

**R A V E N**

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# Installation & Service Manual



**Radar Speed Sensor  
for Radars Other Than Raven**



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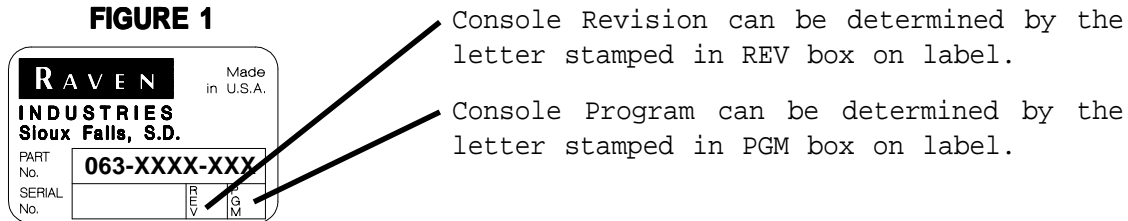
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# RADAR SPEED SENSOR SYSTEM COMPONENTS

Locate the radar to be used from the radar type column in Table 1. Proceed to the vehicle type column and find the vehicle that corresponds with the radar type chosen. Identify the column that specifies the Console program letter. All Console program letters can be found on a serial tag located on the back of the Console (See Figure 1). Choose the radar speed sensor part numbers that matches with the vehicle type and program letter of the Console you are using.



RADAR TYPE	VEHICLE TYPE	RADAR SYSTEM P/N's FOR CONSOLES: SCS 330 SCS 550 SCS750 SCS 440 PGM E AND UP SCS 450 PGM A AND UP SCS 460 PGM A AND UP SCS 600 PGM A AND UP SCS 660 PGM A AND UP SCS 700 PGM D AND UP SCS 710 PGM A AND UP	P A G E	RADAR SYSTEM P/N's FOR CONSOLES: SCS 400 SCS 500 SCS 440 PGM A TO D SCS 700 PGM A TO C	P A G E
DICKEY JOHN	CASE IH	115-0159-517	9	063-0159-793	9
	AGCO-ALLISON 94/95/96 FORD *** WHITE *	115-0159-529	10,11	063-0159-822	10,11
	JOHN DEERE **	115-0159-519	4	063-0159-795	4
	CHALLENGER *	115-0159-518	8	063-0159-794	8
	CAT C-MOD, D-MOD ROW CROP 35,45,55 CHALLENGER	115-0159-627	14		
	JOHN DEERE 7000/8000/9000 SERIES	115-0159-700	13		
	FORD GENESIS/VERSATILE NEW HOLLAND 1996	115-0159-709	12		
	OTHER	115-0159-526	5,16	063-0159-598	5,16
MAGNAVOX	JOHN DEERE **	115-0159-519	6	063-0159-795	6
	JOHN DEERE 7000/8000/9000 SERIES	115-0159-700	13		
	OTHER	115-0159-462	7,17	063-0159-599	7,17
TRW	CASE	115-0159-432	15	063-0159-589	15,18
	OTHER	115-0159-463	18	063-0159-589	15,18

**TABLE 1**

- \* 1990 model year or later with factory installed performance monitor
- \*\* 1990 model year or later with factory installed performance monitor  
Not used for 7000/8000/9000 series tractors
- \*\*\* 1990 model year or later with factory installed performance monitor  
Not used for Genesis/Versatile tractors

Table 2 details the components which are included in the radar speed sensor part numbers identified in Table 1.

PAGE	RADAR SPEED SENSOR SYSTEM PART NUMBERS	COMPONENTS INCLUDED IN CABLE ASSEMBLIES		
		RADAR CABLE P/N	RADAR ADAPTER	RADAR INTERFACE
15,18	063-0159-589	115-0159-432	NOT USED	063-0159-590
5,16	063-0159-598	115-0159-434	NOT USED	063-0159-590
7,17	063-0159-599	115-0159-436	NOT USED	063-0159-590
9	063-0159-793	115-0159-517	NOT USED	063-0159-590
8	063-0159-794	115-0159-518	NOT USED	063-0159-590
4,6	063-0159-795	115-0159-519	NOT USED	063-0159-590
10,11	063-0159-822	115-0159-529	NOT USED	063-0159-590
15	115-0159-432	115-0159-432	NOT USED	NOT USED
9	115-0159-517	115-0159-517	NOT USED	NOT USED
8	115-0159-518	115-0159-518	NOT USED	NOT USED
4,6	115-0159-519	115-0159-519	NOT USED	NOT USED
5,16	115-0159-526	115-0159-526	NOT USED	NOT USED
10,11	115-0159-529	115-0159-529	NOT USED	NOT USED
7,17	117-0159-462	115-0159-436	115-0159-522	NOT USED
18	117-0159-463	115-0159-432	115-0159-522	NOT USED
13	115-0159-700	115-0159-700	NOT USED	NOT USED
12	115-0159-709	115-0159-709	NOT USED	NOT USED
14	115-0159-627	115-0159-627	NOT USED	NOT USED

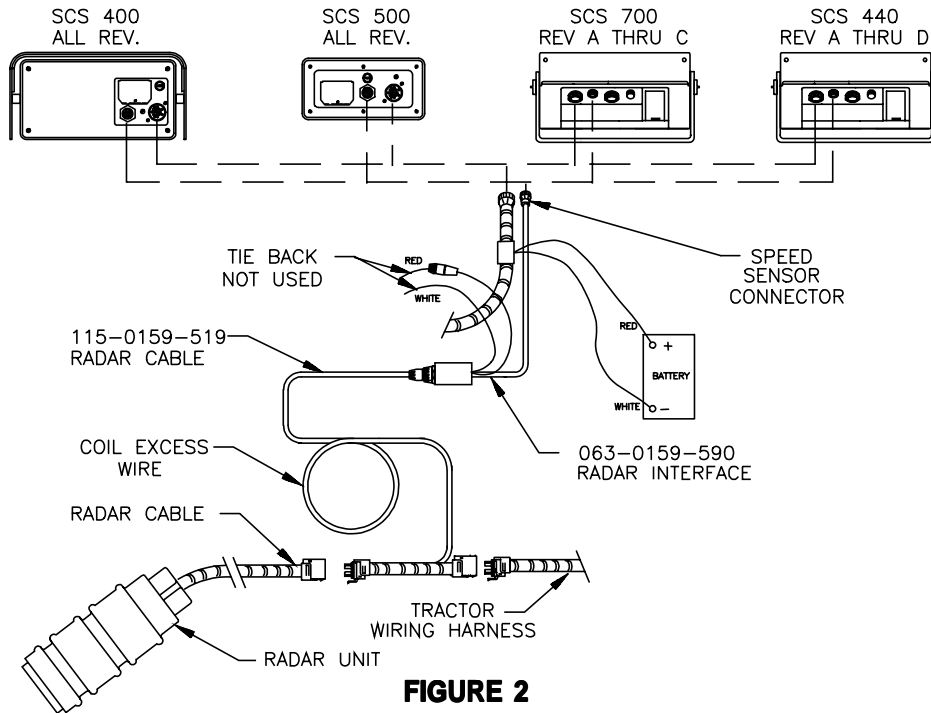
**TABLE 2**

# INSTALLATION FOR VEHICLES WITH FACTORY EQUIPPED RADAR

## 1. JOHN DEERE WITH DICKEY JOHN RADAR

### A. 1990 OR LATER MODEL

Figure 2 illustrates how components of the sprayer control system are interconnected.  
**ORDER SYSTEM PART NO. 063-0159-795**

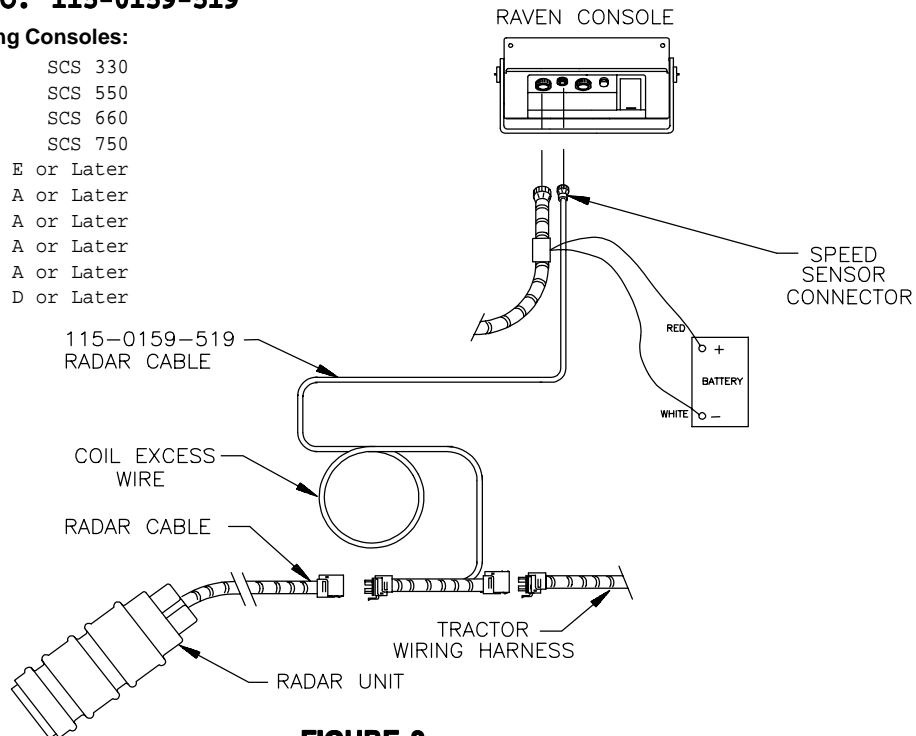


**FIGURE 2**

Figure 3 illustrates how components of the sprayer control system are interconnected.  
**ORDER SYSTEM PART NO. 115-0159-519**

Compatible with the following Consoles:

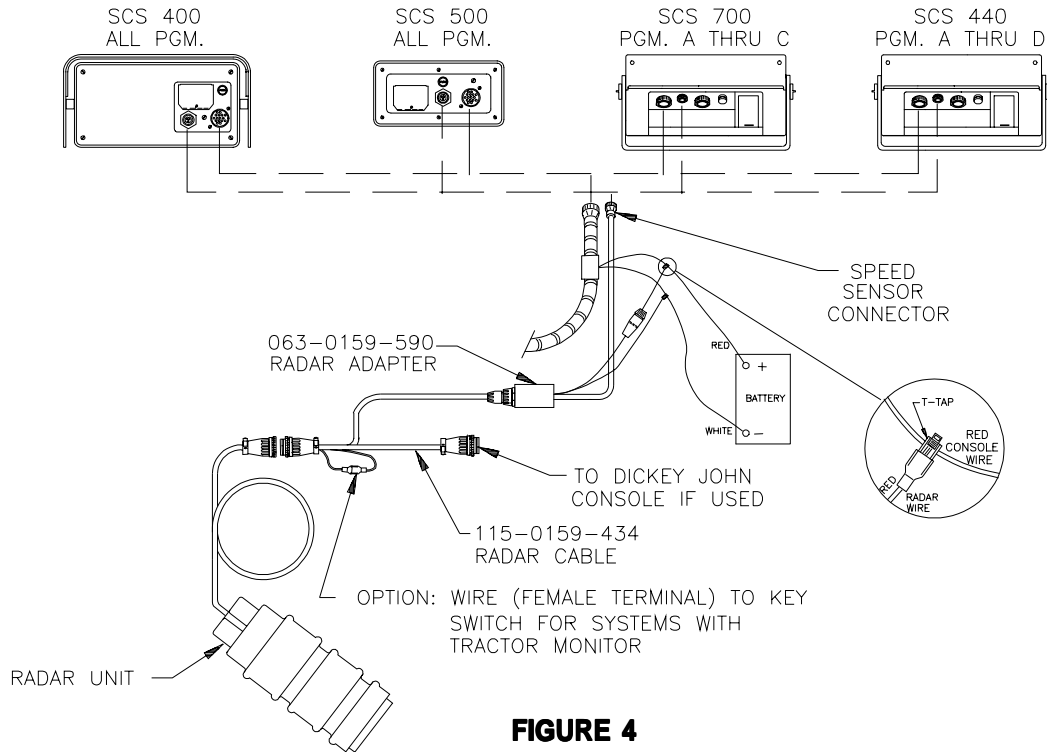
- SCS 330
- SCS 550
- SCS 660
- SCS 750
- SCS 440 - Program E or Later
- SCS 450 - Program A or Later
- SCS 460 - Program A or Later
- SCS 600 - Program A or Later
- SCS 710 - Program A or Later
- SCS 700 - Program D or Later



**FIGURE 3**

## B. 1989 OR EARLIER MODEL

Figure 4 illustrates how components of the sprayer control system are interconnected.  
**ORDER SYSTEM PART NO. 063-0159-598**

