



# Goshawk Level Transmitter

This document contains the recommended procedures installing and calibrating the Hawkeye Industries Goshawk Level Transmitter for use on a Redtail or Roadside Gauge Head.

## Requirements

The gauge board, indicator, float, and gauge head, shall be in place on the tank prior to Goshawk installation.

## Contents

A.) Goshawk Installation on Gauge Head

B.) Electrical Connections

C.) Calibration (Zero & Span)

D.) Calibration (Tank Height) \*

E.) Transmission Installation & Calibration \*\*

Sections D.) and E.) are only required for transferring a previously-installed Goshawk to a different sized tank.

## Tools

### Installation onto Gauge Head

▶ #3 Robertson Screwdriver

▶ 9/16 Open-end wrench (for Redtail)

▶ 1/2 Open-end wrench (for Roadside)

▶ 9/32 Allen Key

Calibration (Zero & Span)

▶ 24 VDC Loop calibrator - or - multi-meter capable of reading current in mA plus a 24 VDC Power Supply\*

▶ Pen-size flat screwdriver

Calibration (Tank Height)

▶ Multimeter capable of read-

## Tools (cont'd)

ing resistance in ohms ( $\Omega$ ), with Allen Key

spring-hook leads

▶ Pen-size flat screwdriver

Transmission Installation &

Calibration

▶ Slot-head screwdriver 1/16

▶ 3/32 Allen Key

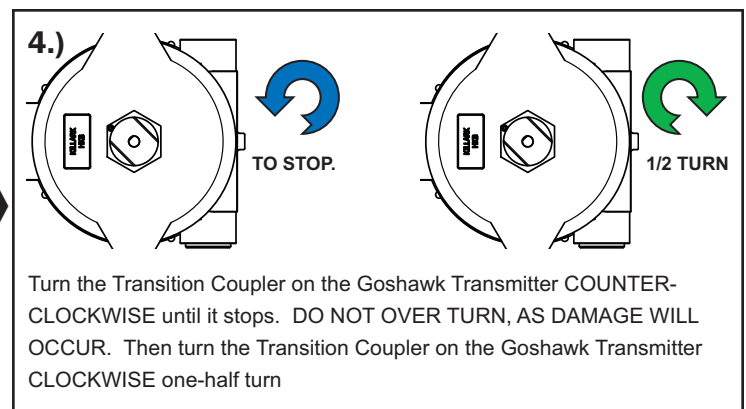
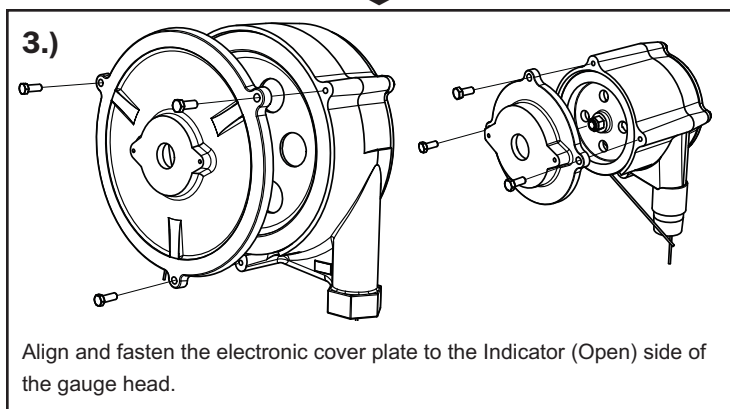
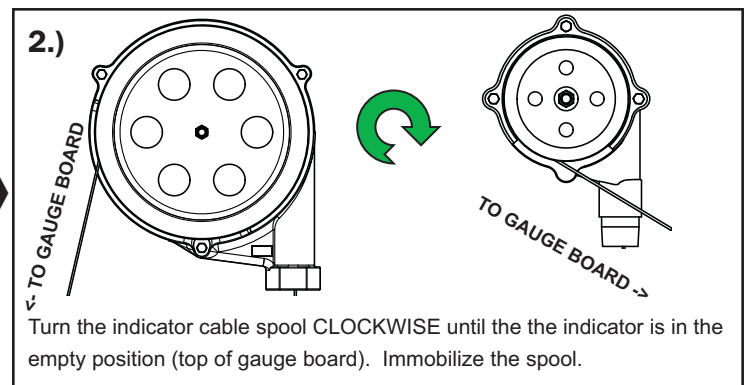
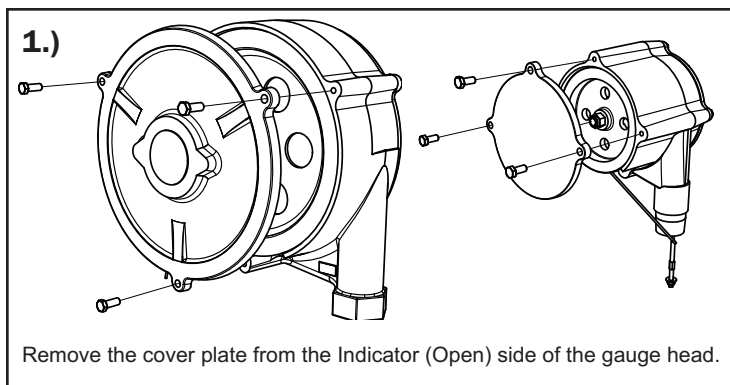
▶ 1/2 Wrench

