[www.pigpopper.com]

Pig Popper Installation Guide

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1.0 Disclaimers and Privacy

2.0 Overview

The Pig Popper™ is an intrusive pig signal that is manually reset once it has been tripped by a pig.

» Pig Popper Manual (PPM) alert (# 0200-19-09714)

Extensions are available in 6 inch increments for buried pipe locations. All units are also available in a lighted (beacon) version. The Pig Popper™ is designed to be fitted on most existing 2 inch fittings.

The Pig Popper™ Assembly may be installed in any location around the pipe – perpendicular to the center line of the pipe.

U.S. Patent # 8109162

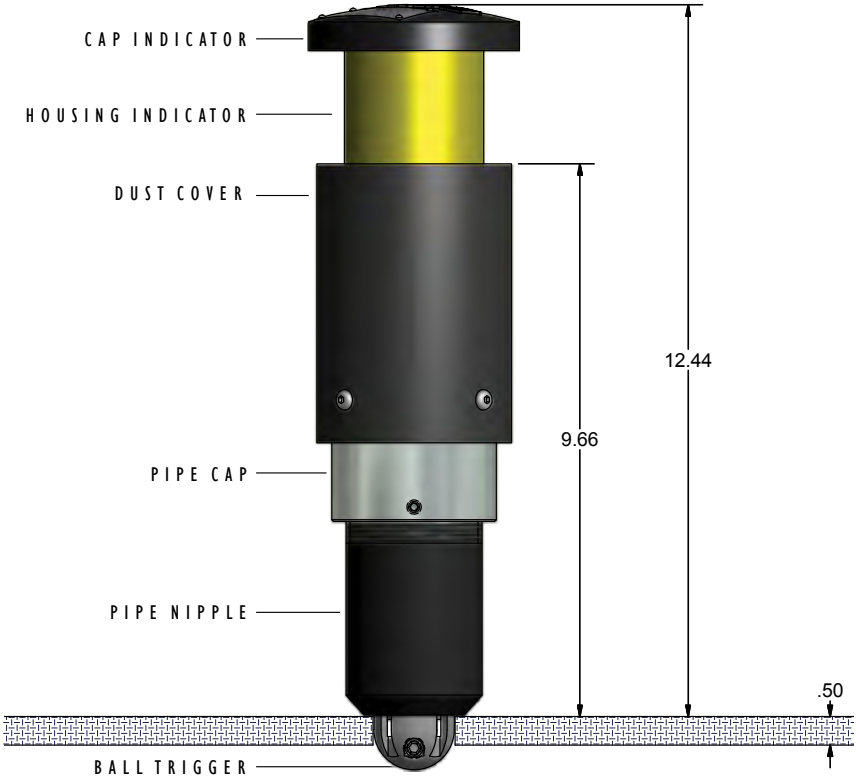


Figure 2.0

3.0 Pressure Test Log

We have designed and built a test vessel specifically for the testing of our pig signal devices. The vessel presently tests our Pig Popper™ Model (PPM units) at pressures from 0 to 4,000 psi. A pneumatic plunger resets the pig signal each time a pig simulator passes and triggers the pig signal probe. With our Pressure Compensated Pig Popper™ there is no need to change the internal spring based on line pressures.

The following chart indicates the number of cycles (pig passes) and the operating pressure maintained during testing.

Note: The life of the Pig Popper™ test is the additive cycle period of each test combined. The mechanical testing of the Pig Popper™ is equivalent to approximately 30 years with no failure.

Pressure	Cycles	Media
0	500 / 500	Water
400	500 / 1000	Water
800	500 / 1500	Water
1200	500 / 2000	Water
1600	500 / 2500	Water
2000	500 / 3000	Water
2400	500 / 3500	Water
2800	500 / 4000	Water
3200	500 / 4500	Water
3600	500 / 5000	Water
4000	500 / 5500	Water

Test ran 500 cycles at each pressure from 0 psi. to 4000 psi. and then from 4000 psi. back down to 0 psi. Running Total of cycle count was 11,000.

