



LIQUIP ROAD TANKER EQUIPMENT

INSTALLATION INSTRUCTIONS

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INSTALLATION MANUAL FOR TANKER EQUIPMENT

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INTRODUCTION

This information is presented as a guide and must be used in conjunction with local legislation and standards, Owners' requirements and Tank Manufacturers' procedures.

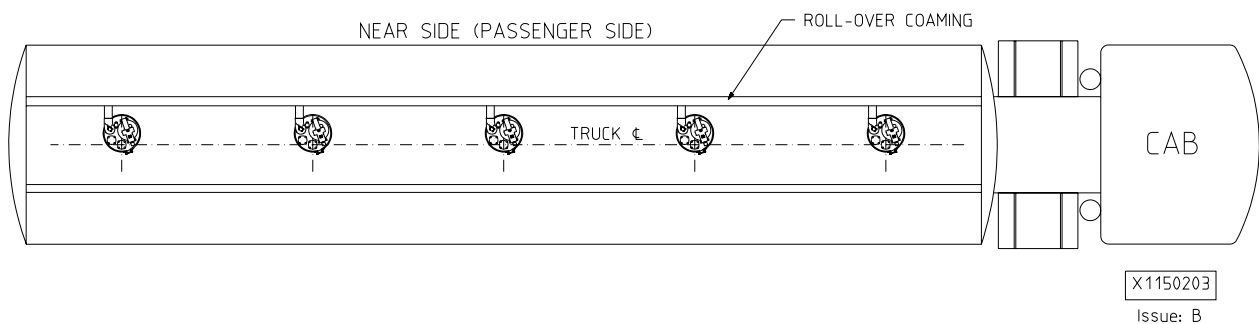
When planning the equipment to be purchased, always design the fittings and layout so that a future conversion to bottom loading, vapour recovery and overfill protection will be a simple task. Much of this is a no-cost item, such as spacing outlet pipes within the API envelope and using 100mm diameter outlet pipes.

If bottom loading and vapour recovery are already standard practice, it is wise to consider future innovations in the design. These include features such as electronic dipsticks and sealed parcel equipment. Liquip will be glad to advise.

Manhole Covers

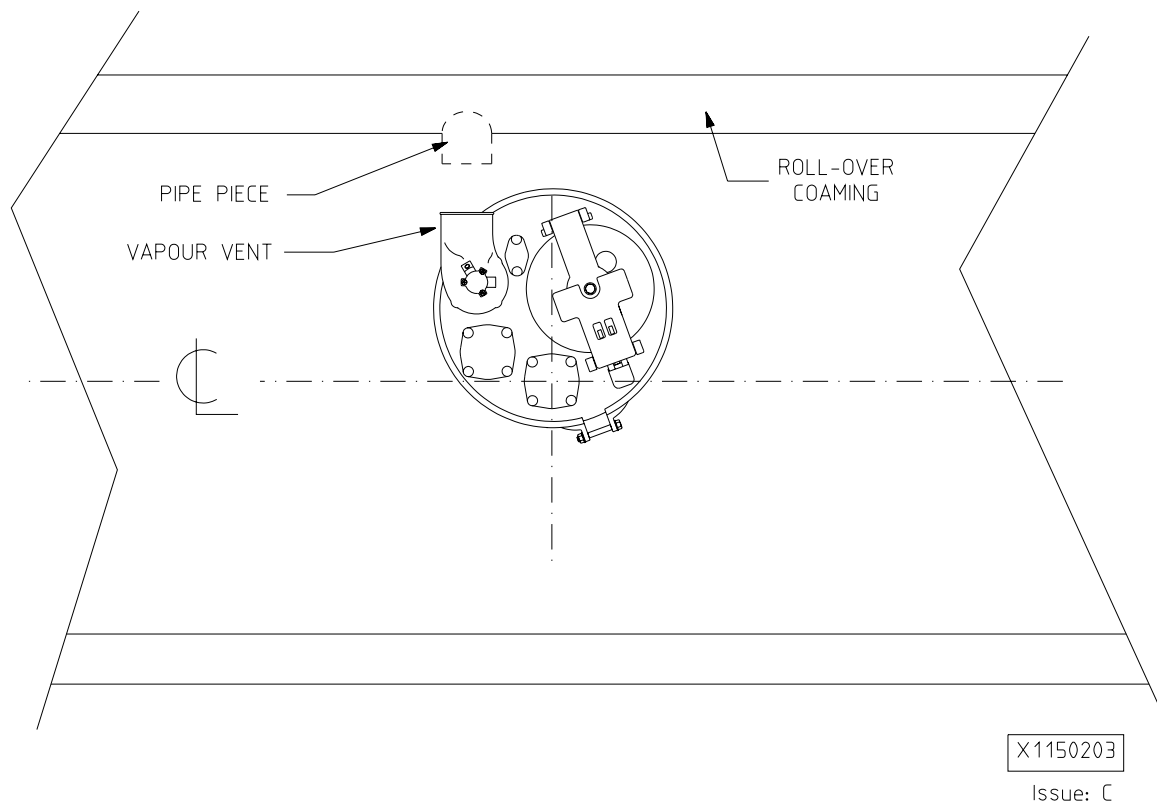
Manhole covers with dip points must have the dip point located along the centre line of the tank. Rotate manhole around the dip point to maximise clear walkway passage and direct the vapour vent outlet towards the roll-over coaming. Similarly, ensure the overfill probe wiring duct will lie neatly into the same area.

Manhole covers and other equipment are normally sited on the kerb side (near/passenger side) of the walkway leaving a clear path along the offside (driver's side) of the walkway.

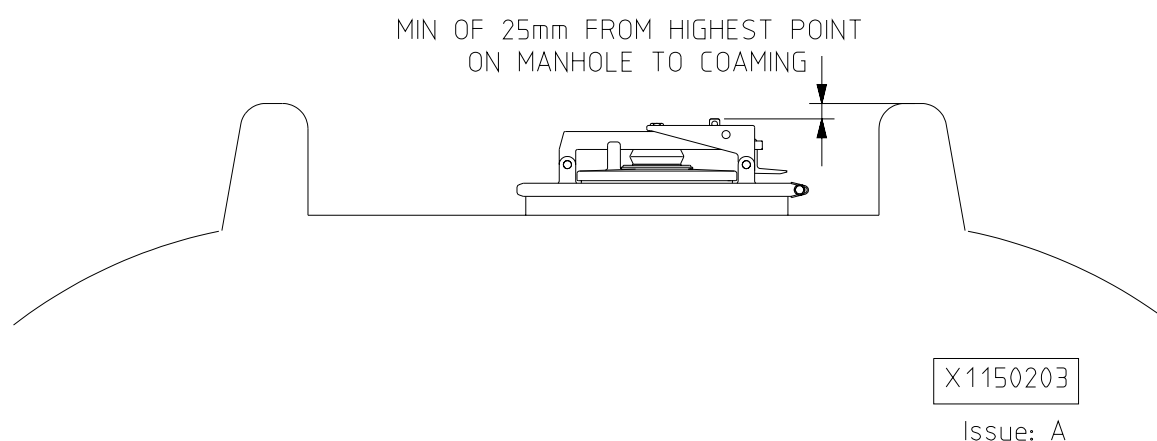


In Liquip's experience there is no requirement to prefer any particular hatch opening orientation. However some companies specify that the handle must hinge forward so it cannot be flipped open.

Attach the vapour vent (vapour valve) to the manhole cover and fit the hatch to its weld-ring. Position the manhole so that the vapour vent is directed towards the roll-over coaming. Mark off the position and height of the vapour duct into roll-over coaming. It is recommended to weld the pipe piece for the vapour vent into the coaming prior to welding in the manhole cover weld-ring, as weld torch clearance is normally limited.



The manhole cover weld-ring may sit on or in the walkway dependent on allowable height (to leave 25mm clearance from top of rollover coaming to top of manhole or any attachment to the manhole, dip/fill caps, etc). Check clearances between coaming and walkway to ensure access for welding torch.



Cut a hole in walkway for the weld-ring to go inside tank (See following table for sizes), this will provide 1 – 2 mm maximum air gap.

