A DIVISION OF TRANSNET SOC LIMITED

FLEET PLANNING

WORKS INSTRUCTION

SAMPLE TESTING PROCEDURE FOR XB-5, 8, 9,10, 11, 12, 13, & 14 TANK WAGONS: 2025/2026

Compiled by:

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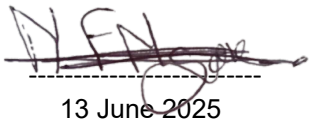
13 June 2025

Accepted by:

N. Ngwane

(**Technical Asset Owner**)



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13 June 2025

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Witness Makonano

Circulation Restricted To: Transnet Freight Rail

Transnet Engineering

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Revision table

Revision #	Clause	Description of revision	Date Issued
Rev 00	1.7, 1.8		13 February 2018
Rev 01	1.8; 1.9; 1.17; 3.1	Updated drawing(s) and/or specification(s)	24 February 2020
Rev 02	1.1; 1.2; 1.3; 1.7.; 2.; 3.; 4.; 5.	Updated statements and procedures	01 Aug. 22
Rev 03	1.1.	New statement	28 Nov. 22
Rev 03	4.2	Updated statements (removed spring washers)	28 Nov. 22
Rev 04	6.10.	Removal from service of wagons with cracks on Tank or in welds	31 January 2024
Rev 05	1.13	Updated statement	05 March 2025
Rev 05	6.	S.R.V socket replacement methods-**removed**	16 April 2025
Rev 06	6.	Updated Pressure test procedure	01 Apr. 25
Rev 06	1.20	Fitment of new discharge pipes	01 Apr. 2025
Rev 06	5	Re-certification process	16 April 2025
Rev 07	1.20	Fitment of new **Manifold pipe & included drawings**	13 June 2025
Rev 07	5.2.12	Updated statement to Pneumatic pressure test	13 June 2025

NB: Works instruction order re-arranged & revision clauses updated accordingly

NB: ALL WAGONS MUST BE VISUALLY INSPECTED FOR NEGATIVE CAMBER, TWISTED UNDERFRAME AND COLLISION DAMAGE AND OTHER DAMAGES FOUND UPON SEPARATING WAGON BODY FROM THE BOGIES. ALL THESE DAMAGES MUST FIRST BE APPROVED BY THE TECHNICAL ASSET OWNER (TAO), PREVIOUSLY KNOWN AS TFO, BEFORE TE CAN CONTINUE WITH THEM AND THE SAMPLE TEST.

1. WORK TO BE PERFORMED ON XB SAMPLE TEST TANK WAGONS

1.1. Remove all residual of product inside the tank wagons. Prepare the tankers for light repair inspection; remove all the sumps on **XB-8, 9, 11, 12, 13, 14** and send the sumps for shot blasting and primer coating. Note: primer coating must not be done on the sump flange contact surfaces.

1.1.1. Ensure that all the barrel tie down bolts are secured. Remove the barrel tie down bolts that have visible wear & replace them.

1.2. Send the sumps for surface preparation of the flange contact surfaces.

1.2.1. Ensure flange contact surfaces and flange holes are free of debris, corrosion, and other material.

1.2.2. Lightly sand flange surface to ensure effective adhesion of silicone.

1.2.3. Ensure flange surfaces are true and square.

1.3. Remove butterfly valves and Storz coupling seals.

1.3.1. Remove debris, corrosion, and other material from barrel flange surfaces and holes.

1.3.2. Lightly sand flange surface to ensure effective adhesion of silicon.

1.4. Hydro clean (water jet blasting) the top dished ends on the inside and outside.

1.5. Shot blast the outside of the top-dished ends and paint with primer.

1.6. The complete vessels must be visually inspected by the AIA for any pit marks or mechanical damage.

1.7. Conduct pre-inspection of the flanges (Section 3), fit new aeration pads (Section4) and replace the sumps according to tightening sequence (Section 5). Fit new butterfly valves, new storz coupling seals and new safety relief valves (SRVs). Fit SRV anti-theft bracket.

1.8. Clean the non-return valve and test for functionality. Remove Glen 40 & Glen 50 valves and replace with new valves. Remove old discharge pipes and cover, replace with new type, which should be in accordance with Drawing **BFX_3885_A000_B**.

