The Force injection system is designed for use on planting and seeding implements with a liquid fertilizer application delivery system and a carrier product tank already installed. Carrier rate control is not included with the Force system, but is available as an optional feature.

The Force CS injection system has an output range of 1 to 40 oz./min. The system must be operated within the range to ensure proper operation of the injection pump and application of injected products. To help ensure that the minimum injection rate is achieved, the smallest section or implement width for use with Force CS injection system should not be below 8 row units.

**NEW Force® CS Insecticide Closed Application System**

Raven and Syngenta have partnered to develop a new Force® closed application system. The application system is an innovative new option for growers looking for improved corn rootworm control with an in-furrow application of Force® CS soil-applied insecticide.

- **4 Box Capacity, 8 ounces per acre, 40 acres per box, 160 acres total.**
- **Box Size - 24"x24"x30" Wide, not including the mounting brackets.**
- **Approximately 75 lbs.**

### REPLACEMENT PARTS

<table>
<thead>
<tr>
<th>Cabinet and Injection Plumbing - 117-0171-477</th>
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<tbody>
<tr>
<td>The Plumbing Items Listed Below are Included in this Kit</td>
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<tr>
<td><strong>Item#</strong></td>
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</table>
Ordering Instructions for SCS4400

A. Select One (1) Chassis Cable

115-0171-915 Cable, Power/CAN, Chassis, Tractors with Front Mounted Batteries: $1,333.58

Approved Tractor Models: CAT Challenger MT700, 800, 900, JD6120, 6320, 7220, 7320, 7420, 7230, 7330, 7430, 7530, (Small Frame 7x20 and 7x30 Series JD)

115-0171-933 Cable, Power/CAN, Chassis, Generic 4WD $1,509.05

Approved Tractor Models: JD4WD; Case IH 4WD; New Holland 4WD; Bulwer 4WD

115-0171-932 Cable, Power/CAN, Chassis, Row Crop Tractors $1,463.77

Approved Tractor Models: Case IH Row Crop Tractors, CAT Challenger MT500, 600; JD 7x00, X1x; New Holland Row Crop

115-0171-938 Cable, Power/CAN, Chassis, Large Frame JD and Bulwer Row Crop Tractors $1,181.50

Approved Tractors: JD 8x00, 8x10, 8x20, 8x30, 7620, 7720, 7820, 7920, 7630, 7730, 7830, 7930; Bulwer Row Crop Tractors

B. Select One (1) Can/Power Tee Extension Cable

115-0172-222 Cable, Speed Sensor Extension Cable, 10’ $159.09

115-0159-032 Cable, Speed Sensor Extension Cable, 12’ $166.11

115-0171-239 Cable, Speed Sensor Extension Cable, 18’ $180.15

115-0159-018 Cable, Speed Sensor Extension Cable, 24’ $191.85

115-0171-241 Cable, Speed Sensor Extension Cable, 29’ $208.23

C. Select One (1) CAN/Power Tee Extension Cable for Each Node

115-0171-928 Cable, CAN/Power Implement Tee, 12’ Long $677.02

115-0171-951 Cable, CAN/Power Implement Tee, 6’ Long $1,090.26

115-0171-916 Cable, CAN/Power Implement Tee, 12’ Long $931.17

115-0171-917 Cable, CAN/Power Implement Tee, 24’ Long $1,045.81

115-0171-934 Cable, CAN/Power Implement Tee, 36’ Long $1,286.79

D. Select One (1) CAN Terminator per Implement

063-0173-224 Terminator, CAN Passive, 16 Pin AMP $387.86

E. Select One (1) In-Cab CAN Terminator (already included inOmniRow Planter System, Steering Only Chassis Cables, and Boom Sense/Speed/CAN Switch Box Kits)

063-0172-369 Terminator, CAN Passive $287.30

F. Select One (1) Speed Sensor Extension Cable (if applicable)

115-0171-237 Cable, Speed Sensor Extension Cable, 10’ $159.09

115-0159-032 Cable, Speed Sensor Extension Cable, 12’ $166.11

115-0171-239 Cable, Speed Sensor Extension Cable, 18’ $180.15

115-0159-018 Cable, Speed Sensor Extension Cable, 24’ $191.85

115-0171-241 Cable, Speed Sensor Extension Cable, 29’ $208.23

G. Select One (1) CAN/Power Tee Extension Cable for Each Node (excluding SmarTrax and OmniRow Planter nodes)

115-0171-928 Cable, CAN/Power Implement Tee, 12’ Long $627.02

115-0171-951 Cable, CAN/Power Implement Tee, 6’ Long $1,090.26

115-0171-916 Cable, CAN/Power Implement Tee, 12’ Long $931.17

115-0171-917 Cable, CAN/Power Implement Tee, 24’ Long $1,045.81

115-0171-934 Cable, CAN/Power Implement Tee, 36’ Long $1,286.79

H. Select One (1) CAN Terminators per implement (already included inOmniRow Planter, Product Controller & AccuFlow System Kits)

