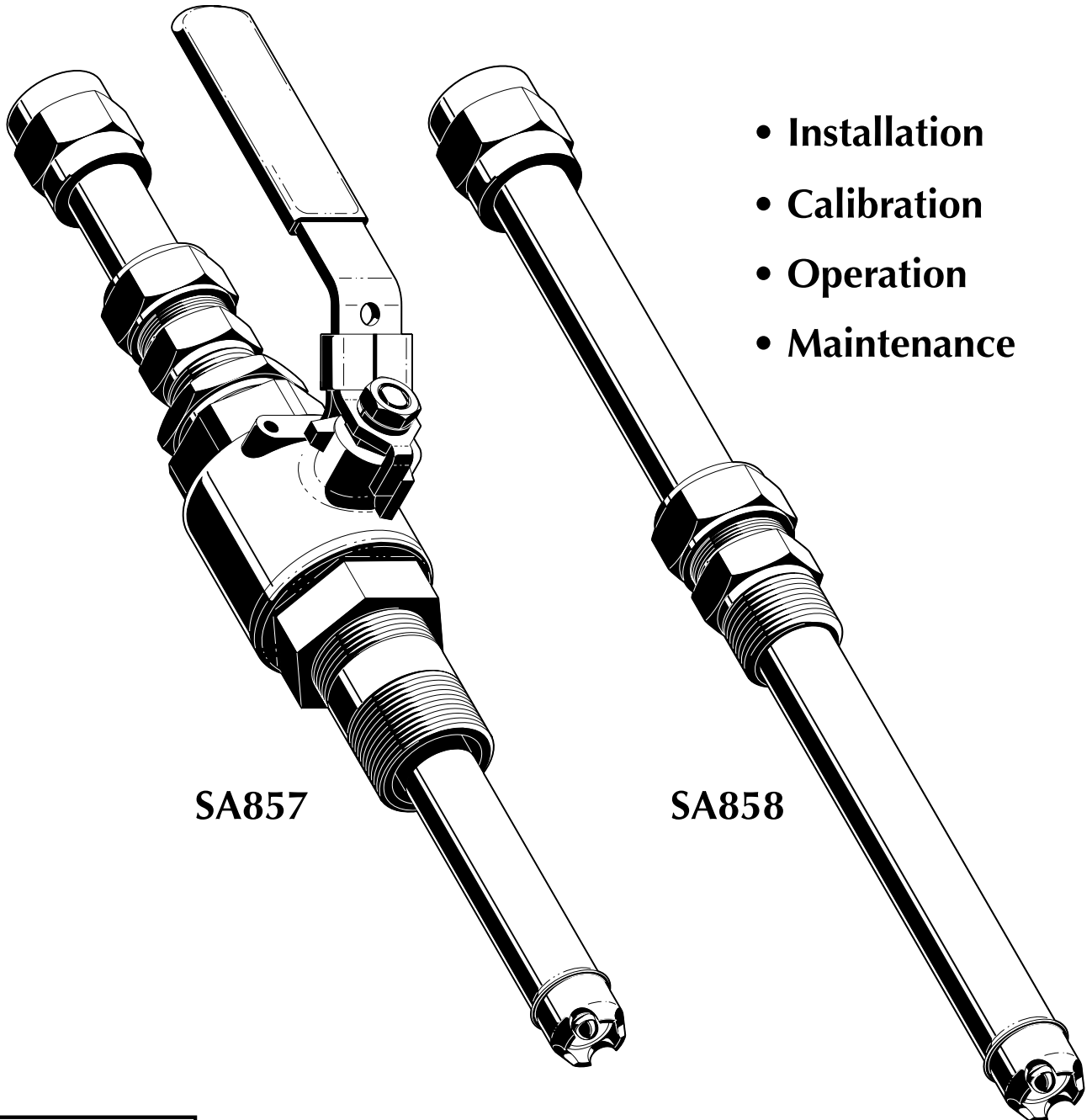


INSTALLATION & SERVICE

Models SA857 & SA858 Retraction Sensor Assemblies: Service Manual

Doc. Nr:	P1047
Rev:	B
Group:	Dynaprobe
Type:	Product Data
Part Nr:	SA857 & SA858
Date:	20-AUG-98
Drwgs:	R. Ramus



- Installation
- Calibration
- Operation
- Maintenance

**BROADLEY
JAMES**
CORPORATION

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Manufacturers of pH and D.O. Sensors for Science and Industry

SA857 SENSOR HOUSING ASSEMBLY

SERVICE MANUAL

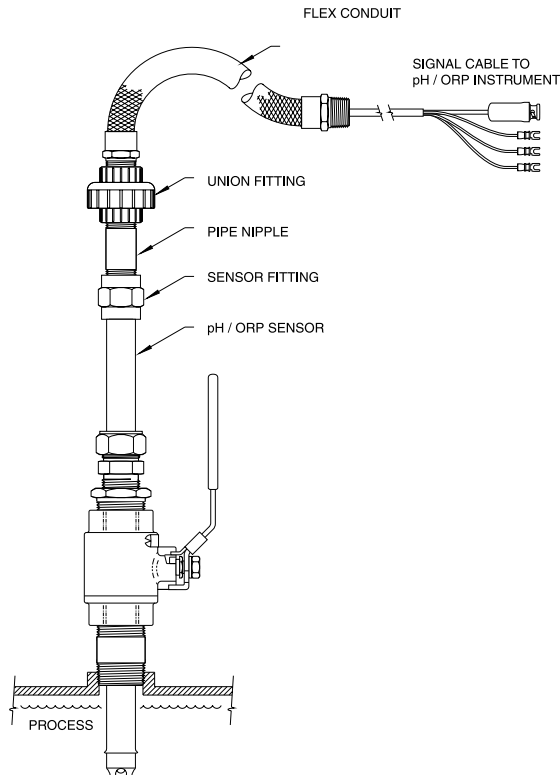
TABLE OF CONTENTS

<u>Page</u>	<u>Section</u>	<u>Description</u>
i		Table of Contents
1	Installation	Preview
2 - 5	Assembly	Assembly Instructions - Stage #1 Two-Point Buffer Calibration
6 - 7	Assembly	Assembly Instructions - Stage #2
8	Installation	Final Installation - Stage #3
9 - 10	Service	Removal from Process
11	Service	Disassembly - Stage #1 Cleaning and Two-Point Buffer Calibration Check
12 - 14	Service	Replacement of DynaProbe® Sensor
15	Service	Itemized Exploded View of SA857
16	Service	Itemized Part Numbers and Descriptions
17	Print	SA857 Dimension and Clearance Requirements
18	Print	SA858 Dimension and Clearance Requirements

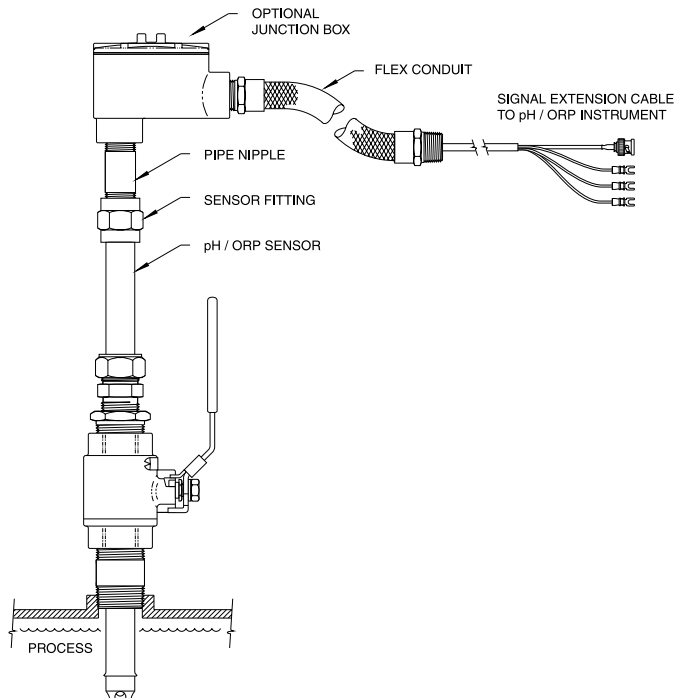
Model SA857 Sensor Installation Preview

NOTE: THE FOLLOWING INFORMATION IS INTENDED TO PROVIDE THE USER WITH A PREVIEW OF WHAT WILL BE REQUIRED TO INSTALL THE MODEL SA857 SENSOR ASSEMBLY. PLEASE REVIEW THE DIAGRAM AND GUIDELINES BEFORE PROCEEDING.

Typical Sensor Installation Diagrams:



Standard Installation



Installation With Optional Junction Box

Sensor Installation Guidelines:

1. Install DynaProbe® sensor in pipe or vessel between vertical and 15° above horizontal.
2. Select a junction box (optional) suitable for the service area.
3. Connect union, nipple and flex conduit with adequate service loop to sensor fitting or junction box.
4. Locate and mount junction box as close to the DynaProbe® sensor as possible.
5. Make connection of DynaProbe® sensor cable to the extension cable inside the junction box.
6. Keep cable run between junction box and pH / ORP instrument as short as possible.
7. Disconnect sensor cable in junction box prior to removing DynaProbe® sensor for service.

Model SA857 Sensor Assembly Instructions - Stage #1

BEGIN STAGE #1 ASSEMBLY OF THE MODEL SA857 SENSOR BY FOLLOWING THE STEP-BY-STEP INSTRUCTIONS [A] THROUGH [F] IN ORDER AS SHOWN BELOW:

[Step B]. SLIDE PACKING GLAND, ITEM NO. 3, ONTO SHEATH, ITEM NO. 4. KEEP LOCKING NUT AND FERRULES LOOSE BUT ATTACHED TO PACKING GLAND.

[Step A]. INSTALL PACKING GLAND O-RING, ITEM NO. (3d), INTO PACKING GLAND BODY, ITEM NO. (3c).

FLARED END OF SHEATH

[Step D]. THREAD SENSOR CABLE THROUGH SHEATH AND SLIDE THE SENSOR INTO SHEATH UNTIL IT STOPS AGAINST FLARED END.

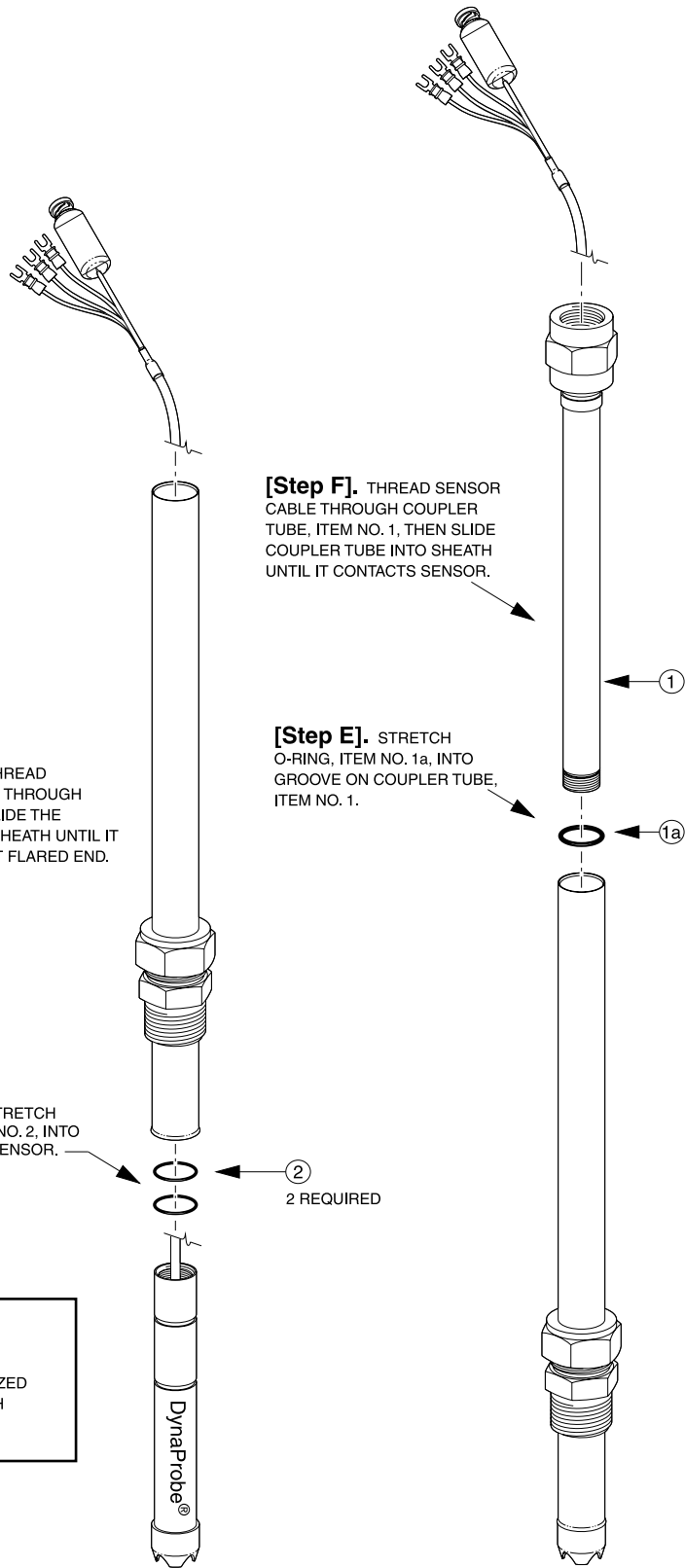
[Step C]. STRETCH O-RINGS, ITEM NO. 2, INTO GROOVES ON SENSOR.

