

# ***SmarTrax***»»»

*Straight shot to easy steering*



Supplement & Installation Manual

**New Holland 9684 & 9884**

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Raven Industries shall not be held responsible or liable for the effects of atmospheric conditions and sunspot activity on the performance of our products.

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## CHAPTER

# 1

## INTRODUCTION

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Congratulations on your purchase of the Raven SmarTrax system! This system is designed to provide cutting-edge, hands-free steering of your machine via GPS coordinates.



Below you will see the kit contents that you should have received with this SmarTrax kit.

## Basic Kit Contents

### New Holland 9684 & 9884 SmarTrax Kit Contents

Quantity	Item Description	Part Number
1	Yaw Sensor	063-0172-684
1	Plate, Mounting, Universal Hydraulic, Part "B"	107-0171-578
1	Cable, Hydraulic Solenoid/Override	115-0171-775
1	Weldment, Bracket, Universal Hyd., Mtg., Part "A"	116-0159-527
1	Switch, Pressure, Micro, HD, 15-100 Bar Adj. W/Ftgs.	422-0000-074
4	Bolt, 5/16"-18 x 7/8" Hex Head	311-0052-104
4	Bolt, Hex, 3/8"-16 UNC x 1/2"	311-0054-105
4	Nut, 3/8"-16	312-1001-037
4	Washer, Lock, 5/16"	313-1000-019
4	Washer, Lock, Split, 3/8"	313-1000-022
8	Washer, Flat, 3/8"	313-2300-013
1	Valve, Hyd., Closed Center LS W/Relief	334-0003-066
1	Manual, Installation	016-0190-076
1	Manual, Installation, Smartrax	016-9001-021
1	Label, Warning, Tampering	041-0159-689
3	Ftg., Elbow, 45° Swivel, -6 JIC M/F	333-0012-027
1	Ftg., Adapter, Swivel Run Tee, -8 JIC M/M/F	333-0012-039
6	Ftg., Elbow, 90° Swivel, -6 JIC M/F	333-0012-042
1	Ftg., Adapter, -12 JIC (F) to -6 JIC (M)	333-0012-101
2	Ftg., Elbow, 90° Swivel, -10 JIC M/F	333-0012-108
1	Ftg., Adapter, Swivel Run Tee, -12 JIC M/M/F	333-0012-109
2	Ftg., Adapter, Swivel Run Tee, -10 JIC M/M/F	333-0012-113
1	Ftg., Elbow, 45° Swivel, -12 JIC M/F	333-0012-236
2	Hose, Hyd., 10JF -6 120" 6JF	214-1000-454
1	Hose, Hyd., 8JF90S -6 66" 6JF	214-1000-455
1	Hose, Hyd., 6JF -6 22" 6JF	214-1000-456
1	Hose, Hyd., 4JF90S -4 34" 6JF	214-1000-457
1	Hose, Hyd., 4JF -4 51" 6JF	214-1000-458

## CHAPTER

## 2

## SAFETY

## Hydraulic Safety Requirements



**Important:** Hydraulics are under pressure. Never attempt to open or work on a hydraulic system with the equipment running. Care should always be taken when first opening a system that was previously pressurized.

When disconnecting the hydraulic hoses or when purging is required, be aware that the hydraulic oil within the machine system may be extremely hot and under high pressure. Caution must be exercised. Any work carried out on the hydraulic system must be performed in accordance with the machine manufacturer's approved maintenance instructions. Raven Industries recommends that appropriate protective equipment be worn when working on the hydraulic system. Objects or materials that are able to bypass the machine's hydraulic filtration system will adversely reduce performance and possibly damage the hydraulic valves.

## Electrical Safety Requirements

Do not reverse the power leads. Doing so will cause severe damage to the equipment. Always check to make sure that the power leads are connected to the right polarity as marked. Ensure that the power cable is the last cable to be connected.

# Contacting Raven Industries

We welcome your feedback about this manual. If you have any comments or suggestions for improvement, please let us know by contacting our Customer Support Center by any of the following methods:

- ◆ **Via phone:** 1-800-243-5435
  
- ◆ **Via mail:**  
Raven Industries  
Flow Control Division  
205 E. 6th St.  
Sioux Falls, SD 57104
  
- ◆ **Via email:** [fcdinfo@ravenind.com](mailto:fcdinfo@ravenind.com)

## CHAPTER

# 3

### MOUNTING THE UNIVERSAL BRACKET AND VALVE

1. Attach the pressure switch to the PS Port. Be sure to do this before mounting the valve to assure the proper clearances.
2. Mount the valve to the left front fender support. Drill two holes in the fender support and bolt the valve directly to the support. The valve could also be mounted under the hood on the firewall support using the supplied t-shaped bracket.