Coaming	Material	Hole diameter required	Mount type/ torque	Typical Test Pressure
VOH200U-30	Aluminium 5083 0 temper	416-417mm	Clampband/27-34Nm	35kPa
VOH300-15 & 15P	Aluminium 6060-T595	449-450mm	Clampband/27-34Nm	45kPa
VOH300-17	Mild Steel 250 grade	449-450mm	Clampband/27-34Nm	45kPa
VOH500-14A	Aluminium 5005 H34	515-516mm	24 bolts/10Nm	35kPa
VOH500-17M	Mild Steel 250 grade	502-503mm	24 bolts/10Nm	35kPa
VOH700-26	Aluminium 5005 H34	400-401mm	24 bolts/10Nm	35kPa
VOH700-26M	Mild Steel 250 grade	400-401mm	24 bolts/10Nm	35kPa

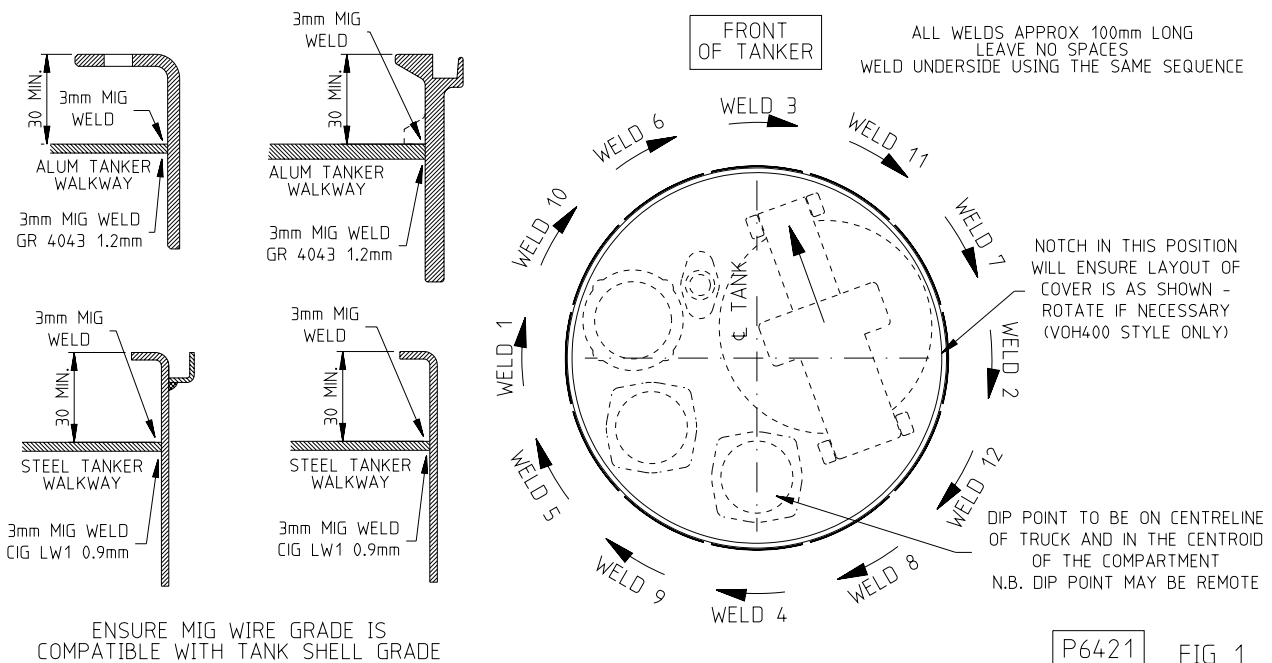
Temporarily attach manhole cover to weld ring using clamp band or bolts to provide extra rigidity (do not fit seal or gasket).

Place 6 tack welds evenly around outside of the weld-ring.

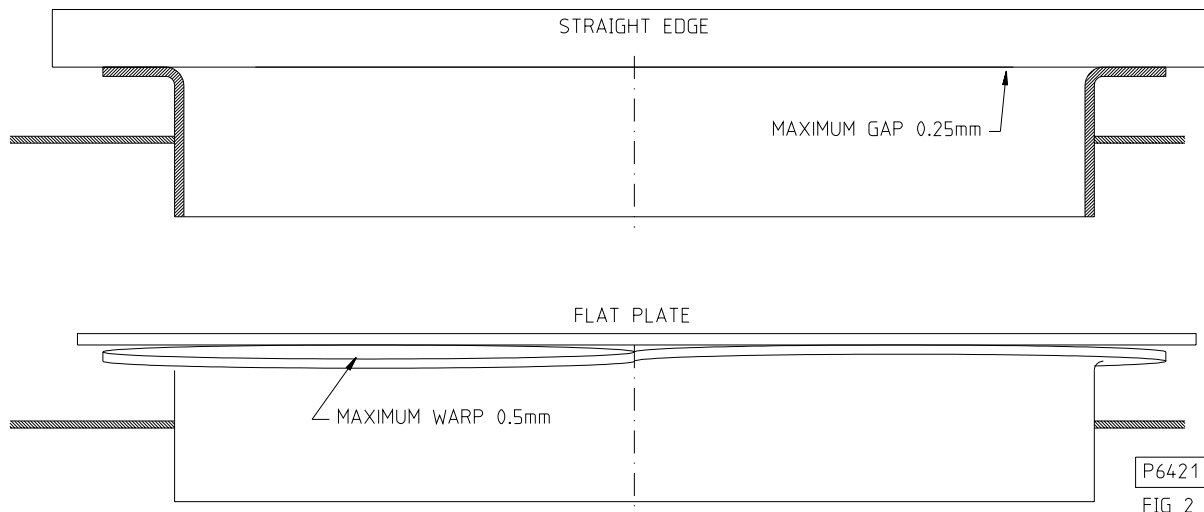
Check positioning and that the weld-ring is level and flat.

Remove the manhole cover from the weld-ring.

Fully weld around the outside of the weld-ring with fillet weld runs no more than 100mm long on opposite sides of the weld-ring in turn, or taking other steps to minimise distortion and stress.



Allow to cool down completely and clean off any weld spatter, and then check the following:
Flatness of the seal face must be within 1.0mm; roundness of seal face must be within 2mm.



Fit gasket or seal as required onto top of weld-ring and fit manhole cover in the correct orientation.

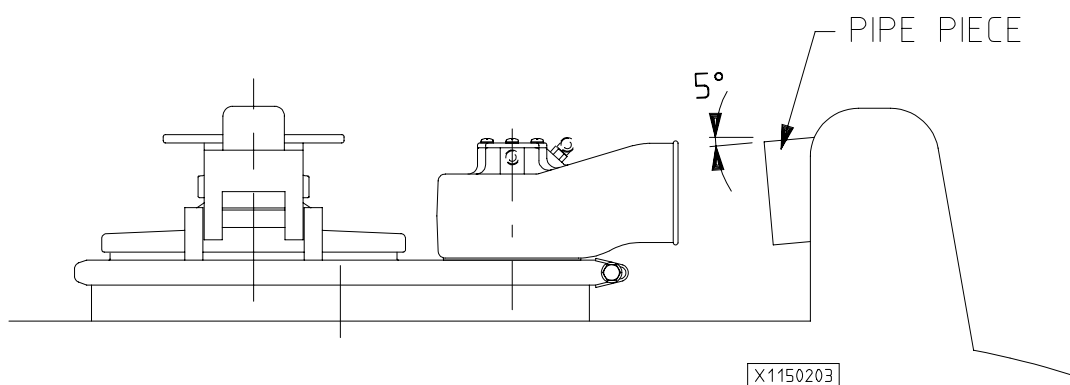
When assembling the VOH400 & VOH200 manhole covers to the weld-ring, the clamp-band nut tension should be **27-34 Nm**. *As the clamp-band is being tensioned the clamp-band must be tapped gently around the band during tightening of the nut.*

When assembling the VOH700 & VOH500 manhole covers to the weld-ring the fastener tension should be **10-12 Nm**. Draw down fasteners evenly to prevent a lopsided fit.

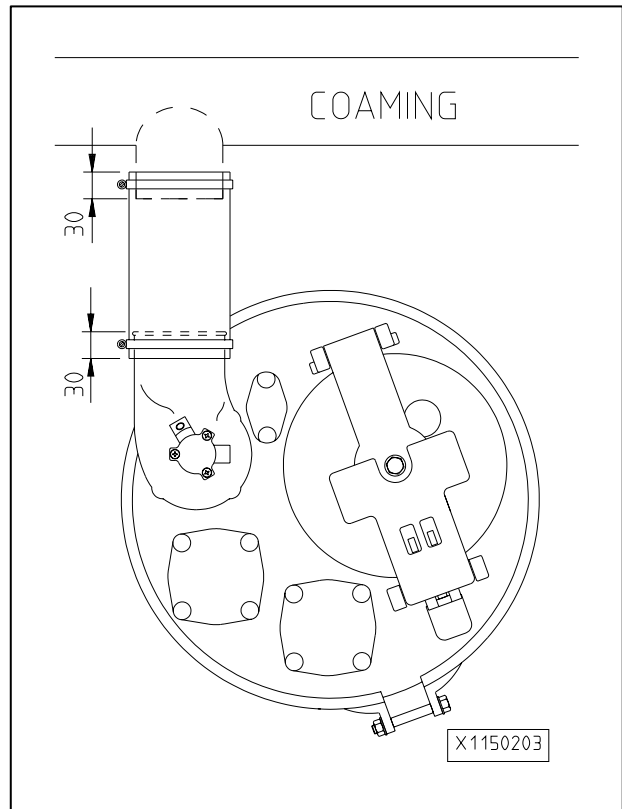
Vapour Vents (Vapour Valves)

Vapour vents must be sited as near as possible to the compartment centre line to avoid problems when the tanker is not on a level surface. Vapour vents should never be sited adjacent to a bulkhead or too far to the left or right across the tank.

The pipe piece welded into the roll-over weld-ring of the tank should be inclined down towards the vapour vent approximately 5 degrees.