1.9. Fit chromedec danger signs per drawing No. **RS_A052_001_A97_A**.

1.10. Send wagon to the test/inspection centre.

1.11. Repair all pit mark and mechanical damage on top dish by means of welding and in accordance with the Pressure vessel code.

1.12. Replace all the dome seals.

1.13. Pressure test the wagons and repair all leaks.

1.14. Test the safety valves for functionality.

1.15. If the wagon passed pressure test, the AIA must hard stamp the data plate and issue a certificate.

1.16. Repair/ replace all damaged steps, commode handles, and ladders.
1.17. If tow hooks found broken or damaged, replace the damaged tow hooks and fit tow hook gusset for strengthening of tow hook. Drawing no.: **RS_A057_001_379.**
1.18. The Approved Inspection Authority to perform Radio graphic testing and Magnetic Particle Inspection on the vessels.
1.19. After the tests have been performed – send the wagon for touch-up paint and stencilling. Stencilling must be done according to the following drawing (latest):

- **RSA067_001_A97 for XBJ-5**
- **RSA068_001_A97 for XB-8**
- **RSA068_001_A97 for XB-9**
- **RSA069_001_A97 for XBJ-10**
- **RSA052_001_A97 for XBJ-11**
- **RSA052_001_A97 for XBLJ-12**
- **RSA052_001_A97 for XBLJ-13**
- **RSA052_001_A97 for XBLJ-14**

1.20. All manifold pipes must be replaced with new ones, see drawings of manifold pipes below.
1.20.1. **XBLJ-11 & 12:** W_202_D063/latest
1.20.2. **XBLJ-13 & 14:** W_137_F040/latest

2. PRE-INSPECTION OF FLANGES

2.1. Check conditions of flange surfaces for corrosion, wear, debris; surfaces must be true and square.
2.2. Check conditions of holes; must be kept clean, corrosion-free and undamaged.

3. AERATION PADS FITTING PROCEDURE

3.1. Check aeration pads for defects. The aeration pads holes must be perfectly aligned with the sump holes; do not use aeration pad if not perfectly aligned.
3.2. Apply high durability silicone to both the sump and barrel flange surfaces.
3.3. Ensure sufficient silicone is applied consistently, with a steady bead on the entire flange surfaces.
3.4. Perfectly align and fit the aeration pad. “Fluitex E800” Aeration pad must be evenly stretched to ensure no slackness or rippling effects occur.

4. TIGHTENING SEQUENCE

4.1. Check flange alignment; flange faces must be parallel and flange bolt holes must be aligned.

4.2. Insert bolts from below and hand-tighten all the nuts to ensure 2-3 threads are visible above the top of the nuts. Use self-locking nuts (e.g., Nyloc nuts) to maintain the required torque value over time.

4.3. Torque bolts/nuts in a clockwise "SPIRAL" pattern to the required toque value of 210 Nm as shown in Figure 1. Start at Position 1 and move sequentially up to Position 29. Repeat this sequence three (3) times as follows:

4.3.1. Using a torque wrench, tighten to a maximum of 30% of the required torque value (approximately 60 Nm). Check that flange is compressed uniformly.

4.3.2. Using a torque wrench, tighten to a maximum of 60% (approximately 120 Nm). Check that flange is compressed uniformly.