- Simulated pig passage in test vessel with mechanical pig passage and pneumatic reset.
- Terminated test after 11,000 cycles with a full range of psi levels having been met with no leaks or failures.
- To date the unit has exceeded all expectations and has proven to be of sound engineering and material selections.
- Further testing of the Pig Popper™ is constantly taking place.
- Additional models, such as a lighted version and control panel electrical units are also available.

4.0 Installation Procedure: Pig Popper Manual (PPM)

Parts List				
ITEM	QTY	PART NUMBER	REV.	DESCRIPTION
1	1	SEE TABLE		SEE TABLE
2	1	0200-19-09587	1	ASSEMBLY, PIG POPPER PLUG
3	1	0200-19-10365	1	ASSEMBLY, PIPE CAP
4	1	0200-19-08401	2	ASSEMBLY, INDICATOR

Table matrix applies to all models

Table		
WALL THICKNESS	LENGTH "A"	PART NO.
.250" TO .500"	4.000"	0200-10-03480
.501" TO .750"	3.750"	0200-10-03481
.751" TO 1.000"	3.500"	0200-10-03482
1.001" TO 1.250"	3.250"	0200-10-03483
1.251" TO 1.500"	3.000"	0200-10-03484
1.501" TO 1.750"	2.750"	0200-10-03485

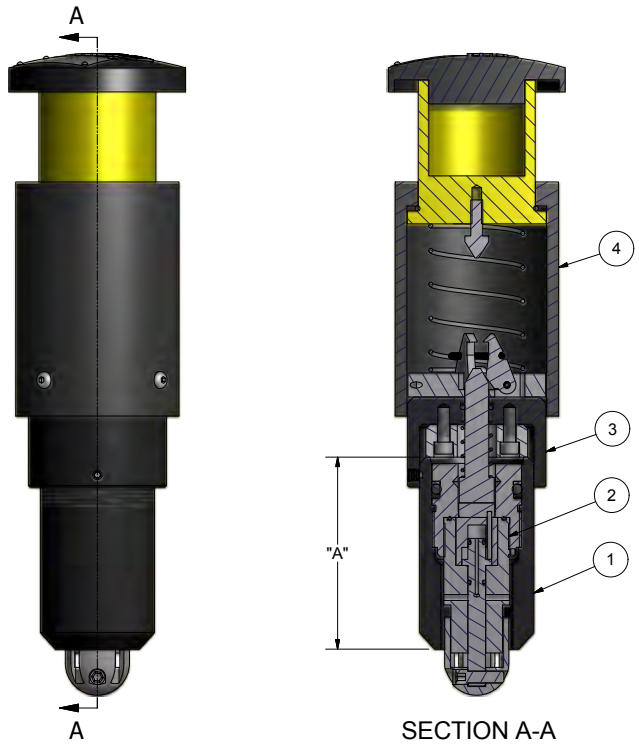


Figure 4.0

4.1 Installation

These instructions apply to all models of the Pig Popper™. See Section ”5.1.2 Removing the Pipe Nipple” on page 7” for Adjustable Spring Guide exception.

IMPORTANT: Your Pig Popper™ has been assembled and tested prior to shipping, however; some disassembly of the unit is required prior to welding the pipe nipple to the pipeline. This will protect the working components and O-ring seals.

WARNING: Welding the Pig Popper™ to the pipeline with the trigger ball assembly inside the pipe nipple will compromise its integrity and will **void** the warranty.