When fitting the vapour vent to the manhole, position the vapour vent onto the manhole and cut a piece of 90mm ID hose allowing for approx 30mm of hose to go onto the vent and another 30mm over the pipe piece on the rollover coaming. Fit the hose to the vent and attach with a hose clamp. Position the hose onto the pipe piece on the rollover coaming aligning the mounting holes in the vent with the holes in the manhole cover. Secure the vent to the manhole cover ensuring the screws that secure the vent to the cover and tighten to 10-12 Nm. Secure the hose to the pipe-piece with a hose clamp.



The vapour vent can be walkway mounted either directly in the case of a flat walkway, or by installing a weld flange.

When installing a vapour vent to the walkway the “W” (walkway) model vents must be used in conjunction with blind tapped weld flanges. These vent models allow mounting from above only so access from inside the tank compartment is not required. The vent must not be installed too close to a bulkhead and as close to the tank centre line as possible.

It is essential the correct Liquip-designed weld flange be used otherwise venting may be severely restricted.

Pressure & Vacuum Vents (P & V)

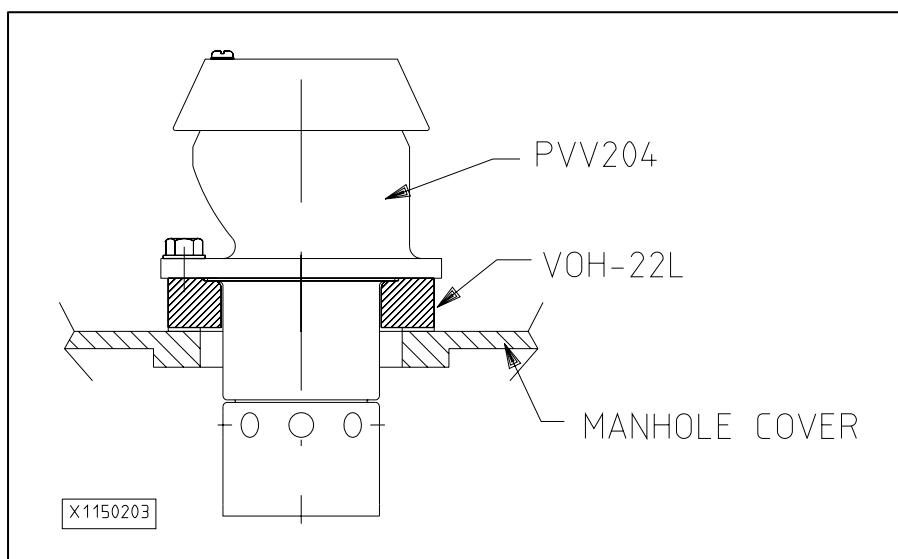
All manhole hatches can be supplied with 1 off PVV104 / PVV104U or 1 off PVV204 / PVV204U vent.

Roll-over protection is built into the pressure and vacuum vent. A poppet completely seals off the vent if it reaches an angle of 60 degrees or more from the vertical. Flame proofing is provided by stainless steel gauze.

The PVV204 series vents are designed for use on tankers which load or discharge at less than 500 litres/minute without any other free to air openings.

The PVV204 provides more capacity than the standard PVV104, which accommodates only the thermal effects on the tanker. Roll-over protection is designed in and it locks shut at any angle greater than 60 degrees from vertical.

The PVV204 vent can be fitted to the VOH200, VOH400 and VOH700 manhole cover using the VOH-22L adaptor flange.

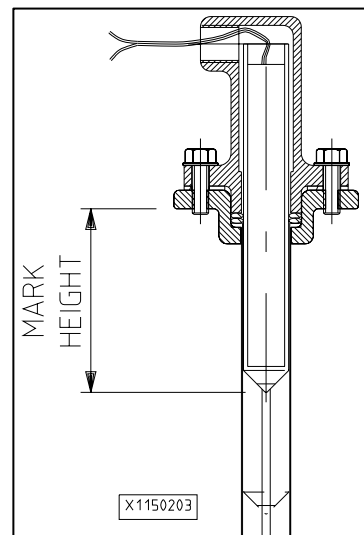


The PVV204 vent can be fitted to the walkway of the tank using the VRB-1 mounting flange. When the PVV204 is mounted to the walkway it must be as close to the centre of the compartment as possible and be mounted on a short pedestal above the walkway to lift it up above product surge effects.

Overfill Protection System

Overfill Protection Probe

When installing the probe in the VOH200-5 housing on the manhole cover, it is essential that from the probe actuation point (trip point) there is at least 230 litres space remaining to allow for the normal delay in slow stopping. After setting, mark the probe body or extension so if replacement is required the new probe can easily be set to the required position. LDP probes have an extension with a scale engraved along the side to allow the set height value to be marked on the safe fill plate.



All electrical wiring should be in water-resistant and UV stabilised conduit and junction boxes. (Refer *Tech Talk 37 IP66 min*)

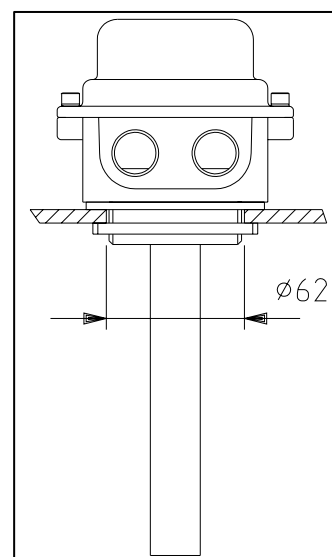
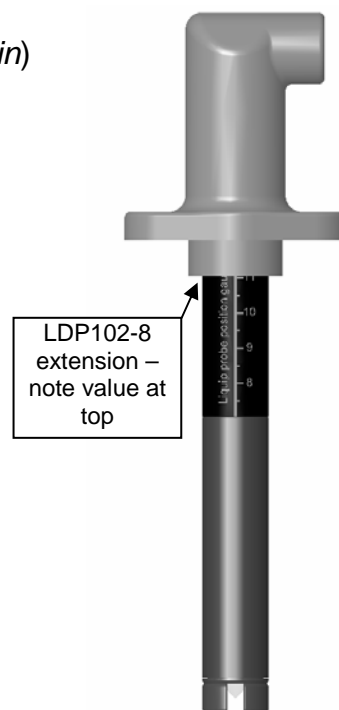
When using the PJB301 probe housing it should be sited on the walkway as close to the centre of the compartment as possible.

The PJB301 can be fitted directly to a tanker with a flat walkway by drilling a 62mm hole in the desired position and securing the PJB301 with the locknut.

The PJB301 can be fitted to a curved walkway on a tanker by first installing a 2" BSP socket then screwing in the PJB301.

The PJB301 can be fitted to Liquip VOH500 manholes or manholes made by other manufacturers.

Using the PJB301 housing with its 2 off M20 threaded ports you eliminate the need to mount a tee with cover into the conduit line. This allows for better connection, easier fault finding and quicker installation.



Truck Plug (TP103/TP104)

Mount the Liquip “Ground Boss” truck plug as per the API connection envelope drawing attached and the sheet supplied with the truck plug.

The Liquip “Ground Boss” truck plug has been developed as a cheap and effective method of assuring that the common earth return wire of the overfill system is forced to pass through the tank structure, ensuring that the tank is bonded to the loading rack to prevent static electrical sparks while loading.

Wiring

The greatest causes of failure of vehicle electrical systems are poor wiring and moisture.

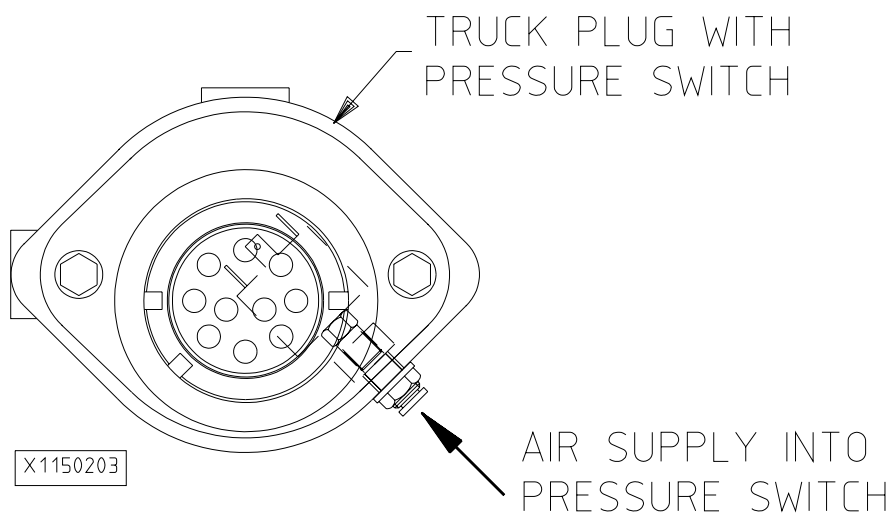
All outdoor mounted equipment such as junction boxes and conduit should be minimum IP66 weatherproof rated (Completely dust-proof and protected against strong jets of water from all directions with minimal ingress permitted). Temperature range –40 to +70 degrees Celsius. U-V resistant, petroleum resistant.

Threaded ports are essential on housings and junction boxes to achieve IP66 rating. Through hole with lock nut inside box do not in general survive the vibration and shock loads on mobile equipment.

The system should be wired up to suit the particular overfill probes being used (2 wire or 5 wire) as detailed in the instructions supplied with the probes.