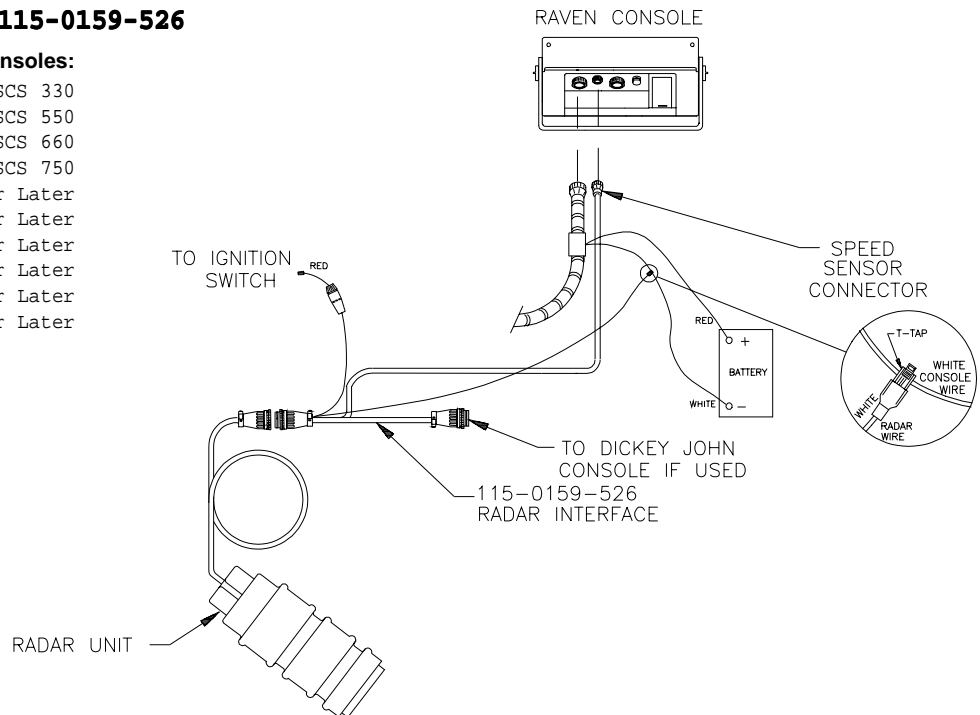


**FIGURE 4**

Figure 5 illustrates how components of the sprayer control system are interconnected.  
**ORDER SYSTEM PART NO. 115-0159-526**

**Compatible with the following Consoles:**

- SCS 330
- SCS 550
- SCS 660
- SCS 750
- SCS 440 - Program E or Later
- SCS 450 - Program A or Later
- SCS 460 - Program A or Later
- SCS 600 - Program A or Later
- SCS 710 - Program A or Later
- SCS 700 - Program D or Later



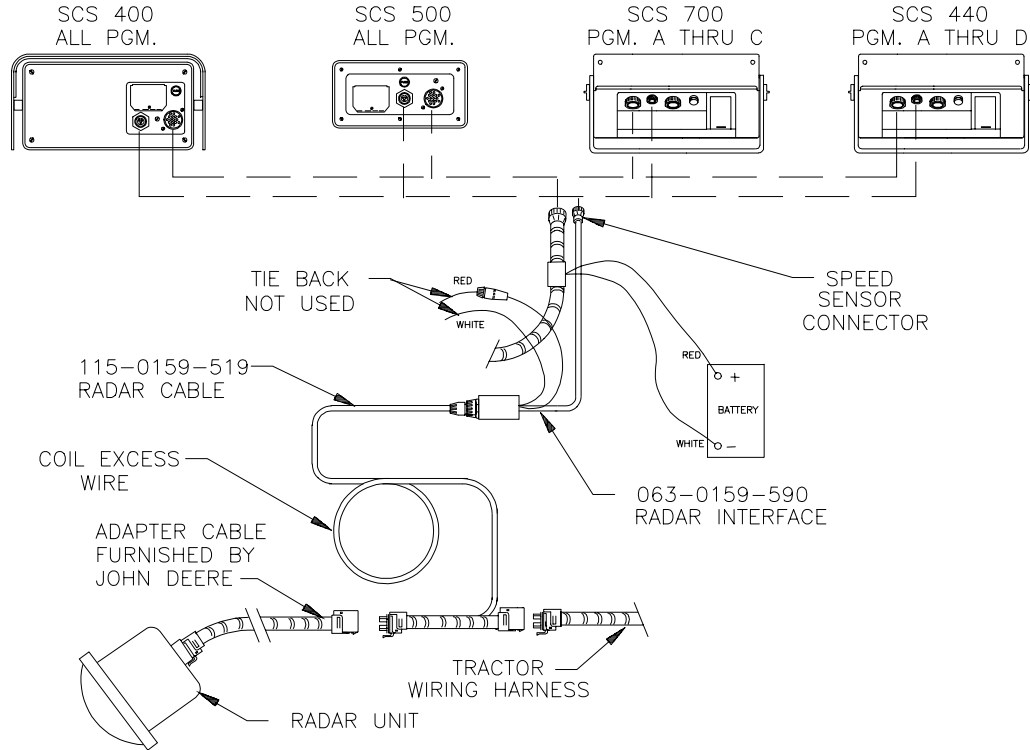
**FIGURE 5**

## 2. JOHN DEERE WITH MAGNAVOX RADAR

### A. 1990 OR LATER MODEL

Figure 6 illustrates how components of the sprayer control system are interconnected.

**ORDER SYSTEM PART NO. 063-0159-795**



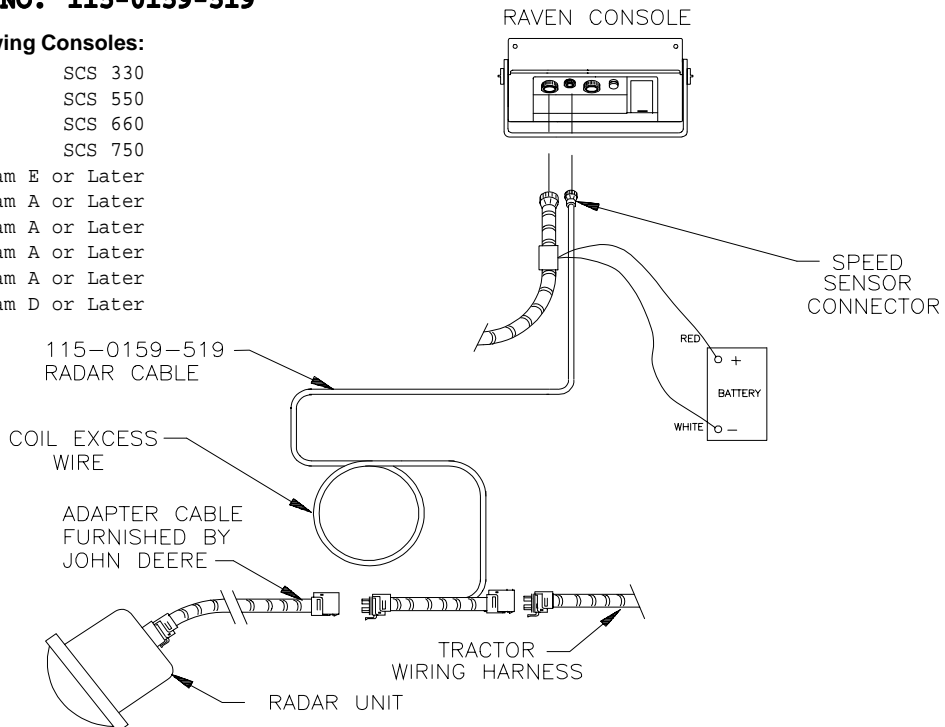
**FIGURE 6**

Figure 7 illustrates how components of the sprayer control system are interconnected.

**ORDER SYSTEM PART NO. 115-0159-519**

**Compatible with the following Consoles:**

- SCS 330
- SCS 550
- SCS 660
- SCS 750
- SCS 440 - Program E or Later
- SCS 450 - Program A or Later
- SCS 460 - Program A or Later
- SCS 600 - Program A or Later
- SCS 710 - Program A or Later
- SCS 700 - Program D or Later

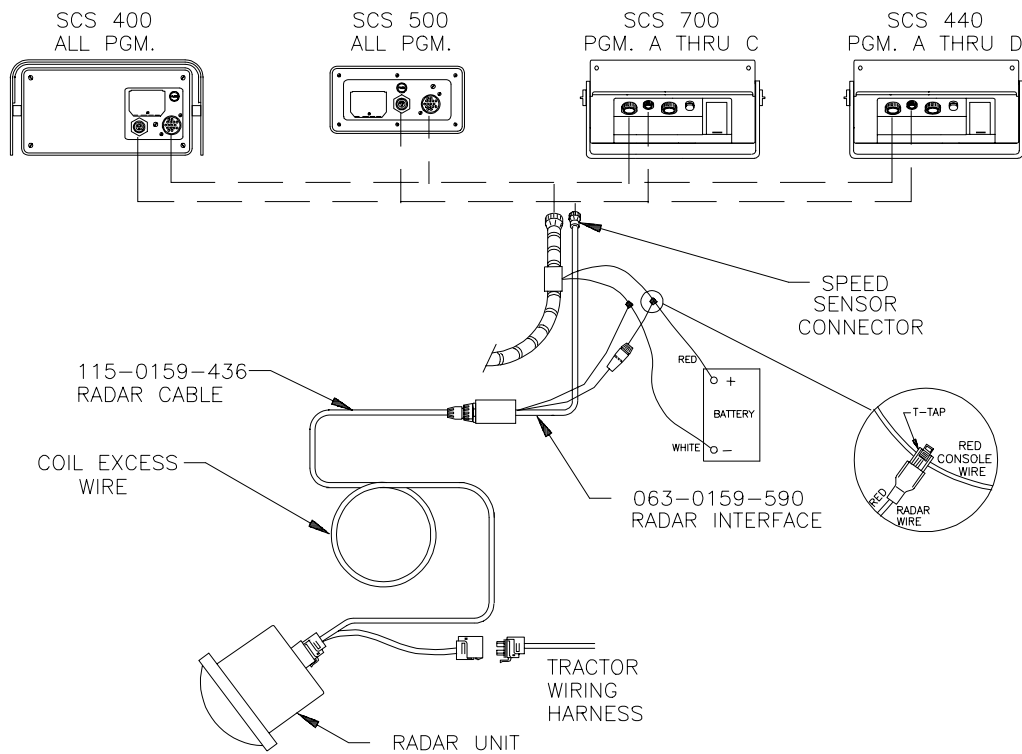


**FIGURE 7**



## B. 1989 OR EARLIER MODEL

Figure 8 illustrates how components of the sprayer control system are interconnected.  
**ORDER SYSTEM PART NO. 063-0159-599**

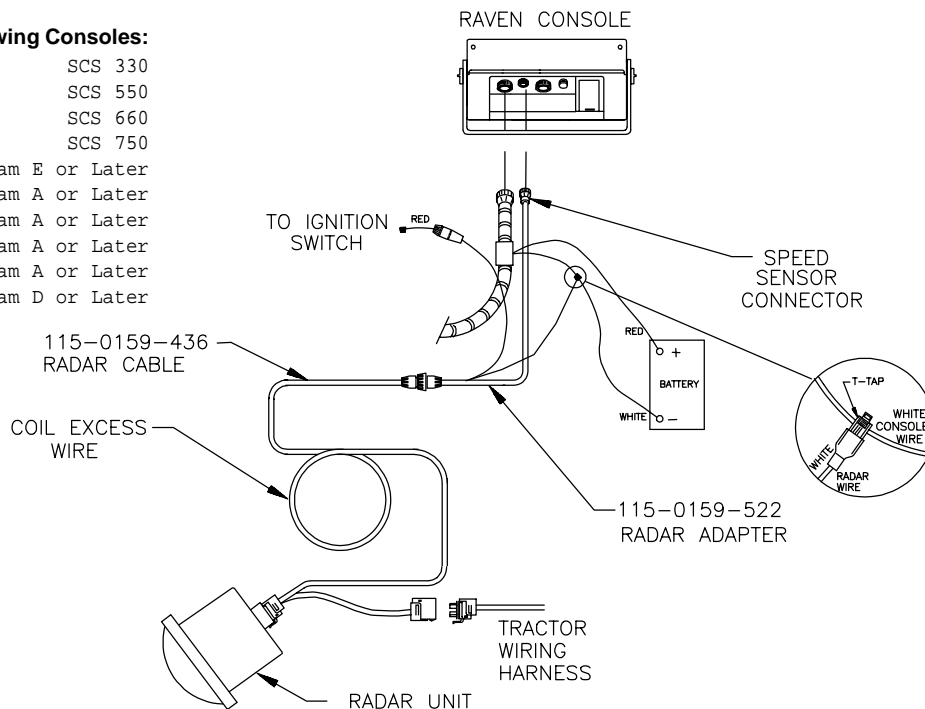


**FIGURE 8**

Figure 9 illustrates how components of the sprayer control system are interconnected.  
**ORDER SYSTEM PART NO. 115-0159-462**