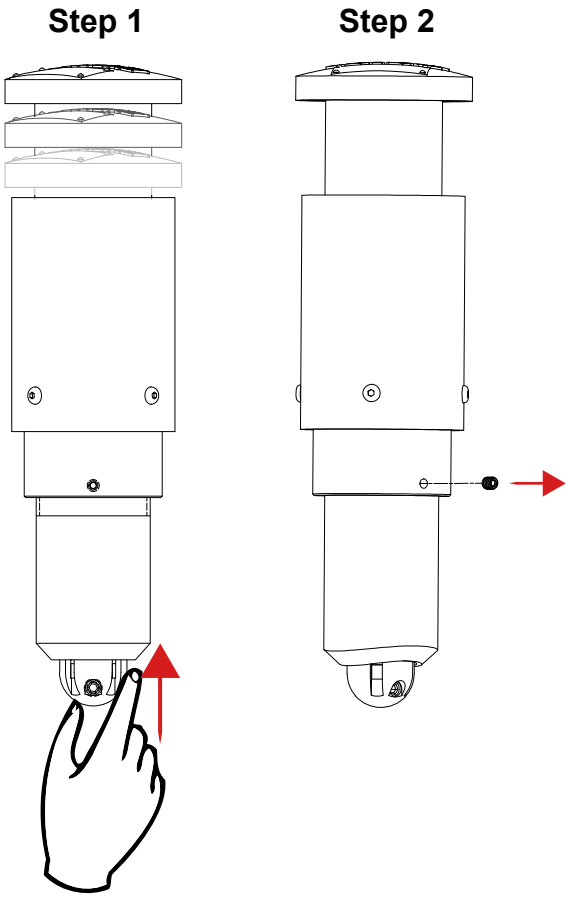
4.1.1 Tools Needed

1/2 inch x 3/4 inch socket adapter (included)	
3/16 inch hex key	
Socket wrench with 1/2 inch drive	

4.1.2 Removing the Pipe Nipple

Step 1 - Trip the Trigger Ball to release the Indicator Cap Assembly. This will release the Cap Assembly from the internal catch finger assembly. Does not apply to model PPE.

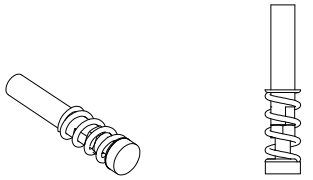
Step 2 - Remove the safety set screw from the Pipe Cap.



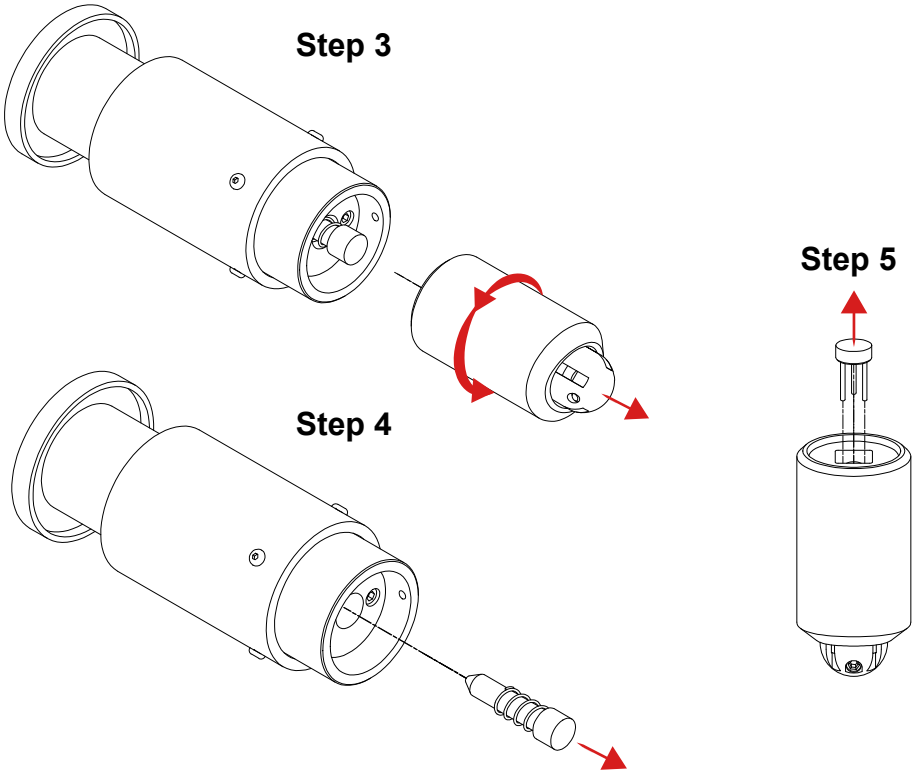
Step 3 - Unscrew the Pipe Nipple Assembly from the Pipe Cap (counter clockwise).

