DIRECT REPLACEMENT PROBE INSTALLATION GUIDE

Drumline probes endeavour to maintain the same design ideas as the original equipment. In some instances, we have replaced the gasket used by the original manufacturer with a higher performance gasket. Below are the installation instructions supplied by the original manufacturer, but modified where necessary.

HYDRASTEP

Low Pressure Electrodes - Drumline: DL459600602 - DL459600802

The correct procedure on low pressure electrodes for repairing either a seal or an electrode failure is to remove the knurled nut(s) and disconnect the electrode lead(s). Next, remove the electrode complete with its sealing washer from the column. A thorough examination of the electrode and washer is likely to give a more positive identification of the cause of the leak. However, unless it can be definitely established that the electrode was not at fault, it is advisable to fit a new electrode at this stage. To assist in identifying a seal leak, this may be caused by:

a) Failure to remove the old washer on a previous occasion before inserting the replacement washer and electrode.

b) Re-using an old and already compressed washer instead of a new one.

c) Failing to ensure that the land and the recess in the electrode port were clean and undistorted at the last inspection.

Note: When installing low pressure electrodes, ensure that the threads in the electrode port are free of loose particles. Lightly coat the electrode threads with anti-seize compound.

Insert the electrode, ensuring that the new gasket is centred in the electrode groove, and tighten the electrode with a torque wrench to 40 lbft (55Nm). After 15 minutes, re-tighten the electrode with the torque wrench set to 40 lbft (55Nm). The maximum torque is 50 lbft (68Nm) so **DO NOT OVERTIGHTEN**

High Pressure Electrodes - Drumline: DL246781ZA - DL246781AB - DL247682AC - DL247684AA - DL246785

In the case of high pressure electrodes, sealing is performed by a taper form on the electrode body. The act of tightening the electrode clamping nut compresses the taper form into the port sealing taper, thereby effecting a pressure seal. For these electrodes, the condition of the electrode port sealing surface is of great importance, and the tightening procedure is given to prevent damage to the electrode or the water column electrode port. Should a leak develop, the electrode must be removed and both the port and taper seating surfaces examined for signs of surface deterioration.

Tightening Procedure For High Pressure Electrode Installation

a) Ensure the electrode is clean and the electrode port bore is clean and free of debris.

b) Lightly coat the column port thread with anti-seize compound.

c) Assemble the electrode to the column port and tighten the electrode nut until the electrode will not rotate in its seat.

d) Finally, tighten the electrode nut a further 1 /8 to ¼ turn to complete the procedure.

NOTE: The final 1 /8 to ¼ turn corresponds to a torque level of between 28lbft (35Nm) and 47lbft (60Nm). 1 /8 turn is the recommended tightening condition. ¼ turn is the maximum allowable, and the tightening torque used must be the minimum to achieve this. Failure to comply with this limitation may cause damage to the port or to the electrode, due to over tightening.

If necessary, where the sealing surfaces can be recovered by simple cleaning practices, the old electrode can be refitted and tightened to within the maximum torque value given and the system pressure tested. However, it is recommended that the best solution to minimise the system 'down time' is to fit a new electrode.

LEVELSTATE SYSTEMS

Type 801 - Drumline: DL801 – DL811 – DL801LP

1. First clean the vessel seating recess ensuring it is dry and free from radial score marks. Do not use any form of release coating or jointing compound on the seating face; the spiral wound gasket has exfoliated graphite filler which does not stick to seating faces.

2. Use a Molly Disulphide anti-scuffing paste on threads avoiding contact with seating face and Probe insulators.

3. Screw in each Probe and tighten. Do not exceed 7ONm (52 lb.ft).

4. Connect wires to Probe terminals, tighten knurled nuts using finger pressure only. Refit Guards for Probe protection.

Type 802 - Drumline: DL802

1. Inspect the column seating taper ensuring it is clean, dry and free of radial score marks.

2. Use a Molly Disulphide anti-scuffing paste on threads.

3. Fit Probe and tighten retaining nut until Probe body is just nipped, i.e. where it just cannot be rotated.

4. Apply 27mm/30mm A/F long socket and initially tighten just beyond one hex flat (75° to 80°).

5. Subsequent insertion of Probes should only require 10° to 20° rotation using torque wrench.

6. Connect wires to Probe terminals tighten knurled nuts using finger pressure only. 7. Refit Insert End Cap for Probe connection.

Type 803 - Drumline: DL803

1. Inspect the vessel seating recess ensuring it is clean dry and free of radial score marks. Clean butting faces of Clamp Plate and Vessel.

