Trolley Operations Procedure, Vx Spectra

Testing and Process-Singapore Well Testing Centre

Introduction

This SWI consist of steps for the trolley operation for the mounting and dismounting of Venturi to or from the trolley.

Steps

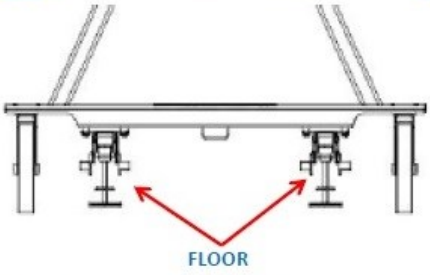
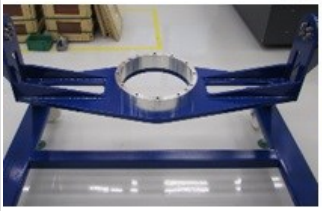
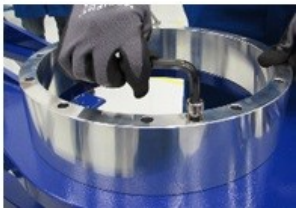
1 Tools needed.

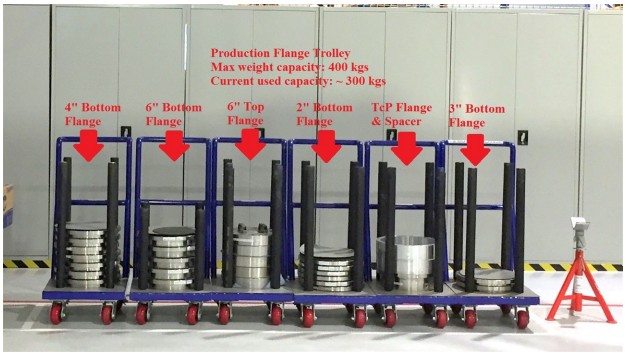
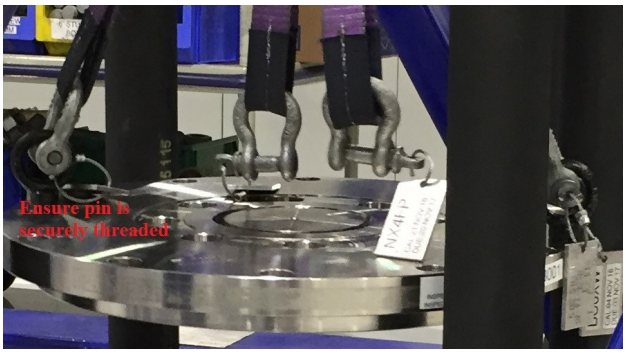
SL No	Description
1	Torque wrench (0-100 Nm)
2	Torque wrench (500-1500 Nm)
3	8mm Allen key (L-shape, 6" handle)
4	Nut Running Machine
5	8mm Allen Key Socket
6	Cleaning alcohol
7	Lint free wipes
8	Chesterton 785 Parting Lubricant
9	Foam swab
10	Overhead crane
11	2X 1 ton crane slings + 4 shackles
12	Small brush
13	Small flashlight
14	1-1/16" socket
15	1-7/16" socket
16	1-5/8" socket
17	1-13/16" socket
18	8mm Allen Key