**Compatible with the following Consoles:**

- SCS 330
- SCS 550
- SCS 660
- SCS 750
- SCS 440 - Program E or Later
- SCS 450 - Program A or Later
- SCS 460 - Program A or Later
- SCS 600 - Program A or Later
- SCS 710 - Program A or Later
- SCS 700 - Program D or Later

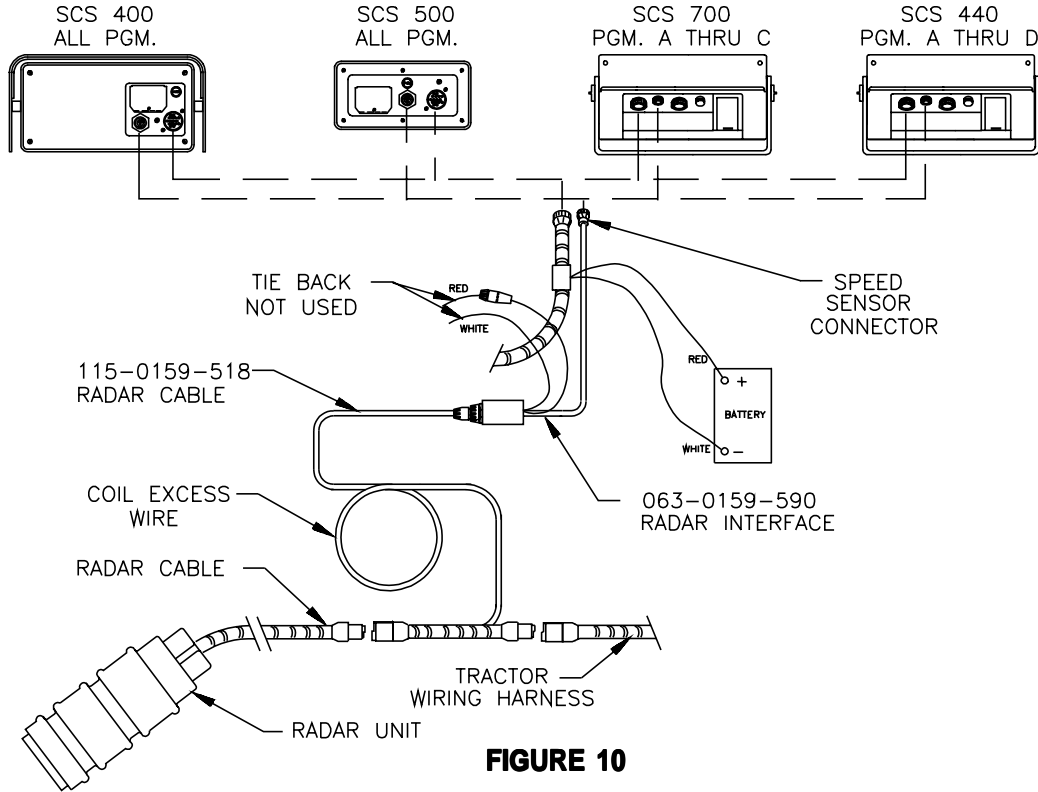


**FIGURE 9**

### 3. CAT CHALLENGER WITH DICKEY JOHN RADAR (1990 OR LATER)

Figure 10 illustrates how components of the sprayer control system are interconnected.

**ORDER SYSTEM PART NO. 063-0159-794**



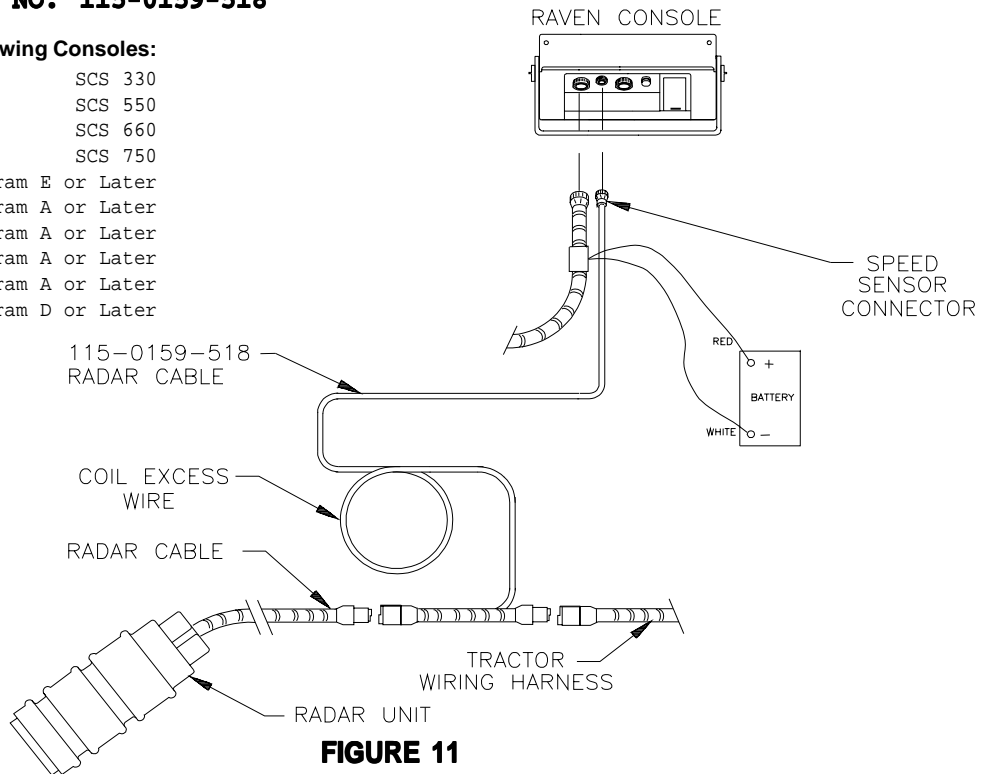
**FIGURE 10**

Figure 11 illustrates how components of the sprayer control system are interconnected.

**ORDER SYSTEM PART NO. 115-0159-518**

**Compatible with the following Consoles:**

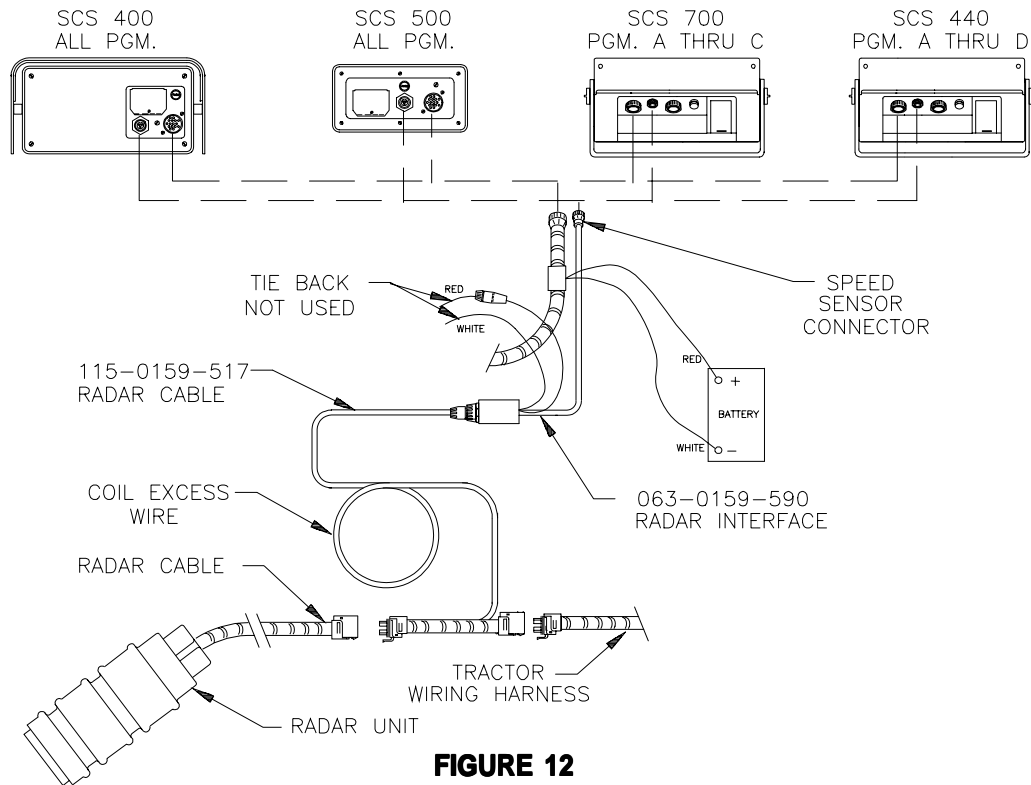
- SCS 330
- SCS 550
- SCS 660
- SCS 750
- SCS 440 - Program E or Later
- SCS 450 - Program A or Later
- SCS 460 - Program A or Later
- SCS 600 - Program A or Later
- SCS 710 - Program A or Later
- SCS 700 - Program D or Later



**FIGURE 11**

# 4. CASE-IH WITH DICKEY JOHN RADAR (1990 OR LATER)

Figure 12 illustrates how components of the sprayer control system are interconnected.  
**ORDER SYSTEM PART NO. 063-0159-793**

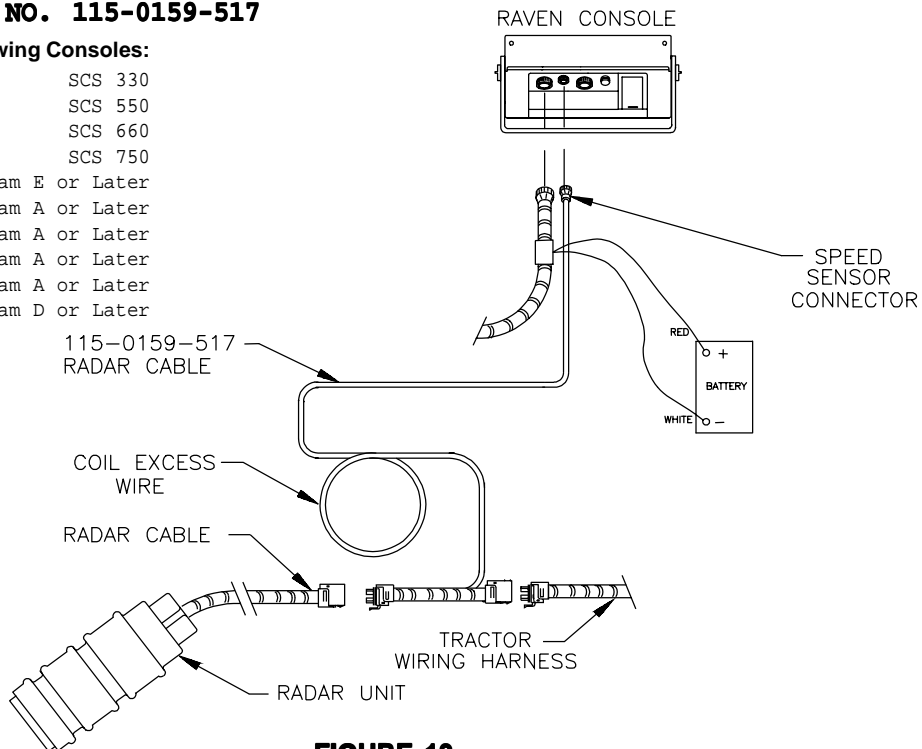


**FIGURE 12**

Figure 13 illustrates how components of the sprayer control system are interconnected.  
**ORDER SYSTEM PART NO. 115-0159-517**

Compatible with the following Consoles:

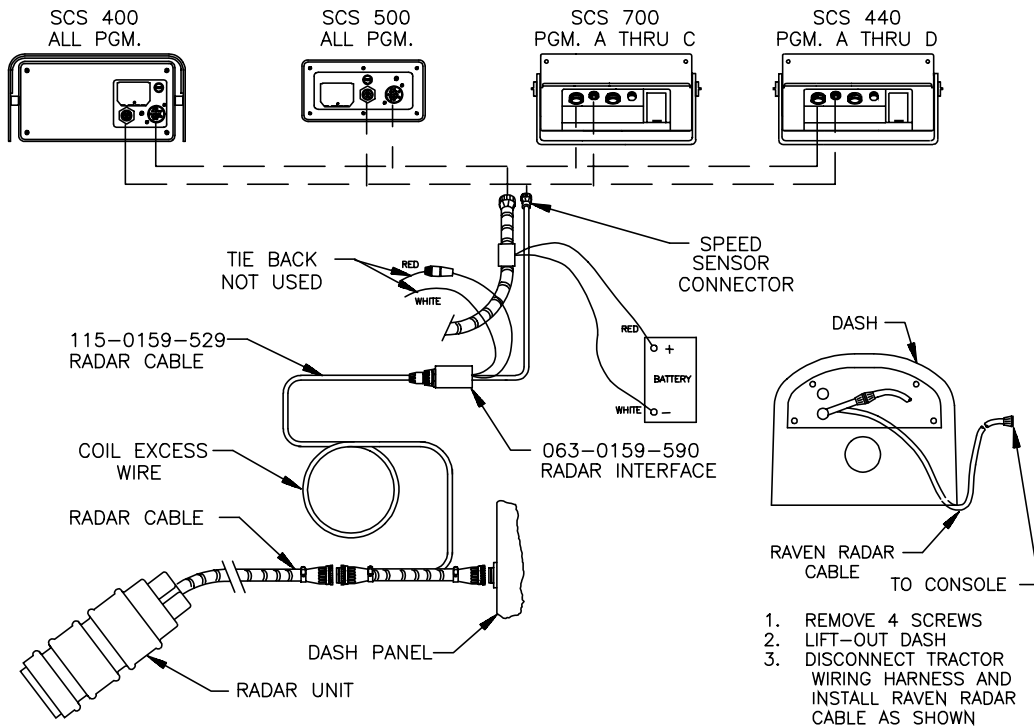
- SCS 330
- SCS 550
- SCS 660
- SCS 750
- SCS 440 - Program E or Later
- SCS 450 - Program A or Later
- SCS 460 - Program A or Later
- SCS 600 - Program A or Later
- SCS 710 - Program A or Later
- SCS 700 - Program D or Later