## CHAPTER

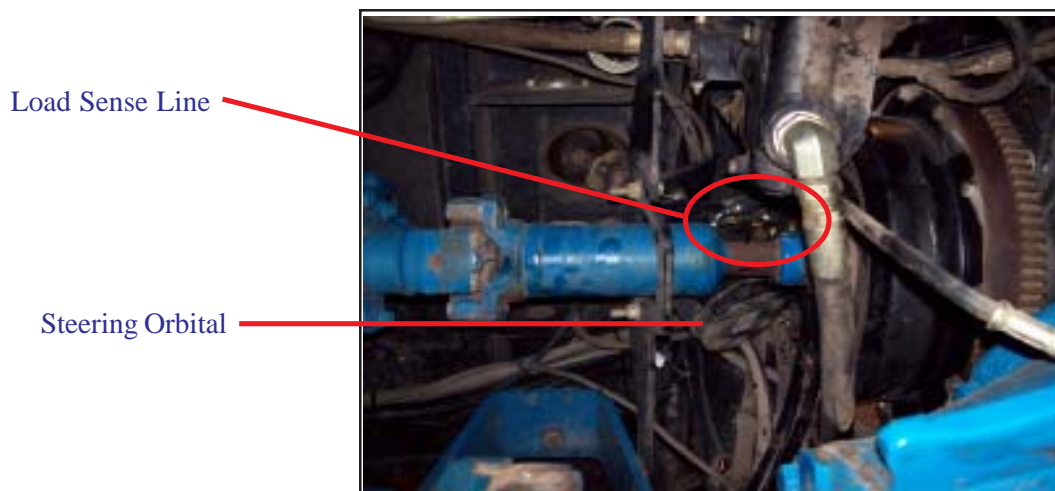
# 4

## HYDRAULICS

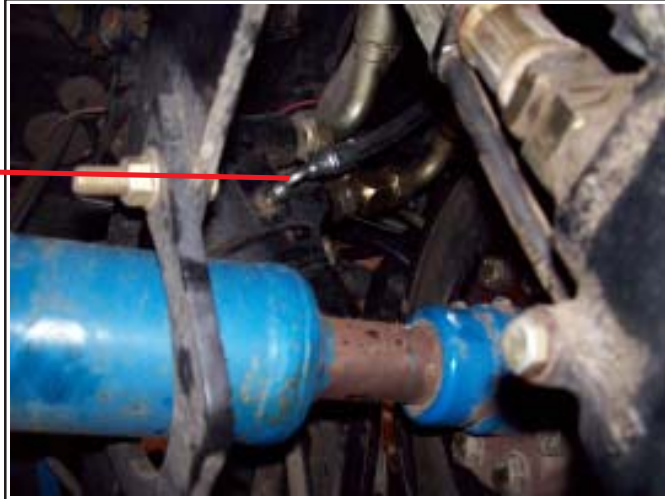
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### Installing the LS Steer and LS PV Hoses

1. Locate the load sense hose on the right side of the steering orbital. This will be a small 1/4" hose.
2. Clean the debris off of both ends of the hose and then remove the hose from the orbital and priority valve.
3. Attach the 90° end of the hose (P/N 214-1000-457) to the open port on the steering orbital.
4. Attach the hose installed in step 3 to the LS steer port using a 90° fitting.



LS Steer Hose



5. Attach the hose (P/N 214-1000-458) to the priority valve that the steering load sense line was connected to.
6. Route the hose to the SmarTrax valve and attach it to the LS PV Port using a 90° fitting.

LS PV Hose



## Installing the Tank Hose

1. Locate the hydraulic tank underneath the engine.
2. Remove the hose from the front left connection.
3. Install the provided fitting onto the tee fitting already there.
4. Re-attach the original tank line to the tee fitting.
5. Attach the 90° end of the hose (P/N 214-1000-455) to the tee fitting.
6. Route the hose to the SmarTrax valve and attach it to the T port using a 45° or 90° fitting.