Step 4 - Remove the Spring Guide Assembly and set it aside to re-install later.

Note/Exception: For Model PPE, the Spring Guide Assembly is pre-adjusted to the necessary length to trigger the indicator (Adjustable Spring Guide Assembly).



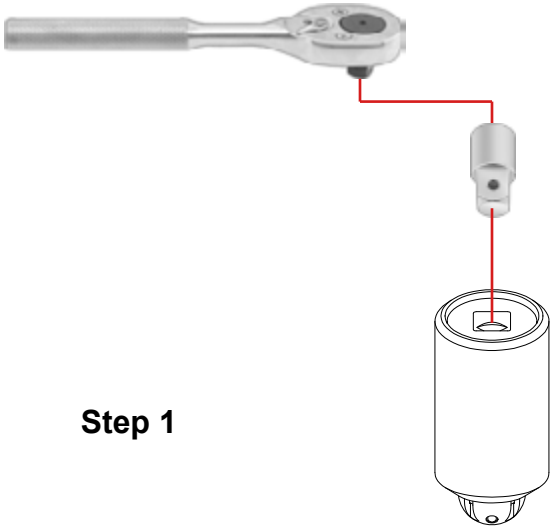
Step 5 - Remove the Trigger Pin from the Trigger Ball Assembly to prevent it from getting it lost.



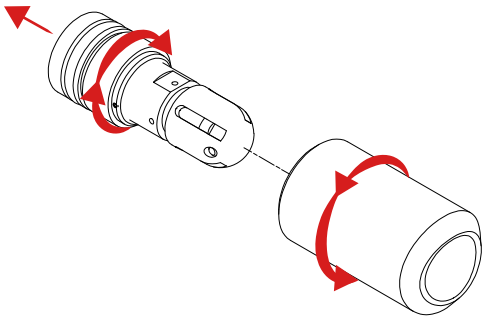
4.1.3 Removing the Pig Popper Plug Assembly

Step 1 - Remove the Pig Popper Plug Assembly (turn counter clockwise) from the Pipe Nipple using the ½ inch X ¾ inch socket adapter included with the pig popper™ kit.

Note: You will require a socket wrench with a ½ inch drive for the adapter socket.



Step 1



4.1.4 Installing the Pipe Nipple

HOT TAPPING

WHEN TAPPING A LINE THAT IS IN SERVICE, REFER TO THE TAPPING MACHINE MANUFACTURER'S PROCEDURES FOR HOT TAPPING.

IMPORTANT: **EXTREME CARE REQUIRED** when welding the nipple to the pipeline. The Pig Popper is made of high precision, close-tolerance parts and any deformation of the nipple will result in the inability to reassemble the unit after nipple installation.

COOL TO THE TOUCH: It is important to keep the nipple as cool as possible during the welding process by allowing the weld and surrounding material to cool to the touch between each weld pass and prior to installing the plug assembly.

CAUTION

USE WELDING AND SAFETY CODES

Welding Codes

ASME B31.4	For liquid transportation systems inclusive of hydrocarbon, liquid petroleum gas, anhydrous ammonia and alcohol.
ASME B31.8	Gas transportation and distribution piping systems.

Pressure/Hydro Information

Hydro Testing	Hydro testing can be performed with the pig popper plug assembly installed in the nipple; **NO ADDITIONAL PIPE CAP ON THE NIPPLE IS REQUIRED**. It is not recommended to use a pipe cap for pressure tests as they can be over-torqued, causing damage to the nipple.
Debris/Brass Plug	If there is a high amount of debris expected, it is recommended to replace the pig popper plug assembly with a solid brass plug during the test. This will prevent any debris from getting into the mechanism of the pig popper during testing. Brass plugs are available from Enduro.