**FIGURE 13**

# 5. FORD WITH DICKEY JOHN RADAR (1990 OR LATER)

Figure 14 illustrates how components of the sprayer control system are interconnected.  
**ORDER SYSTEM PART NO. 063-0159-822**

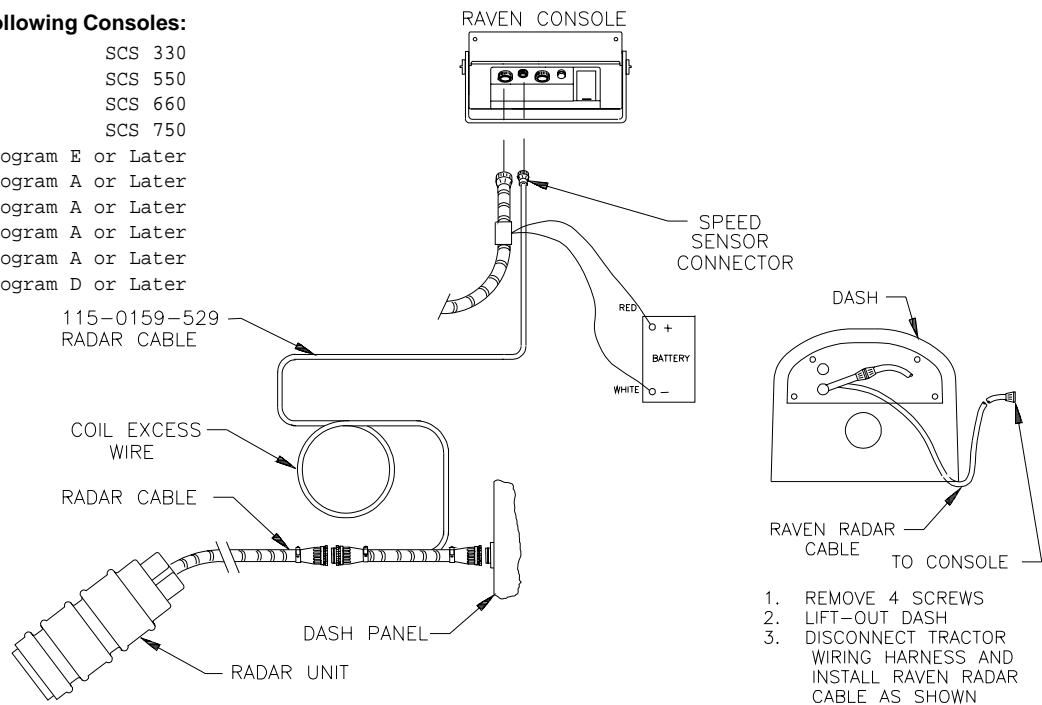


**FIGURE 14**

Figure 15 illustrates how components of the sprayer control system are interconnected.  
**ORDER SYSTEM PART NO. 115-0159-529**

Compatible with the following Consoles:

- SCS 330
- SCS 550
- SCS 660
- SCS 750
- SCS 440 - Program E or Later
- SCS 450 - Program A or Later
- SCS 460 - Program A or Later
- SCS 600 - Program A or Later
- SCS 710 - Program A or Later
- SCS 700 - Program D or Later

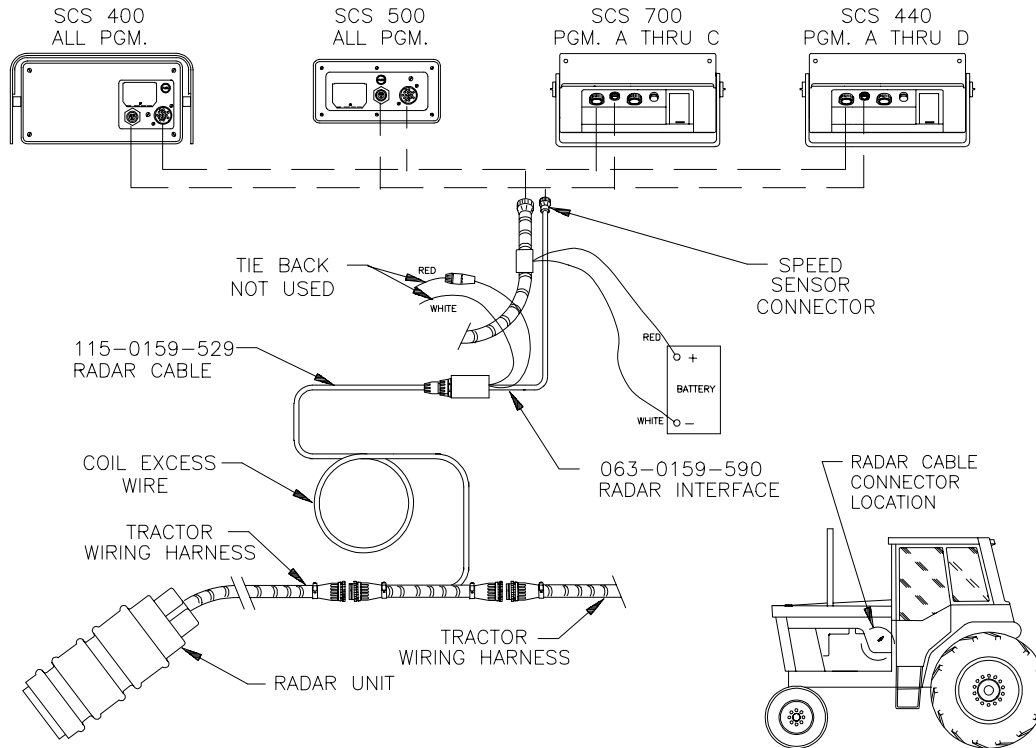


**FIGURE 15**

## 6. WHITE/AGCO-ALLISON '94/'95/'96 WITH DICKEY JOHN RADAR (1990 OR LATER)

Figure 16 illustrates how components of the sprayer control system are interconnected.

**ORDER SYSTEM PART NO. 063-0159-822**



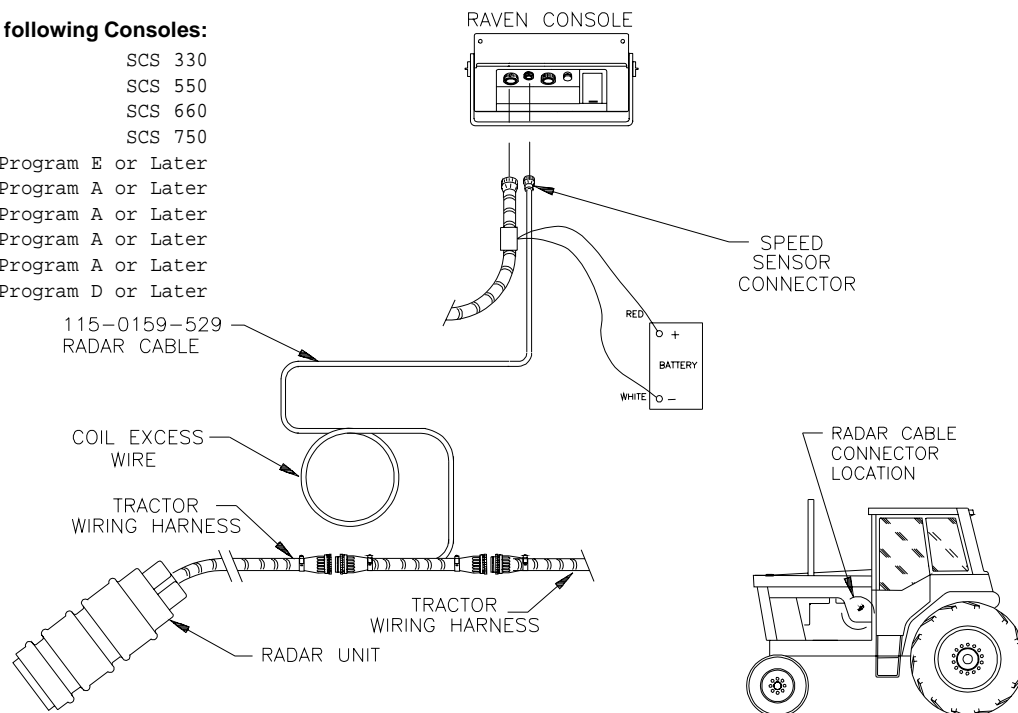
**FIGURE 16**

Figure 17 illustrates how components of the sprayer control system are interconnected.

**ORDER SYSTEM PART NO. 115-0159-529**

Compatible with the following Consoles:

- SCS 330
- SCS 550
- SCS 660
- SCS 750
- SCS 440 - Program E or Later
- SCS 450 - Program A or Later
- SCS 460 - Program A or Later
- SCS 600 - Program A or Later
- SCS 710 - Program A or Later
- SCS 700 - Program D or Later



**FIGURE 17**

# 7. FORD GENESIS / VERSATILE / NEW HOLLAND

Illustration below shows how components of the sprayer control system are interconnected.

**ORDER SYSTEM PART NO. 115-0159-709**

**Compatible with the following Consoles:**

SCS 330

SCS 550

SCS 750

SCS 450 - Program A or Later

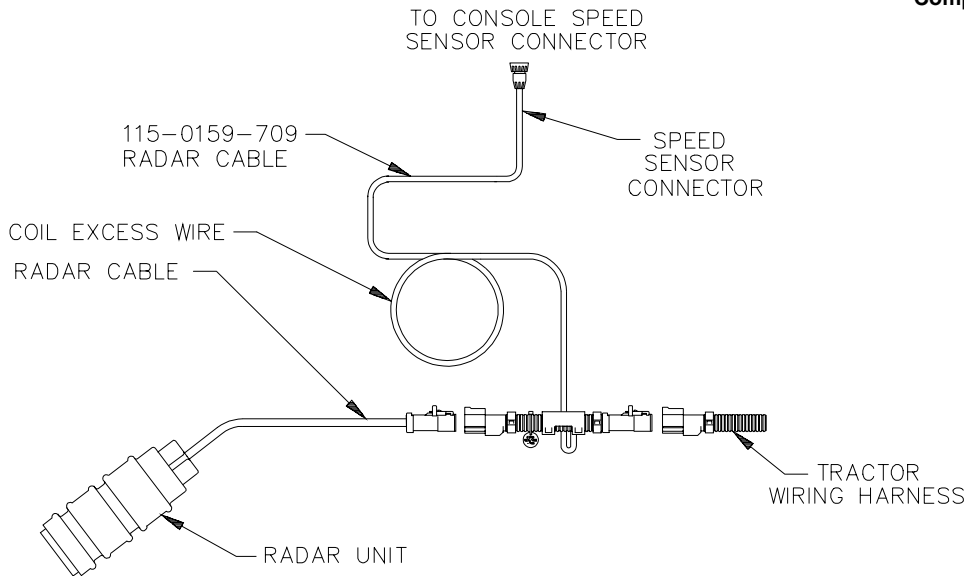
SCS 460 - Program A or Later

SCS 600 - Program A or Later

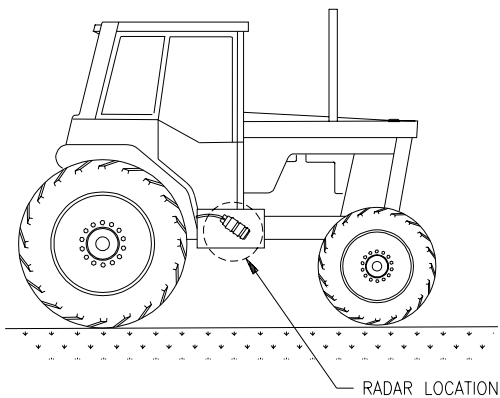
SCS 710 - Program A or Later

SCS 700 - Program D or Later

SCS 440 - Program E or Later

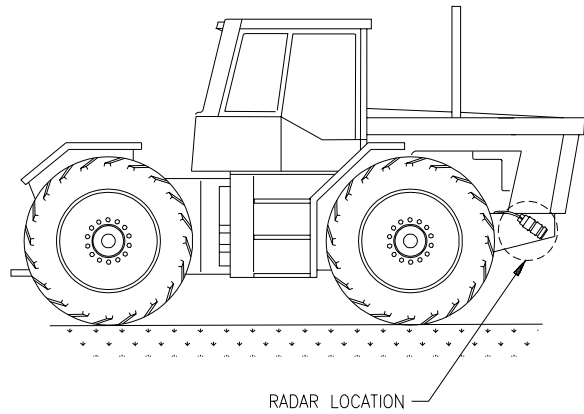


**80 SERIES GENESIS  
96-97 NEW HOLLAND**



**FIGURE 18**

**90 SERIES VERSATILE  
96-97 NEW HOLLAND**



**FIGURE 19**

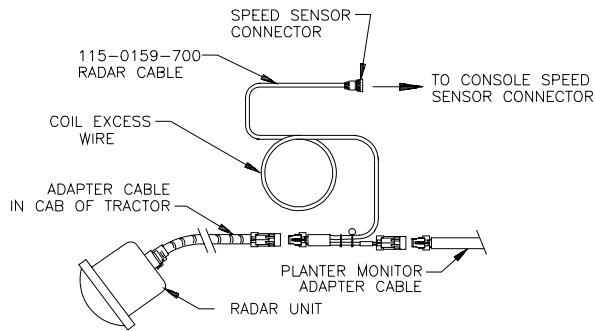
1. Locate radar on tractor.  
80 series Genesis / New Holland: Remove battery cover to access radar.  
90 series Versatile / New Holland: Radar is mounted below tractor radiator.
2. Locate connection between radar cable and tractor wiring harness.
3. Install Radar Interface Cable between radar cable and tractor wiring harness.
4. Connect Radar Interface Cable to Raven Console in cab of tractor.
5. Program Console as described on following page.