4.3.3. Using a torque wrench, tighten to 100% of the required torque value, 210 Nm.

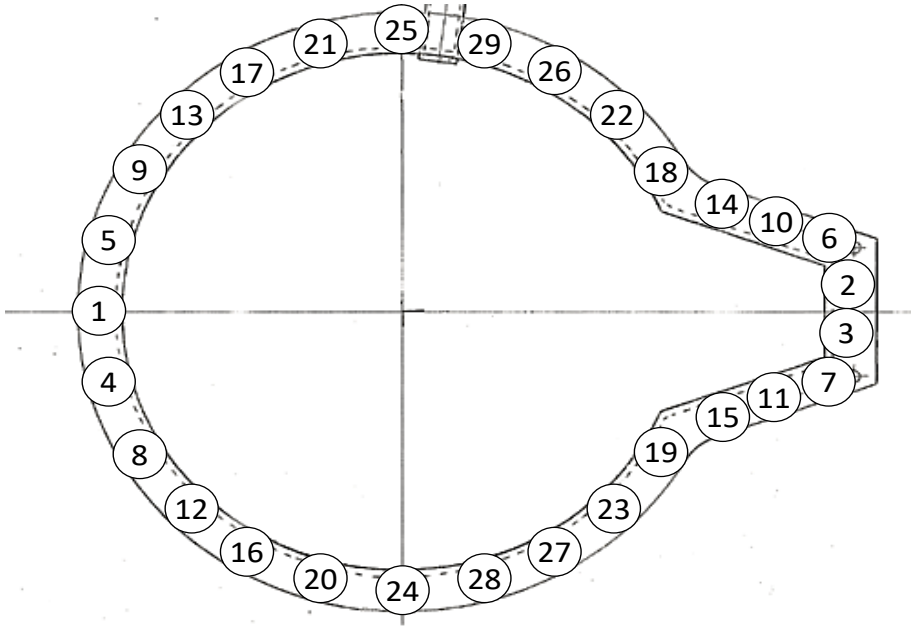

Figure 1. Illustration of 'Spiral Pattern' for tightening sequence of bolts/nuts

5. RE-CERTIFICATION PROCESS (SOW)

THIS SECTION ENTAILS THE PROCESS OF ISSUING DOCUMENTATION AND CERTIFICATION BEFORE THE AIA INSPECTION, ALONG WITH THE ISSUANCE OF THE FITNESS OF SERVICE INSPECTION/ASSESSMENT REPORT.

5.1. **Issuing of documentation and certification prior to the inspection:**

5.1.1. AIA-m accreditation, schedule certificates from SANAS & approval certificate from Department of labour.

5.1.2. SAQCC PV/IPE certificate of the authorised inspector carrying out the inspection.

5.1.3. Thickness meter calibration certificate.

5.1.4. NDT certificates for technician/inspector carrying out the NDT, wall thickness tests.

5.1.5. Design engineer's qualification/certificate.

5.2. **Issuing of fitness of service inspection/assessment report will contain the following:**

5.2.1. Positive material identification.

5.2.2. Dimensional survey.

5.2.3. Design verification/calculations of wagons.

5.2.4. Design appraisal certification of completion.

5.2.5. Drawing of vessel with dimensions.

5.2.6. New data name plate drawing/template.

5.2.7. NDT/Radiography survey if carried out.

5.2.8. Other non-destructive test reports required by design code.

5.2.9. Certificate of re-instatement.

5.2.10. Certificate of continuance.

5.2.11. Data dossier/inspection/assessment report.

5.2.12. Pneumatic pressure test certificate.

5.2.13. Wall thickness measurements.

5.2.14. Supplied & stamped new data name plate, compliant to the PER of Act 85.

5.2.15. Photograph of new data name plate.

5.2.16. New data name plate to be affixed to vessel.

5.2.17. Other photographs if required.

6. PNEUMATIC PRESSURE TEST: PERFORMED BY TE & WITNESSED BY THE AIA

6.1. Wagons to be subjected to a witnessed internal & external inspection of the pressure test by an approved inspection authority (AIA) as per the Pressure Equipment Regulation (PER) 11(1) (a).
6.2. Close and secure hatch covers
6.3. Couple air pipe to the wagon to pressurise the wagon.
6.4. Test safety relief valves (SRV) for functionality.
6.5. The pressure release valves (Glen 40 valves) for the pots & air intake valves must be on close position.
6.6. Allow pressure on **Pot A** to build up by opening the air inlet valve for **Pot A**.
6.7. Inspect for the following defects:
6.7.1. No air leakage on butterfly valves/discharge pipe, replace butterfly valve if leaking.
6.7.2. No air leakage between manhole lid cover and manhole seat, replace manhole rubber seal if leaking.
6.7.3. After inspections are completed, close the air inlet valve for **Pot A**, and open the pressure release valve for **Pot A** to release the accumulated pressure on the **Pot A**.
6.8. Do the same as above for Pots B & C.
6.9. Once all the Pots have been inspected, shut down the air supply. Make sure that all pressure release valves are **opened** & air inlet valves are **closed**.
6.10. The AIA to perform none destructive testing (NDT) on the all the Pots.
6.11. Should cracks appear in a tank or in the welds on a particular wagon, that wagon should be considered to have reached the end of its fatigue life and should be immediately removed from service as recommended by report **#BBH6490** from Technology Management.

7. MISCELLANEOUS

7.1. Re-certification data
7.2. Submit RMQA1