BRAVO
PROBLEM SOLVED

INSTALLATION GUIDE

Tall Collar Tank Sump Doublewall

Part #'s B423, B483, B453

Step by step installation

Step 1 – Abrade Tank Top
Step 2 – Apply Paste to Tank Top
Step 3 – Sump Tank to Base Lamination
Step 4 – Prepping Sump Top
Step 5 – Cutting Sump Top
Step 6 – Complete V=Channel Joint
Step 7 – Install Sump Top
Step 8 – Testing
Step 9 – Doublewall Filling Procedures
Step 10 – Install Tube to Manometer
Step 11 – Troubleshoot/Repair
Step 12 – Doublewall Fiberglass Repair
Step 13 – Topping Off Bravo IF
Step 14 – Doublewall Fiberglass Repair

Required Items

T-400 Tool Kit (1)

K-402 Lam 2 gal Kit (1)
K-401 Lam 1 gal Kit (1)

K-410 1 gal Paste Kit (1)
K-410.5 ½ gal Paste Kit (1)

K-900 Vacuum Kit

EPC-S1.0 Slurry 1 gal Kit (1)

SAFETY FIRST

Safety First. S. Bravo Systems, Inc. recommends adherence to standard safety procedures and precautions provided by your company and to follow the regulations and compliances by OSHA, local, state and federal regulations regarding the use of this product.

UL LISTED
UL 2447

Epoxy cure cycle. Full cure cycles vary depending on site conditions. Note that epoxy will not cure at temperatures below 40°F. See epoxy jar for more details.

UL2447 is the standard for secondary containment and covers sumps and lids, sump fittings and sump accessories. Products are tested in accelerated conditions that have long term use in environments with extreme heat and cold, aggressive biofuel and ethanol blends, and extreme soil environments.

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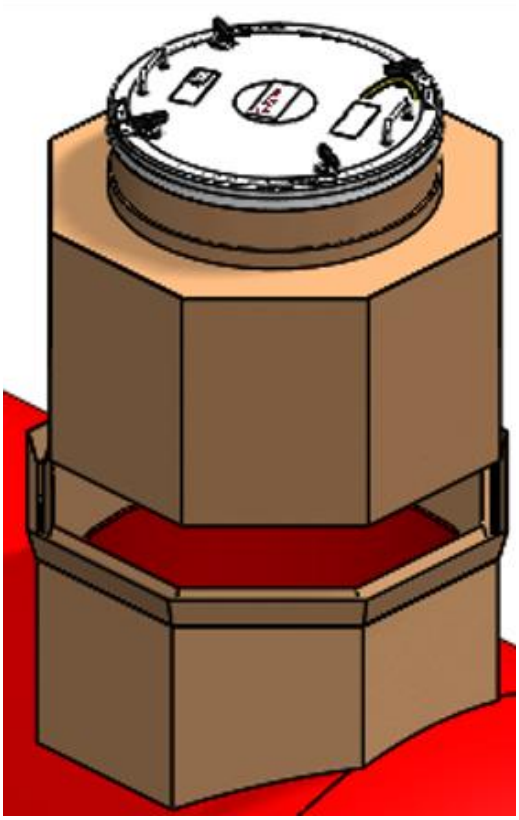
HOW TO INSTALL TALL COLLAR TANK SUMP - DOUBLEWALL

STEP 1 – ABRADE TANK TOP

1. Abrade tank top and laminate per tank manufacturers' instructions.
2. Factory saddle cut base
   a. Set base on tank, level and mark base for any adjustments.
   b. Mark base location on tank top.
   c. Modify using appropriate tools, if necessary.
   d. Sand base at base 4" inside and outside surfaces.
   e. Clean with acetone.
3. Field cut base
   a. Use provided template to mark base.
   b. Cut along line using appropriate tool.
   c. Dry fit and make any adjustments as needed.
   d. Mark base location on tank top.
   e. Sand base at base 4" inside and outside surfaces.
   f. Clean with acetone.