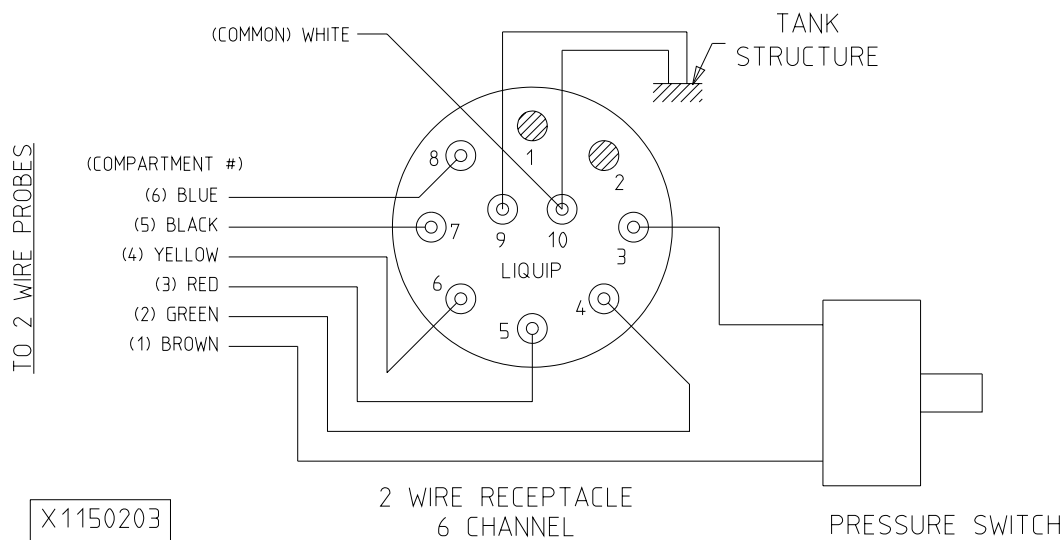
When sequential vapour vents are being utilised to ensure all vents are open prior to loading being permitted, a pressure switch is fitted at the end of the air line going through all the vents.

Therefore the switch will only be pressurised (and therefore energised) when all the vapour vents are open and air is permitted through all the vapour vents poppets.

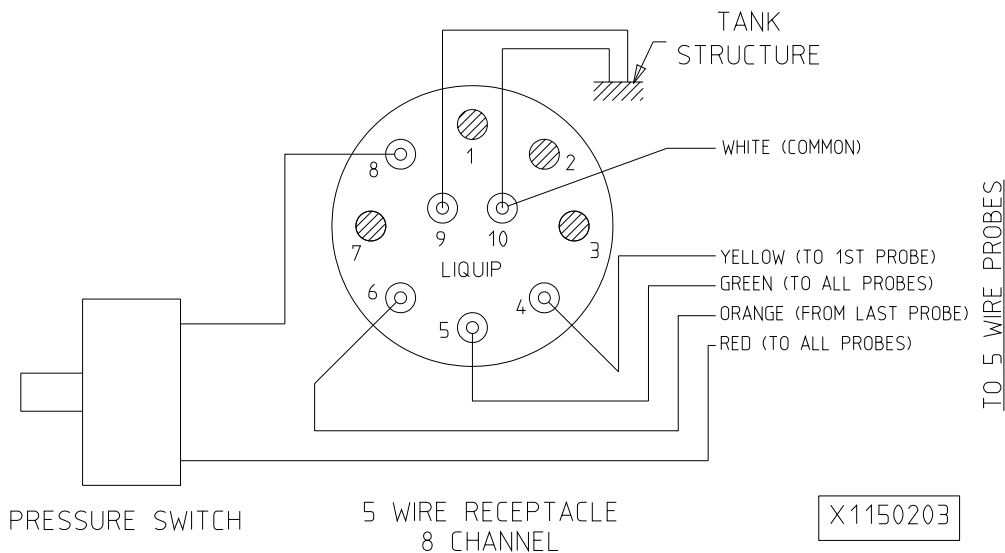


Recommended position of the switch in the overfill probe wiring for a 5 wire system is in the truck plug with the red 'power' wire on the No 1 probe going into switch and the output of the switch going to pin 3 on the truck plug.

REAR VIEW OF TRUCK PLUG (2 wire)



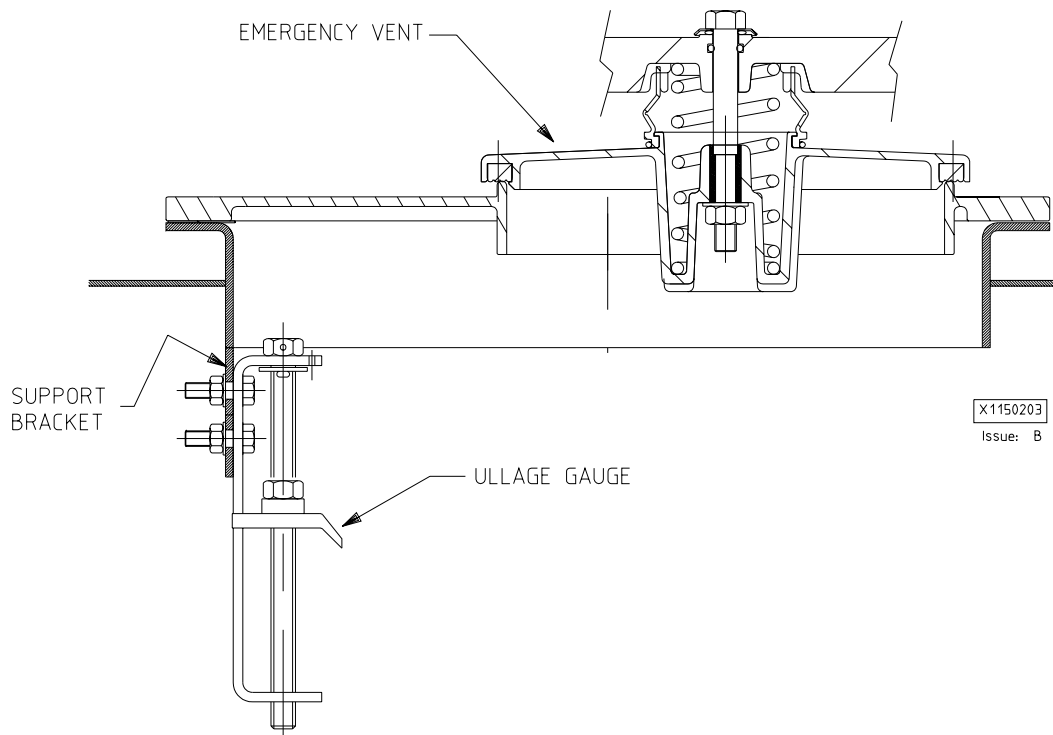
REAR VIEW OF TRUCK PLUG (5 wire)



Conduit for the probes should be run along the top of the tank and under the vapour pipe pieces to reduce the chance of damage to the conduit and wiring and make the layout on the top of the tank neater.

Ullage Gauge

The ullage gauge (UG101) fits to any Liquip manhole cover and can be locked and sealed into position. A support bracket can be welded or bolted onto the bottom of the weld ring on the inside of the tank and the gauge is fitted so that it can be easily seen through the emergency vent.



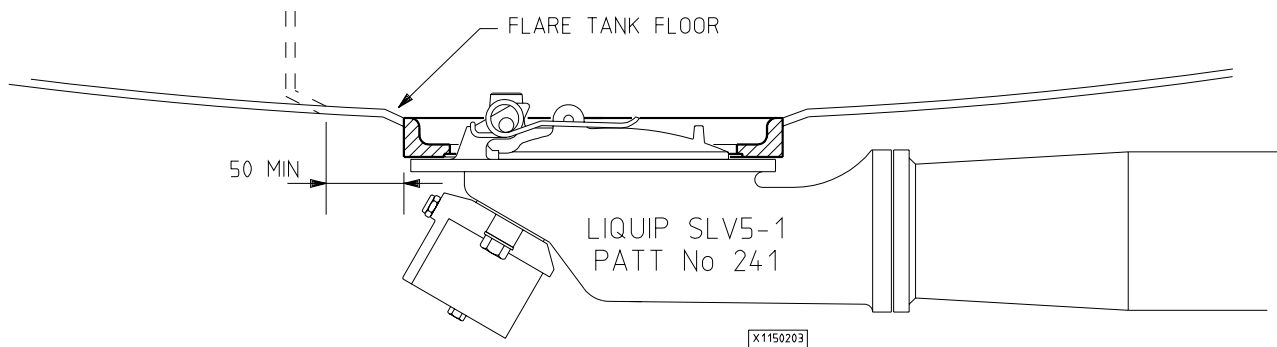
Internal / Emergency Valve SLV5

Due to its unique, low profile within the tank & patented method of operation, the SLV5 requires only 50mm of clearance under the body to enable removal from the tank.

It is essential that the Liquip manufactured tank weld flange (eg SLV5-13 in aluminium) be used as it is designed to provide a full cross-sectional liquid flow area. A tank flange cut with a simple parallel bore restricts the flow and can cause a hazard when bottom loading due to higher back pressures and higher velocities. The Liquip tank flange and flap valve provides the lowest pressure drop, lowest velocity and least vortexing when compared with any other internal valve in common use in the world.