Attach the indicator nipple to the pipeline in accordance with the pipeline company's welding specifications in the following sequence (use Figure 4.1.0 as a reference):

General Installation Procedures
Step 1 - Mask off the internal and external threads on the Pipe Nipple to protect against weld splatter.
Step 2 - At the point of installation, drill the pipe for indicator protrusion into the pipeline by using a 1-1/2" diameter drill bit.
Step 3 - Remove all drill shavings and burrs from the edge of the hole.
Step 4 - Carefully position the nipple on the pipe so that it is centered over the 1-1/2" hole and level with the line pipe. Proper alignment is critical for the pig popper to function correctly. Weld in accordance with the appropriate welding codes. Allow weld and nipple to cool to the touch.
Step 5 - Remove all masking material.

Pre-existing Nipple
Step 1 - Verify with the factory that the housing is compatible for use with the pig popper.
Step 2 - Chase the internal threads of the nipple with a thread chaser. This will require a special 1.875-8 thread chaser available from Enduro. The nipple is now ready for pig popper installation.

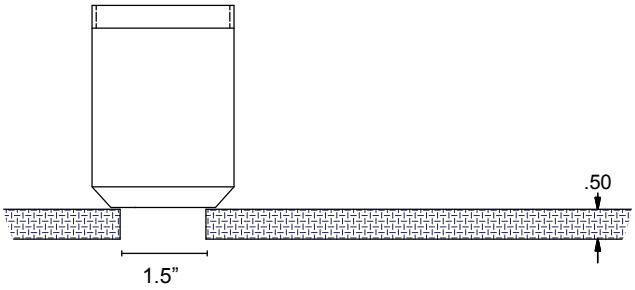


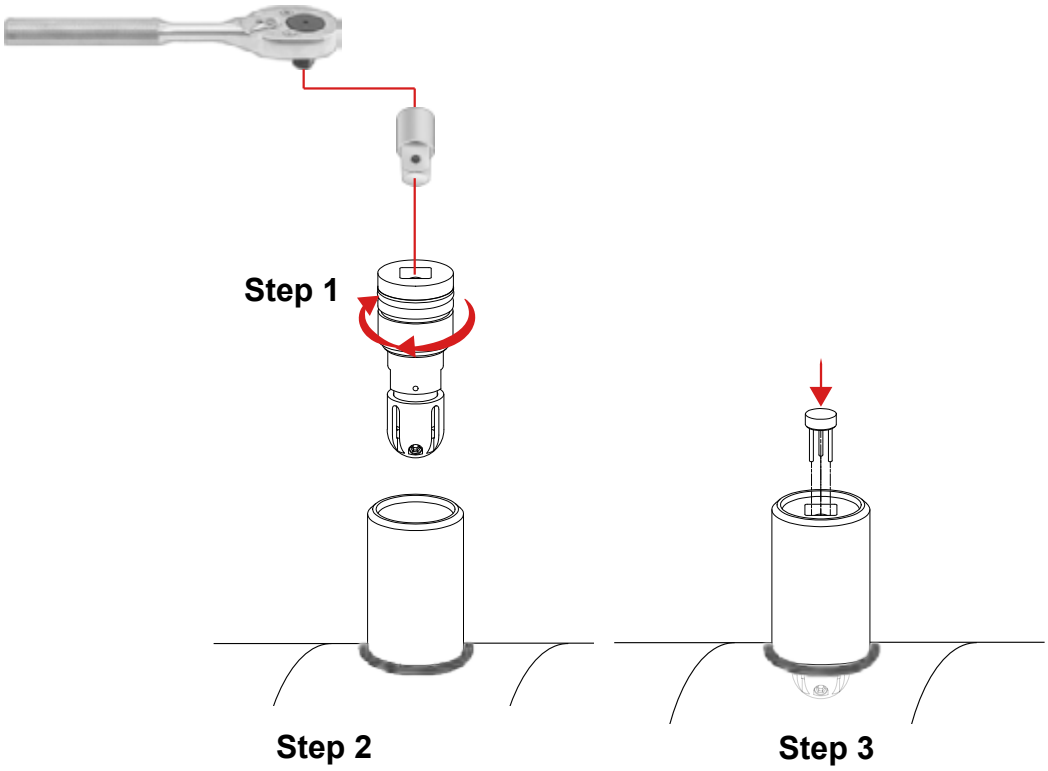
Figure 4.1.0

4.1.5 Inserting Trigger Ball Assembly into Pipe Nipple

Step 1 - Apply grease to the Pig Popper™ housing O-rings.