[Step F]. THREAD SENSOR CABLE THROUGH COUPLER TUBE, ITEM NO. 1, THEN SLIDE COUPLER TUBE INTO SHEATH UNTIL IT CONTACTS SENSOR.

[Step E]. STRETCH O-RING, ITEM NO. 1a, INTO GROOVE ON COUPLER TUBE, ITEM NO. 1.

PLEASE NOTE

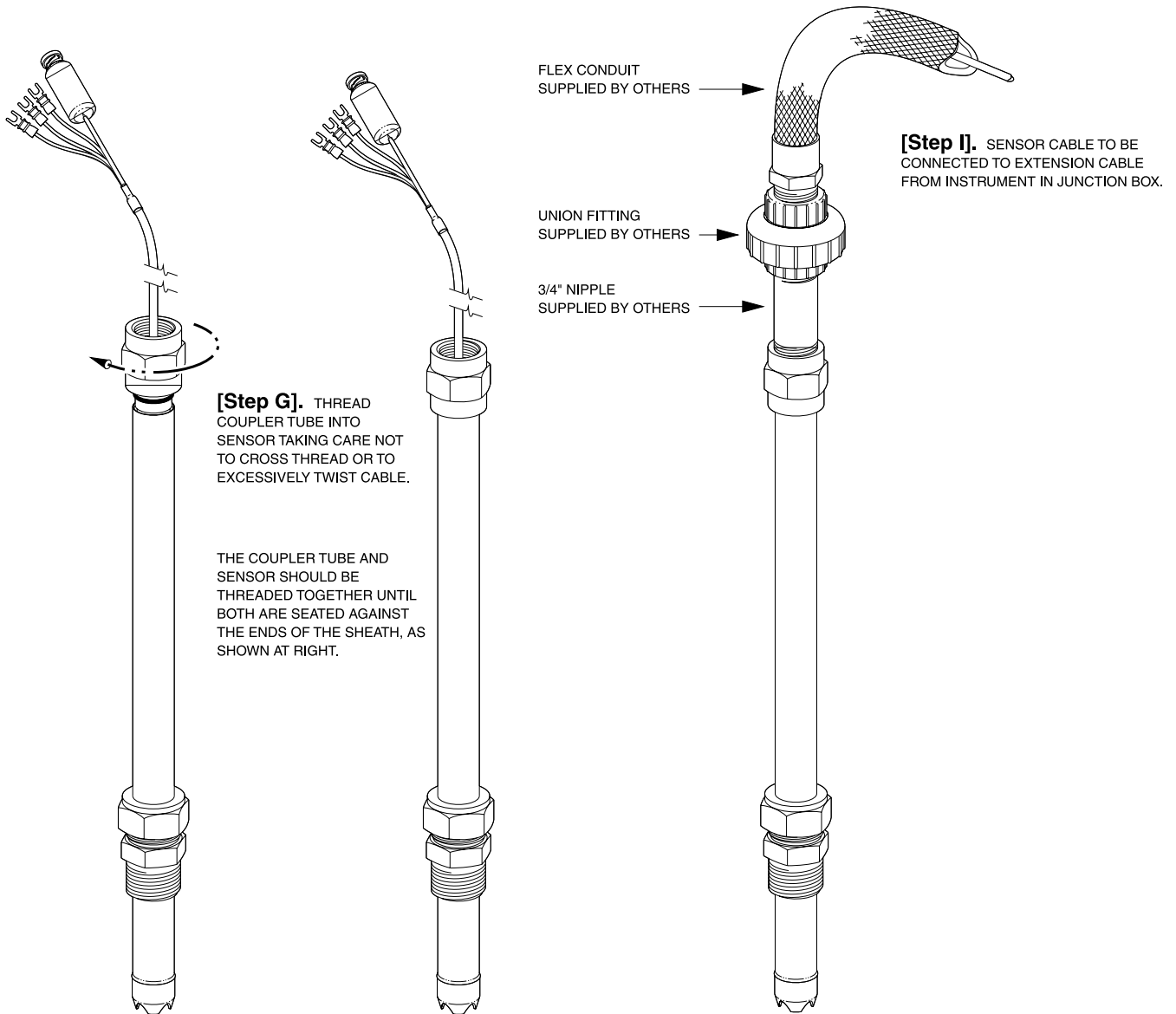
REFER TO EXPLODED VIEW DRAWING AND ITEMIZED PART NUMBER LIST FOR DESCRIPTIONS OF EACH SENSOR ASSEMBLY COMPONENT.



Model SA857 Sensor Assembly Instructions - Stage #1

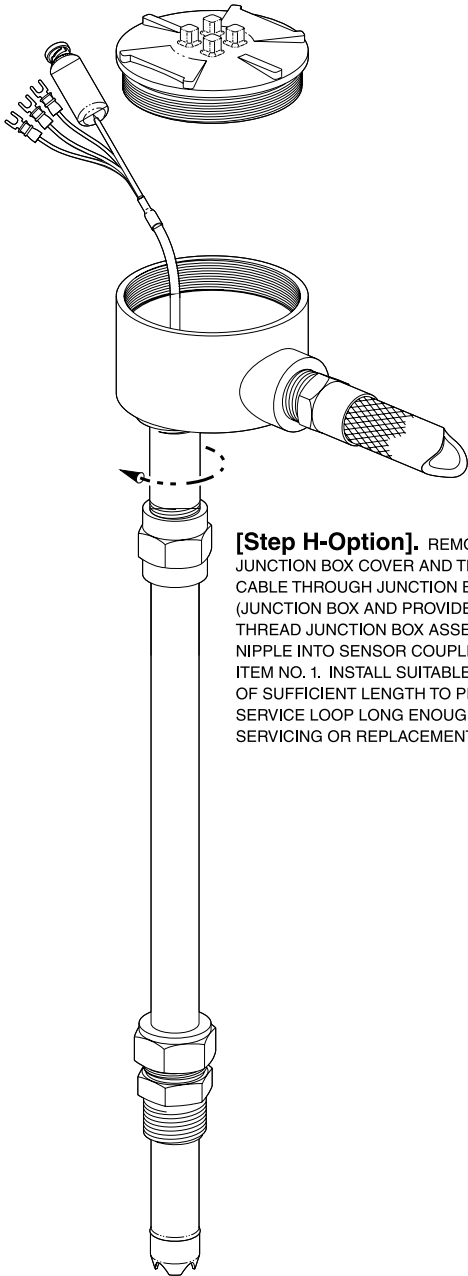
CONTINUE STAGE #1 ASSEMBLY OF THE MODEL SA857 SENSOR BY FOLLOWING THE STEP-BY-STEP INSTRUCTIONS [G] AND [I] IN ORDER AS SHOWN BELOW:

[Step H]. INSTALL SUITABLE FLEX CONDUIT OF SUFFICIENT LENGTH TO PROVIDE A SERVICE LOOP LONG ENOUGH TO ALLOW FOR SERVICING OR REPLACEMENT OF SENSOR. FLEX CONDUIT TO BE CONNECTED TO A JUNCTION BOX SUITABLE FOR AREA OF APPLICATION AND LOCATED AS CLOSE AS POSSIBLE TO THE DynaProbe™ SENSOR. INSTALL A UNION BETWEEN THE FLEX CONDUIT AND THE SENSOR AS SHOWN BELOW TO FACILITATE SENSOR REPLACEMENT (SEE SERVICE INSTRUCTIONS).

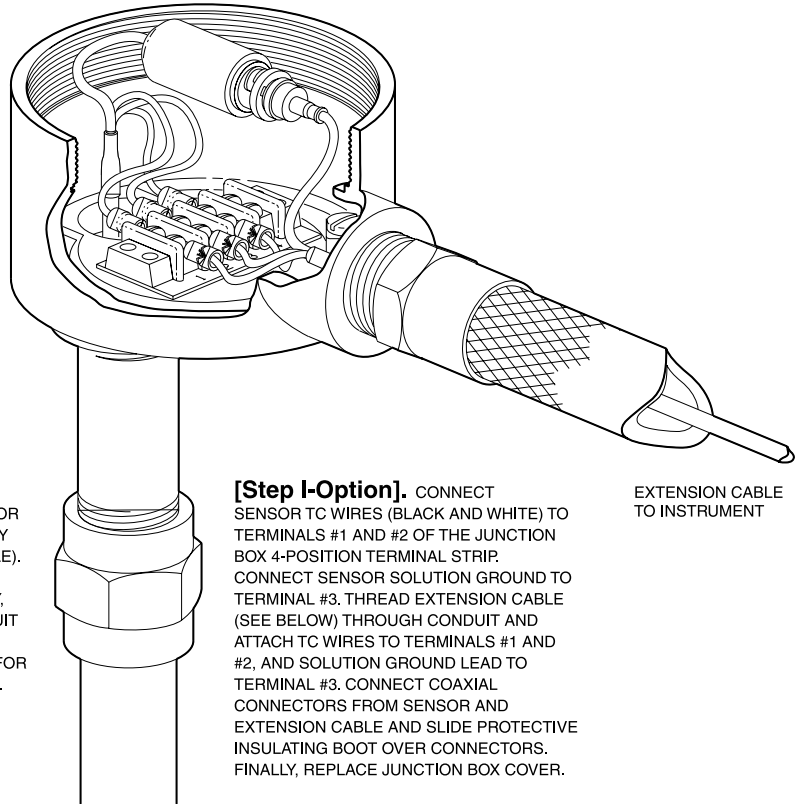


Model SA857 Sensor Assembly Instructions - Stage #1 (Optional Sensor Mounted Junction Box)

INSTALL OPTIONAL SENSOR MOUNTED JUNCTION BOX TO STAGE #1 ASSEMBLY OF THE MODEL SA857 SENSOR BY FOLLOWING THE STEP-BY-STEP INSTRUCTIONS [H-OPTION] AND [I-OPTION] IN ORDER AS SHOWN BELOW:

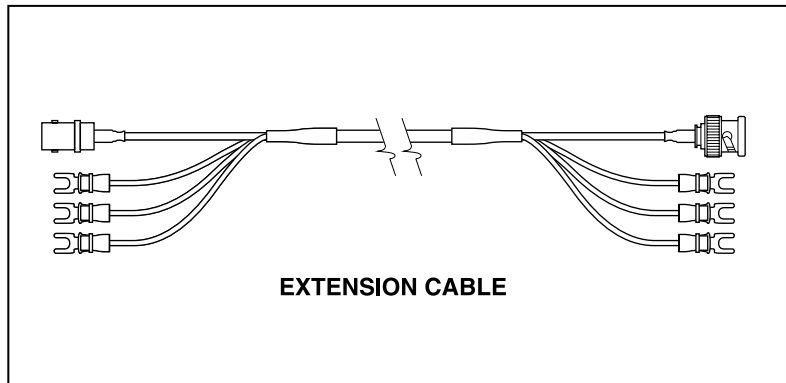


[Step H-Option]. REMOVE JUNCTION BOX COVER AND THREAD SENSOR CABLE THROUGH JUNCTION BOX ASSEMBLY (JUNCTION BOX AND PROVIDED PIPE NIPPLE). THREAD JUNCTION BOX ASSEMBLY PIPE NIPPLE INTO SENSOR COUPLER ASSEMBLY, ITEM NO. 1. INSTALL SUITABLE FLEX CONDUIT OF SUFFICIENT LENGTH TO PROVIDE A SERVICE LOOP LONG ENOUGH TO ALLOW FOR SERVICING OR REPLACEMENT OF SENSOR.