Firstly, determine valve position giving consideration to where the outlet of the valve will lie (ie parallel with or 90 degrees to length of tank etc) Weld in flange so that the studs line up with holes in the valve body.

The SLV should be located at the lowest point of each compartment to ensure drainage. Leave at least 50mm clearance from the edge of bulkhead weld to the edge of the tank flange to minimise stress.



Cut a hole 242-244mm diameter and flare tank shell circumference outwards, for improved drainage and so the tank flange can be welded in easily. Continue flaring until tank flange can fit inside cut out.

Before welding in tank flange, fasten footvalve to tank flange. Hold in the finished position and rotate assembly until outlet of elbow is in the required direction. Place a mark on the side of the flange and tank shell for realignment.

Insert tank flange inside tank with stud holes facing out and markings lined up. Place 4 tack welds around tank flange inside of tank, make sure all studs are removed from flange, then fully weld around outside of flange to the following procedure.

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PROCEDURES FOR WELD IN TANK FLANGES

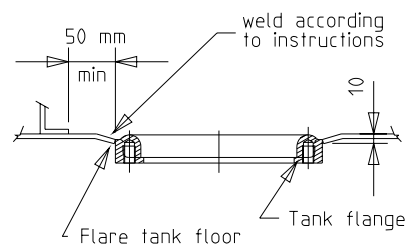
LOCATION

This equipment should be located at the lowest point of each compartment to ensure drainage. Leave at least 50mm clearance from the edge of the bulkhead weld to the edge of the tank flange to minimise stress.

FITTING OF THE WELD FLANGE

In the determined position, cut a hole slightly smaller than the diameter of the selected flange (see table) to allow for trimming later if needed. Flare the tank shell around the circumference outwards for improved drainage and so the tank flange can fit inside the hole.

Before welding in the flange, assemble the tank flange to the outlet elbow, hold up in the hole and rotate the assembly until outlet of the elbow faces the required direction. Using a suitable marker, place a mark on the side of the flange and the tank shell for easy re-alignment.



OUTSIDE DIAMETERS FOR WELD-IN TANK FLANGES

ITV2-1	140
ITV2-3	140
ITV4-1	214
ITV4-3	214
ITV6-1	295
ITV6-3	295
SLV5-13 SERIES	244
SLV5-34	247
EFV100-5 & 7	226
PBV100-5 & 7	226

*ALL DIMS IN mm.

FLANGE WELDING

Hold the tank flange inside the hole and ensure the flange face is flush with the flared tank shell and lined up with the location marks. Place 4 tack welds equally spaced to secure the flange.

NOTE: REMOVE ALL STUDS BEFORE WELDING.

Fully weld the flange from the underside (outside) following this procedure:

WELD NO 1 - A TO B

WELD NO 2 - C TO D

WELD NO 3 - B TO C

WELD NO 4 - D TO A

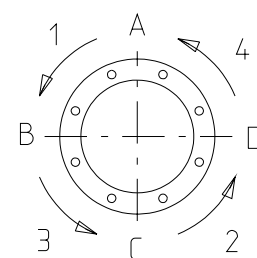
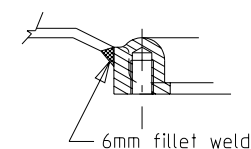
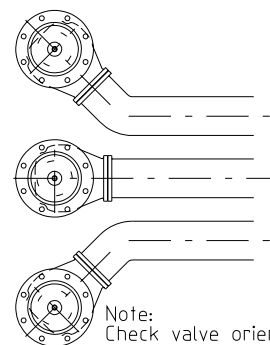
Weld for maximum penetration but keep heat to a minimum to reduce stress, distortion and keep seal face flat (within 0.5mm).

NOTE: ALL WELDING IN ACCORDANCE WITH AS1554.1

OR AS1665

MINIMUM WELDING STANDARD: STRUCTURAL PURPOSE.

When cool, remove all swarf, spatter and filings from the tank to avoid damage to valve. Clean all sealing faces.



X1300097

Issue: C

METERS - VALVES - VENTS - MANHOLES - PUMPS - HOSEREELS - OVERFILL PROTECTION - LOADING ARMS - ELECTRONIC DIPSTICKS



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Follow sketch closely to ensure that distortion and stress is kept to a minimum.

When cool, remove all swarf, spatter and filings from tank to avoid damage to valve. Clean all sealing faces and test for flatness. Flatness must be within 0.5mm.

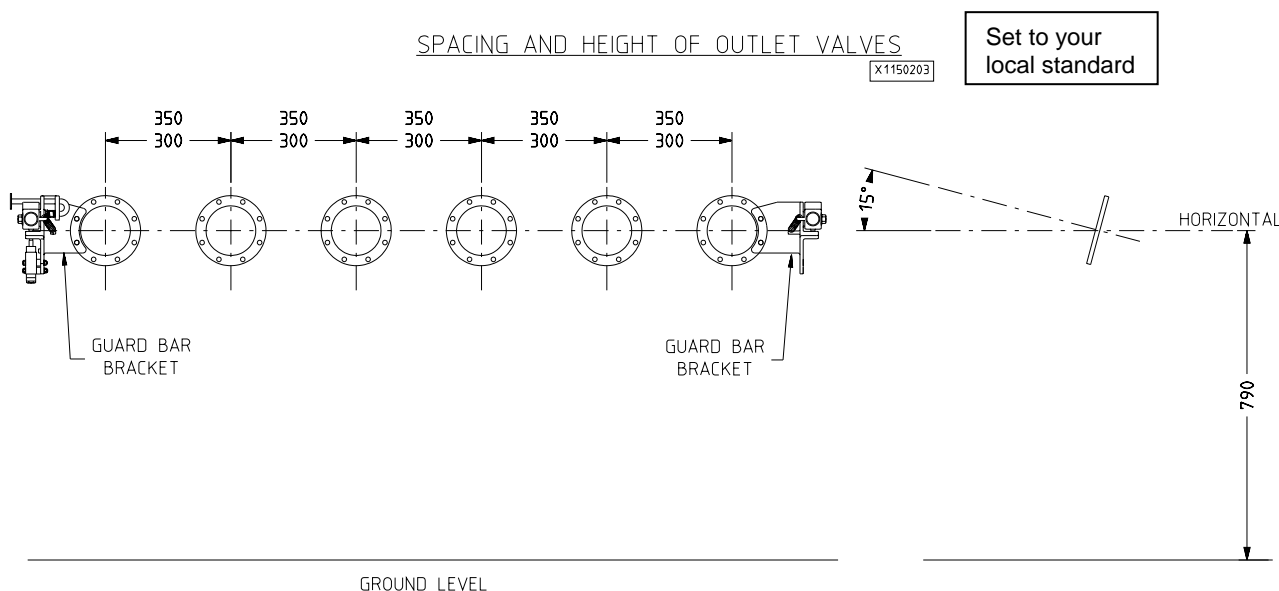
Screw studs into tank flange, fit gasket and valve with the valve outlet facing the required direction. Using supplied nuts, fit footvalve and tighten to 10-12 Nm.

Note: When welding in flanges for any valve, they must have sufficient clearance all round the equipment poppet (eg SLV5 mentioned above) to provide full flow.

Pipelines Footvalve to API outlet valves

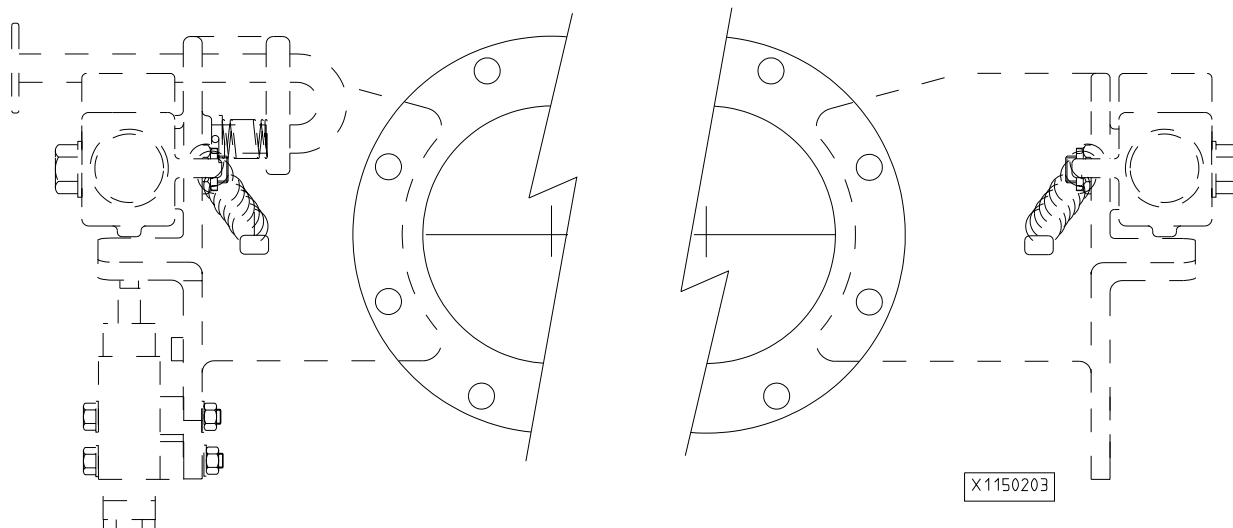
Pipeline between footvalve and API outlet valve should be 100mm tube.