▶ Retaining Ring Pliers

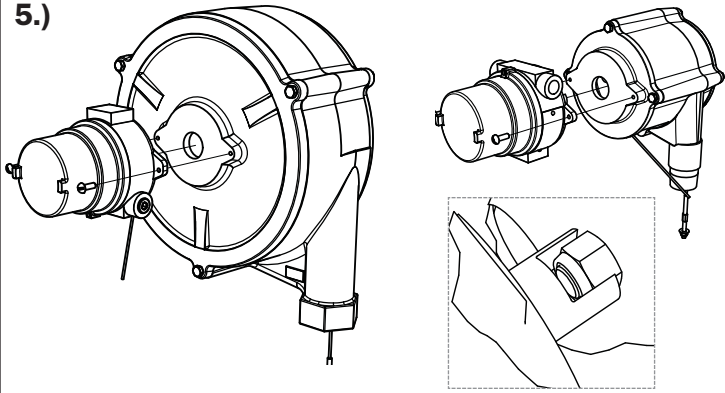
## Parts Required

QTY	Part
▶ 1	Goshawk Level Transmitter
▶ 2	1/4-20 UNC x 3/4 Button-head screw
Installation on Redtail	
▶ 1	Redtail Gauge Head
▶ 1	Redtail Electronic Cover Plate
Installation on Roadside	
▶ 1	Roadside Gauge Head
▶ 1	Roadside Electronic Cover Plate
Transmission Installation	
▶ 1	Goshawk II Transmission Kit

## A.) Goshawk Installation on Gauge Head

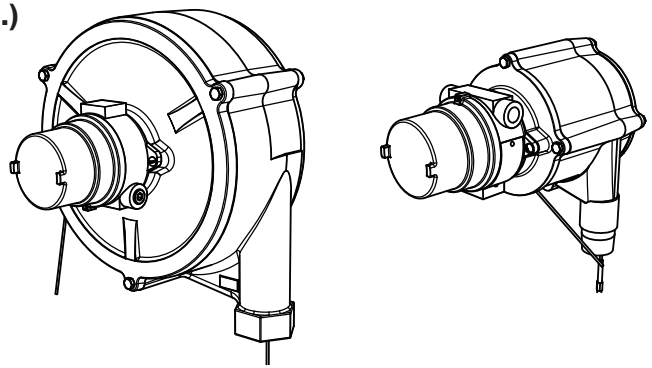


5.)



Place the transmitter on the electronic cover plate. Ensure the transition coupler mates with the gauge head axle without binding.

6.)



Align the bolt holes on the transmitter with the tapped holes on the cover plate, and secure using the 1/4-20UNC x 3/4 Machine Screws. Release the spool so the gauge head components can move freely

**Installation on Gauge Head Complete. Proceed to B.)**

## B.) Electrical Connections

**NOTE!** In November 2008, Hawkeye Industries Significantly Revised the Goshawk Circuit Board. All labels and functions remain the same, but component locations have changed. The boards are simple to identify, as the **newer** is significantly **smaller**, and **rectangular** in shape, compared to the **older** board, which is **larger**, and **circular**.

### B1.) Power & Signal Connections

NOV. 2008 TO PRESENT

PRIOR TO NOV. 2008

The Goshawk Transmitter has a three position terminal block (orange) located on the left-side of the circuit board (after Nov. 2008) or in the centre (before Nov. 2008) for connecting the 13-24 VDC power supply, signal out, and a shield termination connection. **NOTE:** the shield termination connection is not connected to the circuit, and is provided for convenience only.