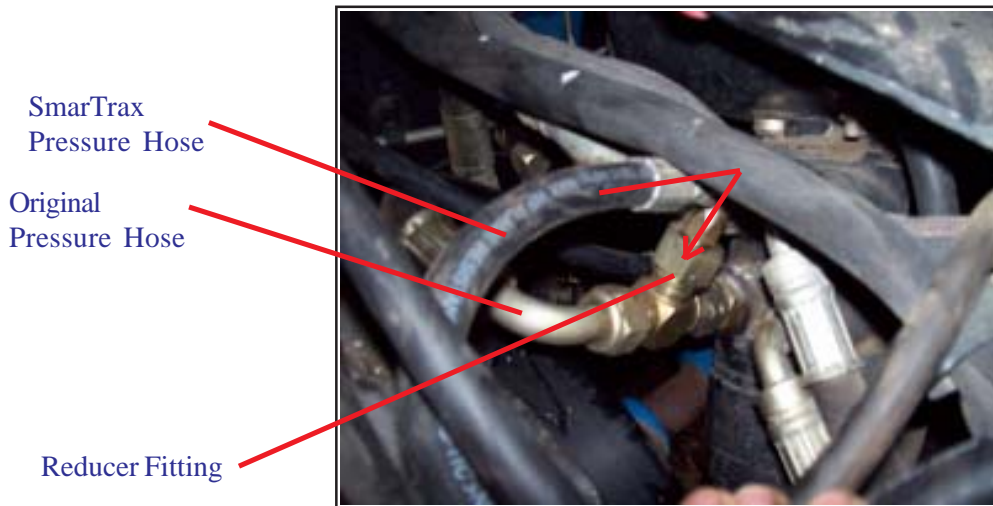
SmarTrax  
Tank Connection



## Installing the Pressure Hose

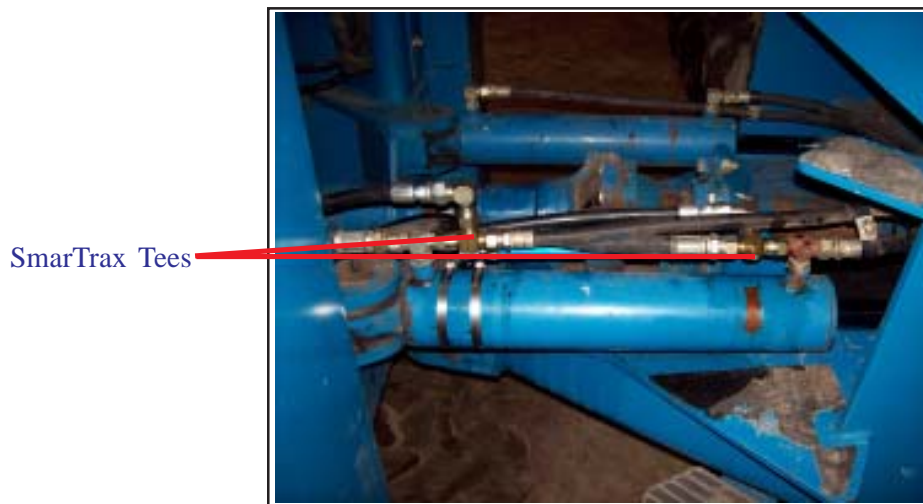
1. Locate the pressure hose on the steering orbital. It will be the front right port when sitting in the cab and it will go to the same priority valve that the load sense hose was connected to.
2. Disconnect the pressure hose from the steering orbital.
3. Install the provided reducer fitting onto the branch portion of the -12 JIC run tee.
4. Attach the tee to the pressure port on the orbital.
5. Re-attach the original pressure line to the tee fitting using the supplied 45° fitting, if necessary.
6. Attach the hose (P/N 214-1000-456) to the reducer fitting on the previously installed tee using a 90° fitting.

7. Route the hose to the P Port on the SmarTrax valve and attach it using a 45° or 90° fitting.



## Installing the Left and Right Hoses

1. Disconnect the hoses from the steering cylinder on the left side of the machine.
2. Install the provided tees onto both ends of the cylinder and re-attach the hydraulic hoses.
3. Connect the hoses (P/N 214-1000-454) onto the tee fittings using 90° fittings.
4. Route the hoses along the left frame, securing to existing hoses, up to the SmarTrax valve.
5. Connect the left steer hose (connected to the rod end of the cylinder) to the A Port on the SmarTrax valve.
6. Connect the right steer hose to the B Port on the SmarTrax valve.