We recommend that a standard jig for the API weld flanges be used so they can be positioned and fixed to the tank, the jig will hold the flange while the pipelines are fabricated.



Tack weld all flanges to outlet pipes and check position prior to removal for full seam welding and pressure testing.

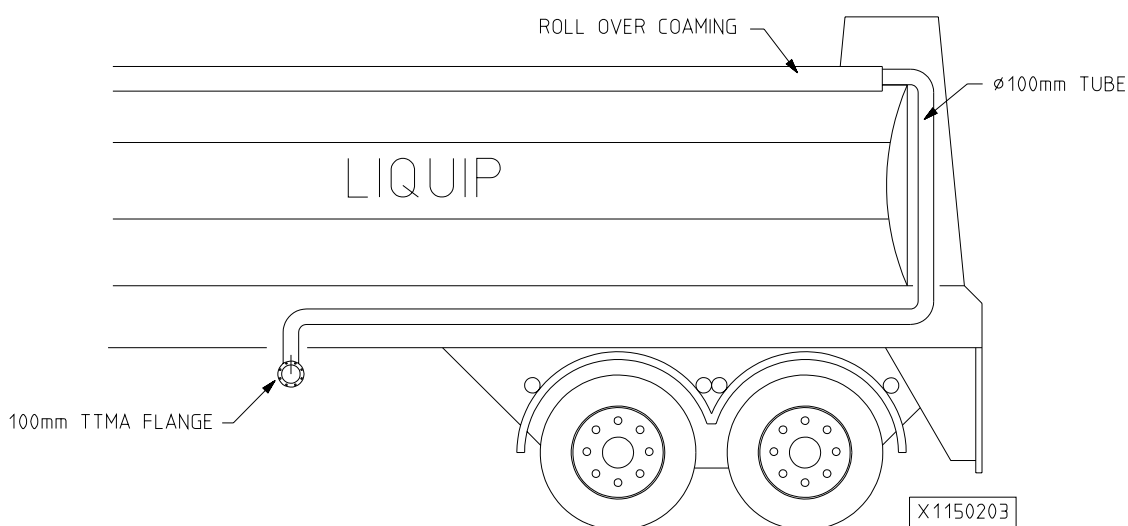
Bolt completed pipelines to tanker, ensuring all pipelines have very little if any spring (3mm maximum) that could cause stress on the footvalve. Ensure that flange faces are clean and flat. Loosely bolt on all assemblies, remembering the outer 2 screws of the outer 2 API adaptors (left and right) need extra length to accept the guard bar brackets. When everything is positioned and checked to be correct, tighten fasteners to **24-27 Nm**.



Vapour adaptor & Vapour Pipeline

Cut a hole on the outside of the roll-over coaming at the rear of the tank large enough to accept 100mm tube.

Run 100mm tube down the rear of the tank to chassis level. Run the tube towards the front of the tank terminating in position on the right hand side of the outlet pipes as shown in the *API connection envelope drawing following..*



The pipeline should have no section lower than its outlet to allow for drainage.

The pipeline should terminate with a 100mm TTMA flange, ensuring that when the vapour adaptor is fitted that it is within the API connection envelope and is pointing outwards from the tank.

Vapour gate (guard bar)

Prior to installation of the guard bar, fit all normal transit caps to the API adaptors.

The guard bar requires aluminium pipe 34mm inside dia x 3mm wall thickness to form the joiners. Unless specifically requested by the purchaser, this pipe is not included in the kit.

Refer *Drawing X5004* and parts list attached. Left-hand bracket incorporates hand-release lock pin. Right hand is plain. Leave off springs until final assembly.

Hold brackets vertically and mark off and drill from TTMA pipe flange (normally 10mm or 3/8" bolts). Cut the aluminium 34mm ID tube to suit clearances and to fit the weld-on corner pieces.

Tack weld first to check swing clearance and for any obstructions. Ensure all caps are in position when sizing. Clearance between gate/guard bar should allow gate/guard bar to cover and uncover transit caps without hitting but not large enough to allow the transit caps to be removed without lifting the gate/guard bar.

Weld on a stub tube to the right hand side arm to cover/uncover the overfill truck plug.

Replace springs, mount interlock air valve and adjust. Brakes should activate on tanker before the gate can be raised sufficiently to fit a hose to adaptor.

Pneumatics

Pneumatic lines should be run along side the overfill protection conduit to make layout neat and protect the lines from damage.

Always fit exhaust filters or pipe "tails" out of the exhaust ports of any operating valves to protect against the ingress of dust and water. All exhausts should be sited so as not to allow "breathing" of vapours. This may require the ducting of air lines from breathers to a remote, clean air, ingress/exhaust point.

Mount the pneumatic control box as per customer requirements.

Note:

- Always take feed from top of auxiliary air tank.
- Always ensure there is an auxiliary air tank
- Always fit air filter / drier

Use 6mm dia (1/4") air line in general to avoid excessive pressure drops.
(*Drawing X1151000*)

International variations

From country to country there are variations in the standard way tankers are set up. Below is a list of examples of some of the possible variations.

- Left hand drive versus right hand drive.
- API adaptors can be mounted at 15° or horizontal.
- Vapour adaptors and couplers may be not standardised.
- Overfill plugs may be 4 bayonet or 3 bayonet with 2 wire or 5 wire overfill protection. (refer to tech talk 26).

Codes and Regulations

Standards vary all around the world. There are Australian standards that have been specially drawn up for Australia, CEN standards that cover most of Europe, USA standards as well as API Recommended Practices (American Petroleum Institute).

Individual installation document list

Bitumen and tank vents: PV401, PV2, VV2.

Bitumen internal valves: BTO100, BMV100.

Butterfly valves: LBV300, LBV450.

Cable operators: CL401, CL402, ACL405R, LW410, LCO series.

Camlock adaptors & accessories: API-MC80, API-MC4, API DC, API-DCLA, API-T3, API-PC, API-LC, AIV3.

Dip & fill fittings: DTA80, DTA65, FTA80, FTA65, DTS3-6, DTS3-2200, DTM80, DS150, DP3.0, DP4.0, DTG3 TS3x3, DSS21, DSR21, DBA50, DBC50.

Diptronic measuring system: DIP120, DIP130, DIP150, DIP200, DIP240, DPS100, PPC200.

Dispensing Accessories: LTE4x4, LTE3x4, LTE3x3, VTE-3, LTA adaptors. AVN042, SJ032, SJ1.5L, ITV1-AO.

Discharge manifolds: DM104, RVA100, MAC100 series, VB100U.

Electronic registers: EMH500, EMH600, ERP200, EJB101, EMH500IS, EJB200.

Emergency valves: SLC100-AT, SLV100, SLV5-ARO, SLV5CO.

Emergency hatch: EH230 Series.

Hatch Weather Cover: HWC301, HWC700, HWC304.

Hazchem Signs: HLS102.

Inline strainer: ILS400, LS200, LS250, ILS2.5.

Internal chemical valve: ITV2, ITV4, SE4.

Manhole covers: VOH200, VOH410, VOH750, VOH500.

Mechanical Engine Strangler: MES3, MES5.

On-board monitors: MPP102, PPM310, PPM320, PPM330, PPM340.

Outlet adaptors: API403, API450 series, API490 series

Overfill probes: AGP202, AGP205, FOT100, FOB100, FOL100, LDP102, LDP105.

Probe mounts: VOH200-5, PJB301.

Product indicators: PI1200.

Pressure balance internal emergency valve: NOR 904120, PBV200.

Pressure hatch: PH20L, PH20.

Pressure vacuum vents PVV104, PVV204.

Probe installation. 6403. X7505.

Roll-over sensors: RS305

Sight Glass: BF3-SG, BF4-SG-25, BF4-SG-40, API-SG-150.

Static reel: SR100, SR101, SR200.

Swing Hatches: SH302, SH303.

Trug plugs: TP103, TP104, ITP103, ITP104, ITP113, ITP114, ITP104U, 5069 cap.

Truck plug with ground boss. Dwg X11499.

Truck plug Installation. 4729, Dwg X600698.

Ullage gauge UG101, Dwg X1200002.

Vapour adaptors: VCM3, VCM450.

Vapour Couplers: VCF075, VCF500.

Vapour Gate: GC301.

Vapour recovery Vents: AVV3, AVV3ST, AVV075V, AVV075VW, AVVF075V.

Vapour Vent Mounting. Dwg X200801.