TERMINAL	FUNCTION	LABEL
1	+13 TO +24 VDC	+
2	Signal Out	-
3	Shield	G or S

### B2.) Potentiometer Connections

NOV. 2008 TO PRESENT

PRIOR TO NOV. 2008

The grey terminal block provides connections for the potentiometer. Should the potentiometer be replaced, connect the wires accordingly:

TERMINAL	WIRE COLOUR
1	WHITE
2	BLUE
3	YELLOW

**Electrical Connections Complete. Proceed to C.)**

## C.) Calibration (Zero & Span)

NOV. 2008 TO PRESENT

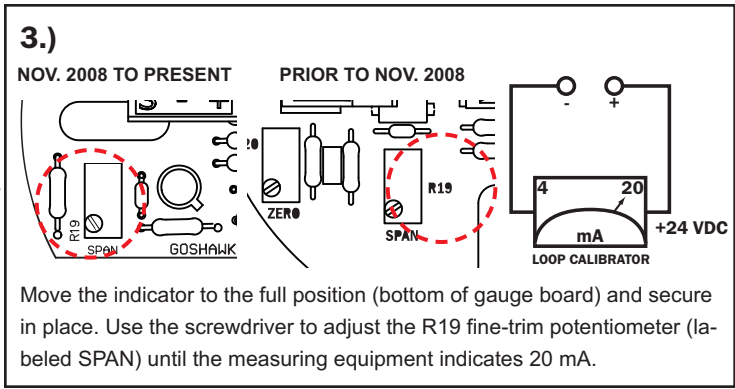
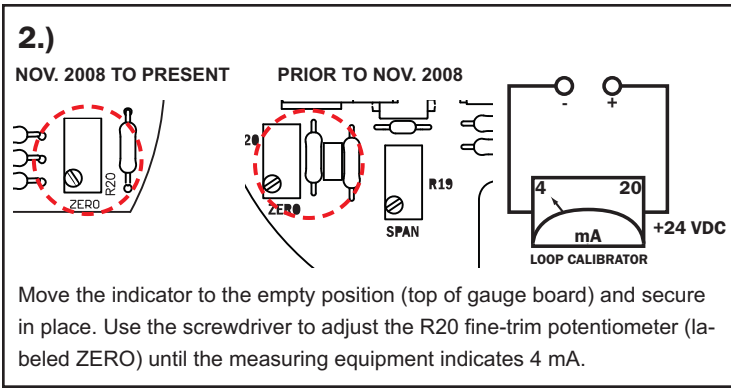
PRIOR TO NOV. 2008

Identify the circuit board, and note the locations of the zero and span adjustments before proceeding.

1.)

Connect the +24 lead from the Loop Calibrator to the positive (+) terminal on the circuit board terminal block.

\* If using a 24 VDC power supply and multi-meter, ensure that the multimeter is set to mA and connected in-line with the +24VDC lead and the positive (+) on the circuit board terminal block.



