PNEG-1336 VTDL-72-8X9 DOOR ASSEMBLY INSTRUCTIONS

8/20/03 REV.

## Written Instructions for Installation of a VTDL-72-8X9 Large Vehicle Traffic Door in 72' Diameter, Externally Stiffened Tanks.

Prior to door installation, tank should be fully erected and anchored. The VTDL-72-8x9 door is to be installed in the bottom 4 rings of the tank. Adequate provisions should be made for door installation. A list of necessary tools and equipment is attached. Also some field fabrication and welding will be necessary.

- 1). The VTDL door is to be installed in the bottom 4 rings of the tank.
- 2). The door must be placed near an intermediate discharge well such that grain will clear away from the door panels when tank is emptied. Installation of a standard one-ring access door or two-ring door in addition to the VTDL door is recommended.
- 3). Tank erection will be done as normal until the fifth ring from the bottom is to be installed. The fifth ring will be installed as normal except that the orientation of the sidewall sheets should match the sidewall layout shown on page 1. At door location, install special punched, special length door sheets at the correct position as shown on page 1. Use two non-laminated sidewall sheets (minimum 12 gage) per ring without caulk to temporarily complete the ring. Use only horizontal seam bolts to connect the filler sheets to the door sheets. Continue installing the sidewall as normal except for installing the special door sheets and temporary sheets. These sheets are used as filler sheets to keep the tank round until fully erected. They will be removed prior to door installation. Also 4 sets of stiffeners should be omitted at the door location (see page 1). Standard base stiffener weldments will be used in these locations after doorframe is completely installed. Anchor tank securely before installing door.
- 4). When tank is properly anchored, remove filler sheets. Be sure the sidewall is installed as shown on page 1.
- 5). Review pages 2 & 11 to identify door frame and outer cover parts.
- 6). Place threshold weldments (VTDL-0381 & VTDL-0382) in door opening between sidewall sheets. Install left and right column weldments (VTDL-0375 & VTDL-0380) as shown on page 3. Fasten column weldments to sidewall sheets with 3/8" x 1 ½" bolts (S-5060) and 3/8" nuts (S-456). (Note bolt size may change slightly with gage changes) Do not tighten bolts at this time. Insert corrugated sealing strips onto the outer edge of the sidewall sheets and the inner edge of the sidewall attachment plates. Caulk around seal strip as well. Align edge of column base plate with edge of threshold weldment. Also the door panel attachment strips of the columns and threshold must be aligned (see pages 3 & 5). The columns and threshold weldments will be anchored with <sup>3</sup>/<sub>4</sub>" epoxy type anchors or by field welding to tunnel girder. The column weldments must be field welded to the threshold weldments. Do not anchor or weld until door is fully installed.

- 7). Install header beam weldment (VTDL-0370) on the top of the column weldments. The header beam weldment will slide onto the top of the columns from the inside of the tank. Fasten loosely with 1" x 3 ½" Gr. 8 bolts (S-7622), 1" washers (S-7623) and 1" nuts (S-240). See detail A page 5. Be sure that the sidewall attachment plate holes of the header and column are aligned. Attach the sidewall of the fifth ring to the header seal strip with 3/8" x 1.1/2" bolts. Do not tighten bolts until door panels are installed.
- 8). The center column weldments (VTDL-0383) will be installed within the doorframe. The bottom of the center column weldment will rest between the column outer cover strip on the threshold weldment. The top of the center column weldment will bolt to the header beam weldment with 1" x 3 <sup>1</sup>/<sub>2</sub>" bolts. See details B and C page 6. Use VTDL-0338 shim plates between center column and header beam and threshold weldment. Place one shim plate on the threshold weldment splice prior to the placement of the column near the threshold weldment splice. Tilt the column upward into position and bolt it to the header beam. Install the top shim plate. The door panel attachment plates of the column, header and threshold weldments should be aligned (see page 6). The center column is to be removed when door is opened; do not field weld to center column. Do not tighten bolts until door panels are installed.
- 9). Verify that the door frame is square and all door panel attachment plates are in alignment prior to installing door panels.
- 10). Assemble door panels as shown on page 7. Door panels must be installed in this manner to maintain proper orientation of hinges. Door hinge plate weldments (VTDL-0391) are to be placed as shown on page 7 detail D. Use 3/8" x 1" bin bolts at door panel splices and 3/8" x 1 ½" bolts at hinge plate weldments. Bolt head with sealing washer should be on the outside for all splice connections and on the inside for all hinge weldment connections. Follow installation details on page 8 for door panel placement. Use 1" x 2 1/2" Gr. 8 bolts to attach door panels to the door fame. 1" x 3 1/2" Gr. 8 bolts will be used at hinge location. Use only enough bolts to hold panels in place and clamp the panels to the door fame. Be sure that the panels are closed completely and all holes are aligned. The door panels will be opened later to allow for field welding and sealing. Caulk all along door panel splices.
- 11) Insert hinge pins (VTDL-0244) through hinge plates on the door panels and column weldments. See detail E page 9. Place ½" washer over top of the hinge pin and secure it with 1/8" cotter pin (S-7241). Tighten all door panel bolts and doorframe connection bolts at this time.
- 12). Attach standard base stiffener weldments above header beam as shown on page 9. Use 3/8" x 1" bin bolts for attaching to seal strip and 3/8" x 2" bolts for attaching to sidewall plates. Tighten all sidewall and stiffener bolts at this time. Shim as necessary and field weld stiffeners to header beam. Base plates may have to be trimmed to align with header beam. See page 9.