[Step I-Option]. CONNECT SENSOR TC WIRES (BLACK AND WHITE) TO TERMINALS #1 AND #2 OF THE JUNCTION BOX 4-POSITION TERMINAL STRIP. CONNECT SENSOR SOLUTION GROUND TO TERMINAL #3. THREAD EXTENSION CABLE (SEE BELOW) THROUGH CONDUIT AND ATTACH TC WIRES TO TERMINALS #1 AND #2, AND SOLUTION GROUND LEAD TO TERMINAL #3. CONNECT COAXIAL CONNECTORS FROM SENSOR AND EXTENSION CABLE AND SLIDE PROTECTIVE INSULATING BOOT OVER CONNECTORS. FINALLY, REPLACE JUNCTION BOX COVER.

EXTENSION CABLE TO INSTRUMENT



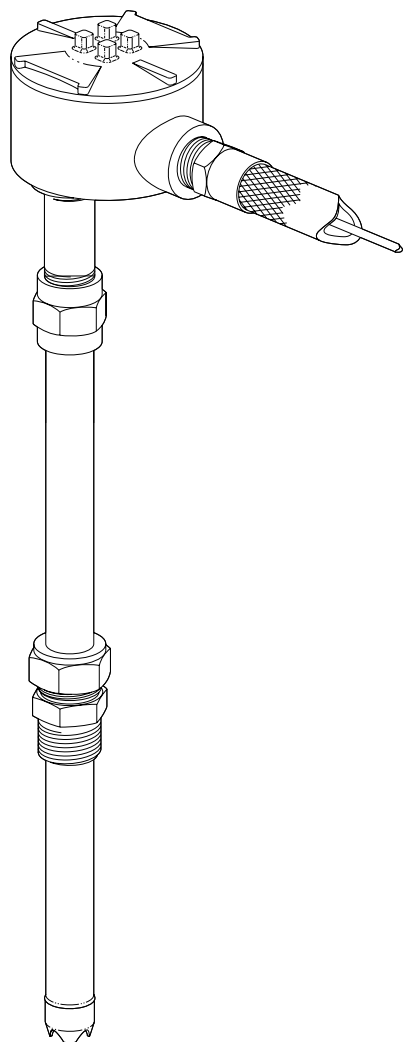
EXTENSION CABLE

Model SA857 Sensor Assembly Instructions - Stage #1

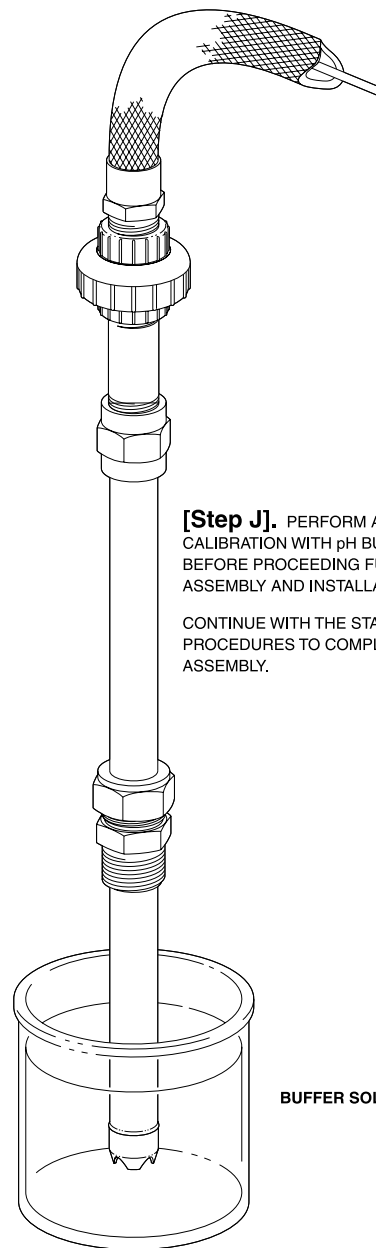
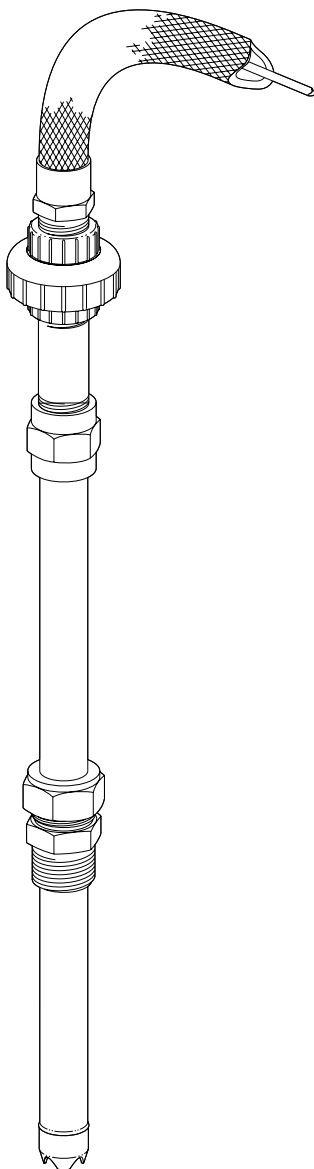
COMPLETE STAGE #1 ASSEMBLY OF THE MODEL SA857
SENSOR BY FOLLOWING INSTRUCTION [J] AS SHOWN BELOW:

THE STAGE #1 ASSEMBLY OF THE SA857 SENSOR IS NOW COMPLETE AND SHOULD
APPEAR AS ONE OF THE TWO ASSEMBLIES SHOWN BELOW.

OPTIONAL SENSOR MOUNTED
JUNCTION BOX ASSEMBLY



THE STANDARD ASSEMBLY



[Step J]. PERFORM A 2-POINT
CALIBRATION WITH pH BUFFER SOLUTIONS
BEFORE PROCEEDING FURTHER WITH THE
ASSEMBLY AND INSTALLATION.

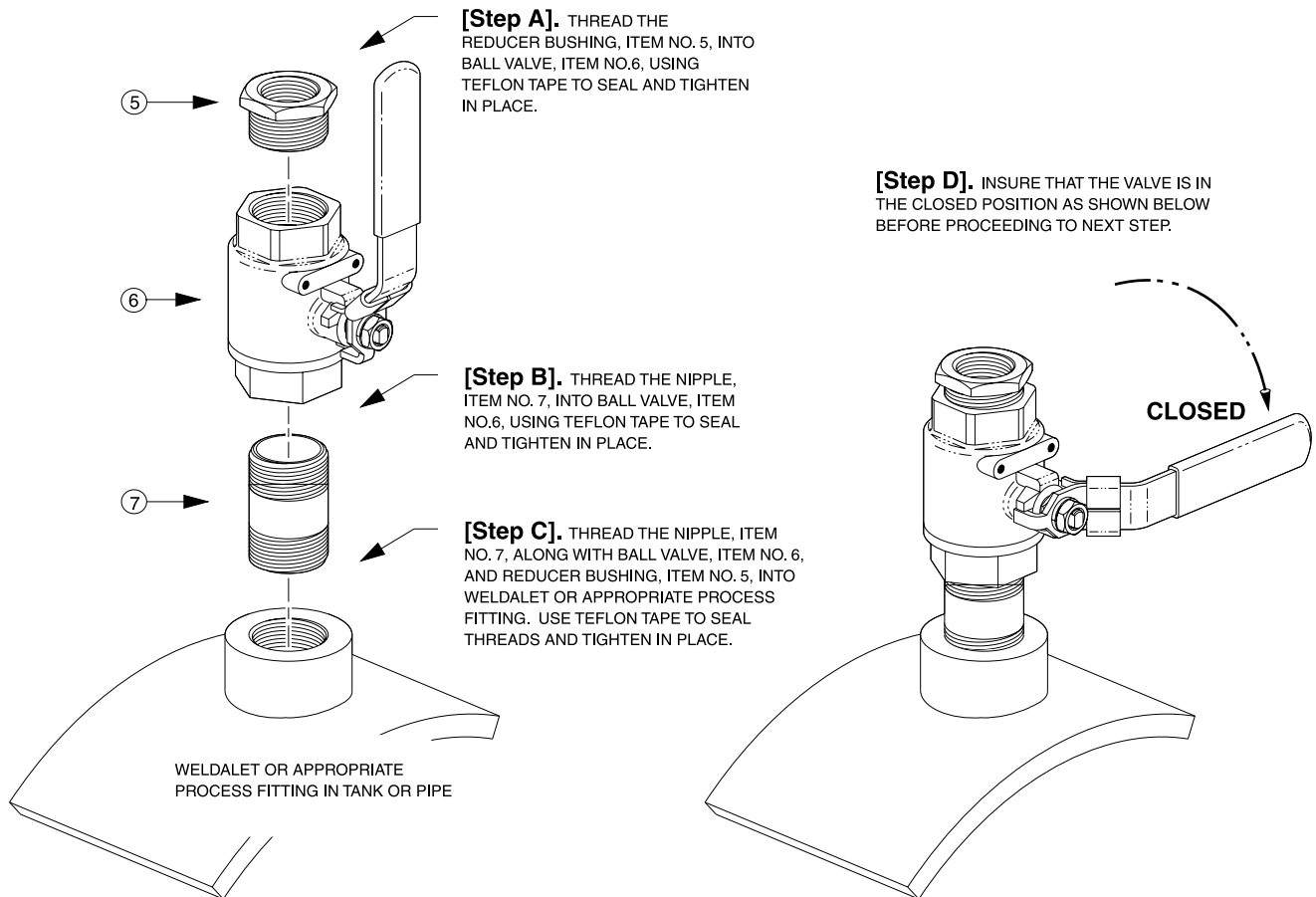
CONTINUE WITH THE STAGE #2 ASSEMBLY
PROCEDURES TO COMPLETE THE FINAL
ASSEMBLY.