Step 2 - Install the Pig Popper Plug Assembly into the welded Pipe Nipple using a ½ inch drive socket wrench and the provided ½ inch to ¾ inch adapter.

Step 3 - Place the Trigger Pin Plate pre-assembly inside the Pipe Nipple.

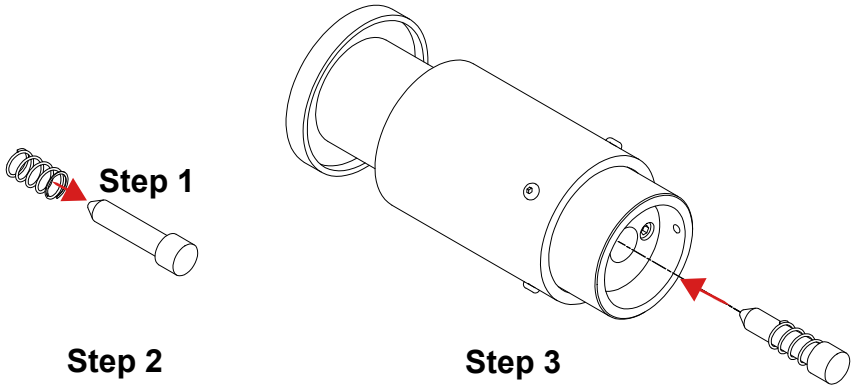


4.1.6 Spring Placement

Step 1 - Apply grease to the top portion of the Spring Guide.

Step 2 - Place the Spring back onto the Spring Guide.

Step 3 - Slide the Spring Guide, with the Spring on it, into the Pipe Cap Assembly.