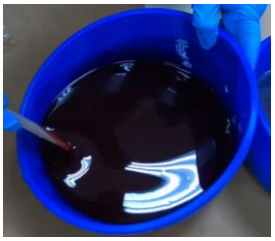


STEP 2 – APPLY PASTE TO TANK TOP

1. Mix paste and catalyst per instructions on bottle.
2. Place a 1" high bead of paste on tank where collar will sit.
3. Place collar on paste and use the yellow plastic spreader to apply additional past and feature in the paste until it squeezes out of seam.
4. The object is to eliminate the right angle of the joint with the paste and smooth out the transition from sump to tank.

STEP 3 – SUMP BASE TO TANK LAMINATION

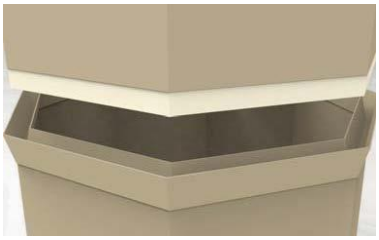
1. Cut or tear matting into 18-24” strips (x4).
2. Mix resin in ½ gal increments (smaller quantities for higher temps).
3. Fully wet out mats with resin and offset each layer 1”.
4. Roll out air bubbles with each layer.
5. Lay mats on seam overlapping mat 4”.
6. Roll out air bubbles and seal edges .
7. Let cure.

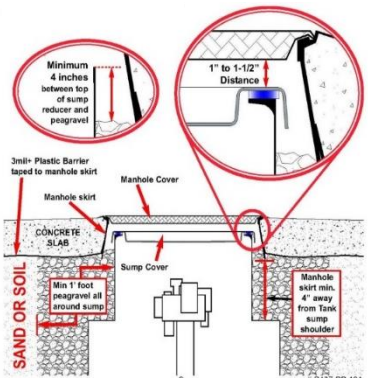


NOTE: Install fittings and piping before proceeding.

STEP 4 – PREPPING SUMP TOP

1. Position sump top into sump base V-channel.
2. Measure for at least 1-1/2” clearance from highest point of sump lid to underside of manhole cover.
3. Mark base of sump top with measurement from Step 3 Note: must be above the sealed portion approx. 2”.
4. Remove vacuum from sump top using barb fitting and leave vented to atmosphere until time to test.





HOW TO INSTALL TALL COLLAR TANK SUMP - DOUBLEWALL

STEP 5 – CUTTING SUMP TOP

1. The top portion of the sump should be installed after piping.
2. Height adjustment is made by cutting from the base of the upper portion of the sump.
3. The cut should be made + or – ¼"; Note: must cut off past sealed edge approx. 2".
4. Sand a minimum of 3" section from base edge surfaces inside and outside of sump top.
5. Sand inside V-channel.
6. Clean all sanded surfaces with acetone.

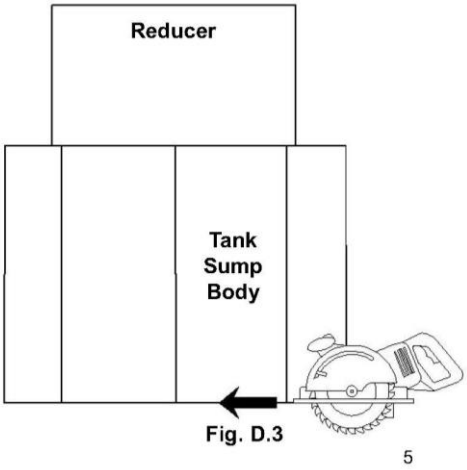


Fig. D.3

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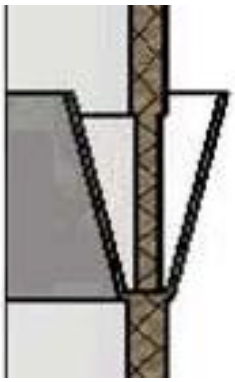
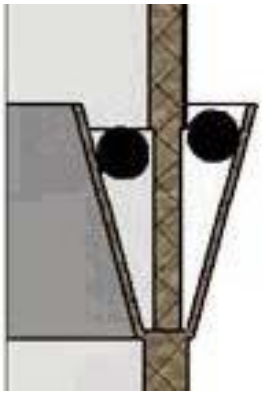
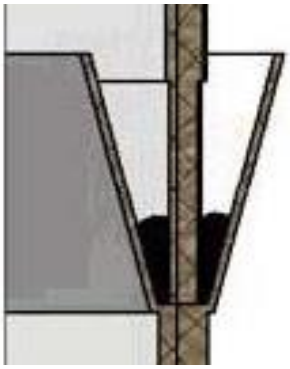
STEP 6 – COMPLETING V-CHANNEL JOINT

1. Center sump top into V-channel.
2. Dry fit backer rod and cut to length to ensure both ends meet with no gap.
3. Install backer rod in channel inside and outside, pushing it down to base of V-channel and tight against the walls to ensure a tight seal with no gaps; slurry pour must be a minimum of 2' thick.