Right Steer Tee



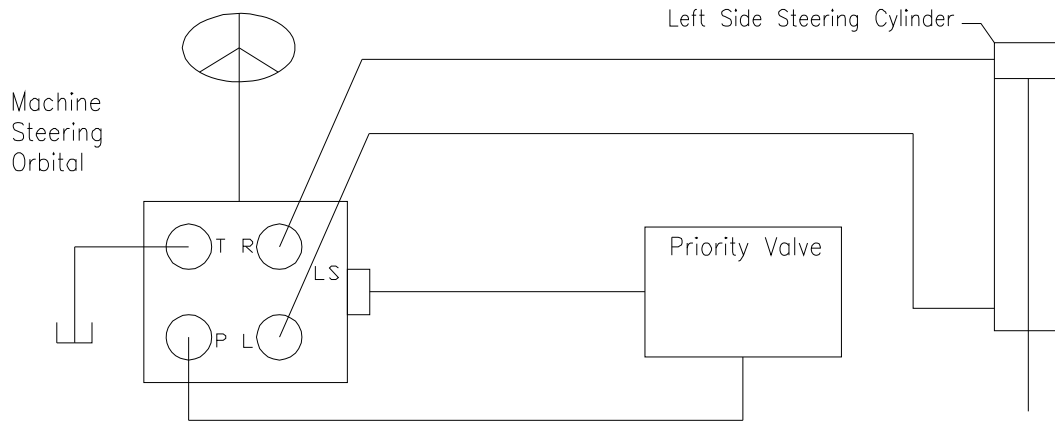
Left Steer Tee



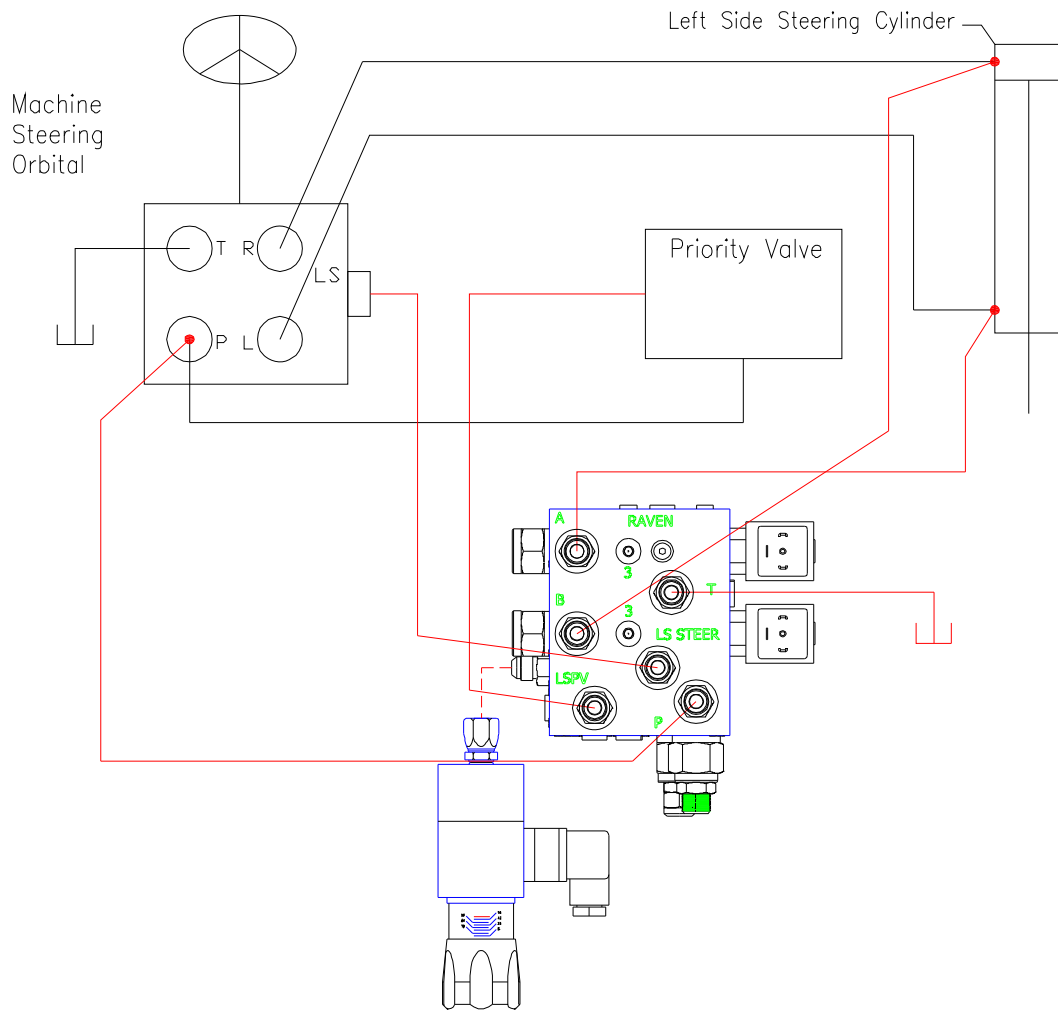
Hose Routing

# Hydraulic Schematic

Before Smartrax Installation



After Smartrax Installation



## CHAPTER

# 5

## SENSOR MOUNTING

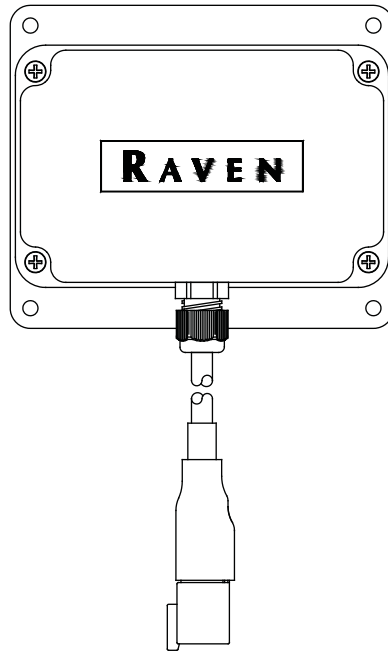
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### **Yaw Sensor Installation**

#### Mounting the Yaw Sensor

- Installing the Raven Yaw Sensor is quick and easy. Raven recommends that you keep the following points in mind while installing the sensor:
- The sensor is not weatherproof. Mount the sensor inside of the machine's cab or drivers compartment.
- Mount the sensor to a flat surface parallel to the ground with the Raven logo facing up. The floor of the cab is generally ideal.
- Once mounted, the sensor should remain fixed in relation to the vehicle. The sensor should not become loose or rotate due to machine vibration or movement.
- The sensor should also be mounted in a location where it will not be kicked or jarred during normal equipment operation.

- The cable does not need to be oriented in any way to the direction of travel of the vehicle. Mount the sensor with the cable routed to avoid tripping hazards or damaging the cable or yaw sensor.



## Installation

- Mount the Yaw Sensor to the floor inside of the vehicle's cab using the double sided tape on the sensor or steel bolts or screws through the mounting plate. See the Mounting the Yaw Sensor section on the previous page for mounting location considerations.
- Connect the supplied sensor cable to the Yaw sensor and to the Yaw Sensor connector on the SmarTrax Interface cable.



## CHAPTER

# 6

## START-UP PROCEDURES

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After installing the SmarTrax on your machine, always follow these start-up procedures.