BUFFER SOLUTION

Model SA857 Sensor Assembly Instructions - Stage #2

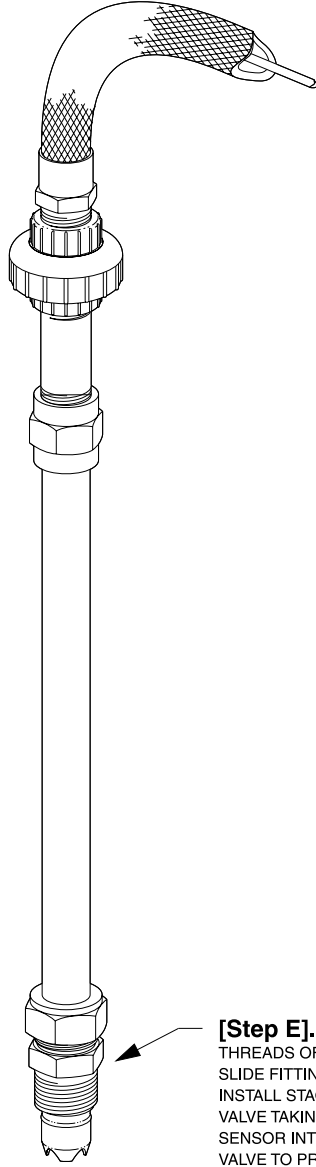
BEGIN STAGE #2 ASSEMBLY OF THE MODEL SA857 SENSOR BY FOLLOWING THE STEP-BY-STEP INSTRUCTIONS [A] THROUGH [D] IN ORDER AS SHOWN BELOW:

○ → REFER TO EXPLODED VIEW DRAWING AND ITEMIZED PART NUMBER LIST FOR DESCRIPTIONS OF EACH SENSOR ASSEMBLY COMPONENT

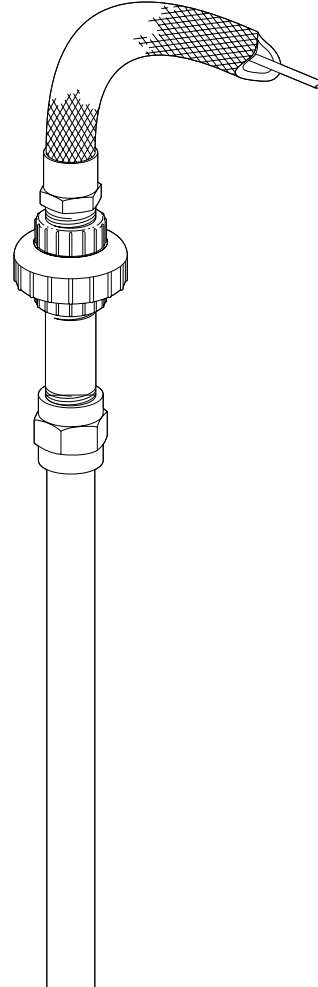


Model SA857 Sensor Assembly Instructions - Stage #2

COMPLETE STAGE #2 ASSEMBLY OF THE MODEL SA857 SENSOR BY FOLLOWING THE STEP-BY-STEP INSTRUCTIONS [E] AND [F] IN ORDER AS SHOWN BELOW:



[Step E]. APPLY TEFLON TAPE TO PIPE THREADS OF PACKING GLAND FITTING AND SLIDE FITTING TO SENSOR END OF SHEATH. INSTALL STAGE #1 SUBASSEMBLY INTO VALVE TAKING CARE NOT TO FORCE THE SENSOR INTO THE BALL PORTION OF THE VALVE TO PREVENT BREAKAGE OF THE GLASS BULB.



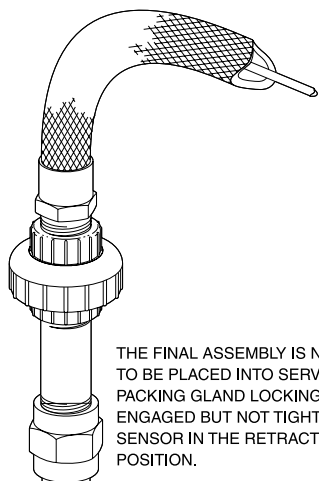
[Step F]. SECURELY TIGHTEN PACKING GLAND FITTING INTO VALVE ASSEMBLY TO PROVIDE A PROPER SEAL.

THE STAGE #2 ASSEMBLY OF THE SA857 SENSOR IS NOW COMPLETE AND SHOULD APPEAR AS SHOWN. DO NOT TIGHTEN PACKING GLAND LOCKING NUT OR OPEN BALL VALVE UNTIL SENSOR ASSEMBLY IS READY TO GO ON-STREAM.

Model SA857 Sensor Assembly Instructions - Stage #3

COMPLETE STAGE #3 ASSEMBLY OF THE MODEL SA857 SENSOR BY FOLLOWING THE STEP-BY-STEP INSTRUCTIONS [A] THROUGH [C] IN ORDER AS SHOWN BELOW:

○ → REFER TO EXPLODED VIEW DRAWING AND ITEMIZED PART NUMBER LIST FOR DESCRIPTIONS OF EACH SENSOR ASSEMBLY COMPONENT.



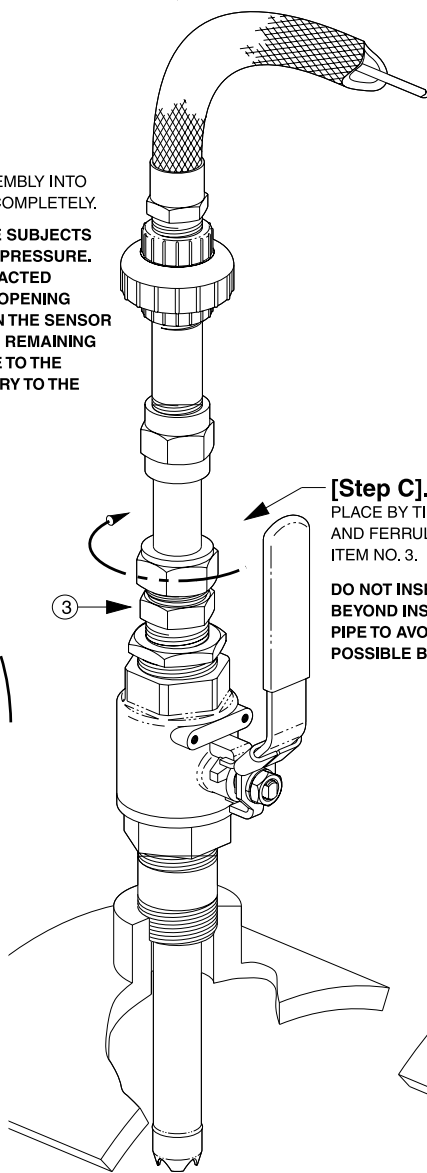
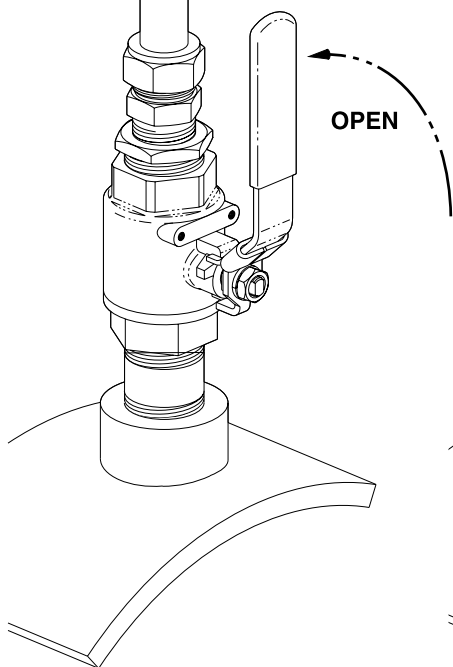
THE FINAL ASSEMBLY IS NOW READY TO BE PLACED INTO SERVICE, WITH PACKING GLAND LOCKING NUT ENGAGED BUT NOT TIGHTENED AND SENSOR IN THE RETRACTED POSITION.

[Step B]. INSERT STAGE #1 SUBASSEMBLY INTO PROCESS.

THE IN SERVICE ASSEMBLY SHOULD APPEAR AS SHOWN BELOW.

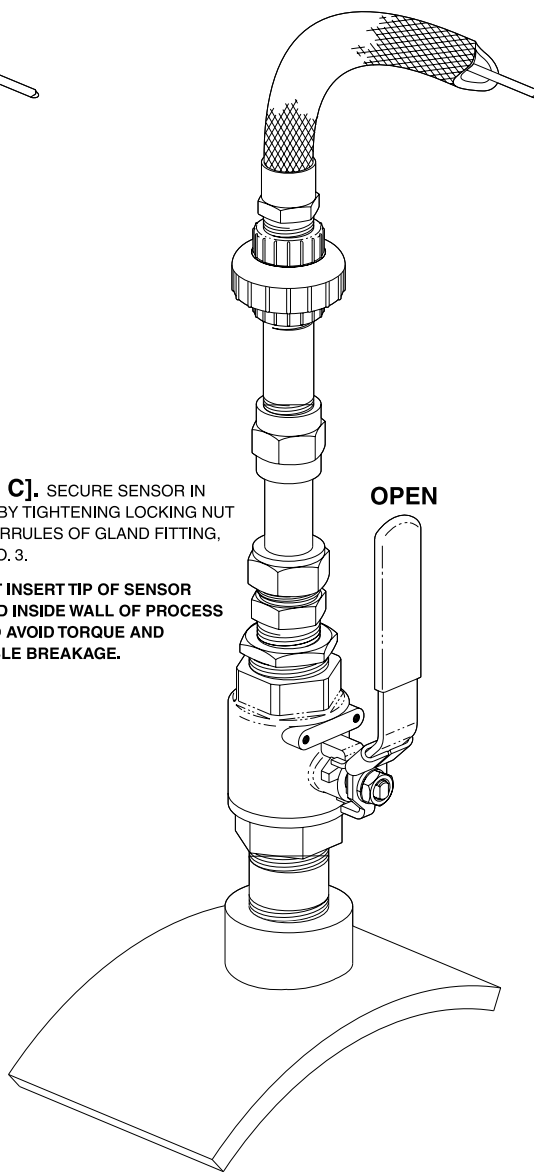
[Step A]. TO PLACE ASSEMBLY INTO SERVICE OPEN BALL VALVE COMPLETELY.

Caution: OPENING VALVE SUBJECTS SENSOR ASSEMBLY TO LINE PRESSURE. IF THE SENSOR IS NOT RETRACTED COMPLETELY AGAINST STOP, OPENING THE VALVE COULD RESULT IN THE SENSOR SUDDENLY RETRACTING THE REMAINING DISTANCE CAUSING DAMAGE TO THE SENSOR ASSEMBLY OR INJURY TO THE SERVICE PERSON.



[Step C]. SECURE SENSOR IN PLACE BY TIGHTENING LOCKING NUT AND FERRULES OF GLAND FITTING, ITEM NO. 3.

DO NOT INSERT TIP OF SENSOR BEYOND INSIDE WALL OF PROCESS PIPE TO AVOID TORQUE AND POSSIBLE BREAKAGE.