**NOTE!** FOR ADJUSTING R20 (ZERO) AND R19 (SPAN) ALWAYS!

**Goshawk Calibration Complete.**

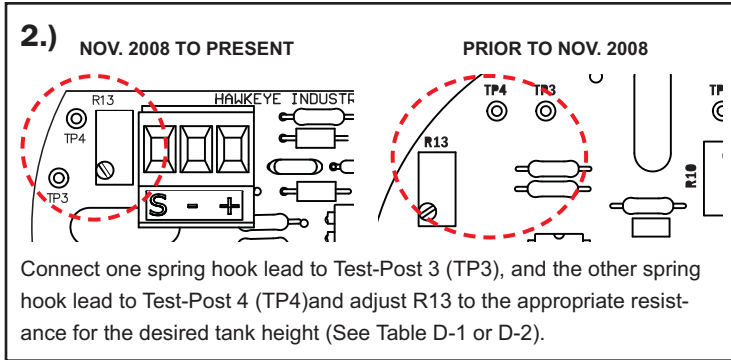
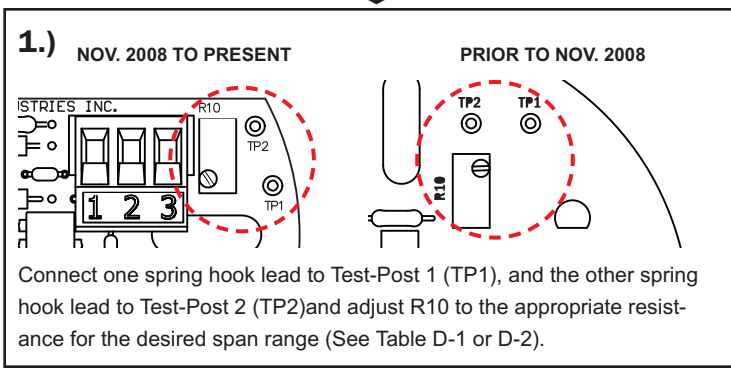
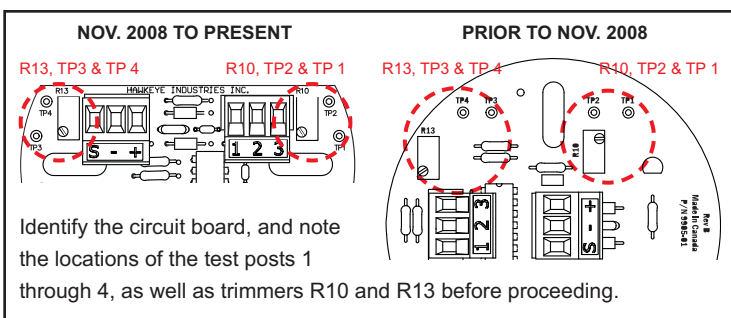
**NOTE!** Sections D.) and E.) are only required if in-situ adjustment to the operating range of the Goshawk Transmitter is required, and are not part of the standard installation procedure. **DISCONNECT GOSHAWK FROM POWER SOURCE BEFORE PROCEEDING.**

**D.) Range Setting (UPDATED MARCH 2014)**

In situations where the encoding potentiometer makes fewer rotations from the tank-empty to tank-full condition, decreasing the resistance of R10 and R13 can allow finer control of the span, increasing the ease of calibration in the full scale (tank full) condition.

**The factory-set resistance of 180 Ω should be adequate for most applications. Only adjust R10 and R13 only if you find the default span sensitivity inadequate.**

The settings below are only valid if steps A4 to A6 have been correctly followed. Unexpected readings and potentiometer damage can result if A4 - A6 are not completed. R10 and R13 must always be equal. Maximum span listed in D-1 and D-2 are maximum allowable spans permitted by the electronics. Always observe the maximum gauge head operating heights as specified in the Goshawk brochure.



**D-1 Redtail Hawk Gauge Head**  
*Span range, in (ft) for given R10 and R13 values*

R10 / R13 (Ω)	Goshawk I		Goshawk II		Goshawk III	
	Min (ft)	Max (ft)	Min (ft)	Max (ft)	Min (ft)	Max (ft)
30	4.75	19.50	7.13	29.25	11.88	48.75
70	4.75	21.00	7.13	31.50	11.88	52.50
80	4.75	22.50	7.13	33.75	11.88	56.25
110	6.25	22.50	9.38	33.75	15.63	56.25
140	6.25	24.00	9.38	36.00	15.63	60.00
<b>180</b>	<b>6.25</b>	<b>25.50</b>	<b>9.38</b>	<b>38.25</b>	<b>15.63</b>	<b>63.75</b>

**D-2 Roadside Hawk Gauge Head**  
*Span range, in (ft) for given R10 and R13 values*

R10 / R13 (Ω)	Goshawk I		Goshawk II		Goshawk III	
	Min (ft)	Max (ft)	Min (ft)	Max (ft)	Min (ft)	Max (ft)
30	2.25	9.25	3.38	13.88	5.63	23.13
70	2.25	10.00	3.38	15.00	5.63	25.00
80	2.25	10.75	3.38	16.13	5.63	26.88
110	3.00	10.75	4.50	16.13	7.50	26.88
140	3.00	11.50	4.50	17.25	7.50	28.75
<b>180</b>	<b>3.00</b>	<b>12.00</b>	<b>4.50</b>	<b>18.00</b>	<b>7.50</b>	<b>30.00</b>

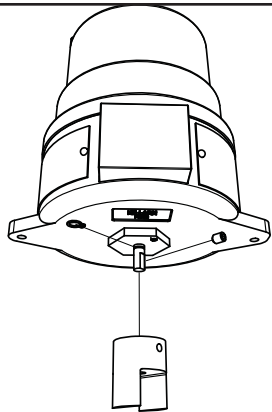
**Goshawk Calibration Complete. Proceed to E.) if the Goshawk has, or will have a transmission.**

## E.) Transmission Installation & Calibration

**NOTE!** Sections D.) and E.) are only required if in-situ adjustment to the operating range of the Goshawk Transmitter is required, and are not part of the standard installation procedure.