## 8. JOHN DEERE 7000/8000/9000 SERIES

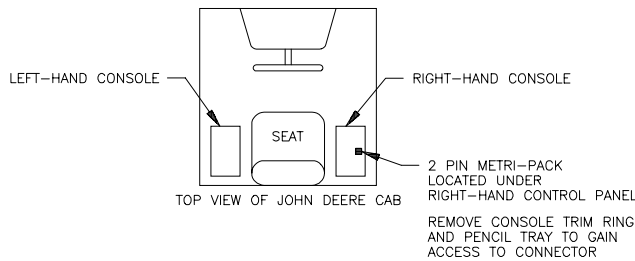
Illustration below shows how components of the sprayer control system are interconnected.

**ORDER SYSTEM PART NO. 115-0159-700**

**Compatible with the following Consoles:**

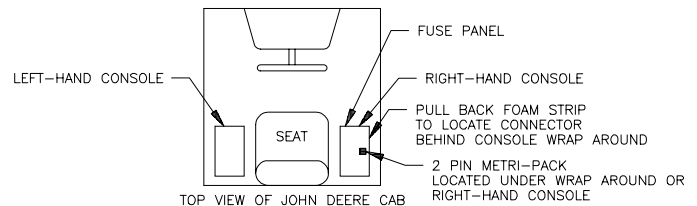


SCS 330  
SCS 550  
SCS 750  
SCS 450 - Program A or Later  
SCS 460 - Program A or Later  
SCS 600 - Program A or Later  
SCS 710 - Program A or Later  
SCS 700 - Program D or Later  
SCS 440 - Program E or Later



**FIGURE 20**

**1992 OR EARLIER 7000 SERIES TRACTOR**



**FIGURE 21**

**1993 OR LATER 7000 SERIES, 8000 SERIES, & 9000 SERIES TRACTOR**

### 1992 OR EARLIER 7000 SERIES

1. Remove right-hand console trim ring (seven screws).
2. Remove pencil tray (two screws).
3. Locate 2-pin connector under right-hand console. See Figure 20.

**NOTE:** If cable is not accessible, remove left-hand console panel near floor. Locate connector and push towards window. Pull connector out right-hand side and connect to interface cable.

4. Connect interface cable to 2-pin connector.
5. Position connector. Install pencil tray and console trim ring.
6. Connect Interface Cable to Raven Console and planter monitor adapter cable (If used).

### 1993 OR LATER 7000 SERIES, 8000 SERIES, & 9000 SERIES

1. Locate fuse panel on right hand console. Open up fuse panel and locate 2-pin metri-pack connector inside fuse panel. See Figure 20.

**NOTE:** If connector is not in fuse panel, Locate connector under foam strip behind right-hand console wrap around. Harness may be under the right-hand console. See Figure 21.

2. Connect interface cable to 2-pin plug connector.
3. Position connector near floor and replace foam strip.
4. Connect Interface Cable to Raven Console and planter monitor adapter cable (If used).

**IMPORTANT:** IF MORE DETAIL IS REQUIRED, REVIEW JOHN DEERE PLANTER RADAR SIGNAL ADAPTER KIT (BA26054) INSTALLATION INSTRUCTIONS.

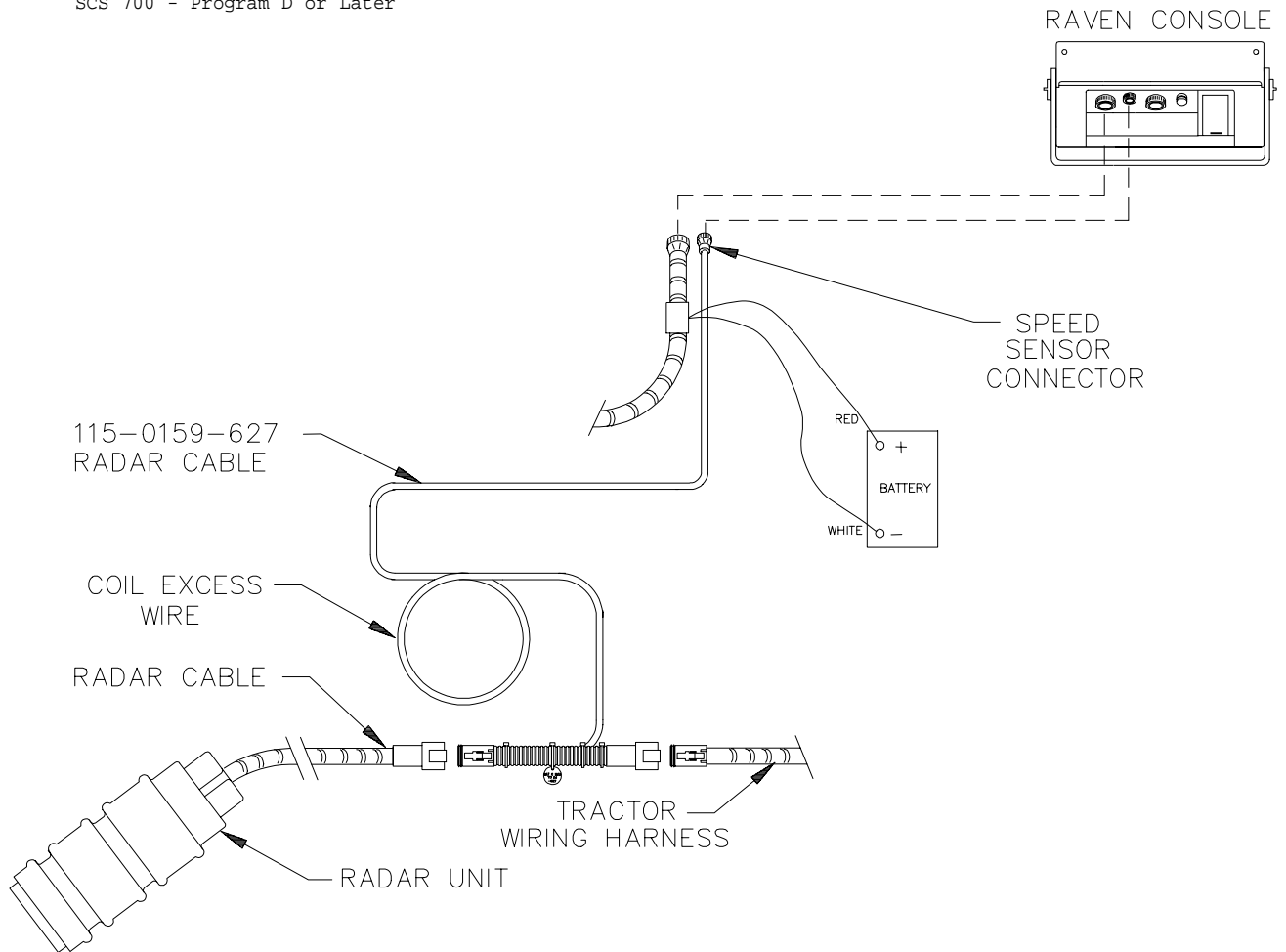
# 9. CAT CHALLENGER MODEL C / D (1990 OR LATER) ROW CROP 35, 45, 55 (1996 OR LATER) WITH DICKEY JOHN RADAR

Figure 22 illustrates how components of the sprayer control system are interconnected.

**ORDER SYSTEM PART NO. 115-0159-627**

**Compatible with the following Consoles:**

- SCS 330
- SCS 550
- SCS 660
- SCS 750
- SCS 440 - Program E or Later
- SCS 450 - Program A or Later
- SCS 460 - Program A or Later
- SCS 600 - Program A or Later
- SCS 710 - Program A or Later
- SCS 700 - Program D or Later



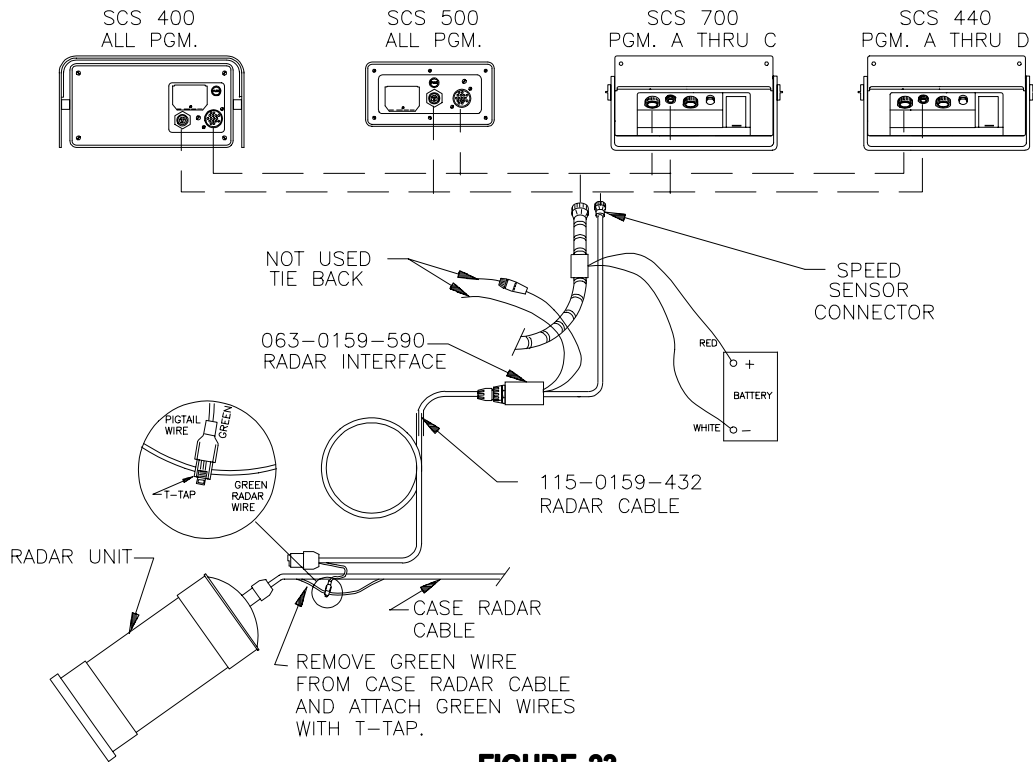
**FIGURE 22**



# 10. CASE WITH TRW RADAR

Figure 23 illustrates how components of the sprayer control system are interconnected.