Typical Checks Upon Completion

- * Hydro or low air pressure test for leaks.
- * Emergency vent lift pressure: check. (Liquip standard 30kPa)
- * With all pneumatic circuits charged (set regulator to 500kPa) soapy-water test all air line joints and carry out pressure-drop check over one hour.
- * Lift 'Vapour Gate':-
 - Check brakes 'on'.
 - Check all vapour vents open.
 - Check each footvalve operation.
- * Close 'Vapour Gate':-
 - Check brakes 'off'.
 - Check all vapour vents close.
 - Check all footvalves close.
- * Check that no connections can be made by loading arms or overfill protection cable with 'vapour gate' closed.
 - Check if connections are then made, the vapour gate cannot be closed (i.e. brakes remain 'on').
- * Check API adaptors, truck plug & vapour adaptor are within API envelope in all 3 axes (See Appendix 3).
- * Check each probe trip point is a minimum of 230 litres below tank full capacity — and set and mark the safe-fill level on the tank and in the Terminal Automation System (TAS) at a volume equal to 12mm below that level.
- * Connect a Liquip HTA204 hand tester (or equivalent) to the tanker overfill protection plug TP104 and with a jar of water or diesel, physically wet test the probe in each compartment in turn, ensuring that the output reverts to non permissive.

Typical Equipment Listing

(example for Bottom loading tanker)

For Each truck

Pneumatics

2241	Air Reservoir	1 off
2242	Bracket	1 off
2243	Drain	1 off
2240	Pressure Protection Valve	1 off
2248	Air Reg. and Filter	1 off
2249	Air Lubricator	1 off
2238	Brake Interlock Valve TR3	1 off
AIV3	Guard Bar Interlock Valve	1 off
2250	Pressure Gauge	1 off
2214	¼ x ¼ BSP Nipple	1 off
1200	¼ BSP x ¼ Air Line	5 off
5901	1/8 BSP x ¼ Air Line	1 off
1204	¼ Air Line	5 metres
-	Brake Line Fittings	2 off
5927	Tee	1 off

Overfill Protection

TP104	Truck Plug	1 off
5069	Cap, Truck Plug	1 off
DP250N	Dummy Probes	1 off
Conduit	16mm conduit (local supply?)	20 metres

(Assumes 2 Wire System)

Auxiliary Equipment

GC301	'Vapour Gate' Interlock Bar	1 off
VCF500	Vapour Coupling	1 off
-	X Metres Vapour Hose and Camlock	1 off
MC4-1	100mm Male Camlock, Weld-on	1 off
-	Tube and Bends, Vapour Pipe	As required
APIMC80	Adaptor, Gravity Drop	2 off
VCM3P	Park Adaptor for Vapour Coupler	1 off

For Each Compartment

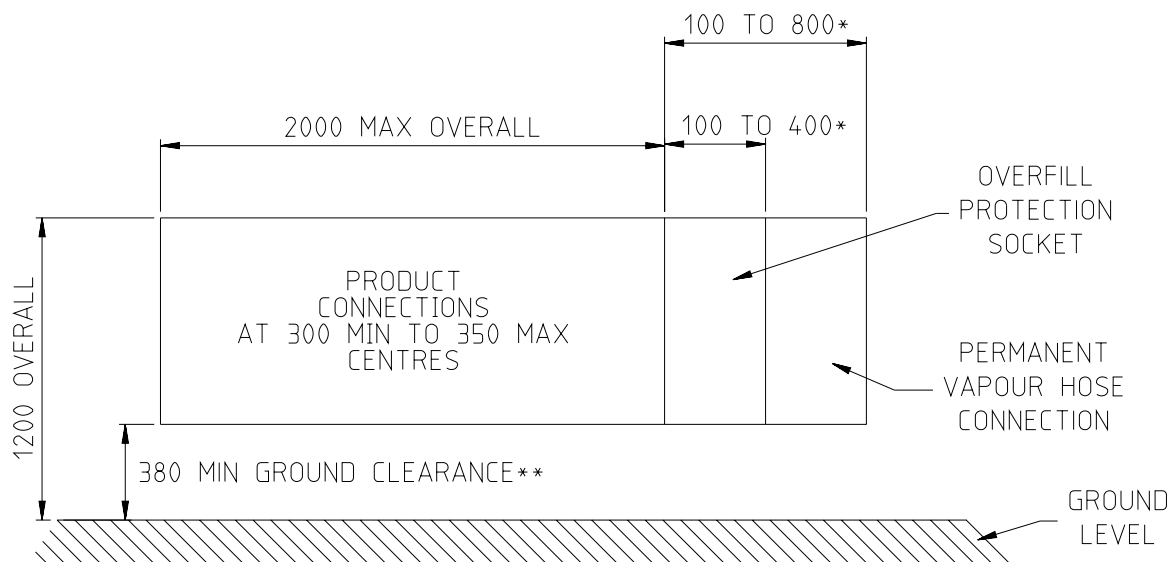
AVV075V	Vapour Vent	1 off
5901	1/8 BSP Air Fitting	1 off
5927	Tee Air Fitting	1 off
1204	6mm Air Line	5 metres
VH3.	Hose and Tube Kit, to Coaming	1 off
PV401-AM-V	Optional-Emergency Vent	(Optional)
PJB301	Probe Housing and Nut	1 off
AGP102/LDP102	2 Wire Probe	1 off
Conduit	16mm Conduit, Local Supply	5 metres
(Splash Deflector)	(Possible Requirement)	1 off
API450	API Adaptor	1 off
APIPC	Dust Cap	1 off
BF4-1	Weld Flange, 100mm TTMA	1 off
VOH4102A4A0Z	Manhole cover	1 off

APPENDIX.

Truck connection location envelopes.

Vapour gate GC300 installation. Dwg X5004.

Vapour recovery air circuits, Dwgs X1151000, X1151100.