HOW TO INSTALL TALL COLLAR TANK SUMP - DOUBLEWALL

STEP 7 – INSTALLING SUMP TOP

1. Pre-mix slurry breaking up clumps for even and smooth consistency.
2. Add all hardener to the PC slurry mix.
3. Using a mixing tool or grout paddle, mix side to side and top to base until consistent color and texture.
4. Fill grout bag with PC slurry and squeeze into channel.
5. Let cure.

STEP 8 – TESTING

POSITIVE PRESSURE TEST

1. Use a restricted air source (regulated to 4psi maximum), or bicycle pump, to provide a maximum of 4psi in the interstice; once pressure has been introduced, spray with joints, connections and penetrations with water and soap formula.
2. The water and soap formula is 10 parts water to 2 parts dish soap.
3. If no bubbles are discovered during positive pressure test, continue to test for 24 hours at 4psi; installing contractor must verify no pressure decay has occurred.
4. If bubbles *are* discovered, it indicates a leak and troubleshooting/repair process should begin; mark location of the bubbles so an appropriate repair can be performed; after full cure has been achieved, perform positive pressure test again; proceed to a vacuum test at 20”Hg and should be under test for at least 12 hours with no decay in gauge reading.

VACUUM TEST

1. Vacuum test with a minimum of 20”Hg for **2** hours.
2. If no loss of vacuum, proceed to doublewall filling procedures.
3. If loss of vacuum, proceed to troubleshooting/repair.

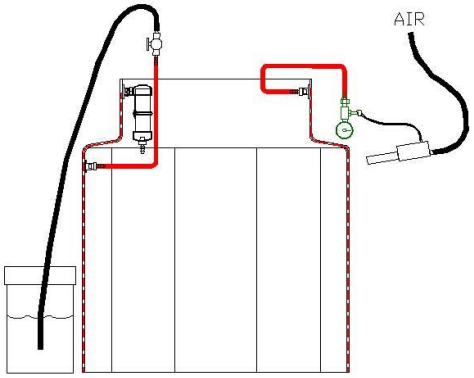
Caution: When using pressure, do not over-pressurize the interstice; maximum of 4 psi

HOW TO INSTALL TALL COLLAR TANK SUMP - DOUBLEWALL

Bravo interstitial fluid (Bravo IF) is required to vacuum fill all Bravo doublewall products. Do not use Bravo IF and other manufacturers' hydrostatic fluids together.

STEP 9 – HYDRO FILL DOUBLEWALL PROCEDURE

1. Use the K-900 kit (Hydro-Vac fill kit) to perform Bravo doublewall fill method on all Bravo doublewall sumps.
2. Fill bucket (5gal) with Bravo interstitial fluid (minimum 3-4 gal) and insert hose into bucket.
3. Connect ball valve (closed position) from the K-900 kit to the fill tube on the sump; this is the tube connected to the lower port on the doublewall sump.
4. Fill the tube with Bravo interstitial fluid inside with ball valve closed.
5. Using the Venturi Vacuum from the K-900 Kit or alternate vacuum device; apply a minimum of 20" Hg vacuum to doublewall interstice.
6. Allow time to reach high vacuum level (25"Hg); once desired vacuum level is reached, slowly open ball valve 15% until it starts to flow; the flow stream should be 1-½" from the port on tank sumps and smooth controlled flow of Bravo IF.
7. There will be a minimum of 2 inspection points (seam or joint, highest penetration fitting) during the fill process to validate integrity of the sump 2" of Bravo IF above inspection point; close ball valve and look for a bubble trail which would indicate a breach or leak; if no bubbles after 5 minutes, proceed to next inspection point.
8. Close ball valve and hold vacuum at 25"Hg or more for 5 minutes while inspecting for bubble trail.
9. Ensure inspections have taken place for all penetrations and seam or joints (V-channel); if no bubbles are visible after 5 minutes, continue.
10. Complete the hydrostatic fill up to the DW port that the gauge is connected to.