063-0172-222 Terminator, CAN Passive, 16 Pin AMP $387.86

I. Select One (1) Speed Sensor Extension Cable (if applicable)

115-0171-262 Cable, Speed Sensor Extension Cable, 10’ $159.09

115-0159-032 Cable, Speed Sensor Extension Cable, 12’ $166.11

115-0171-239 Cable, Speed Sensor Extension Cable, 18’ $180.15

115-0159-018 Cable, Speed Sensor Extension Cable, 24’ $191.85

115-0171-241 Cable, Speed Sensor Extension Cable, 29’ $208.23

G. If second product is going to be controlled by Field Computer, a second Node is required.

117-5100-001 Kit, Product Controller, Liquid 16 Pin $3,670.73

Force CS Inoculation Systems

Ordering Instructions when using JD Greenstar Rate Control (GRC) and Force CS ISO Injection

A. Determine if Extension Cable is needed

115-0172-033 Cable, 6’ Extension Cable $488.98

115-0172-084 Cable, 12’ Extension Cable $561.51

115-0172-095 Cable, 24’ Extension Cable $671.47

B. If Electrical Load is more than 30 AMPS, Cable is Required

115-0171-958 Cable, Adapter, John Deere ISO to Raven ISO $1,193.20

Ordering Instructions when using Raven ISO Product Control with Force CS ISO Injection Kit

A. Cable ISOBUS Hitch to Raven ISO ECU is required

115-0171-974 Cable, ISOBUS to Raven ECU, 12’ Long $1,062.18

115-0171-988 Cable, ISOBUS to Raven ECU, 14’ Long $1,062.18

115-0172-034 Cable, ISOBUS to Raven ECU, 17’ Long $1,106.64

115-0171-975 Cable, ISOBUS to Raven ECU, 18’ Long $1,403.77

B. If Raven ISO Product Control Node (required), this node is required even if carrier control is done by other means because this node provides section width input.

063-0173-006 ECU ISO CAN Product Controller $3,999.13

If Electrical Load is more than 30 AMPS, Cable is Required

115-0171-958 Cable, Adapter, John Deere ISO to Raven ISO $1,090.26

No extension cable allowed between Implement Extension Tee and Cable

115-0172-107 Cable, ISO Sidekick Gen II $935.84

D. A Product Controller Cable is Required

115-0171-945 Product Controller Cable $1,333.58

115-0171-319 Product Controller Optional Ext Cable, 12’ Long $1,029.43

115-0171-320 Product Controller Optional Ext Cable, 24’ Long $1,064.52

E. Select a Flow Control Cable (if carrier control is desired)

115-0171-311 Cable, Flow Control Cable, 10 Boom, 12’ Long $1,181.50

115-0171-312 Cable, Flow Control Cable, 5 Boom, 12’ Long $685.51

115-0171-316 Cable, Flow Control Cable, 5 Boom, 24’ Long $830.56

F. Select a Flow Meter, Control Valve, and Section Valves as Desired.

See Page 169 for Options

G. Cable ISO Implement Extension Tee is required

115-0171-960 Cable, ISO Implement Extension Tee, 12’ $494.28

115-0171-961 Cable, ISO Implement Extension Tee, 6’ $490.52

115-0171-963 Cable, ISO Implement Extension Tee, 12’ $1,065.58

115-0172-035 Cable, ISO Implement Extension Tee, 14’ $1,153.43

115-0171-932 Cable, ISO Implement Extension Tee, 24’ $1,298.48

115-0171-933 Cable, ISO Implement Extension Tee, 36’ $1,509.05

H. A Raven ISO to Active Terminator Adapter Cable is Required

115-0171-963 Cable, Adapter Raven ISO to Active Terminator $215.24

I. A Terminator, Active Powell is Required

063-0172-964 Terminator, CAN Active Powell $340.66

Note: Price does not include installation, controller, cables, carrier system, plumbing or other accessories.
FORCE™ CS INJECTION SYSTEM
FORCE CS FOR ENVIZIO PRO & VIPER PRO

MONITORS AND CONTROLS

NOTES:
1. SECTION SWITCHES ARE TURNED ON BY “ON SCREEN SWITCHES” OR BY SO Switch Box, SO TO JOHN DEERE GS2600/2630 117-0171-437
2. IF ELECTRICAL LOAD IS MORE THAN 30 AMPS REFER TO PARTS REQUIRED TO ADD SECOND INJECTION PUMP
3. NO EXTENSION CABLE ALLOWED BETWEEN IMPLEMENT EXT
   TEE AND CABLE 115-0172-107.