- 13). Anchor threshold weldments to foundation or field weld to tunnel beam. Field weld columns to threshold weldments. Open door panels and field weld door panel attachment plates of header and threshold to left and right column weldments. Be sure that the door panels open and close smoothly. Field weld threshold weldment splice and access cover plates on column weldments. Welding should be done on both the inside and outside of the doorframe. Reference page 10 for complete field welding details.
- 14). Clean, inspect, and paint all welds. Place foam seal strip all along the outer edge of the door panel assembly to seal door panels. Close door panels and install all door panel bolts with washer on each side. Tighten door panel bolts. Inspect all welds and door assembly bolts at this time. Place decals DC-GBC-1A and DC-GBC-1S on the inside of the door panels. Caulk any gaps around the center column weldment and threshold weldments.
- 15). Assemble outer cover as shown on page 11. Apply strip of caulk behind column and header angles before attaching them to column and header beam clips. Attach center post and center door latch (VTDL-0293) to header angle and threshold weldment. Apply caulking to the top and bottom of center post. Assemble door outer cover, reinforcement channels, hinges, latch brackets and door handles as shown on page 11. 3/8" x 1" bin bolts will be used for all connections. Use 3/8" nut and sealing washer as spacer between latch bracket and outer cover. Place outer cover in doorframe and align hinge weldment (VTDL-0337) with hinge bracket (VTDL-0292). Insert hinge pins (VTDL-0335) through hinges and hold in place with washers and cotter pins. Review details G-I page 12 for connection details. Adjust door hinges and latches as necessary until door opens and closes smoothly. Apply foam seal strip around perimeter of outer cover and caulk as necessary to seal outer cover. Place decals DC-GBC-2A and DC-GBC-2S on the outer cover as shown on page 12.
- 14). To open door, open outer cover and remove door cover or tie back to bin, remove center post, unbolt door panels from doorframe. Do not remove hinges or unbolt door panels from one another. Swing door panels open to remove center column. Provisions should be made to hold the door panels open while center column is being removed and bin is being cleaned. Unbolt top of center column from header beam and remove shim plate. Slide center column section inside off the threshold weldment, tilt outward and remove. Caution center column is extremely heavy and proper equipment should be used for removal. Temporary ramps should be made to avoid driving over the door panel attachment plates of the threshold weldment. Once the bin is fully emptied, re-install the center column section, close door panels, and bolt panels to doorframe. It may be necessary to re-seal around door panels and column weldments. Close outer cover and reseal as necessary. Inspect all decals each time door is opened and replace if damaged or missing.

## **Recommended Tools for Installing VTDL-72-8X9 Door**

- 1. Forklift or similar piece of equipment capable of lifting 1,500 lbs. at heights above 10'
- 2. Welder
- 3. Plasma cutter, torch, or similar tool for cutting base plates
- Concrete drill for installing <sup>3</sup>/<sub>4</sub>" epoxy type anchors (if anchors are used).
- 5. <sup>1</sup>/<sub>2</sub>" and 7/16" drill bits
- 6. Sockets and wrenches including 9/16, 5/8, 1-1/8, and 1-1/2 sizes
- 7. Drift pins and/or pry bars

CONTINUE TANK ERECTION AS NORMAL UNTIL THE FIFTH RING IS REACHED. NOTE THE LOCATION OF THE VERTICAL SEAMS AND STIFFENER COLUMNS ABOVE THE DOOR OPENING. THE 5TH RING MUST BE POSITIONED THIS WAY FOR THE DOOR TO FIT ASSEMBLE DOOR SHEETS AND STIFFENER COLUMNS AS SHOWN. PROPERLY. IT MAY BE NECESSARY TO USE FILLER SHEETS THE DOOR LOCATION TO FINISH FRECTING THE TANK. THESE SHEETS MUST ΑT ΒF REMOVED WHEN SET AND DOOR INSTALLATION IS TO BEGIN. DO NOT CAULK FILLER SHEETS. 12 GA OR HEAVIER SHEETS MAY BE USED AS FILLER OMIT THE FOUR (4) STIFFENERS DIRECTLY ABOVE THE DOOR OPENIING. THESE STIFFENERS WILL BE INSTALLED SHEETS AFTER THE DOOR INSTALLATION IS COMPLETED.





REMOVE FILLER SHEETS AND INSTALL THRESHOLD WELDMENTS. THRESHOLD WELDMENTS WILL EITHER BE ANCHORED TO THE WELDED TO A TUNNEL BFAM. DO NOT ANCHOR OR WELD THRESHOLD WFLDMENTS CONCRETE OR FIFID DOOR ASSEMBLY IS SET RIGHT AND LEFT COLUMN WELDMENTS ON THRESHOLD WELDMENTS AND ATTACH TO THE SIDEWALL WITH COMPL SIZE MAY VARY WITH SIDEWALL THICKNESS) 3/8" BIN BOLTS (BOLT THE SIDEWALL WILL BE ON THE OUTSIDE THE OUTSIDE OF OF THE COLUMN WEIDMENT. BOI T HEAD WITH SEALING WASHER WILL BE THIS CONNECTION. ON USF FLAT ALL OF THE SIDEWALL BOLTS MAY BE INSTALLED AT THIS TIME BUT DO NOT WASHER ON THE INSIDE OF THIS CONNECTION. THE PROVIDED MEASUREMENTS TO ASSURE THAT }ASSEMBLY HAS BEEN COMPLETED. THF DOOR USF TIGHTEN UNTIL THE COLUMNS ARE IN THE CORRECT }LOCATION AND THATTHE HEADER WELDMENT WILL SLIDE IN PLACE.

## VIEWED FROM OUTSIDE OF BIN



