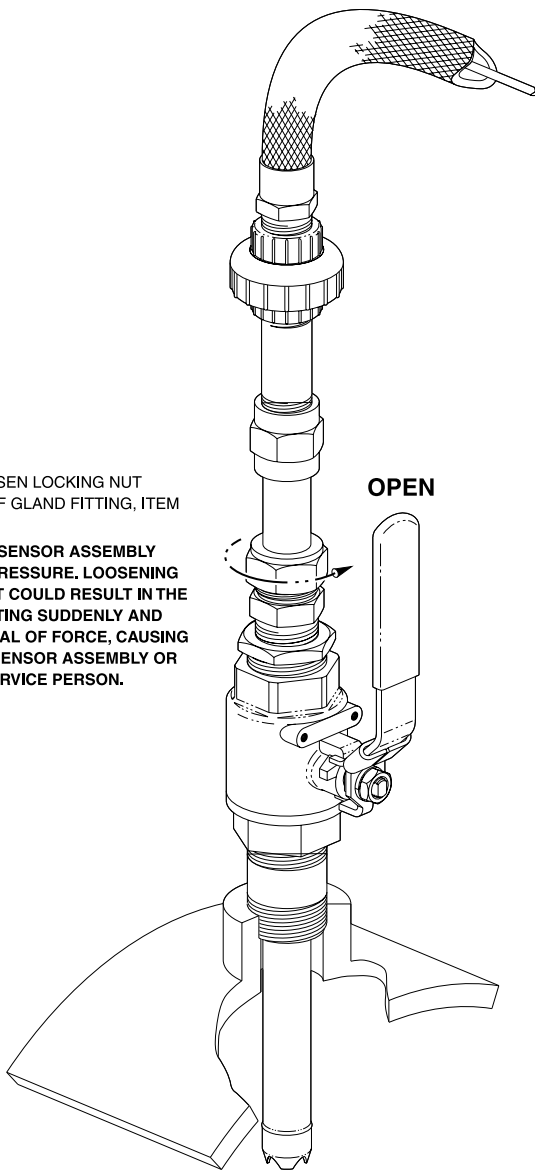


Model SA857 Sensor Service Instructions

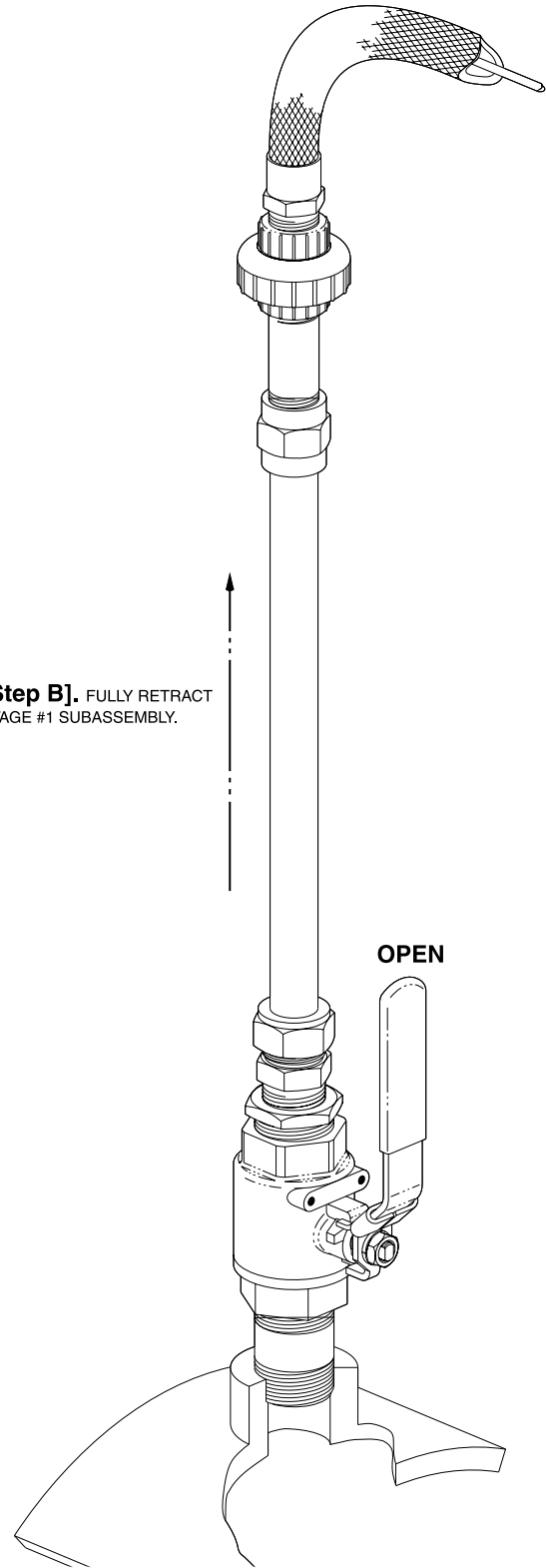
BEGIN SERVICING BY REMOVING THE MODEL SA857 SENSOR FROM SERVICE FOLLOWING THE STEP-BY-STEP INSTRUCTIONS [A] AND [B] IN ORDER AS SHOWN BELOW:

[Step A]. LOOSEN LOCKING NUT AND FERRULES OF GLAND FITTING, ITEM NO. 3.

Caution: THE SENSOR ASSEMBLY IS STILL UNDER PRESSURE. LOOSENING THE LOCKING NUT COULD RESULT IN THE SENSOR RETRACTING SUDDENLY AND WITH A GREAT DEAL OF FORCE, CAUSING DAMAGE TO THE SENSOR ASSEMBLY OR INJURY TO THE SERVICE PERSON.

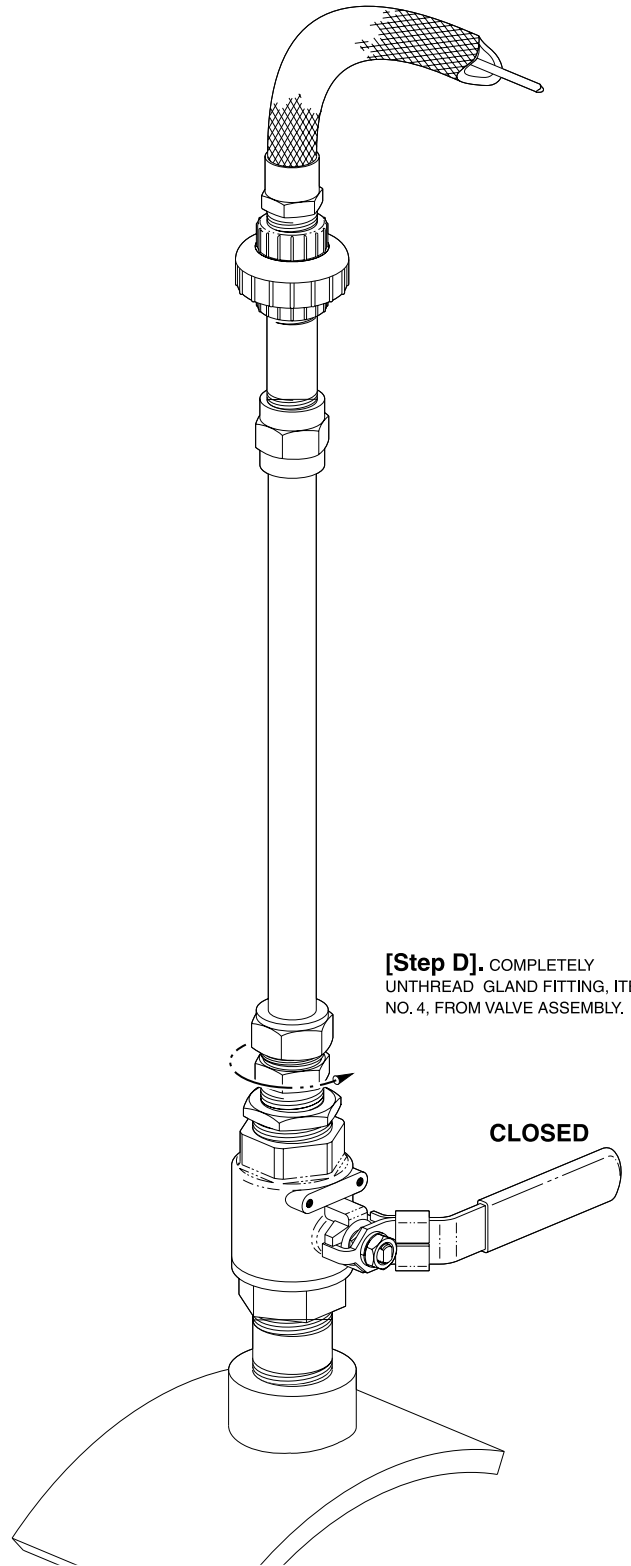
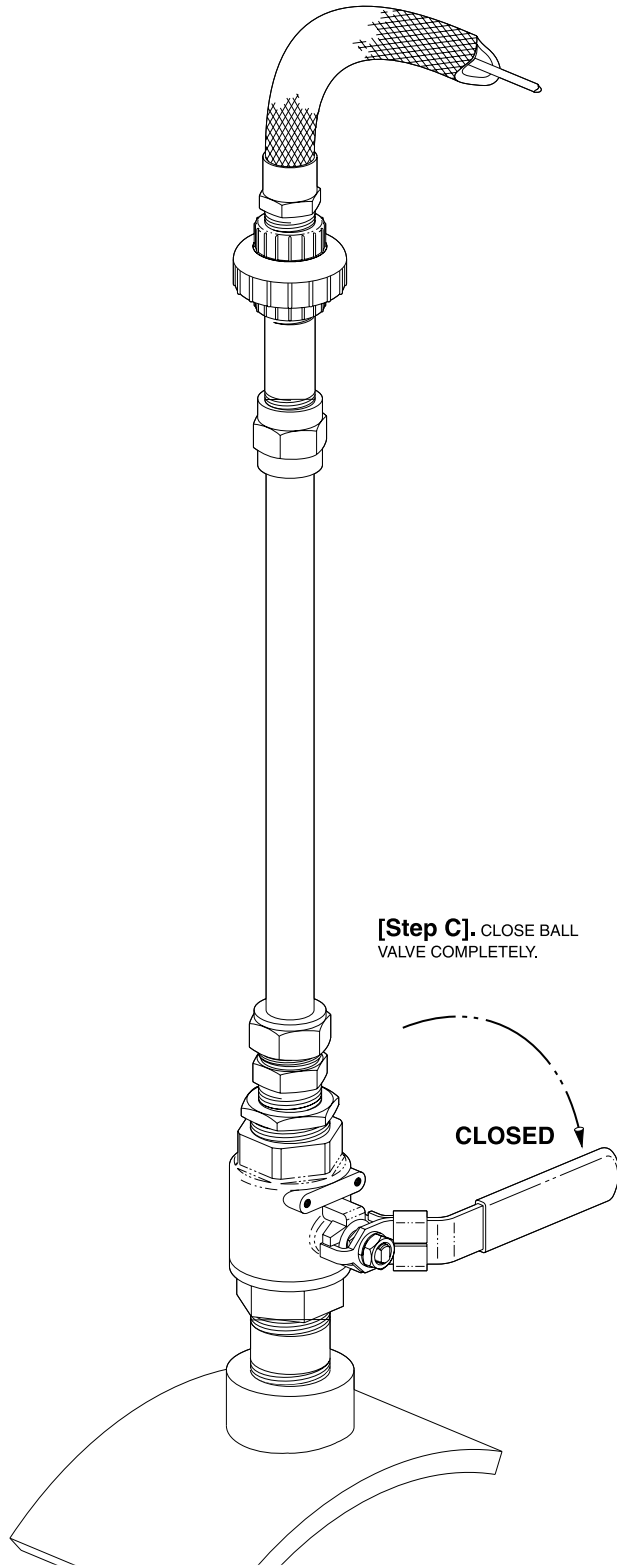


[Step B]. FULLY RETRACT STAGE #1 SUBASSEMBLY.



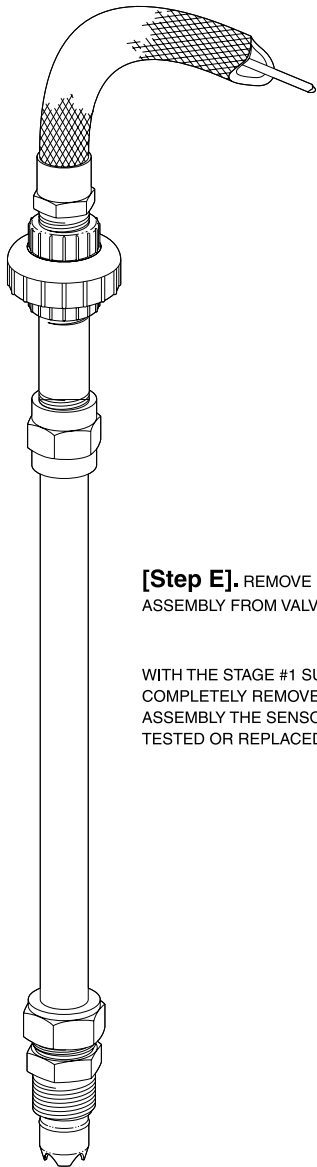
Model SA857 Sensor Service Instructions

CONTINUE SERVICING OF THE MODEL SA864 SENSOR BY FOLLOWING THE STEP-BY-STEP INSTRUCTIONS [C] AND [D] IN ORDER AS SHOWN BELOW:



Model SA857 Sensor Service Instructions

CONTINUE SERVICING OF THE MODEL SA857 SENSOR BY FOLLOWING THE STEP-BY-STEP INSTRUCTIONS [E] THROUGH [G] IN ORDER AS SHOWN BELOW:



[Step E]. REMOVE STAGE #1 ASSEMBLY FROM VALVE ASSEMBLY.

WITH THE STAGE #1 SUBASSEMBLY COMPLETELY REMOVED FROM THE VALVE ASSEMBLY THE SENSOR MAY NOW BE TESTED OR REPLACED.