Grimes, IA 800-351-1587 • Gardner, KS 877-829-8502 • Brimfield, IL 855-778-8500

165
Sidekick Pro™ Kits DO NOT Include a Console

Check Valves & In-Line Mixers on Page 167

The Raven SCS-Sidekick has been discontinued by Raven. Some replacement parts are still available and listed below.
**Chapter 3 Installation**

**Overview**

The following steps must be completed to install a Sidekick Pro™ ISO injection system:

1. Select and plumb the point of injection. See page 12.
   - **a.** Install carrier and chemical injection check valves.
   - **b.** Install in-line mixer.

2. Mount the Sidekick Pro ISO injection module or tank. See page 18.


4. Plumb the Sidekick Pro ISO pump and injection lines into the main carrier line at point of injection. See page 20.

5. Install the closed calibration system. See page 21.

6. Plumb the recommended rinse system. See page 22.


The following sections provide detailed information and procedure to assist with completing the above steps.

Contact a local Raven dealer for assistance or questions during the installation procedure.

### FIGURE 1. Example Sidekick Pro™ ISO Injection System

**EXAMPLE OF SIDEKICK PRO™ ISO INJECTION SYSTEM PLUMBING INSTALLATION**

#### JOHN DEERE GREENSTAR RATE CONTROL (GRC) WITH RAVEN ISO INJECTION

**INJECTION CHECK VALVES**

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DESCRIPTION</th>
<th>LIST PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>333-0011-078</td>
<td>Check Valve, 3/8&quot;, .5 PSI, S.S., Teflon Bal</td>
<td>$208.88</td>
</tr>
<tr>
<td>333-0011-102</td>
<td>Check Valve, 1/2&quot;, S.S., 12 PSI (Use w/ NH3 &amp; NServe)</td>
<td>$186.89</td>
</tr>
<tr>
<td>333-0011-090</td>
<td>Check Valve, 1&quot;, 14 GPM, Carrier</td>
<td>$153.91</td>
</tr>
<tr>
<td>333-0011-091</td>
<td>Check Valve, 1 1/4&quot;, 22 GPM, Carrier</td>
<td>$186.89</td>
</tr>
<tr>
<td>333-0011-093</td>
<td>Check Valve, 2&quot;, 70 GPM, Carrier</td>
<td>$450.75</td>
</tr>
<tr>
<td>333-0011-094</td>
<td>Check Valve, 3&quot;, 110 GPM, Carrier</td>
<td>$780.56</td>
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</table>

**IN-LINE MIXERS**

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DESCRIPTION</th>
<th>LIST PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>063-0173-770</td>
<td>In-Line Mixer w/ Injection Port, 1 1/2&quot; NPT</td>
<td>$543.53</td>
</tr>
<tr>
<td>063-0159-632</td>
<td>In-Line Mixer, 1 1/4&quot; Poly</td>
<td>$358.58</td>
</tr>
<tr>
<td>063-0171-300</td>
<td>In-Line Mixer, 2&quot; Poly</td>
<td>$415.20</td>
</tr>
<tr>
<td>063-0171-303</td>
<td>In-Line Mixer, 1&quot; Poly</td>
<td>$358.58</td>
</tr>
<tr>
<td>063-0173-699</td>
<td>4&quot; Mixer, SS, Assem w/ back check &amp; inj ports, flange</td>
<td>$2,113.74</td>
</tr>
<tr>
<td>063-0173-696</td>
<td>3&quot; Mixer, SS, Assem w/ back check &amp; inj ports, flange</td>
<td>$1,623.05</td>
</tr>
<tr>
<td>063-0173-432</td>
<td>Mixer, Flow Assembly, 1&quot; NPT, Low Flow</td>
<td>$572.56</td>
</tr>
</tbody>
</table>

### Extension Cables

- **12'** - 115-0172-081, $1,056.90
- **12'** - 115-0172-082, $1,182.48
- **24'** - 115-0172-083, $1,412.69
- **6'** - 115-7100-001, $341.58
- **12'** - 115-7100-002, $381.36
- **24'** - 115-7100-004, $505.36

### Notes:

1. Extension cables are used to power the pump.
2. Connect check valve to pump.
3. SEE NOTE 1.

**Implement**

Grimes, IA 800-351-1587 • Gardner, KS 877-829-8502 • Brimfield, IL 855-778-8500