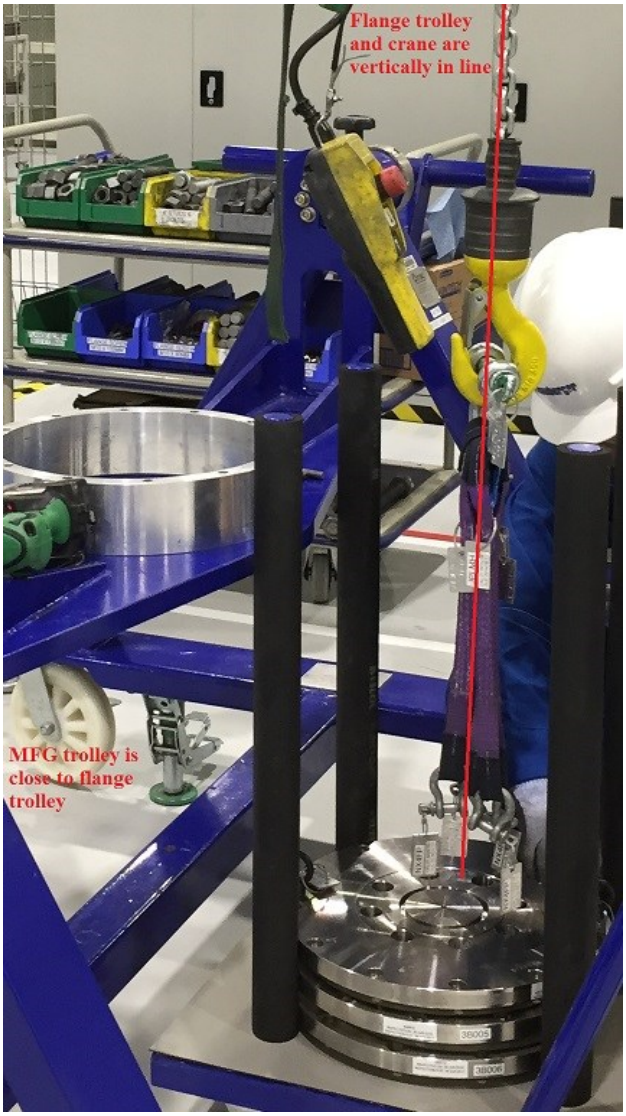
2 Refer to Steps 3-6 for the mounting of the adapter flange.

3 Collect all required parts, tools and equipment for this task. Check their working condition as below.

Steps			
Step 4			
	4a	Trolley - good working condition, arm is locked in vertical position, no obvious damage	   
	4b	Adapter flanges - no scratches on sealing surface or obvious damage	
	4c	Venturi - all protection covers are installed, no obvious damage or defect	
	4d	Stud bolts and nuts - no damage to threads	
	4e	Tools - all needed tools and shop supply available	
	Check Venturi Material, Size, PN and revision		
Step 5			

Steps			
	5a	Move the trolley to the crane area	
	5b	Press down all 4 stoppers on the MFG trolley to lock the trolley in position.	  
		2 people are required for the movement. Use proper trolley movement guidelines (Line of sight, position, stepping);	
Step 6			
	6a	Check if spacer is required for the Venturi and if required, use normal handling to mount the spacer onto the trolley and align the threaded holes.	
	6b	Using a 8mm allen key to tighten the spacer screws (quantity 2).	
		For - 2', 3", 4" make sure spacer is mounted. These use the same spacer. For 6" no spacer is required. Skip to step 7	
		Ensure that the trolley is in a vertical position and stoppers are engaged on both sides.	
		The flange trolley are available for 2", 3", 4", 6". Currently a maximum of 7 flanges are stored in the trolley which has a safe working load of 400 kg	

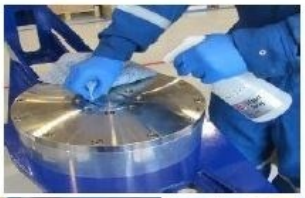
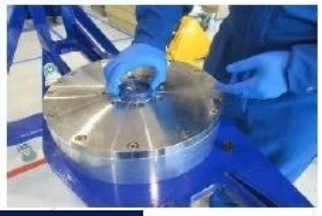
Steps	
7	Based on the Venturi size, select the correct bottom flange from the flange trolley located beside the crane area (2", 3", 4", 6" respectively) 
	Do not store more than the safe working load of the trolley. Check with Production Supervisor for advise.
	Take care of pinch points when assembling the ringbolt on the flange. Use proper gloves.
8	Assemble ringbolt on any two mounting points such that the ringbolts are almost 180 degree apart (Opposite each other) 
	Ensure that the ringbolts are fully engaged with the flange.
	Take care of pinch points when handling shackles. Ensure pin is securely threaded. Do not lift until both the ringbolts are checked.
9	Attach the shackles to the ringbolts and lock the pin.
	Clear the area of obstruction and make sure the MFG trolley is ready for assembly. Check the certification on the sling and shackles

Steps		
10	Before opearting the crane, make sure the flange trolley is close to the MFG trolley	
	Keep the crane and flange trolley in the same vertical line so that the shackles do not swing when operating	
	Take care of pinch points and ensure proper PPE	
Step 11		

Steps			
	11a	Using crane, lift the flange and position on the spacer (On theMFG trolley)	
	11b	"Source" engraved on the bottom flange should be on the same side as the castor wheel	
	11c	Remove the shackles and the ringbolts	
	After the flange has been positioned and shackles removed, move the flange trolley to its home position		
	Take note of the engraving showing the detector or source side. (Source should be on the same side as the castor wheel)		
12	Insert 12 M10 screws and tighten it with 8mm allen key socket with a torque gun.		
	Torque gun is used to tighten the screws until the "click" sound is achieved.		
	Visually inspect the IX-seal ring prior to placing on the flange.		