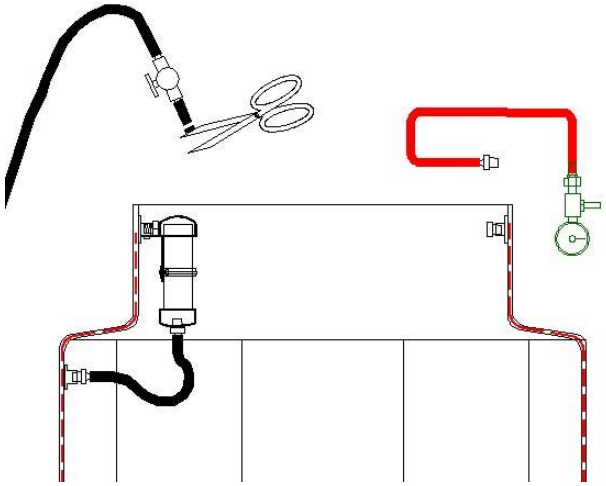


Note: It is highly recommended to leave under vacuum during backfilling process.

HOW TO INSTALL TALL COLLAR TANK SUMP - DOUBLEWALL

STEP 10 – INSTALL TUBE TO MANOMETER

1. With the ball valved closed, dry fit the fill tube to the base of the manometer allowing 4” to 6” of slack to leave a smooth curve to connect at the wall; *avoid* creating a “P-Trap” or excess slack.
2. Cut the tube to the desired length; slide the hose clamp on to the tube and attach the tube to the barb on the manometer. Make sure the hose clamp is on the tube prior to connecting and secure the hose clamp in place with a 5/16” nut driver.
3. Once the hose has been secured to the manometer(s) with hose clamp, fill the primary manometer to 2/3 full; system will balance out between the 2 manometers.
4. Once Bravo fill method is complete, cut gage hose leaving 4” to install on the upper port as a breather, creating an open system.



HOW TO INSTALL TALL COLLAR TANK SUMP - DOUBLEWALL

STEP 11 – TROUBLE SHOOTING REPAIR

Results of positive pressure test/identified leak location; there is not any liquid in the interstice when the repairs are performed.

DW - POSITIVE PRESSURE TEST

1. Verify what testing is recommended by the sump or UDC manufacturer prior to performing testing.
2. With a restricted air source (regulated to 4psi maximum) or bicycle pump, provide a maximum of 4psi in the interstice or specified amount by the manufacturer; once pressure has been introduced, spray with joints, connections and penetrations with water and soap formula. The water and soap formula is 10 parts water to 2 parts dish soap.
3. If no bubbles are discovered during positive pressure test, continue to test for 24 hours at 4psi; installing contractor must verify no pressure decay has occurred.
4. If bubbles *are* discovered, it indicates a leak and troubleshooting/repair process should begin; mark location of the bubbles so a repair can be performed; after full cure has been achieved, perform positive pressure test again; proceed to a vacuum test at 20”Hg; should be under test for at least 12 hours with no decay in gauge reading.

HOW TO INSTALL TALL COLLAR TANK SUMP - DOUBLEWALL

STEP 11 – TROUBLE SHOOTING REPAIR

Results of positive pressure test/identified leak location; there is not any liquid in the interstice when the repairs are performed.

Doublewall Positive Pressure Test

Leak around a fitting (flange to wall, flange to fitting body)

1. Inspect the identified leaking location.
2. Define the area to repair.
3. Abrade repair location per manufacturers' instructions; this area should extend outside the identified leak by 1" in all directions.
4. Remove loose dust with acetone rag leaving the repair area free of debris.
5. Apply Bravo Epoxy EP100RF beveling epoxy from the wall to the installed fitting; use a rag with acetone to remove and smooth epoxy leaving a clean repair that can be inspected.
6. Use the Schrader valve to apply vacuum to sump interstice; draw in the epoxy into the void from the fitting installation; apply vacuum of 4"- 6"Hg using Schrader valve on fitting body.
7. Inspect the repaired area and over-coat with additional epoxy to ensure the vacuum level did not create a hole in the repair.
8. Allow to cure under vacuum.