**ORDER SYSTEM PART NO. 063-0159-589**



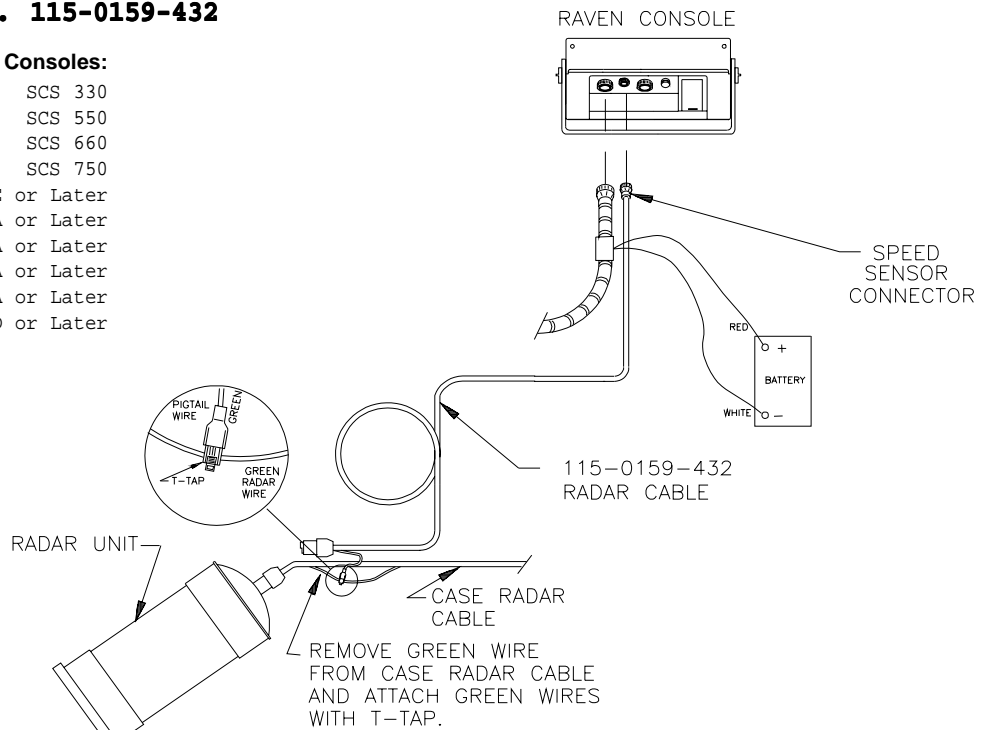
**FIGURE 23**

Figure 24 illustrates how components of the sprayer control system are interconnected.

**ORDER SYSTEM PART NO. 115-0159-432**

Compatible with the following Consoles:

- SCS 330
- SCS 550
- SCS 660
- SCS 750
- SCS 440 - Program E or Later
- SCS 450 - Program A or Later
- SCS 460 - Program A or Later
- SCS 600 - Program A or Later
- SCS 710 - Program A or Later
- SCS 700 - Program D or Later



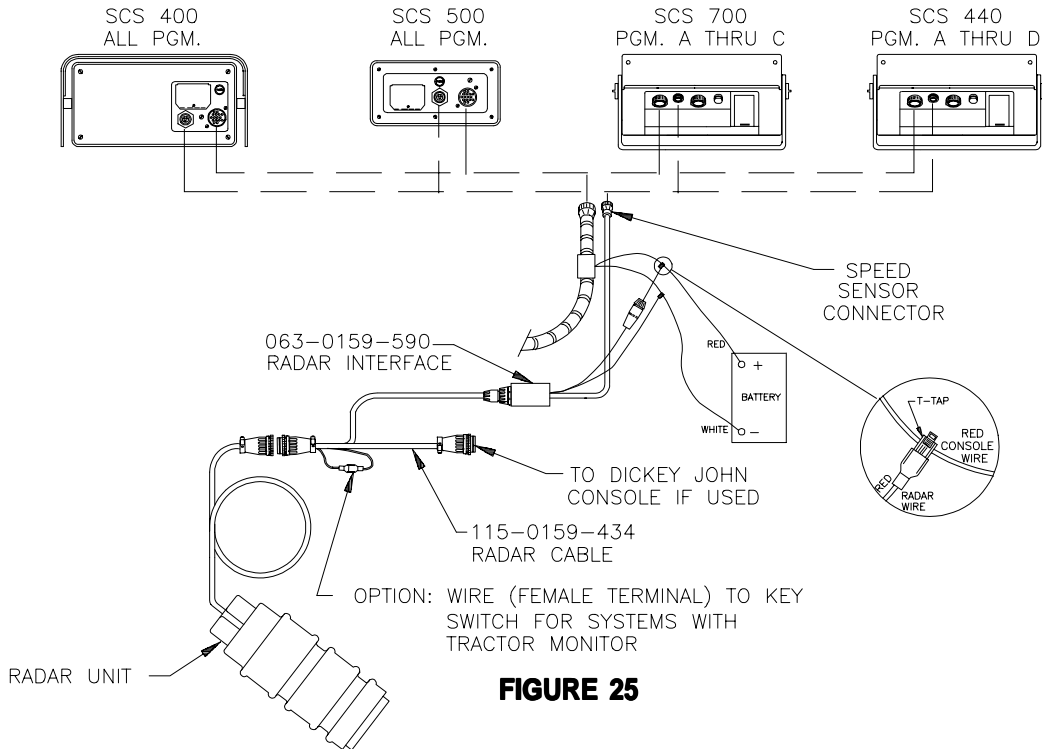
**FIGURE 24**

# INSTALLATION FOR VEHICLES WITH NON-FACTORY EQUIPPED RADAR

## 1. DICKEY JOHN RADAR INSTALLATION

Figure 25 illustrates how components of the sprayer control system are interconnected.

**ORDER SYSTEM PART NO. 063-0159-598**



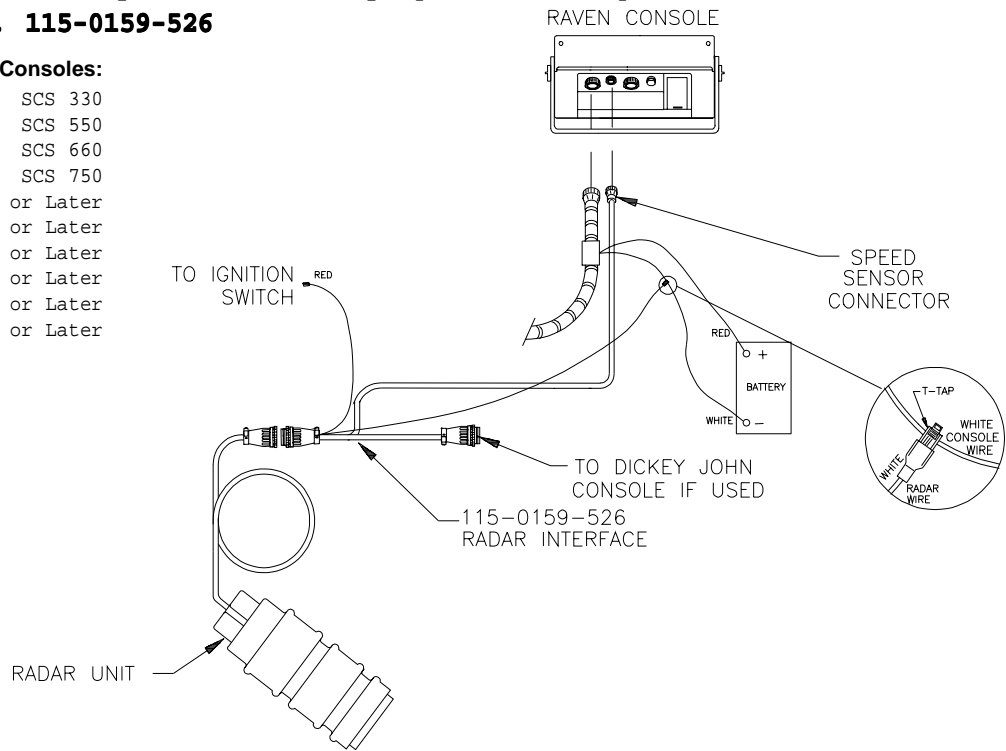
**FIGURE 25**

Figure 26 illustrates how components of the sprayer control system are interconnected.

**ORDER SYSTEM PART NO. 115-0159-526**

**Compatible with the following Consoles:**

- SCS 330
- SCS 550
- SCS 660
- SCS 750
- SCS 440 - Program E or Later
- SCS 450 - Program A or Later
- SCS 460 - Program A or Later
- SCS 600 - Program A or Later
- SCS 710 - Program A or Later
- SCS 700 - Program D or Later

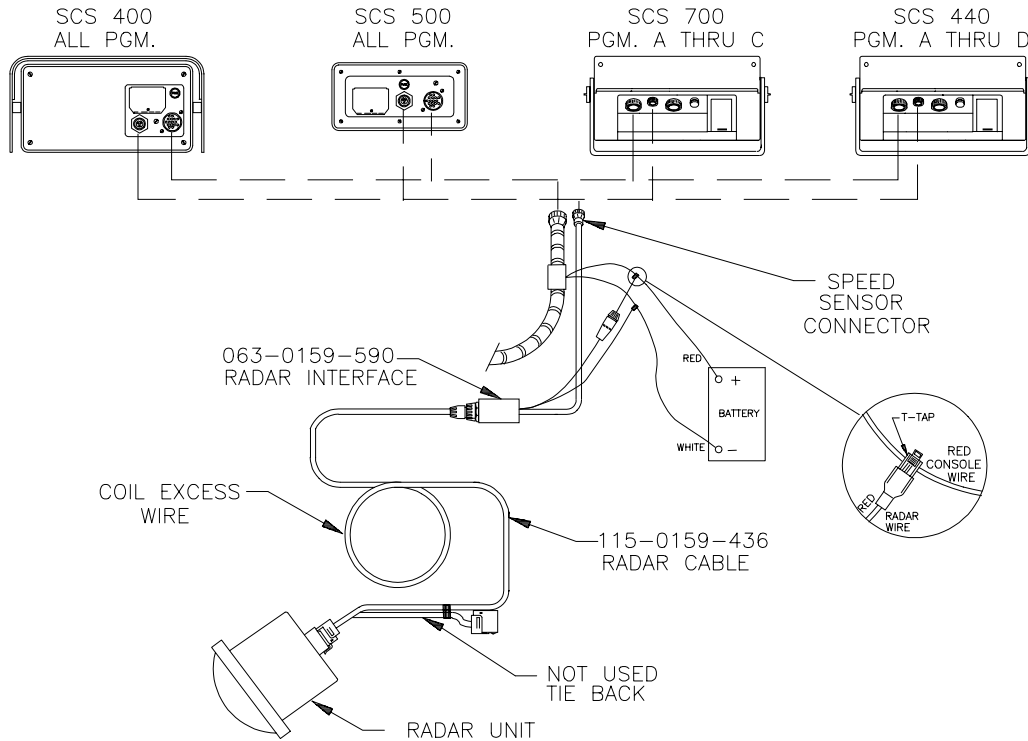


**FIGURE 26**

## 2. MAGNAVOX RADAR INSTALLATION

Figure 27 illustrates how components of the sprayer control system are interconnected.

**ORDER SYSTEM PART NO. 063-0159-599**



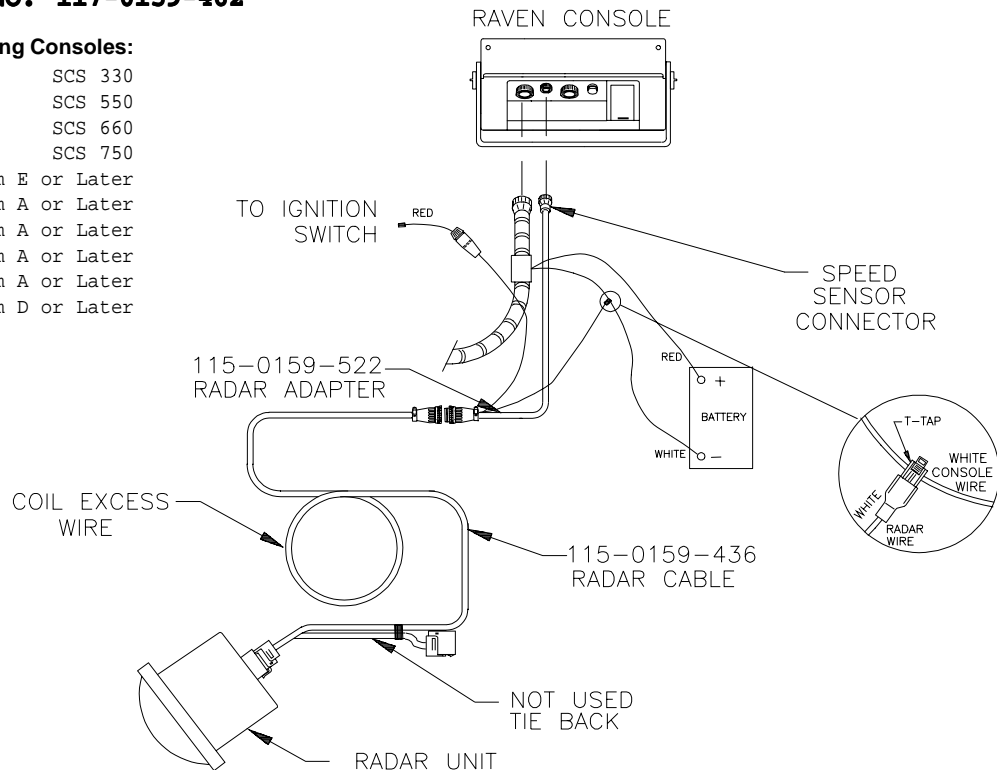
**FIGURE 27**

Figure 28 illustrates how components of the sprayer control system are interconnected.