2. Insert Gasket and Probe to Vessel and carefully fit Clamp Plate over Probe and Studs.

3. Apply a thin film of Copper or Molybdenum based grease to exposed ends of studs.

4. Fit nuts finger tight; adjust nuts to obtain clamp plate parallel to vessel face (approx. 1mm gap).

5. Set Torque Wrench fitted with 17mm A/F long socket to 2ONm. Initially tighten each nut equally through 45º or subsequently where wrench ‘clicks' at torque setting, in the sequence 1, 2, 3, 4 until clamp plate is flush with vessel face. If the torque wrench ‘clicks' without nut rotation this indicates that the Clamp Plate is not parallel to Vessel Face; before proceeding adjust nuts for parallel faces.

6. Set Torque Wrench to 25Nm and tweak each nut until the Wrench clicks at the torque Limit.

DO NOT ROTATE WRENCH BEYOND THE POINT WHERE IT BREAKS (CLICKS) DO NOT EXCEED 25Nm TORQUE SETTING

7. Connect wires to Probe terminals, tighten knurled nuts using finger pressure only. Refit Guards for Probe protection.

CLARK RELIANCE

Replacing the probes:

1. Before removing and replacing any probes, make sure that the column is isolated from any pressure and the drain valve is open.

2. After the column has cooled, remove probe to be inspected or replaced.

3. When replacing the probes, coat the threads lightly and uniformly with a high temperature anti-seize type lubricant such as ‘Never-Seize’, ‘MolyCote G’ or ‘Fel-Pro C’

MAXIMUM TORQUE SETTINGS

Type ZG - Drumline: DLRZG020RK

50 Ft-Lb (68 Newton-Meters)

Type FB - Drumline: DLRFSB030RK

90 Ft-Lb. (122 Newton-Meters)

Type FG - Drumline: DLRFG031RK

52 Ft-Lb (70 Newton-Meters)

Type RT - Drumline: RT020RK

52 Ft-Lb (70 Newton-Meters)

Type RV- Drumline: RV020RK

52 Ft-Lb (70 Newton-Meters)

Hot torqueing is suggested for all probes. However, the column must be isolated from service with the drain valve open before re-torqueing the probes.

The hot torqueing procedure will extend probe sealing gasket life and should be performed as follows:

1. Partially open steam valve to warm up the column with the drain valve slightly open.

2. Close steam (and water) valves to isolate the column.

3. Open the drain valve completely.

4. Re-torque as instructed above.

5. Return to service by closing the drain valve and opening the steam and water valves.

FOSSIL / YARWAY PROBE

YARWAY: 964584-01 - FOSSIL: 9300-0002 - DRUMLINE: DL964

Probe Installation

1. Establish that the threads and sealing surfaces are clean.

2. Insert the probe into the receptacle and snug up the Swagelok nut by hand.

3. Tighten with a wrench 1/4 turn only.

4. The threads on the probe receptacle and Swagelok nut should be re-lubricated each time the probe is reinserted.

The recommended anti-seize compounds noted below prevent galling and will lower take-up torque on the threaded parts: Silver Goop (Swagelok trade name) MP-50 Moly Paste (Jet Lube of Canada) Never Seez (trade name)

QUEST-TEC SOLUTIONS

Type 810 - Drumline: DL801

1. First clean the vessel seating recess ensuring it is dry and free from radial score marks. Do not use any form of release coating or jointing compound on the seating face; the spiral wound gasket has exfoliated graphite filler which does not stick to seating faces.

2. Use a Molly Disulphide anti-scuffing paste on threads avoiding contact with seating face and Probe insulators.

3. Screw in each Probe and tighten. Do not exceed 7ONm (52 lb.ft).

4. Connect wires to Probe terminals, tighten knurled nuts using finger pressure only. Refit Guards for Probe protection.

Type 820 - Drumline: DL802

1. Inspect the column seating taper ensuring it is clean, dry and free of radial score marks.

2. Use a Molly Disulphide anti-scuffing paste on threads.

3. Fit Probe and tighten retaining nut until Probe body is just nipped, i.e. where it just cannot be rotated.

4. Apply 27mm/30mm A/F long socket and initially tighten just beyond one hex flat (75° to 80°).

5. Subsequent insertion of Probes should only require 10° to 20° rotation using torque wrench.

6. Connect wires to Probe terminals tighten knurled nuts using finger pressure only. 7. Refit Insert End Cap for Probe connection.