Steps

Step 13

	13a Clean the sealing surface with alcohol and lint free wipe.	
	13b Apply Molykote 111 on the IX Seal Ring and place it on the adapter flange as shown in the picture.	 

Venturi	IX seal ring
2"	PN #0209090020020
3"	PN #0209090020030
4"	PN #0209090020040
6"	PN #0209090020060

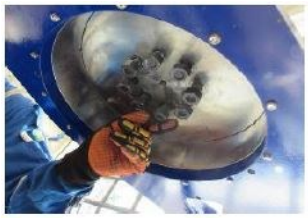
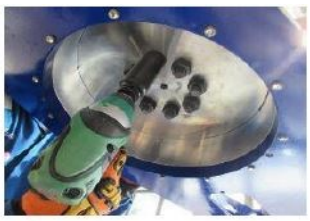
i	Once the IX-seal ring is placed on the flange, ensure that it is seated properly by checking if the IX seal ring is rocking.
14	Refer to Steps 15-23 for the mounting of the venturi onto the trolley.

Step 15

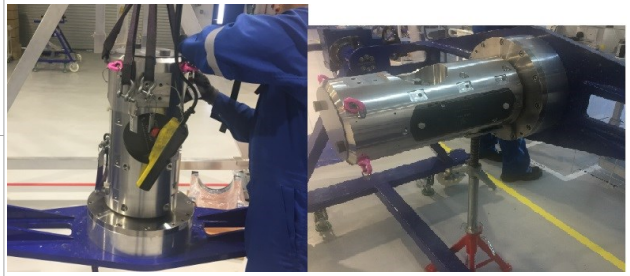
	15a Install the 4 ringbolts, 4 shackles and 2 slings on the Venturi as shown in the picture.	 
	15b Lift Venturi from the crate and place it on the foam sheet with 2 woden blocks underneath.	
	15c Remove the protective cover at the bottom of the venturi	

⚠	**Ensure that the crane, slings and shackles are certified. Checklist to be updated daily prior to any lifting operation.**

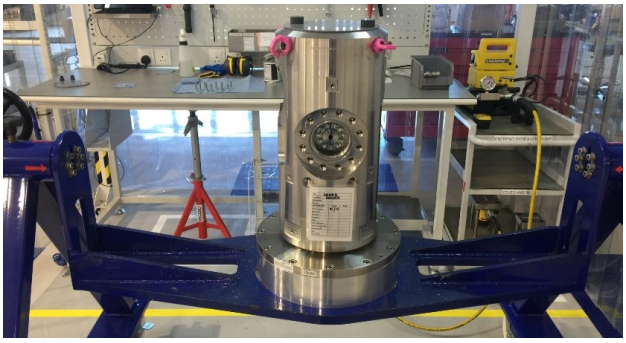
Steps			
Step 16			
	16a	Before lifting vertically, move the 2 ringbolts, 4 shackles and 2 slings as shown in the picture.	 
	16b	Remove the all the side protective cover as shown in the picture.	
	16c	Apply Chesterton 785 on 1 stud and by using another stud to evenly spread it out on the first 10 threads.	 
		Use alcohol to clean the sealing surfaces to ensure no particles prior to assembling the studs.	
		Head and body shall not go below the Venturi.	
17		Tighten 2 studs as a guiding studs as shown in the picture.	 
		Take note of the engraving showing the detector or source side when mounting the venturi	

Steps		
18	Move the Venturi above the adapter flange and slowly lower it with the help of the 2 guiding studs as shown in the picture.	
	Ensure correct orientation of Venturi on the MFG trolley	
19	Install the remaining studs and nuts by hand and tighten with the help of impact socket using a torque gun as shown in the picture.	 
	While using torque tool ensure that star pattern is followed.	
	Make sure area is clear and there are no obstructions during this step.	
Step 20		