**ORDER SYSTEM PART NO. 117-0159-462**

**Compatible with the following Consoles:**

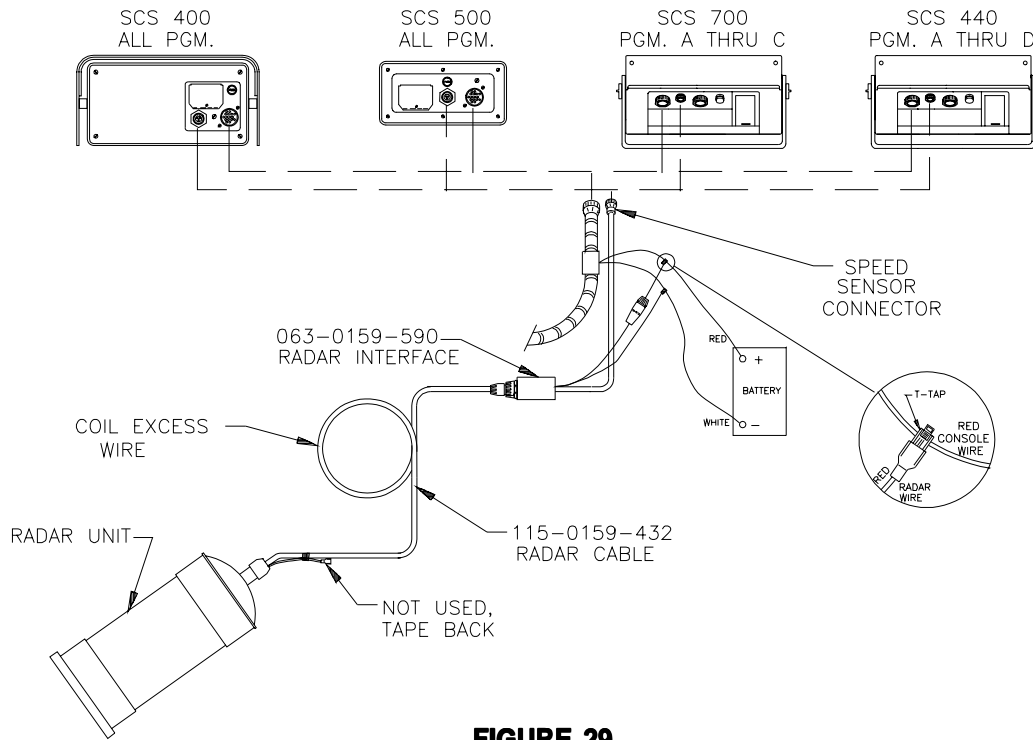
- SCS 330
- SCS 550
- SCS 660
- SCS 750
- SCS 440 - Program E or Later
- SCS 450 - Program A or Later
- SCS 460 - Program A or Later
- SCS 600 - Program A or Later
- SCS 710 - Program A or Later
- SCS 700 - Program D or Later



**FIGURE 28**

### 3. TRW RADAR INSTALLATION

Figure 29 illustrates how components of the sprayer control system are interconnected.  
**ORDER SYSTEM PART NO. 063-0159-589**

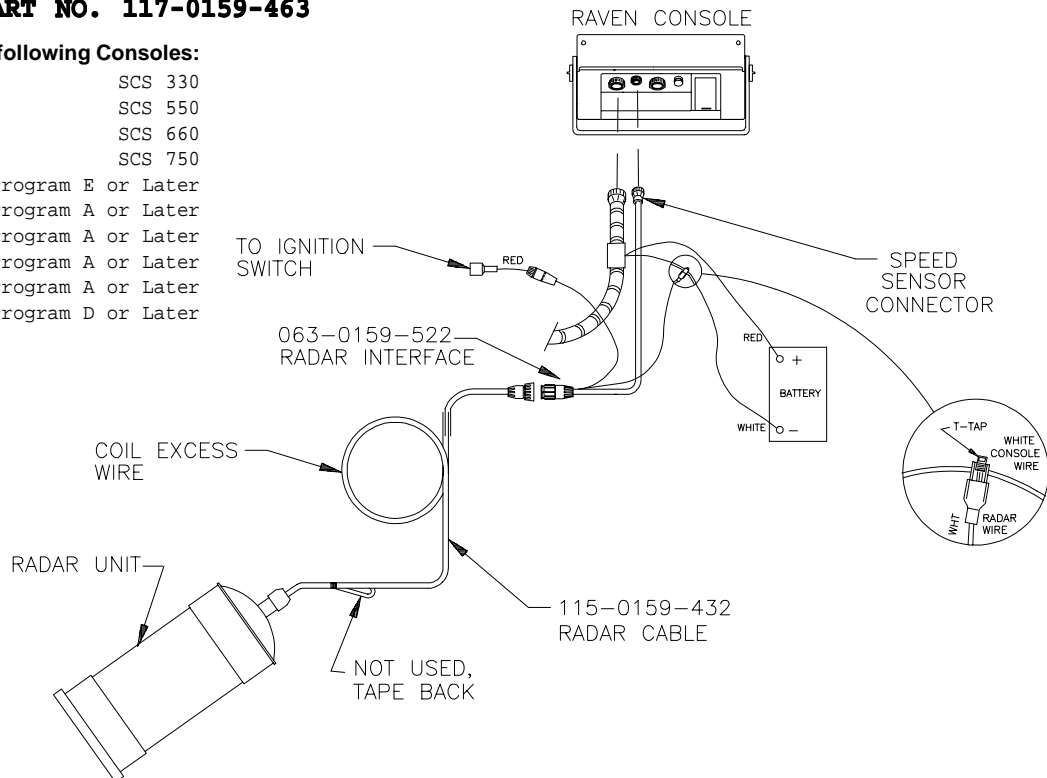


**FIGURE 29**

Figure 30 illustrates how components of the sprayer control system are interconnected.  
**ORDER SYSTEM PART NO. 117-0159-463**

**Compatible with the following Consoles:**

- SCS 330
- SCS 550
- SCS 660
- SCS 750
- SCS 440 - Program E or Later
- SCS 450 - Program A or Later
- SCS 460 - Program A or Later
- SCS 600 - Program A or Later
- SCS 710 - Program A or Later
- SCS 700 - Program D or Later



**FIGURE 30**

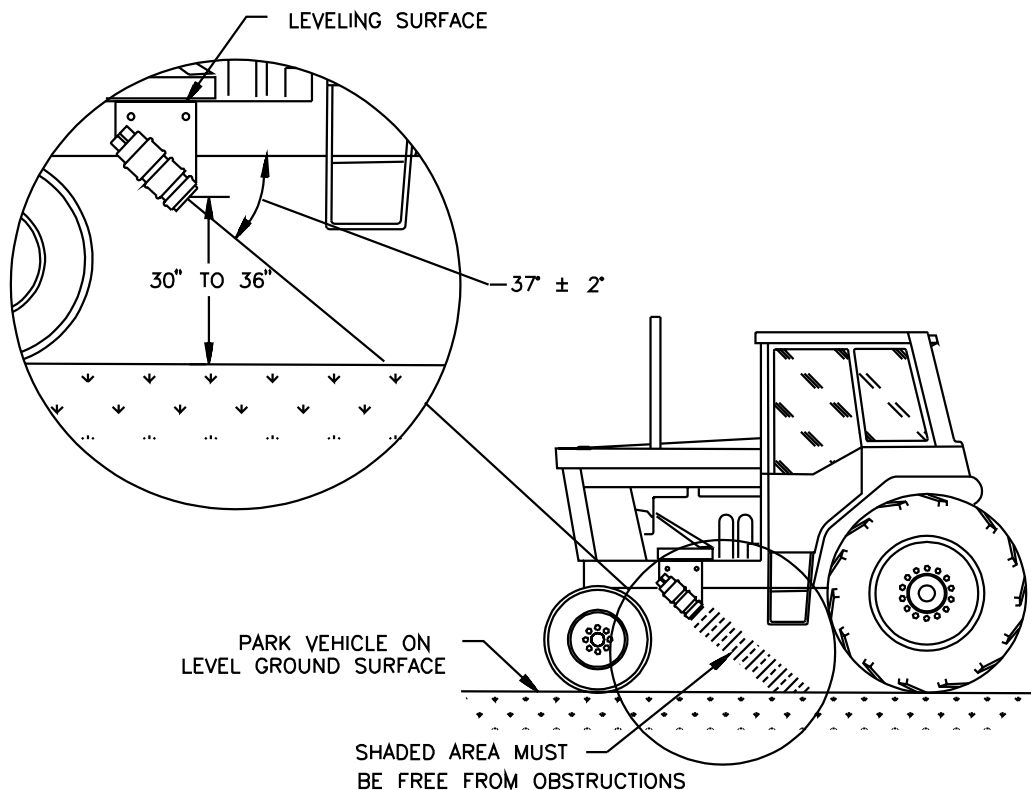
## 4. MECHANICAL RADAR INSTALLATION

### A. DICKEY JOHN

Mount radar to manufacturer's recommendations. If the manufacturer's installation for mounting the radar is not available, the following guidelines will assure proper installation:

**NOTE:** It is suggested that a large, heavy mounting bracket be attached to the vehicle from for use when mounting the radar.

- 1) Park vehicle on level ground.
- 2) Align top edge of bracket with tractor frame if horizontal.
- 3) Use carpenter's level to verify that mounting bracket is level.
- 4) The center of radar lens must be 30" to 36" from the ground.
- 5) The line of sight from the lens to the ground must not be obstructed by structure or tires.
- 6) Bolt radar to mounting bracket.

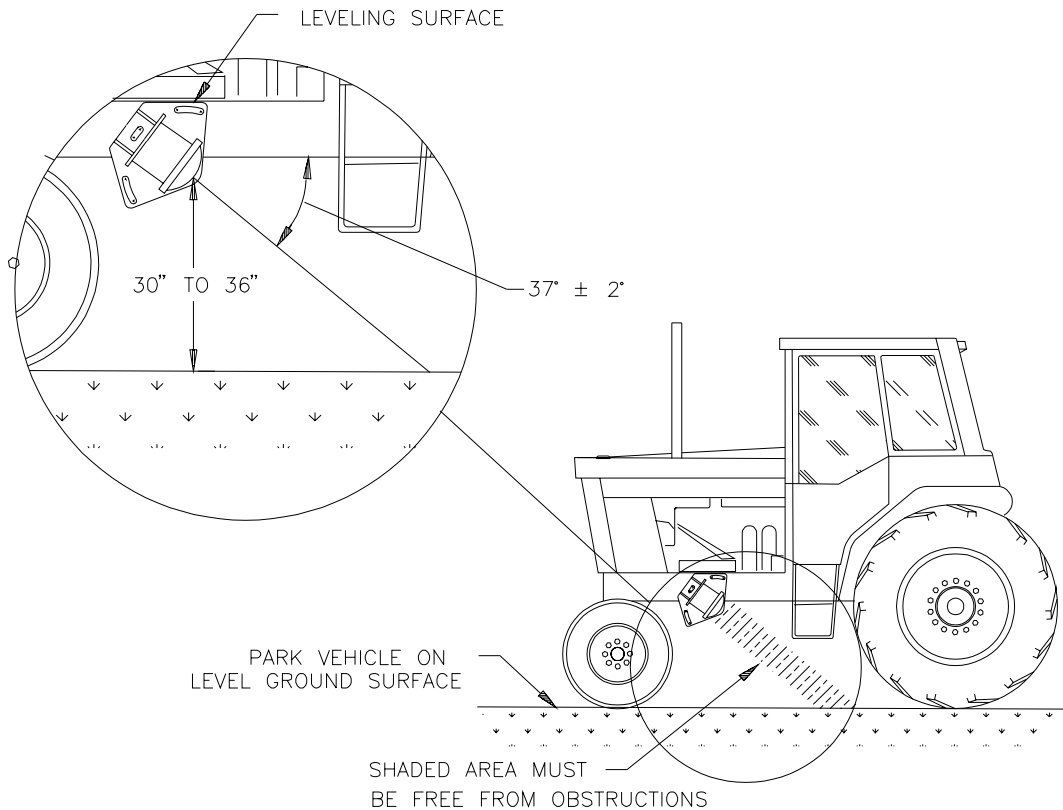


## B. MAGNAVOX

Mount radar to manufacturer's recommendations. If the manufacturer's installation for mounting the radar is not available, the following guidelines will assure proper installation:

**NOTE:** It is suggested that a large, heavy mounting bracket be attached to the vehicle from for use when mounting the radar. See Appendix 1 for a sketch of suggested mounting bracket

- 1) Park vehicle on level ground.
- 2) Align top edge of bracket with tractor frame if horizontal.
- 3) Use carpenter's level to verify that mounting bracket is level.
- 4) The center of radar lens must be 30" to 36" from the ground.
- 5) The line of sight from the lens to the ground must not be obstructed by structure or tires.
- 6) Bolt radar to mounting bracket.