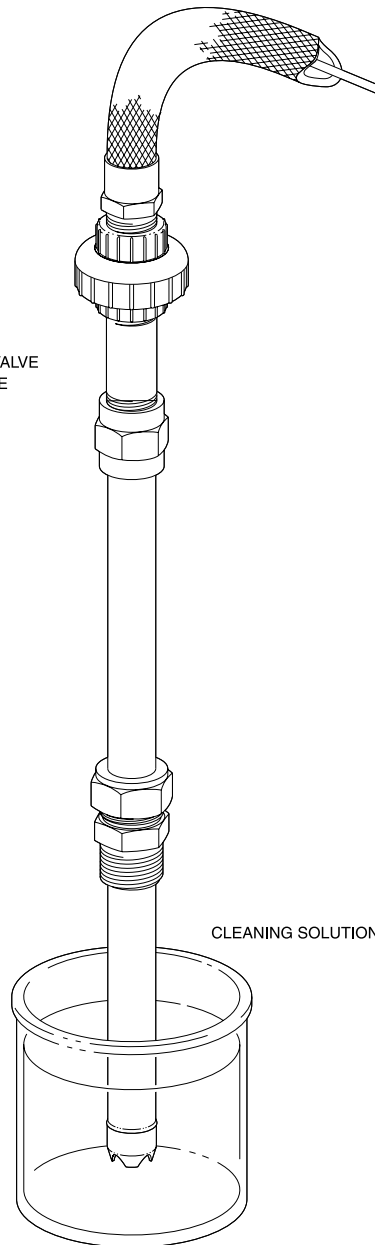
CLOSED

[Step F]. BEFORE TESTING THE SENSOR BE SURE THAT IT IS CLEAN.

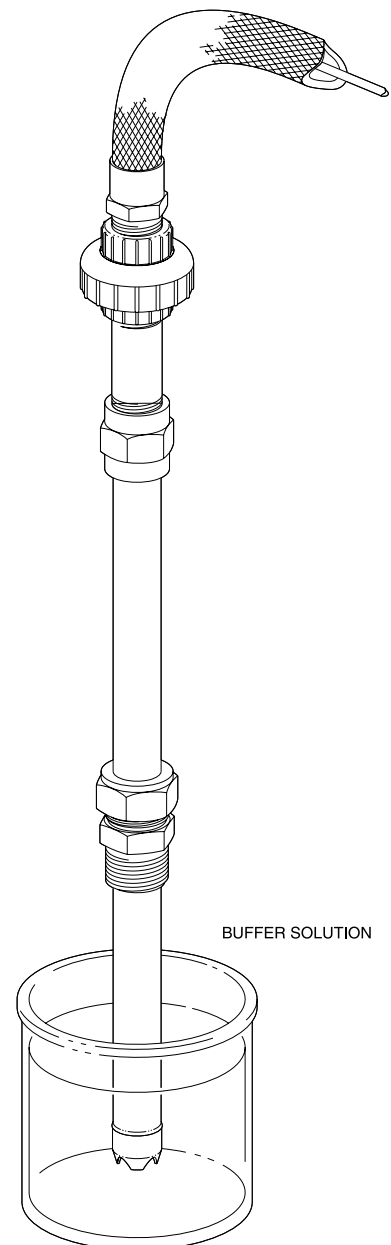
[Step G]. TO TEST SENSOR PERFORM A 2-POINT CALIBRATION WITH pH BUFFER AS SHOWN BELOW.

IF THE SENSOR TESTS WITHIN ACCEPTABLE LIMITS REINSTALL AND PLACE SENSOR BACK IN SERVICE BY FOLLOWING ASSEMBLY INSTRUCTIONS FROM STAGE #2 STEP "D" TO THE COMPLETION OF STAGE #3.

IF TESTING PROVES SENSOR TO BE FAULTY, CONTINUE WITH THE SERVICE INSTRUCTIONS FOR SENSOR REPLACEMENT.



CLEANING SOLUTION

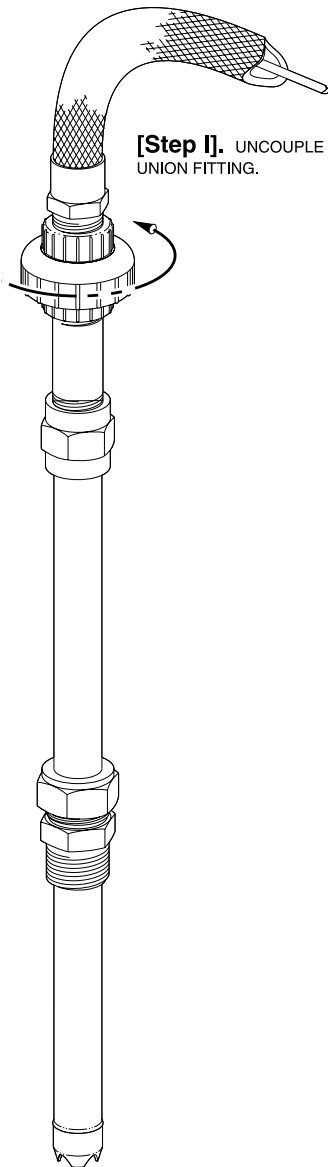


BUFFER SOLUTION

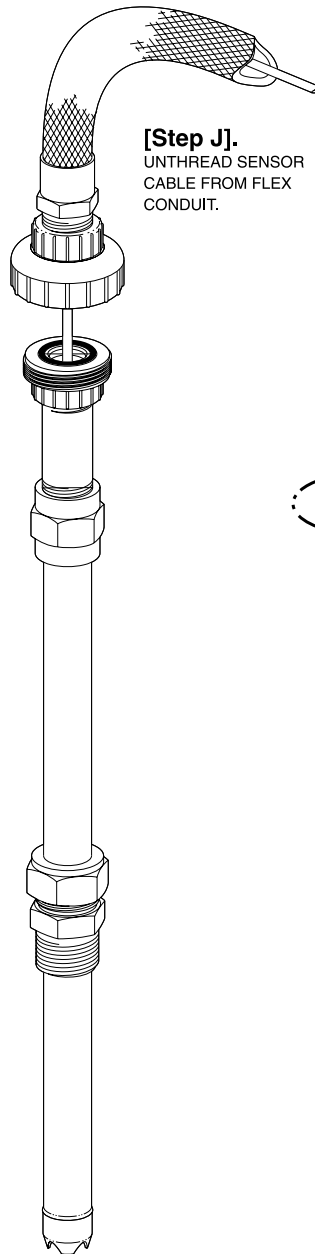
Model SA857 Sensor Service Instructions

CONTINUE SERVICING OF THE MODEL SA857 SENSOR BY FOLLOWING THE STEP-BY-STEP SENSOR REPLACEMENT INSTRUCTIONS [H] THROUGH [M] IN ORDER AS SHOWN BELOW:

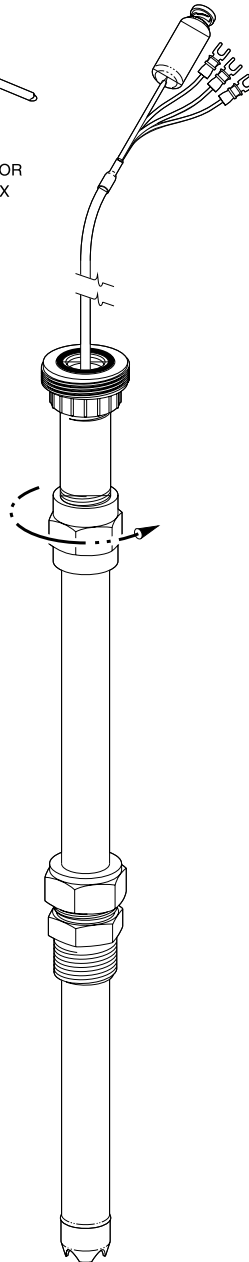
[Step H]. DISCONNECT SENSOR CABLE INSIDE OF JUNCTION BOX FROM EXTENSION CABLE TO INSTRUMENT.



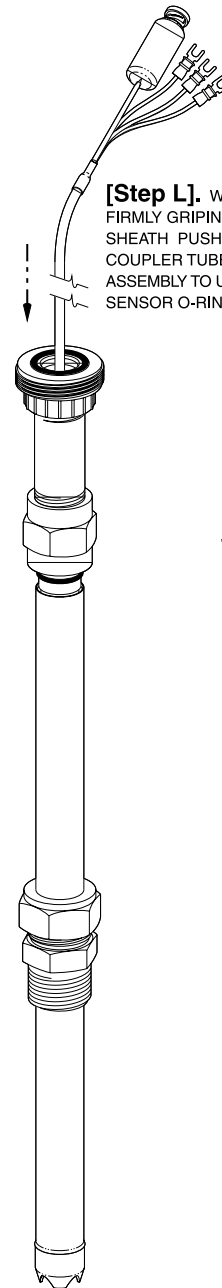
[Step I]. UNCOUPLE UNION FITTING.



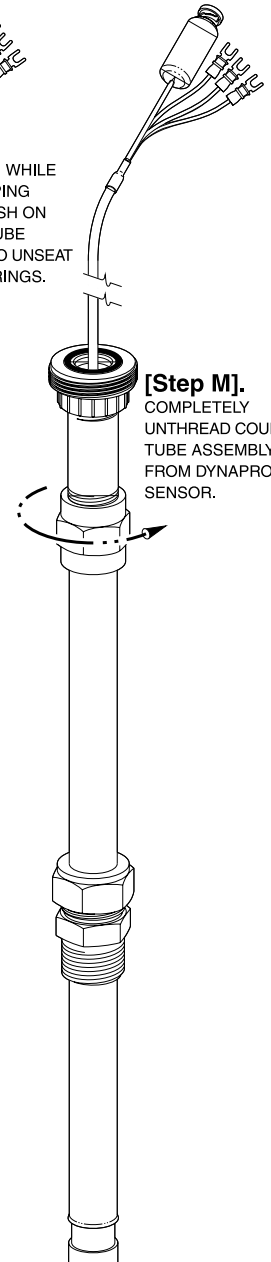
[Step J]. UNTHREAD SENSOR CABLE FROM FLEX CONDUIT.



[Step K]. AT THIS POINT THE SENSOR ASSEMBLY SHOULD BE COMPLETELY DETACHED FROM THE FLEX CONDUIT. UNTHREAD COUPLER TUBE BUT DO NOT COMPLETELY DISENGAGE FROM SENSOR.



[Step L]. WHILE FIRMLY GRIPPING SHEATH PUSH ON COUPLER TUBE ASSEMBLY TO UNSEAT SENSOR O-RINGS.



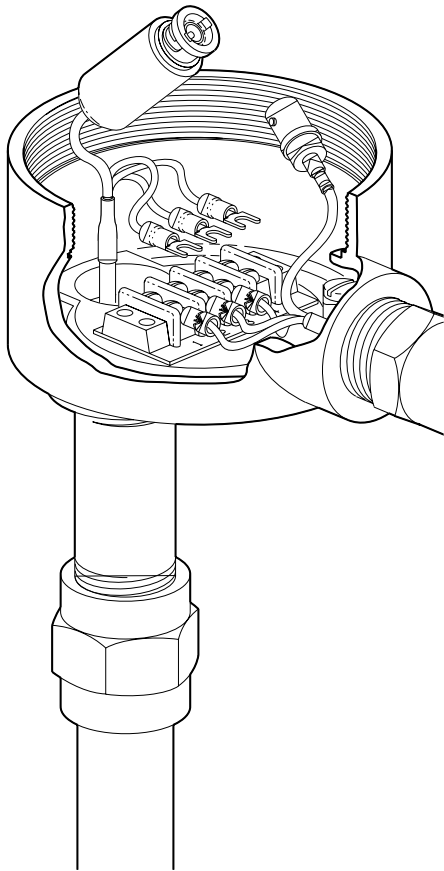
[Step M]. COMPLETELY UNTHREAD COUPLER TUBE ASSEMBLY FROM DYNAPROBE SENSOR.