- ◆ Turn the wheels fully from side to side numerous times to remove air from the hydraulic system.



**Important:** Time the wheels for a full left to right and right to left time of approximately 8 seconds. Refer to the Universal Kit Manual for additional instructions on this.

- ◆ Adjust the pressure switch to the most responsive setting. Refer to the Universal Kit Manual for instructions on this.

**Notes:**



# RAVEN INDUSTRIES LIMITED WARRANTY

## **WHAT IS COVERED?**

This warranty covers all defects in workmanship or materials in your Raven Flow Control Product under normal use, maintenance, and service.

## **HOW LONG IS THE COVERAGE PERIOD?**

This warranty coverage runs for 12 months from the purchase date of your Raven Flow Control Product. This warranty coverage applies only to the original owner and is not transferrable.

## **HOW CAN YOU GET SERVICE?**

Bring the defective part, and proof of date of purchase, to your local dealer. If your dealer agrees with the warranty claim, he will send the part, and proof of purchase to his distributor or to Raven for final approval.

## **WHAT WILL RAVEN INDUSTRIES DO?**

When our inspection proves the warranty claim, we will, at our option, repair or replace the defective part and pay for return freight.

## **WHAT DOES THIS WARRANTY NOT COVER?**

Raven Industries will not assume any expense or liability for repairs made outside our plant without written consent. We are not responsible for damage to any associated equipment or product and will not be liable for loss of profit or other special damages. The obligation of this warranty is in lieu of all other warranties, expressed or implied, and no person is authorized to assume for us any liability. Damages caused by normal wear and tear, misuse, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.



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