Leak at the flange to the pipe and/or secondary pipe if the fitting

1. Follow the steps in the repair above "leak around the fitting", except at step 6, pull vacuum from the secondary port of the fitting; ensure that the other end of the secondary pipe is closed.
2. It is important to follow the preparation steps of the repair for creating and bonding fiberglass repair.
3. Connect the Venturi to the Schrader valve and allow vacuum to build; do not exceed the pipe manufacturers' vacuum limits; achieve 4" – 6"Hg on the secondary to assist in the repair adhesion to the fiberglass area.
4. Once the full cure cycle has occurred, the repair can be tested; ensure the repair has been successful by performing a positive pressure test.

HOW TO INSTALL TALL COLLAR TANK SUMP - DOUBLEWALL

STEP 12 – DOUBLEWALL FIBERGLASS REPAIR

Puncture of the fiberglass wall and or corner leak

1. Locate the identified area and inspect the puncture and damaged area; the overall repair should exceed the damaged area by 2” on all sides or a 360° repair; mark planned repair perimeter with a sharpie.
2. Abrade area of planned repair to the outer edges.
3. Remove any dust with an acetone rag.
4. Doublewall lamination repair (K-401 or K-402) requires 4 layers of FRP mat.
5. Tear the FRP mat into the proper size gradually expanding the size of the layers.
6. Use a brush or roller to saturate the repair layers with resin and catalyst mixture, apply the layers centered over the leak point and roll smooth; repeat process until all four layers have been applied.
7. Allow full cure to occur prior to testing.

STEP 13 – TOPPING OFF BRAVO IF

If Bravo IF level drops more than 2” proceed as follows:

1. Top off with Bravo IF, mark level on manometer and monitor level over time, marking the levelat each visit.
2. If fluid loss continues, review the alarm history to determine if there is a pattern.
3. Then perform ALDP test.

STEP 14 – DOUBLEWALL FIBERGLASS REPAIR

Puncture of the fiberglass wall and or corner leak

1. Make observations of the interior of the sump, i.e. is there any fluid at the base? Is there debris? Clean the base of the sump so accurate observations can be made.
2. To increase the visibility of the testing clean the walls with acetone rag.
3. Remove Bravo IF to 4” above the highest penetration or seam/ joint.
4. Connect a gage so vacuum can be applied. Draw a minimum of 20”Hg for the testing.
5. Once desired vacuum level has been achieved, allow 10 minutes for interstice to settle. This will eliminate false results.
6. Using a light to increase visibility, observe the walls for consistent bubble trail.
7. Follow the bubble down to the source to pin-point the leak. Mark this area.
8. If bubbles are found, remove Bravo IF down to 2” below leak point and observe under test. If the bubbles have stopped, the leak has been sourced.
9. The leak that has been found may not be the only leak but the largest leak.
10. Follow the repair procedures listed above to make the correction.
11. Allow the repair to go through the complete cure cycle prior to testing.
12. Repeat the testing procedure to ensure there are not any additional leaks.

Once repairs have been completed and all tests have passed, use the Bravo fill method (Vacuum) to add Bravo IF to the sump.

WARRANTY
DOUBLEWALL
TANK SUMP

All Bravo products MUST be installed by a Bravo Certified contractor. Information contained in all Bravo literature is subject to change without notice. Bravo does not assume responsibility for liability for loss, damage or expenses resulting from installation, operation use or maintenance from this manual. By installing this product, you agree to S. Bravo Systems warranty terms.

LIMITED WARRANTY

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UL Sump Containment Rating: Secondary

UL 2447 LISTED

Sump Type: Tank Sump

Doublewall

Maximum Burial Depth: 84"

Liquid Rating: Automotive Fuels

- Must be installed by an S. Bravo Systems, Inc. certified installer. Installation by non-certified personnel will void the warranty and may result in damage or leaks.
- Install in accordance with S. Bravo Systems, Inc. installation guides.
- Use only OEM recommended fittings and accessories.
- Failure to use recommended accompanying sump products in the complete assembly may cause damage or leaks.

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