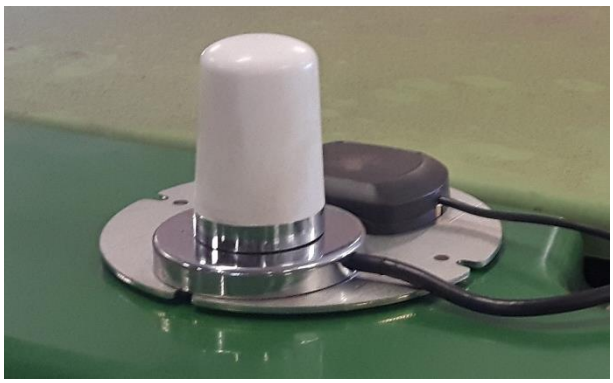


FIGURE 47 GPRS/UMTS-ANTENNA AND GPS PATCH ANTENNA ON A METAL BRACKET

Connect the power cable to the connector with label ''Slingshot PWR'' and connect the RTK IN/GPS OUT connectors with each other. Connect the Serial RTK IN with the Slingshot and connect the Ethernet cable between the SlingShot and the CR7.

- Mount in such a way that driver has a clear view all around.

4.3 MOUNTING THE CR12/VIPER4+ ROS

The following guidelines have been established for mounting the Field Computer:

- Always contact the customer about the terminal position in the cabin.
- Always use a RAM-C or RAM-B ball attachment. (Figure 48 & Figure 49)
- Mount the terminal free of vibrations with a solid bracket. A variety of mounting brackets are available for this purpose.
- Secure all cables in the cabin.
- Mount in such a way that the display is directed straight towards the driver.

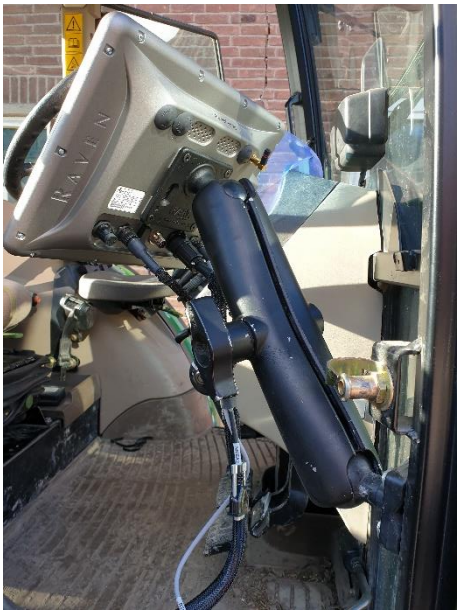


FIGURE 48 RAM B BALL ATTACHMENT ON PILLAR

- **Hint!:**

Mount the terminal in such a way that it does not obstruct the view of the driver over the top of the right-hand fender, but also so that the inside of the front wheel on the ground is still clearly visible.

FIGURE 49 CR12 ON A PILLAR

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