DYNAPROBE SENSOR

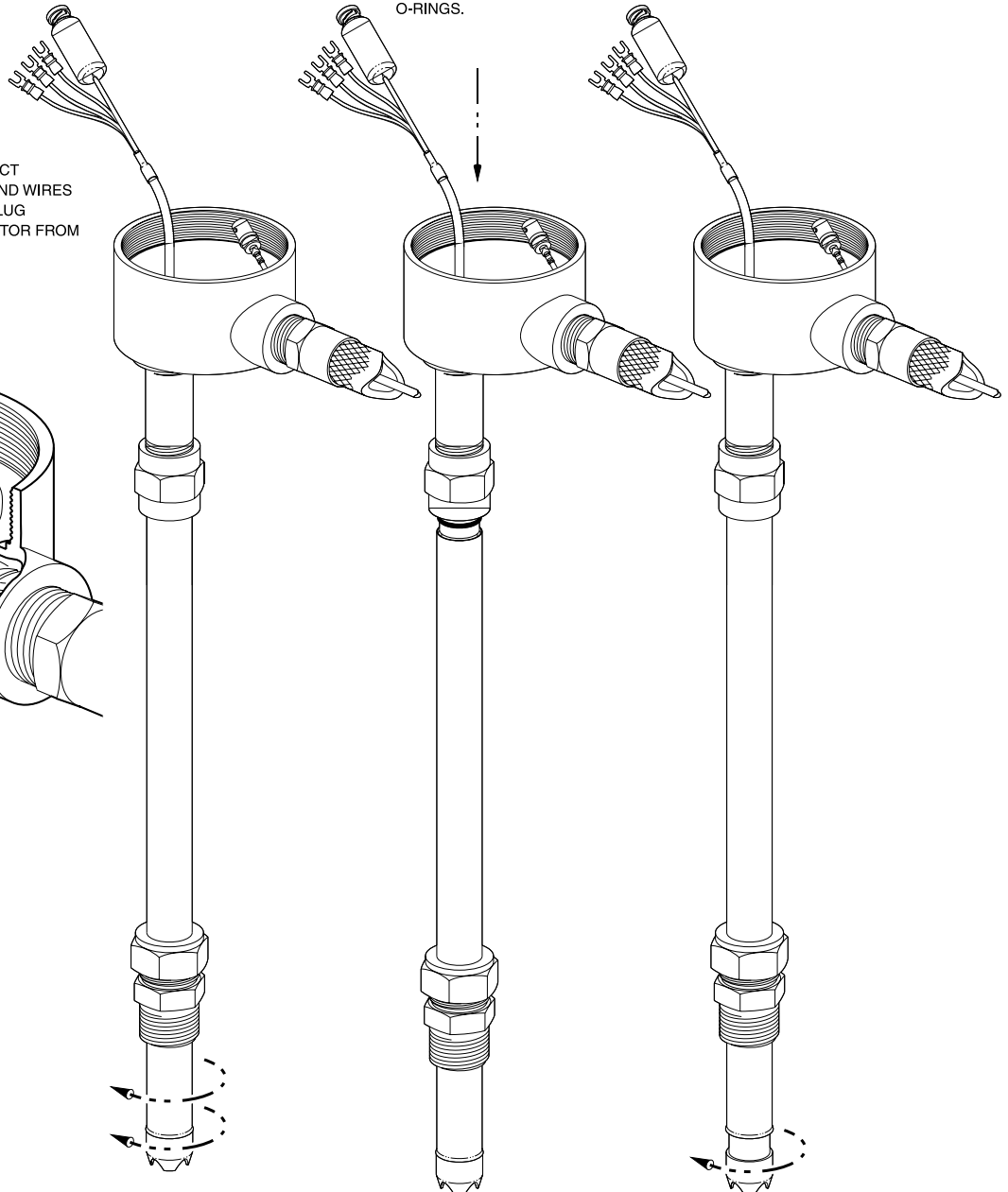
Model SA857 Sensor Service Instructions (Optional Sensor Mounted Junction Box)

TO DISASSEMBLE THE MODEL SA857 SENSOR WITH AN OPTIONAL SENSOR MOUNTED JUNCTION BOX, FOLLOW THE STEP-BY-STEP INSTRUCTIONS [H-OPTION] THROUGH [K-OPTION] IN ORDER AS SHOWN BELOW:

[Step H-Option]. REMOVE JUNCTION BOX COVER. DISCONNECT SENSOR TC AND SOLUTION GROUND WIRES FROM TERMINALS 1, 2 AND 3. UNPLUG SENSOR COAXIAL CABLE CONNECTOR FROM EXTENSION CABLE.



[Step J]. WHILE FIRMLY GRIPPING SHEATH, PUSH ON COUPLER TUBE - JUNCTION BOX ASSEMBLY TO UNSEAT SENSOR O-RINGS.



[Step I-Option]. WHILE FIRMLY GRIPPING THE SENSOR AND THE SHEATH AT THE SAME TIME, UNTHREAD THEM FROM THE COUPLER ASSEMBLY BUT DO NOT COMPLETELY DISENGAGE THREADS.

[Step K-Option]. COMPLETELY UNTHREAD SENSOR FROM COUPLER TUBE ASSEMBLY.

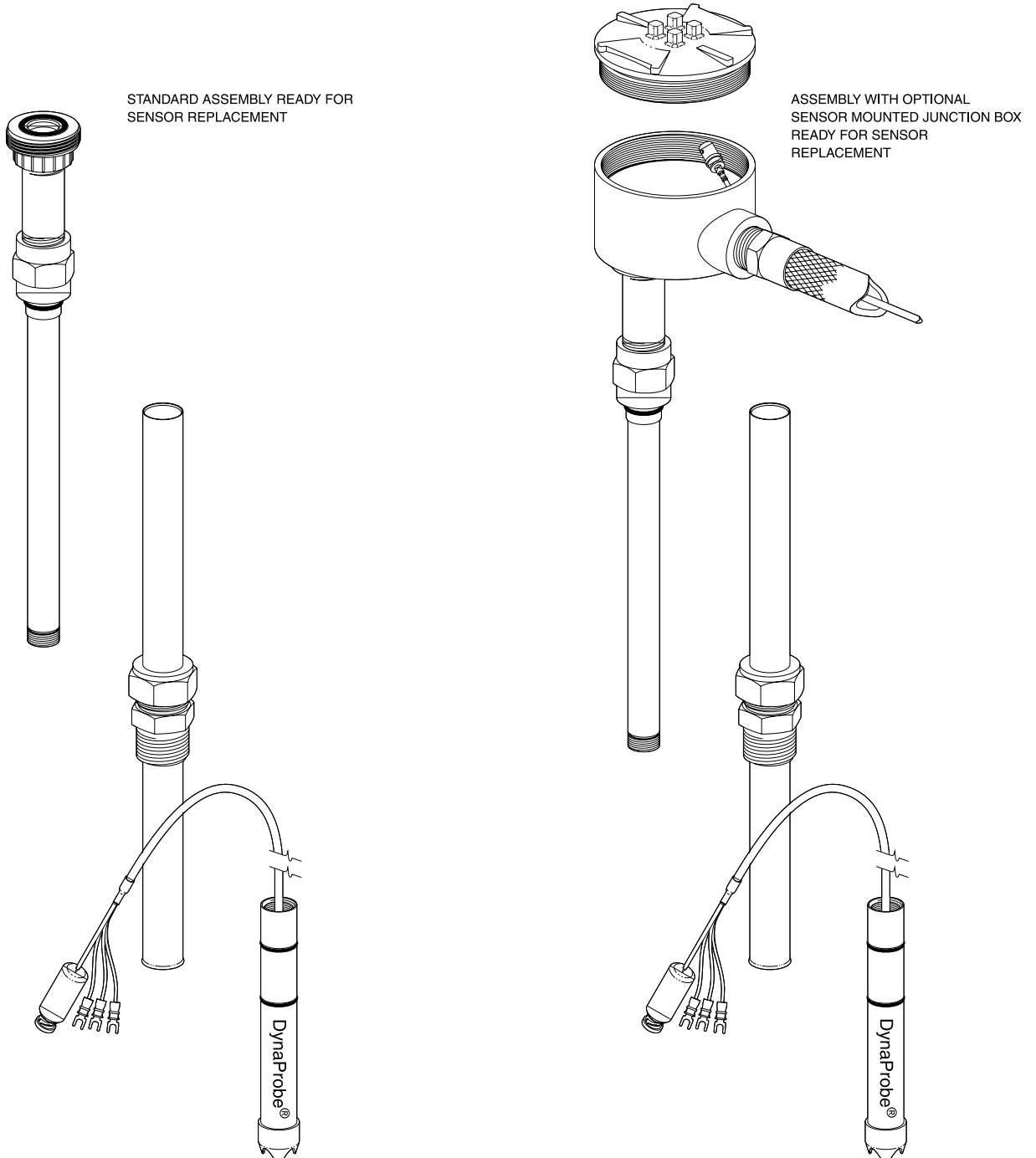
CONTINUE WITH SERVICE INSTRUCTIONS AT STEP "N".

Model SA857 Sensor Service Instructions

CONTINUE SERVICING OF THE MODEL SA857 SENSOR BY FOLLOWING THE STEP-BY-STEP SENSOR REPLACEMENT INSTRUCTIONS [K] THROUGH [N] IN ORDER AS SHOWN BELOW:

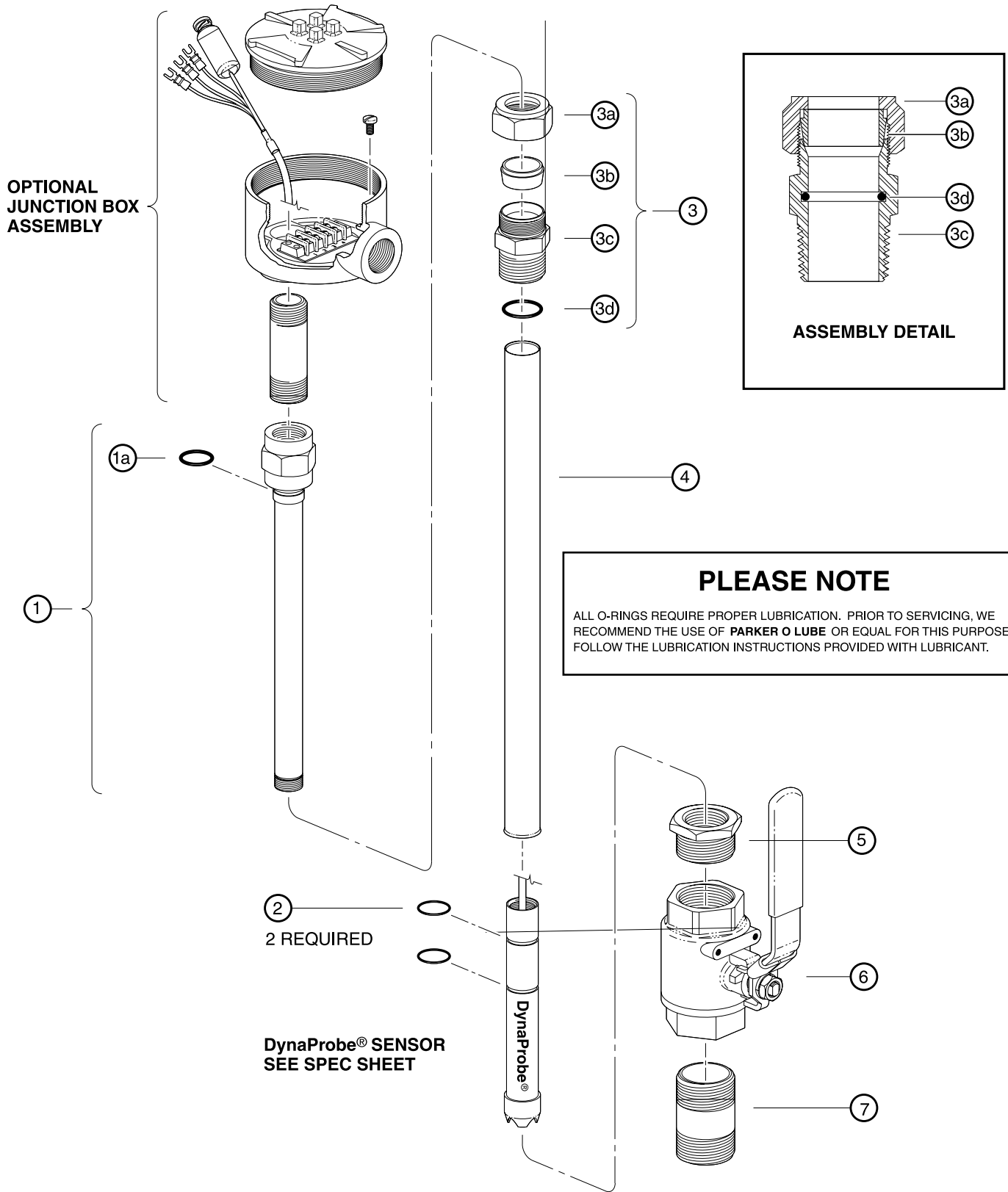
[Step N]. SENSOR MAY NOW BE DISASSEMBLED INTO THE COMPONENT PARTS AS SHOWN IN ONE OF THE ILLUSTRATIONS BELOW.