4.1.7 Pipe Cap Installation

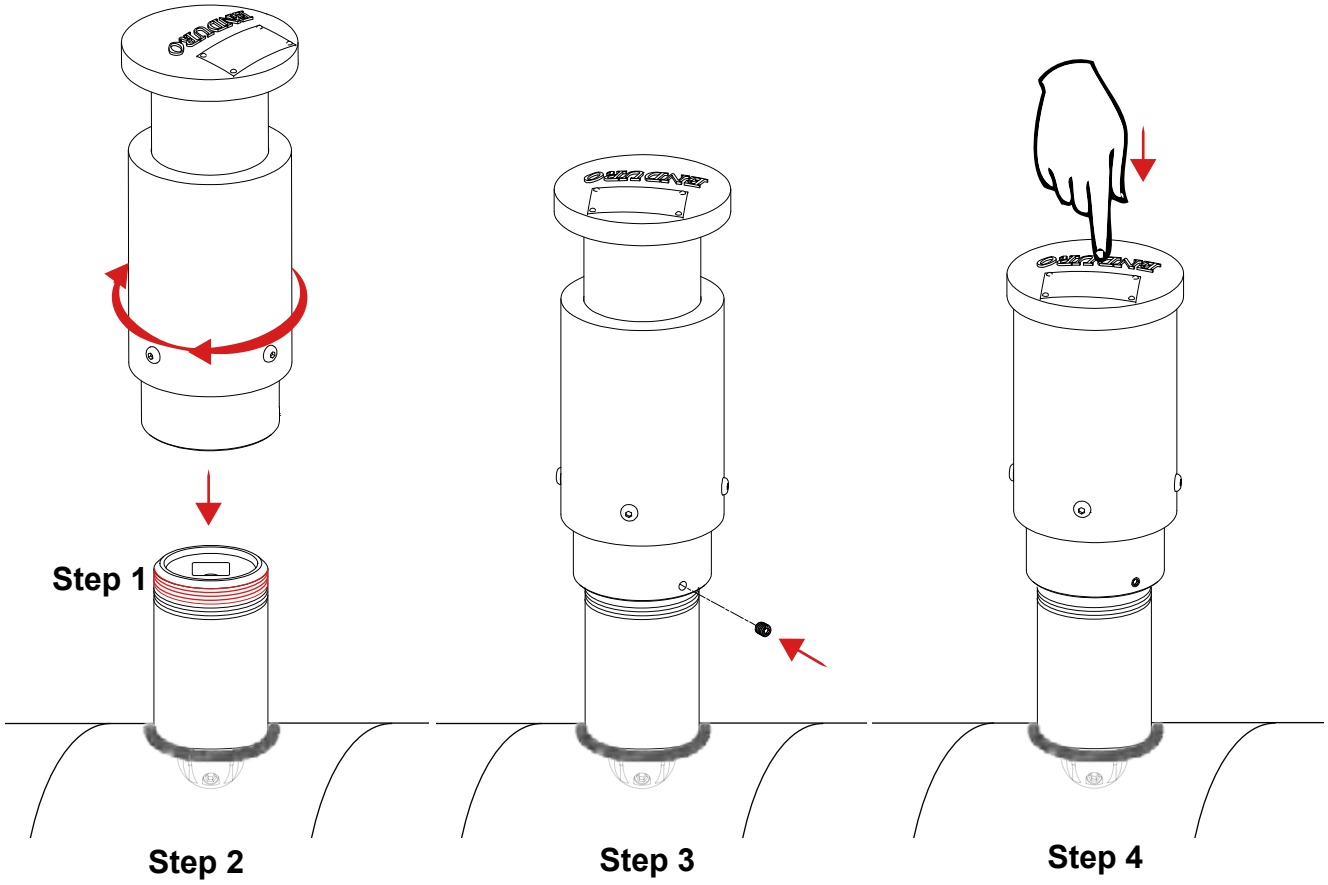
Step 1 - Apply Teflon tape or anti-seize to 5 to 6 threads of the Pipe Nipple.

Step 2 - Install the Pipe Cap Assembly onto the Pipe Nipple with the Spring Guide protruding thru the Pipe Cap and Catch Plate.

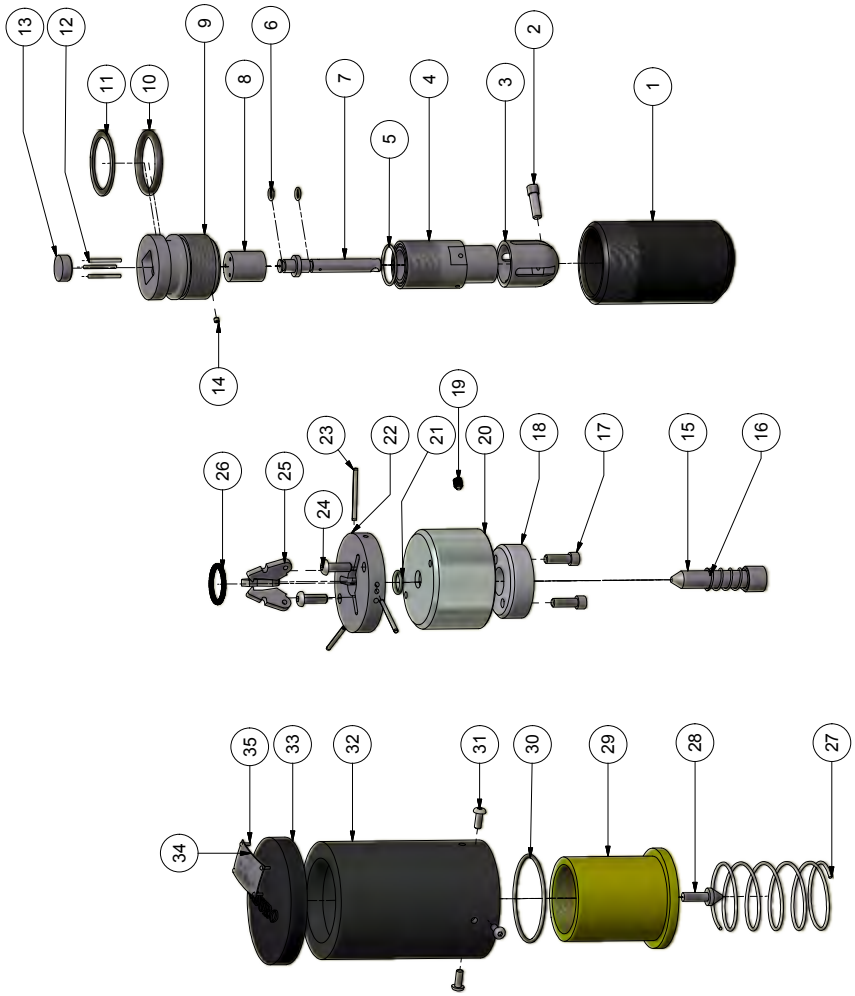
Step 3 - Tighten the Set Screw into the side of the Pipe Cap, thus locking the cap in place.