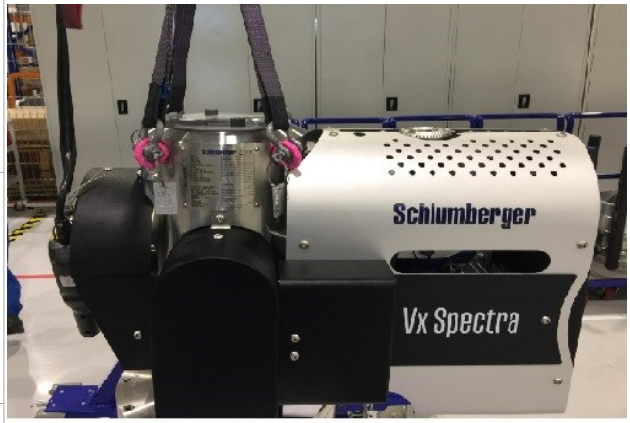
Steps

	20a	Remove the 4 shackles from the ringbolts as shown in the pictures.	
	20b	Unlock the gearbox and rotate the Venturi to horizontal position and support using a jack stand.	
i	Ensure that the gearbox is locked at the end of this step.		
21	Torque all nuts in a star pattern. (Refer to step 22)		
22	Table for various torque values		

Venturi Size	First Torque Value (N.m)	Second Torque Value(N.m)	Final Torque Value (N.M)	Socket size(mm)
2"	60	120	192	1-1/16"
3"	160	320	544	1-7/16"
4"	240	490	816	1-5/8"
6"	360	710	1194	1-13/16"

Steps	
23	Unlock the gearbox and rotate the Venturi to vertical position and lock the gearbox once done. 
	Ensure that the side covers are installed to protect the sealing surfaces i.e windows, thermowell, isloation block and top flange locations
	Ensure that the crane, slings and shackles are certified. Checklist to be updated daily prior to any lifting operation.
24	Refer to Steps 25 - 27 for the dismounting of venturi from the trolley
	Make sure the assembly is lifted with tension rather than slack to ensure it does not fall after loosening flange bolts. Make sure you are not in the zone of fall of the meter.
Step 25	

Steps

	25a	Push final assembly to crane area for unloading from the trolley.	
	25b	Secure all ringbolts with 2 slings, 4 shackles and lift the assembly until there is tension.	
	25c	Loosen the flange bolts and nuts from the bottom of venturi using torque wrench (refer to step 26 for torque values)	 
	2 people are required for the movement. Use proper trolley movement guidelines (Line of sight, position, stepping). Ensure the stoppers on both side of MFG trolley are engaged and trolley does not move.		
	Use proper PPE during the torqueing.		
26	Table for various torque values		

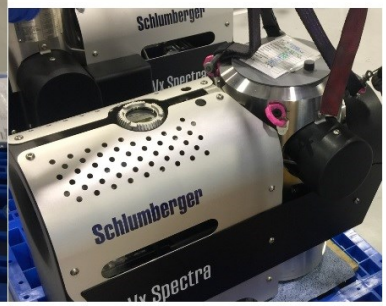
Venturi Size	UnTorqueing Value (N.M)	Socket size(mm)
2"	192	1-1/16"
3"	544	1-7/16"
4"	816	1-5/8"
6"	1194	1-13/16"

	Beware of pinch point.

Steps

Step 27 - For different version of meters

	27a	For ATEX Version without JB - Once all bolts and nuts have been removed slowly lift the assembly and lower to allocated area.Remove slings and shackles and return to designated storage location.
	27b	For ATEX Version with JB - In addition to a), the bottom breathing port needs to be checked to ensure proper clearance with base.
	27c	For CSA Version - In addition to a), use a wooden plank between the meter and base to avoid crushing of the junction box.



i	Make sure assembly is sitting on a wooden plank covered with rubber and ensure both ROTA ports or junction box are not sitting directly on the ground. Ensure proper clearance with base/ground. Ensure the top flange sealing surface is protected using covers.

END OF STANDARD WORK INSTRUCTION

This symbol means that the equipment cannot be discarded in a rubbish-bin. At its end of life, the equipment and/or its components must be treated, following Schlumberger Environmental procedures, in compliance with Schlumberger QHSE Policy and applicable laws and regulations on waste management.