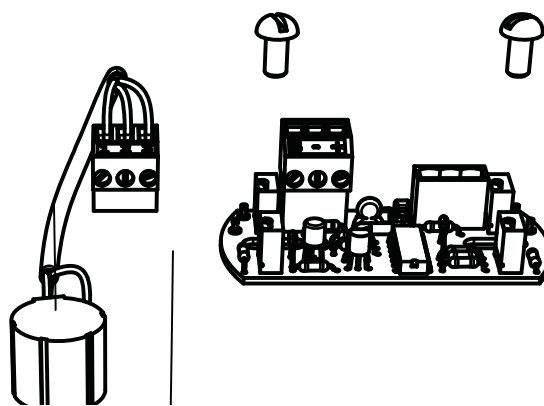
**DISCONNECT GOSHAWK FROM POWER SOURCE PRIOR TO FOLLOWING THESE PROCEDURES.**

1.)



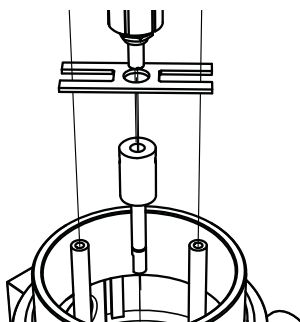
Loosen the retaining screw on the transition coupler with the 3/32 allen key and remove it from the operator shaft. Remove the external retaining ring from the operator shaft.

2.)



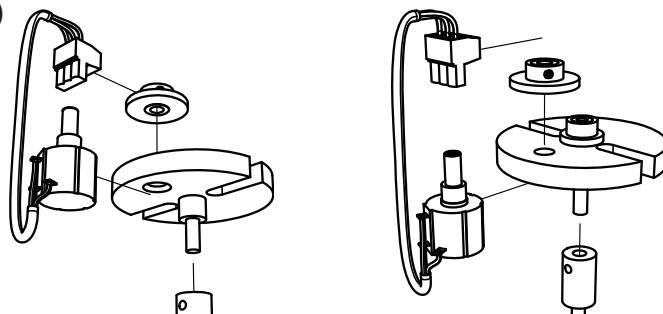
Disconnect power and encoding potentiometer from the circuit board. Remove the two circuit board retaining screws using the slot-head screwdriver, and carefully remove the circuit board and set aside.

3.)



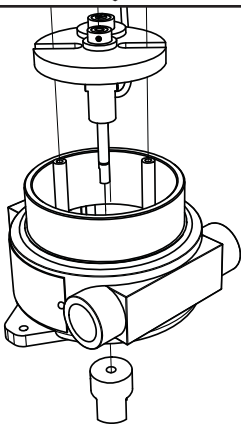
Lift the encoding potentiometer / h-clip /operator shaft assembly out. Using the 3/32 allen key, loosen the retaining screws on the operator shaft, and remove from the potentiometer shaft. Remove the h-clip by removing the potentiometer retaining nut and lock ring with 1/2 wrench.

4.)



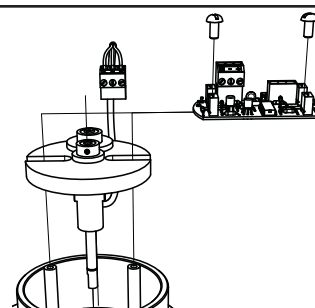
Insert the potentiometer into the threaded hole on the underside of the transmission chassis and tighten. Fit the larger gear, hub up, to the exposed potentiometer shaft. Use the 1/16 allen key to secure the gear set screw to the potentiometer shaft. Connect the transmission centre axle to the operator shaft, and secure the set screws with the 3/32 allen key.

5.)



Drop the potentiometer / transmission assembly into the Goshawk body, taking care to align the chassis slots to the posts, and secure the operator shaft with the external retaining ring. Reattach the transition coupler.

6.)



Align the connection holes on the circuit board with the posts on the goshawk, and secure with the slot-head machine screws. Reconnect the potentiometer to the circuit board.

7.)

Follow steps A through D to reconnect and recalibrate the Goshawk. **NOTE: use Table D-2 for the tank height settings.**

**Goshawk Transmission and Calibration Complete.  
Level Indication System Installation Complete.**