

# ***SmarTrax***»»»

*Straight shot to easy steering*



**Nitro N2**

**Supplement & Installation Manual**

### **DISCLAIMER**

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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.



## Basic Kit Contents

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

### Nitro N2 SmarTrax Kit Contents

Quantity	Item Description	Part Number
1	SENSOR, ASSEMBLY, LINEAR STEERING POSITION	063-0181-001
1	WELDMENT, BRACKET, UNIVERSAL HYD., MTG., PART "A"	116-0159-527
2	HOSE, HYD., 13/16" ORFS (F) TO 9/16" JIC (F) 48" LONG	214-1000-202
1	HOSE, HYD., 9/16" ORFS (F) TO 9/16" JIC (F), 48" LONG	214-1000-207
2	HOSE, HYD., 11/16" ORFS (F) TO 9/16" JIC (F) 52" LONG	214-1000-452
1	SWITCH, PRESS., MICRO, H. D., 15-10 BAR ADJ., W/FITTINGS	422-0000-074
1	VALVE, HYD., CLOSED CENTER LOAD SENSE	334-0003-062
2	FITTING, ADAPTER, SWIVEL RUN TEE, 13/16" ORFS M/M/F	333-0012-028
2	FITTING, ELBOW, 90° SWIVEL, 9/16" JIC M/F	333-0012-042
2	FITTING, ELBOW, 90° SWIVEL, 11/16" ORFS M/F	333-0012-065
2	FITTING, ELBOW, 90°, SWIVEL, 13/16" ORFS M/F	333-0012-067
2	FITTING, ADAPTER, SWIVEL RUN TEE, 11/16" ORFS M/M/F	333-0012-069
1	FTG., ELBOW, 90°, 9/16" ORFS (M) TO 7/16" SAE O-RING (M)	333-0012-103
2	WELDMENT, UNIVERSAL, SMARTRAX, PART "A-1"	116-0159-686
4	BOLT, 5/16-18 x 7/8" HEX HEAD	311-0052-104
4	BOLT, 3/8"-16 x 4-1/2"	311-0054-118
8	NUT, 3/8"-16	312-1001-037
4	WASHER, LOCK, 5/16"	313-1000-019
8	WASHER, LOCK, SPLIT, 3/8"	313-1000-022
12	WASHER, FLAT, 3/8"	313-2300-013
1	MANUAL, INSTALLATION	016-0190-069
1	MANUAL, INSTALLATION, SMARTRAX	016-9001-021
1	LABEL, WARNING, DO NOT STEP	041-0159-688
1	LABEL, WARNING, TAMPERING	041-0159-689
1	CABLE, HYDRAULIC SOLENOID / OVERRIDE	115-0171-466

## CHAPTER

# 2

## SAFETY

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### 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  
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Sioux Falls, SD 57104
  
- ◆ **Via email:** [fcdinfo@ravenind.com](mailto:fcdinfo@ravenind.com)

## CHAPTER

# 3

## ROUTING THE VALVE

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1. Remove the fitting from the LS PV port. Install the 7/16" SAE O-ring to 9/16" ORFS fitting into the port.
2. The valve mounts between the engine and the cab on the front engine cross member.
3. Mount the bracket with the supplied 4 bolts and 2 plates to clamp around the cross member.
4. Mount the valve to the bracket.
5. Attach the pressure switch to the PS port on SmarTrax valve.
6. Refer to the Universal Kit manual for additional instructions on bracket assembly and valve mounting.



**Valve Location**

**Notes:**



## CHAPTER

# 4

## HYDRAULICS

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1. Label hoses L, R, P, T before removal. Orbital ports are labeled.
2. Remove P, L, R hoses. Install the 11/16" ORFS run tee onto the L & R ports. Install the 13/16" ORFS run tee onto the P port.

3. Reattach the original P, L, & R hoses to the tees on their corresponding ports.
4. Attach hose (P/N 214-1000-452) to the L port on the orbital.
5. Route the hose to the SmarTrax valve and attach to the A port using a 90° fitting if needed.
6. Attach hose (P/N 214-1000-452) to the R port on the orbital.
7. Route the hose to the SmarTrax valve and attach to the B port using a 90° fitting if needed.
8. Attach hose (P/N 214-1000-202) to the P port on the SmarTrax valve.
9. Remove the tank line hose from the rod end of the boom center rack adjust cylinders. (This line is teed into the tank line on the steering orbital.)
10. Install a run tee onto the port.
11. Reattach the original tank hose.
12. Attach a 90° fitting to the branch port of the tee.
13. Attach hose (P/N 214-1000-202) to the 90° fitting.
14. Route hose to the T port on the SmarTrax valve and attach.
15. Disconnect the loadsense line from the side of the steering orbital. Route hose to the SmarTrax block and connect to the LS-PV port.
16. Attach hose (P/N 214-1000-207) to the LS-Steer port on the SmarTrax valve and open the loadsense port on the side of the steering orbital.

## CHAPTER

# 5

## STEERING POSITION SENSOR & WIRING HARNESS INSTALLATION

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### Mounting the Steering Position Sensor (SPS)

1. Mount the SPS to the steering cylinder on the right side of the machine.
2. Be sure, upon startup, to turn wheels slowly,. Do not over extend or over compress the sensor.
3. Refer to instructions included with the SPS kit for more information.





## **Wiring Installation**

1. Connect wiring ends to the valve coil, pressure switch, and SPS.
2. Route into cab.
3. Allow slack for wheel adjustment.

## CHAPTER

# 6

## START-UP PROCEDURES

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

- ◆ Make sure the Steering Position Sensor rotates freely when turning the wheels.
- ◆ Turn the wheels fully from side to side numerous times to remove air from the hydraulic system.
- ◆ Time the wheels for full left to right and right to left time of approximately 6 seconds. Refer to the Universal Kit Manual for 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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