Step 4 - To set the unit, push down on the Dust Cover Cap until a click is both heard and felt.

The unit is now ready to be placed into service.



Appendix A: Pig Popper™ Drawings: 0200-19-10826



Parts List

ITEM	QTY	PART NUMBER	REV.	DESCRIPTION
1	1	0200-10-07079	2	PIPE, NIPPLE 4.000" SCARFED
2	1	0200-10-02574	2	PIN, TRIGGER BALL
3	1	0200-10-09592	3	BALL, TRIGGER
4	1	0200-10-09589	3	HOUSING, INDICATOR LOWER
5	1	O'RING INCH		O'RING 2-023
6	2	O'RING INCH		O'RING 2-010
7	1	0200-10-09590	5	PLUNGER, TRIGGER
8	1	0200-10-09591	5	CAP, TRIGGER PLUNGER
9	1	0200-10-09588	3	HOUSING, INDICATOR UPPER
10	1	O'RING INCH		O'RING 2-325
11	1	8-325		BACK-UP RING
12	3	ANSI B18.8.2 - 3/32 x 1		Pin - Hardened Ground Production Dowel
13	1	0200-10-09593	2	PLATE, TRIGGER PIN
14	1	ANSI B18.3 - 6-32 UNC x 0.125		Hexagon Socket Set Screw - Flat Point
15	1	0200-10-10366	1	GUIDE, SPRING
16	1	0200-10-03490	1	SPRING, COMPRESSION .055
17	2	ANSI B18.3 - 1/4 - 20 UNC - 3/4		Hexagon Socket Head Cap Screw
18	1	0200-10-02580	2	SPACER, PIPE CAP
19	1	V-0000020		Sckt Set Screw 1/4"-20 Thrd, 1/4" Lg w/ brass tip
20	1	0200-10-02579	4	CAP, PIPE
21	1	O'RING INCH		O'RING 2-112
22	1	0200-10-02582	1	PLATE, CATCH FINGER
23	3	ANSI B18.8.2 - 1/8 x 1.1/2 Standard Duty		Pin - Coiled Spring
24	2	ANSI B18.3 - 1/4 - 20 x 3/4	8	Hexagon Socket Button Head Cap Screw
25	3	0200-10-02586	2	FINGER, CATCH
26	1	0200-10-02585	1	SPRING, CATCH FINGER
27	1	0200-10-02587	1	SPRING, INDICATOR
28	1	0200-10-02588	1	PIN, CATCH FINGER
29	1	0200-10-02590	1	HOUSING, INDICATOR
30	1	O'RING INCH		O'RING 2-142
31	4	ANSI B18.3 - 10 - 24 x 1/2	8	Hexagon Socket Button Head Cap Screw
32	1	0200-10-02591	1	COVER, DUST
33	1	0200-10-02589	1	CAP, INDICATOR
34	1	0200-10-14875	1	TAG, SERIAL NUMBER
35	4	V-0000036	1	NAIL, #0 X 1/4" EASY-DRIVE

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