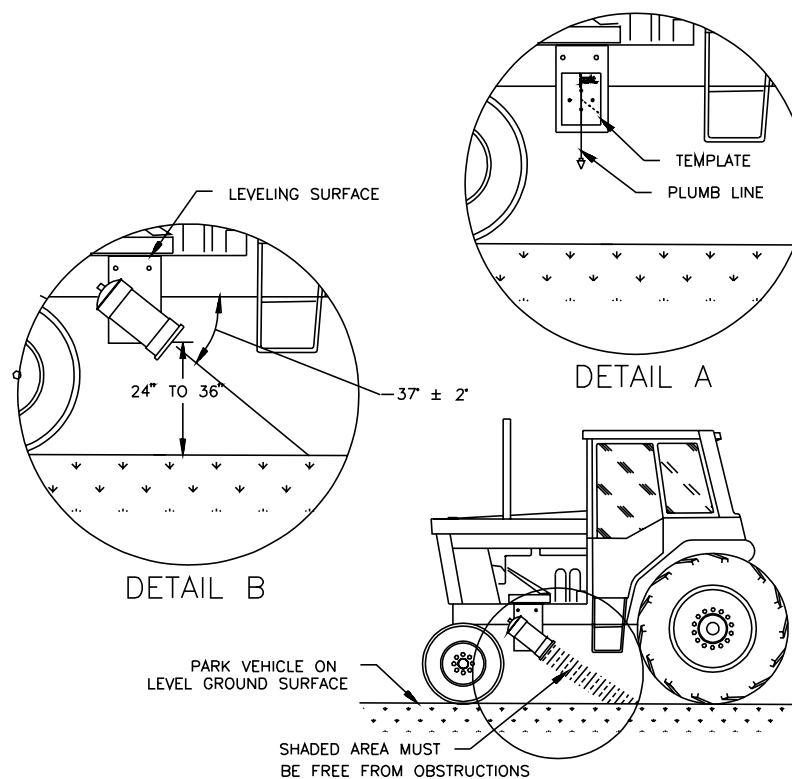


## C. TRW

Mount radar to manufacturer's recommendations. If the manufacturer's installation for mounting the radar is not available, the following guidelines will assure proper installation:

**NOTE:** It is suggested that a large, heavy mounting bracket be attached to the vehicle from for use when mounting the radar.

- 1) Park vehicle on level ground.
- 2) Align top edge of bracket with tractor frame if horizontal.
- 3) Use carpenter's level to verify that mounting bracket is level.
- 4) Fasten plumb line to mounting plate (See Detail A).
- 5) Tape template (See Appendix B or C) to mounting plate and check that actual plumb line and "plumb sight line" (on template) are aligned.
- 6) Drill four 7/16" diameter holes in the center of the circles drawn on the templates.
- 7) The center of the radar lens must be 24" to 36" from the ground (See Detail B).
- 8) The line of sight from the lens to the ground must not be obstructed by structure or tires.
- 9) Bolt radar to mounting bracket.



# CALCULATION OF SPEED

## 1. SPEED CAL FOR ALL CONSOLES (EXCEPT SCS 400)

The switches and keys referred to below are on the Raven SCS Consoles. Use Steps 1 and 2 if Console has SP1/SP2 select.

**NOTE:** Numbers in brackets [ ] are metric equivalents.


- 1) Reset Console according to the instruction manual.
- 2) Complete "INITIAL CONSOLE PROGRAMMING" in the Installation and Service Manual for your Console. Select SP2 for correct operation of Radar. If your Console does not have SP1/SP2 select, you must either update your Console's program, or use a radar adapter (P/N 063-0159-590).
- 3) For all Consoles (except SCS 500\*) enter the SPEED CAL for your Radar in key

labelled  .


Speed cal value can be determined by the following:

<b>RADAR TYPE</b>	<b>SPEED CAL</b>
Dickey John	820 [207]
Magnavox	612 [155]
TRW	612 [155]

\*For SCS 500 Console, enter a SPEED CAL number that is half of the recommended value shown above.

- 4) Set POWER switches to ON, all other switches to OFF.
- 5) Enter "0" in key labelled  .
- 6) Drive 1 mile [1 kilometer]. To achieve the most accurate calibration, accelerate and decelerate slowly.

**CAUTION:** Do not use vehicle odometer to determine distance. Use section lines or highway markers.

- 7) Read DISTANCE by depressing key labelled  .

DISTANCE display should read a value of approximately 5280 [1000]. If it reads between 5260-5300 [990-1010], the SPEED CAL is 612 [155]. If the DISTANCE display reads any other value, divide SPEED CAL by the value observed in DISTANCE, then multiply by 5280 [1000]. This will give you the correct value to enter for SPEED CAL. Round off to the nearest 3 digit number.

**EXAMPLE:** Assume DISTANCE reads 5000 [980].

**ENGLISH UNITS:**

$$= \frac{612 \times 5280}{5000} = 646.3$$

**METRIC UNITS:**

$$= \frac{[155] \times [1000]}{[980]} = [158.5]$$

The number to enter for SPEED CAL is 646 [159].


- 8) Recheck the new SPEED CAL calculated in Step 7 as follows:
  - a) Enter the new SPEED CAL number as in Step 3.
  - b) Repeat Steps 5, 6, and 7.
  - c) Final Speed cal may vary with Radar mount.










## 2. SPEED CAL PROCEDURE FOR SCS 400 CONSOLE

**NOTE:** Numbers in brackets [ ] are metric equivalents.

1) Set the MAN/AUTO switch MAN, POWER switch to ON, MASTER switch to OFF, and BOOM switches to OFF.

2) Enter "990" as boom length in key labelled  .

3) Enter "0" in keys labelled:       .


4) Enter the Speed cal value for your Radar in key labelled  .

Speed cal value can be determined by the following:

<u>RADAR TYPE</u>	<u>SPEED CAL</u>
Dickey John	820 [207]
Magnavox	612 [155]
TRW	612 [155]

5) Drive 1 mile [1 kilometer]. To achieve the most accurate calibration, accelerate and decelerate slowly.

**CAUTION:** Do not use vehicle odometer to determine distance. Use section lines or highway markers.

6) Read TOTAL AREA by depressing key labelled  .

TOTAL AREA display should read a value of approximately 10.0. If it reads 9.9, 10.0, 10.1, the SPEED CAL for your vehicle is correct. If the TOTAL AREA display reads any other value, divide SPEED CAL by the value observed in TOTAL AREA, then multiply by 10. This will give you the correct value to enter for SPEED CAL. Round off to the nearest 3 digit number.

**EXAMPLE:** Assume SPEED CAL is 612 and TOTAL AREA reads 9.3.

**ENGLISH UNITS:**

$$= \frac{612}{9.3} = 65.8 \times 10 = 658$$

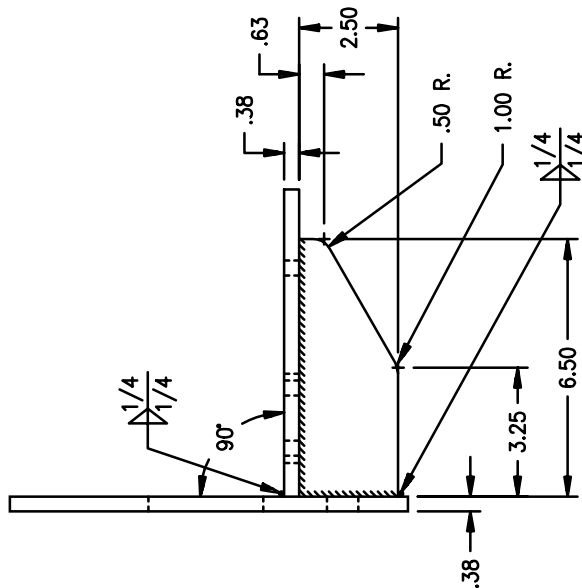
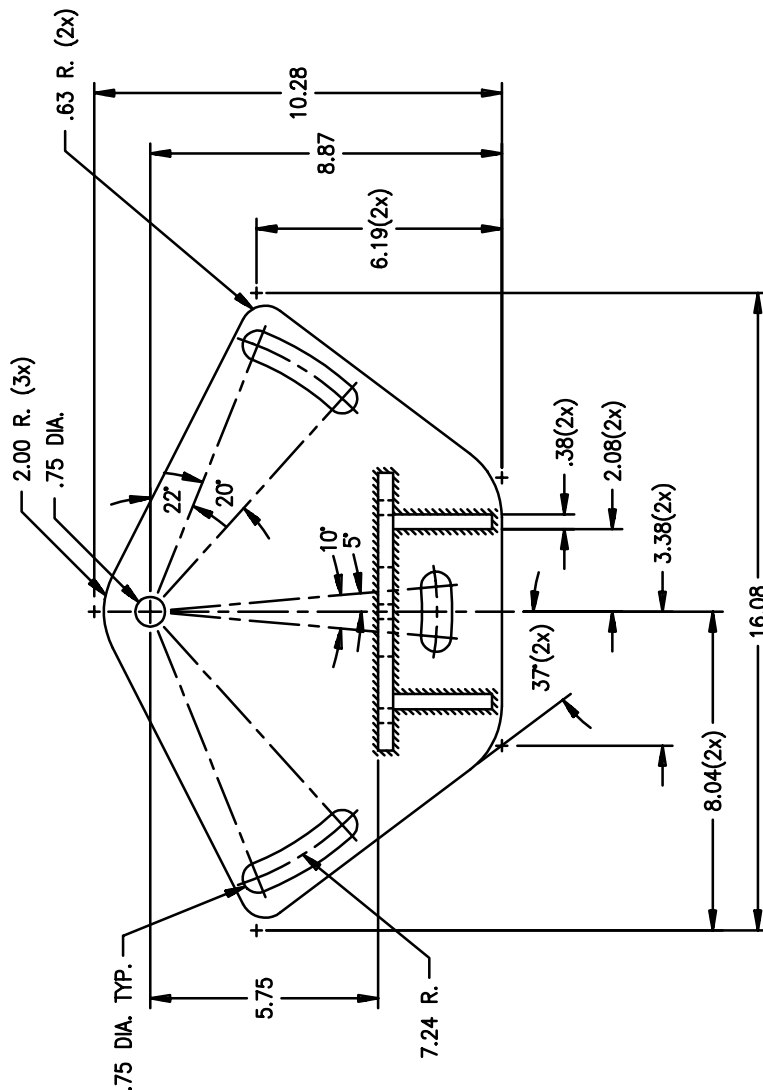
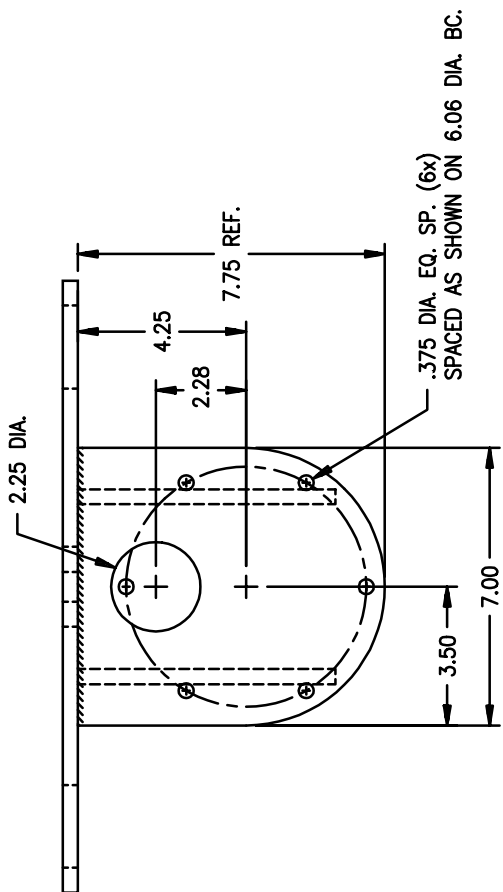
The number to enter for SPEED CAL is 658.

8) Recheck the new SPEED CAL calculated in Step 7 as follows:

- a) Zero out TOTAL AREA display as in Step 3.
- b) Enter new Speed cal number as in Step 4.
- c) Repeat Steps 5, 6, and 7.
- d) Final Speed cal may vary with Radar mount.

**NOTE:** Enter actual Boom lengths, Meter cal, set GPA and Time as described in the OPERATION/PROGRAMMING section of the SCS 400 INSTALLATION AND SERVICE MANUAL, prior to spraying.

# APPENDIX 1 MAGNAVOX RADAR MOUNTING BRACKET



APPENDIX 2  
TRW DRILLING TEMPLATE (37 DEGREE ANGLE)  
MOUNTING HOLES FOR LEFT SIDE OF VEHICLE

APPENDIX 3  
TRW DRILLING TEMPLATE (37 DEGREE ANGLE)  
MOUNTING HOLES FOR RIGHT SIDE OF VEHICLE







**R A V E N**

Radar Speed Sensor  
for Radars Other Than Raven  
Installation & Service Manual  
(P/N 016-0159-414 Rev E 2/09)

*Simply improving your position.<sup>SM</sup>*



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