TO INSTALL A NEW SENSOR AND RETURN THE MODEL SA857 TO SERVICE, FOLLOW THE ASSEMBLY INSTRUCTIONS STARTING FROM STAGE #1 STEP "D" TO THE COMPLETION OF STAGE #3. EXCLUDE STEP "E" OF STAGE #1 AND STEPS "A", "B" AND "C" OF STAGE #2.



SA857 SENSOR HOUSING ASSEMBLY

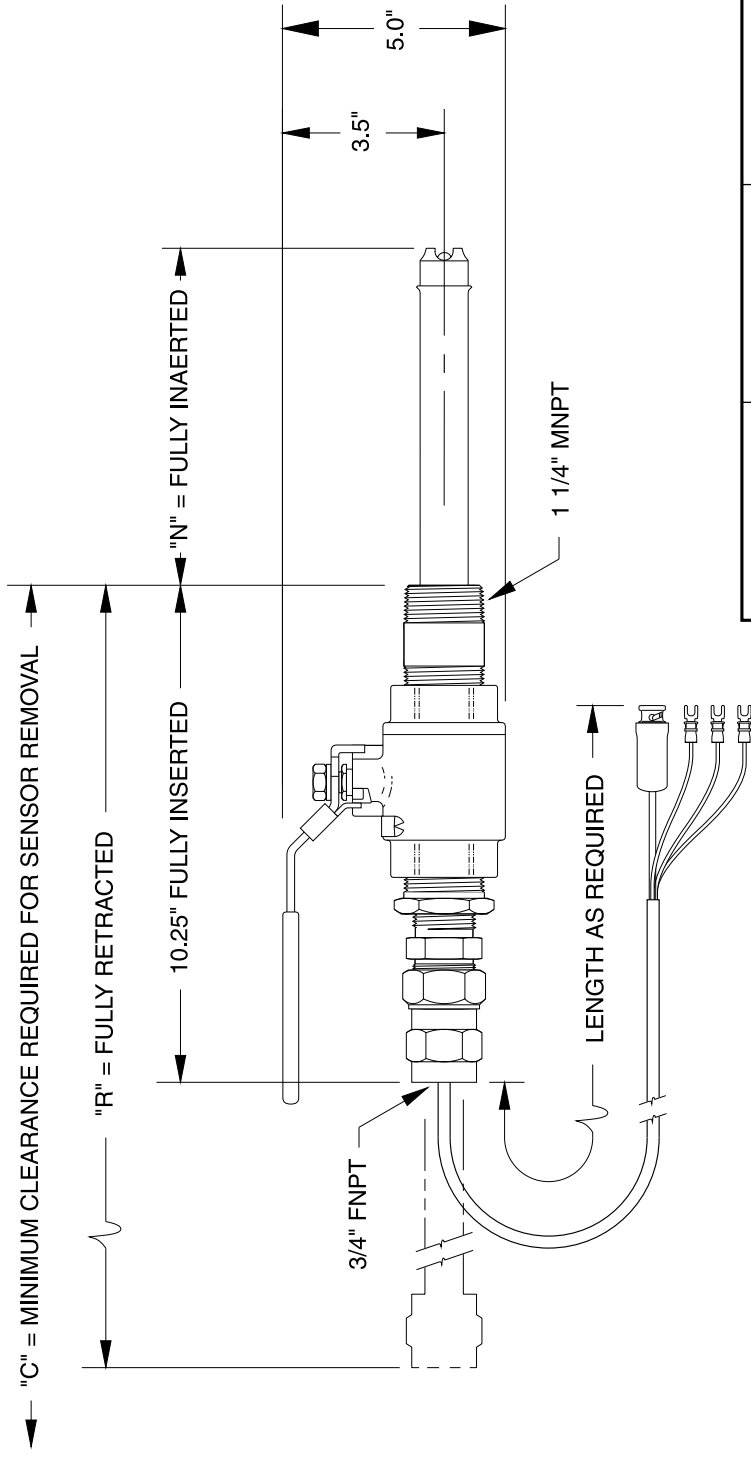
See Itemized List for Part Number & Description



SA857 SENSOR HOUSING ASSEMBLY

EXPLODED VIEW ITEMIZED PART NRS., DESCRIPTIONS, & FAB DRWG. NRS.

Item	Part Number	Description	Fab Drawing Number
1-07	SA857-A-P100	Coupler Assembly, Kynar (PVDF), N= 7"	F1087
1-11	SA857-A-P101	Coupler Assembly, Kynar (PVDF), N= 11"	F1087
1-15	SA857-A-P102	Coupler Assembly, Kynar (PVDF), N= 15"	F1087
1-21	SA857-A-P103	Coupler Assembly, Kynar (PVDF), N= 21"	F1087
1-27	SA857-A-P104	Coupler Assembly, Kynar (PVDF), N= 27"	F1087
1a	SA857-A-P110	O-Ring, Coupler, Viton	n/a
2	SA857-A-P111	O-Ring, Sensor, Viton	n/a
3	SA857-A-P115	Compression Fitting, 1" Tube X 1" MNPT, 316L SS	n/a
3a	SA857-A-P116	Nut, Compression Fitting	F1094
3b	SA857-A-P120	Ferrule, Compression Fitting, Kynar (PVDF)	F1091
3c	SA857-A-P121	Body, Compression Fitting	F1094
3d	SA857-A-P122	O-Ring, Compression Fitting, Viton	n/a
4-07-6	SA857-A-P130	Sheath, 316L SS, N=7"	F1092
4-07-T	SA857-A-P131	Sheath, Titanium, N=7"	F1092
4-07-H	SA857-A-P132	Sheath, Hastelloy C, N=7"	F1092
4-11-6	SA857-A-P133	Sheath, 316L SS, N=11"	F1092
4-11-T	SA857-A-P134	Sheath, Titanium, N=11"	F1092
4-11-H	SA857-A-P135	Sheath, Hastelloy C, N=11"	F1092
4-15-6	SA857-A-P136	Sheath, 316L SS, N=15"	F1092
4-15-T	SA857-A-P137	Sheath, Titanium, N=15"	F1092
4-15-H	SA857-A-P138	Sheath, Hastelloy C, N=15"	F1092
4-21-6	SA857-A-P139	Sheath, 316L SS, N=21"	F1092
4-21-T	SA857-A-P140	Sheath, Titanium, N=21"	F1092
4-21-H	SA857-A-P141	Sheath, Hastelloy C, N=21"	F1092
4-27-T	SA857-A-P142	Sheath, Titanium, N=27"	F1092
5	SA857-A-P125	Bushing, 1 1/4" MNPT x 1" FNPT, 316L SS	F1093
6	SA857-A-P150	Ball Valve, Full Port, 1 1/4" NPT, 316L SS	n/a
7	SA857-A-P155	Insertion Nipple, 1 1/4" NPT, 316L SS	n/a
Sensor	See Spec Sheet	DynaProbe Sensor	n/a
Option	SA 857-A-P160	Junction Box Assembly, Sensor Mounted	n/a



MODEL NO.	"N" LENGTH	"R" DIMENSION	"C" DIMENSION
SA857-6L07	7.0"	22.65"	24.0"
SA857-6L11	11.0"	26.65"	28.0"
SA857-6L15	15.0"	30.65"	32.0"
SA857-6L21	21.0"	34.65"	36.0"
SA857-6L27	27.0"	38.75"	40.0"

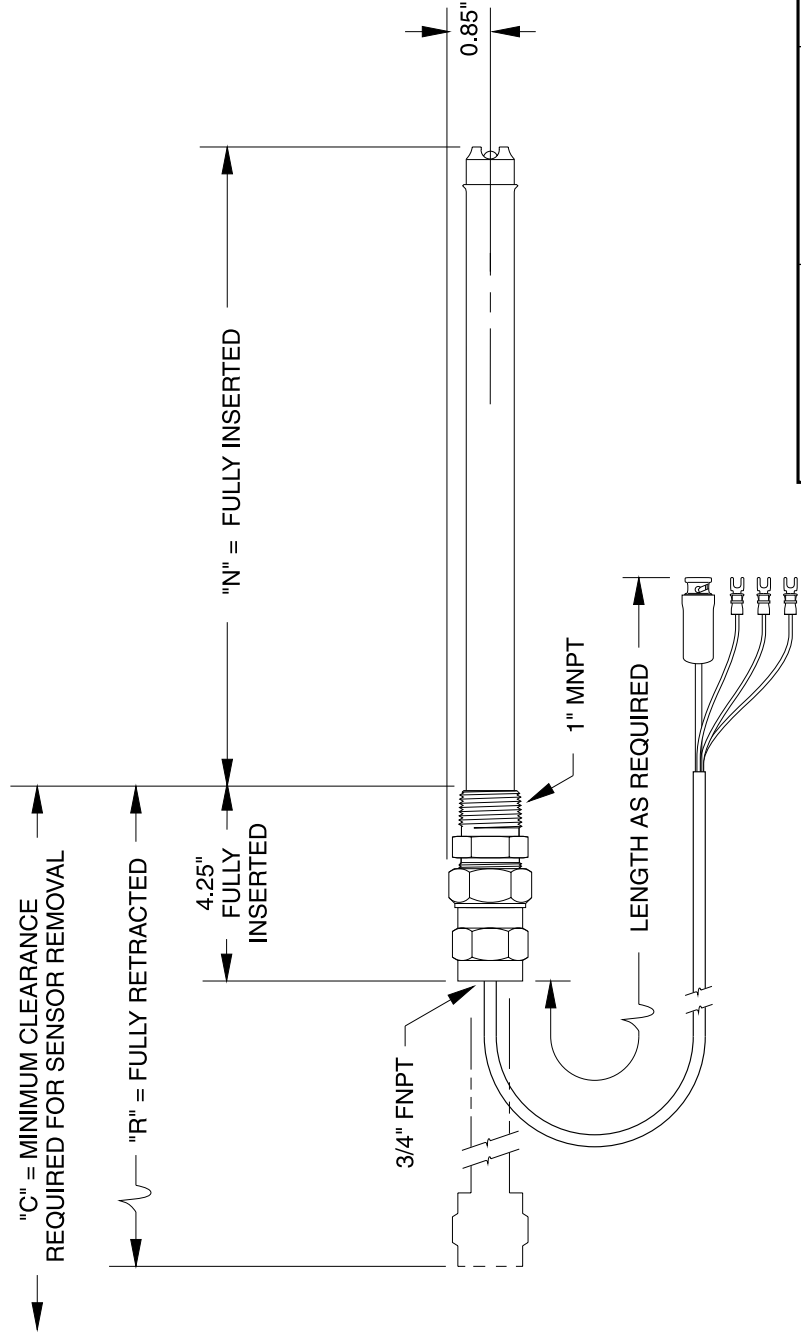
**Broadley-James®
Corporation**
19 Thomas • Irvine, California 92618 USA
Tel: (949) 829-5555 • Fax: (949) 829-5560

Title: **SA857 Retraction Assembly:
Dimensions & Clearance Requirements**

Date: 8-Sept-93
Scale: —
Drawn By: R. Ramus

Group: Dynaprobe
Type: Product Data
Part Nr: SA857

Drwg Nr: **P1048**
Sheet: 1 / 1
Rev: **B**



MODEL NO.	"N" LENGTH	"R" DIMENSION	"C" DIMENSION
SA858-6L07	13.25"	13.75"	17.50"
SA858-6L11	17.25"	17.75"	21.50"
SA858-6L15	21.25"	21.75"	25.25"
SA858-6L21	27.25"	27.75"	31.50"
SA858-6L27	33.25"	33.75"	37.50"

Broadley-James® Corporation 19 Thomas • Irvine, California 92618 USA Tel: (949) 829-5555 • Fax: (949) 829-5560	Title:		Date: 7 Sept-93	Group: DynaProbe	Dwg Nr: P1111
	SA858 Insertion Assembly: Dimensions & Clearance Requirements		Scale: ———	Type: Product Data	
			Drawn By: R. Ramus	Part Nr: SA858	Sheet: 1 / 1