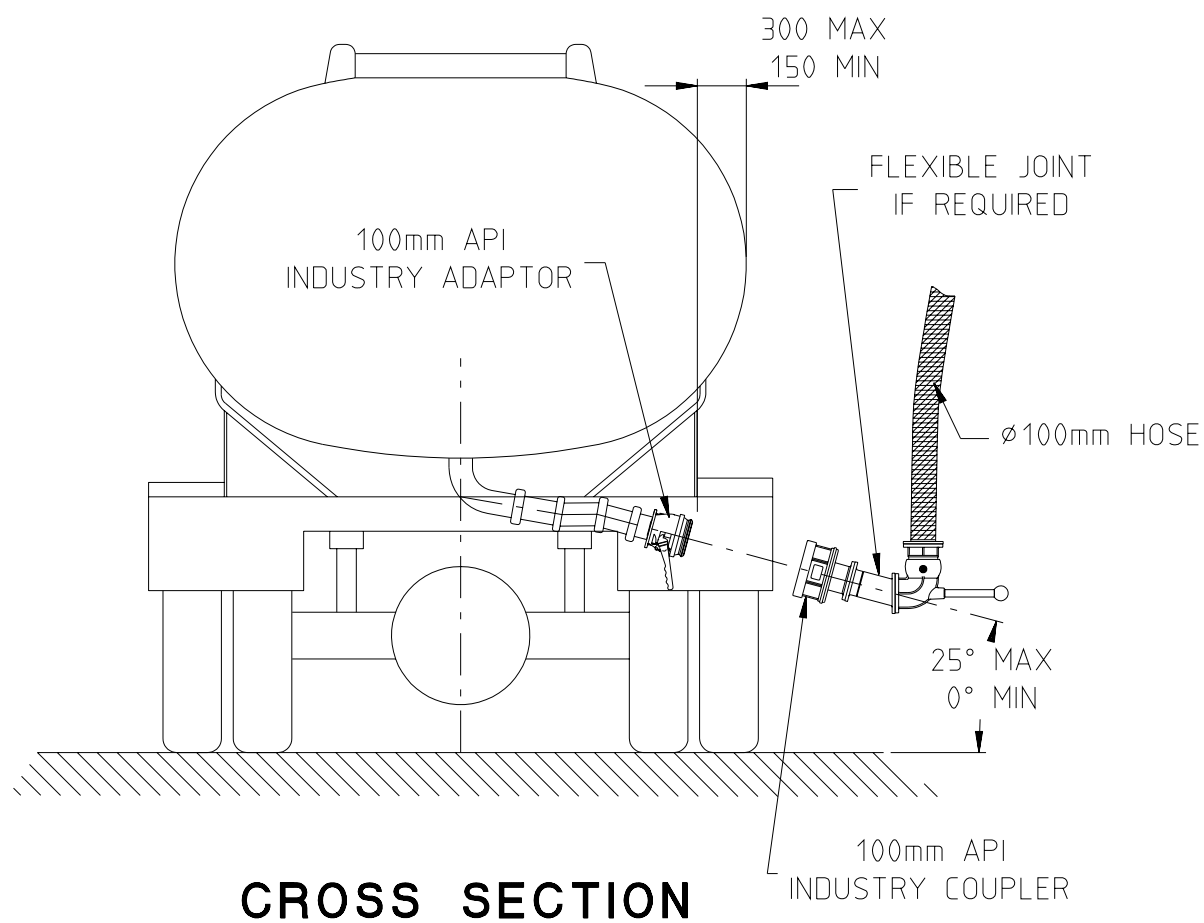
NOTES

* POSITION WITHIN ENVELOPE SO NO INTERFERENCE OCCURS WHEN HOSE IS IN USE

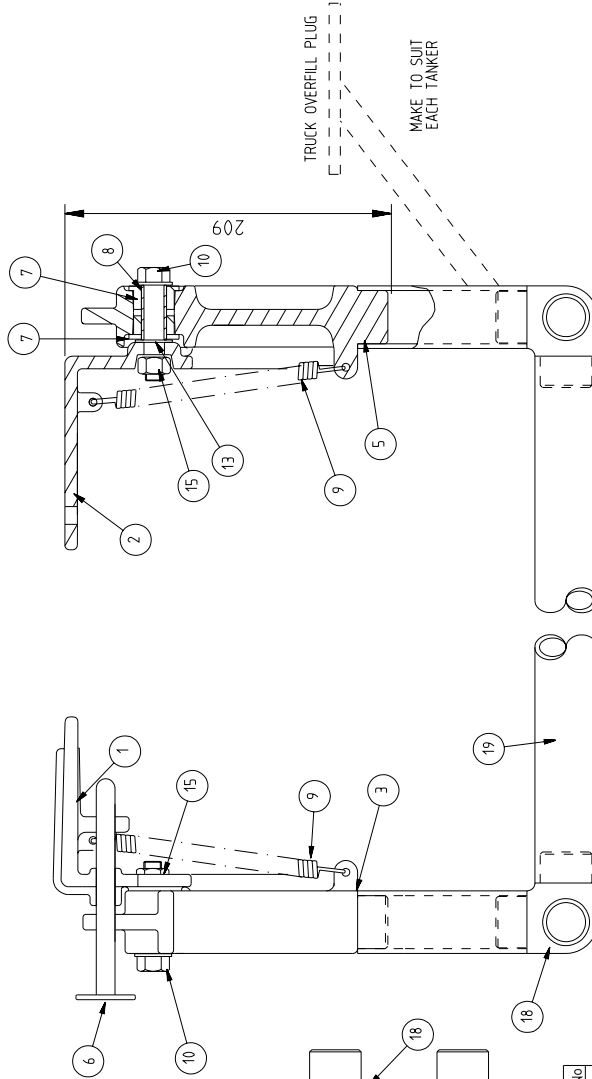
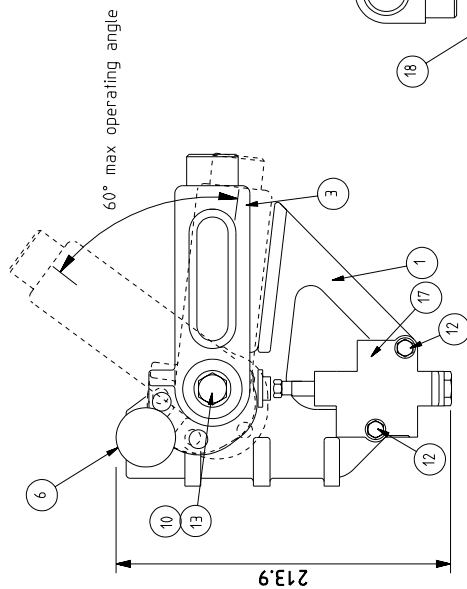
** TO COMPLY WITH AS2809 AMENDMENTS

TRUCK CONNECTION LOCATION ENVELOPES

(ENVELOPE OF OUTER SURFACES OF FITTINGS NOT INCLUDING HANDLES)



GC300 VAPOUR GATE INSTALLATION



FOR AV3 FITTING INSTRUCTIONS SEE AV3 DATA SHEET X2005
1/4" BSP PORTS, 850 kPa MAX. OPERATING PRESSURE.

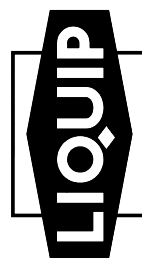
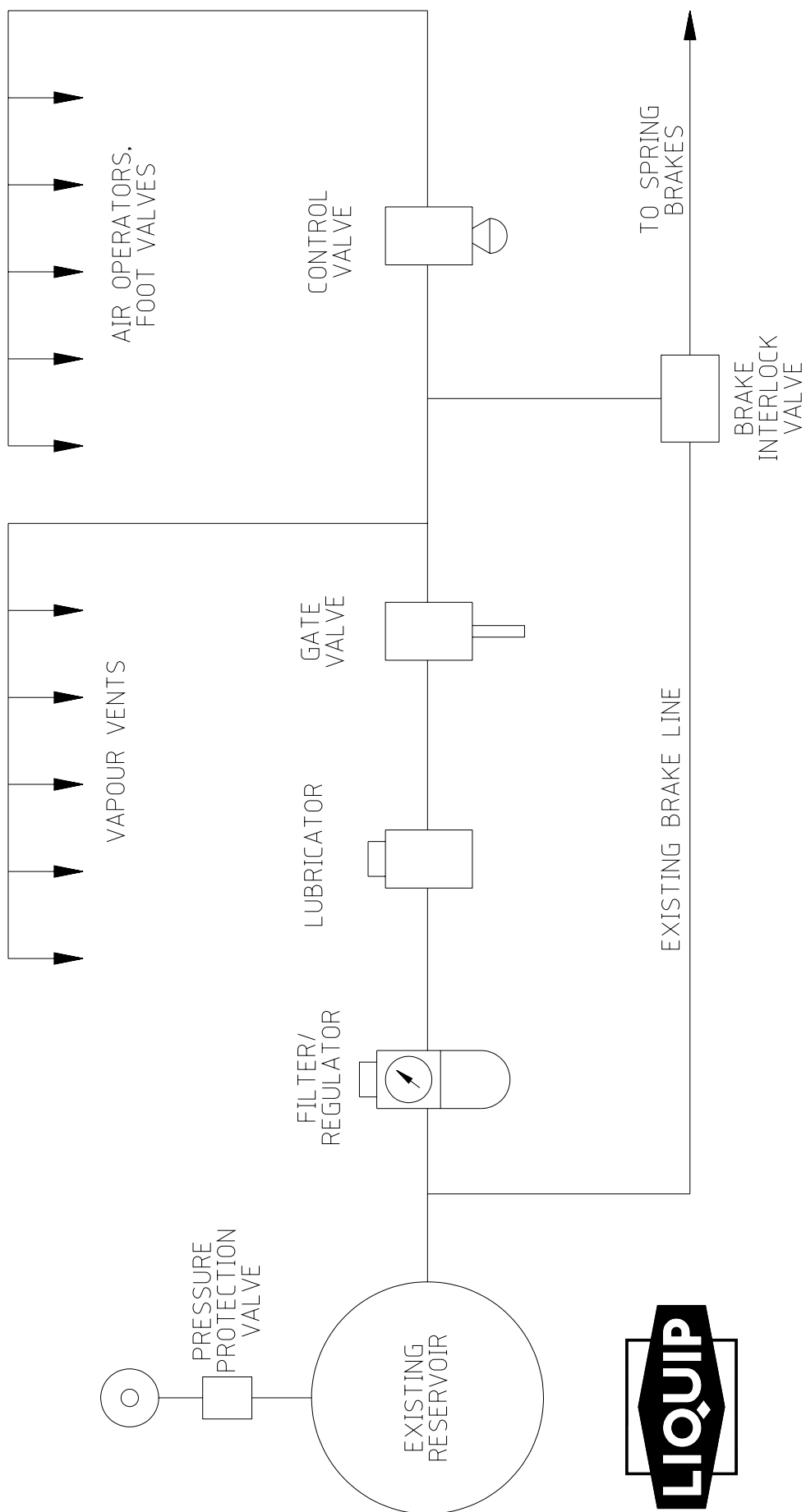
ITEM	PART NO	DESCRIPTION	QTY/ASS	MATERIAL	DRAWING No
1	GC300-1	MOUNTING BRACKET LH	1	CAST ALUM	G301
2	GC300-2	MOUNTING BRACKET RH	1	CAST ALUM	G304
3	GC300-3	OPERATING ARM LH	1	CAST ALUM	G302
4	GC300-4	OPERATING ARM RH	1	CAST ALUM	G302
5	4481	LOCKING LEVER SPRING	1	SPRING ST Z/P	P4481
6	GC300-8	LOCKING LEVER PIN	1	ST STEEL	G303
7	GC300-6	BUSH POLYURETHANE	4	POLYURETHANE	G303
8	GC300-7	OPERATING ARM SPACER	2	MILD ST Z/P	G303
9	4482	GATE TENSION SPRING	2	SPRING ST Z/P	P4482
10	4903	BOLT	2	MILD ST Z/P	
11	0897	PIN SELOX	1	MILD ST Z/P	
12	4901	BOLT	2	MILD ST Z/P	
13	5266	WASHER FLAT	5	MILD ST Z/P	
14	5267	WASHER FLAT	2	MILD ST Z/P	
15	6001	NUT NYLOC	2	MILD ST Z/P	
16	4399	NUT NYLOC	2	MILD ST Z/P	
17	AV3	AIR VALVE	1	CAST ALUM	A600
18	GC300-5	CAST 90° ELBOW (OPTIONAL)	2	CAST ALUM	G305
19	EXT4030Q	ALUMINIUM TUBE Ø40 OD 3mm WALL	AS REQ'D FOR FABRICATION		
20	4772	INSTRUCTION & DATA	1	—	X5004

* NOTE

FOR GC301 ASSEMBLY, OMIT THE FOLLOWING PARTS
ITEM 12 - 4901
ITEM 14 - 5267
ITEM 16 - 4399
ITEM 17 - AV3

X5004

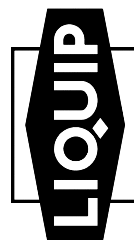
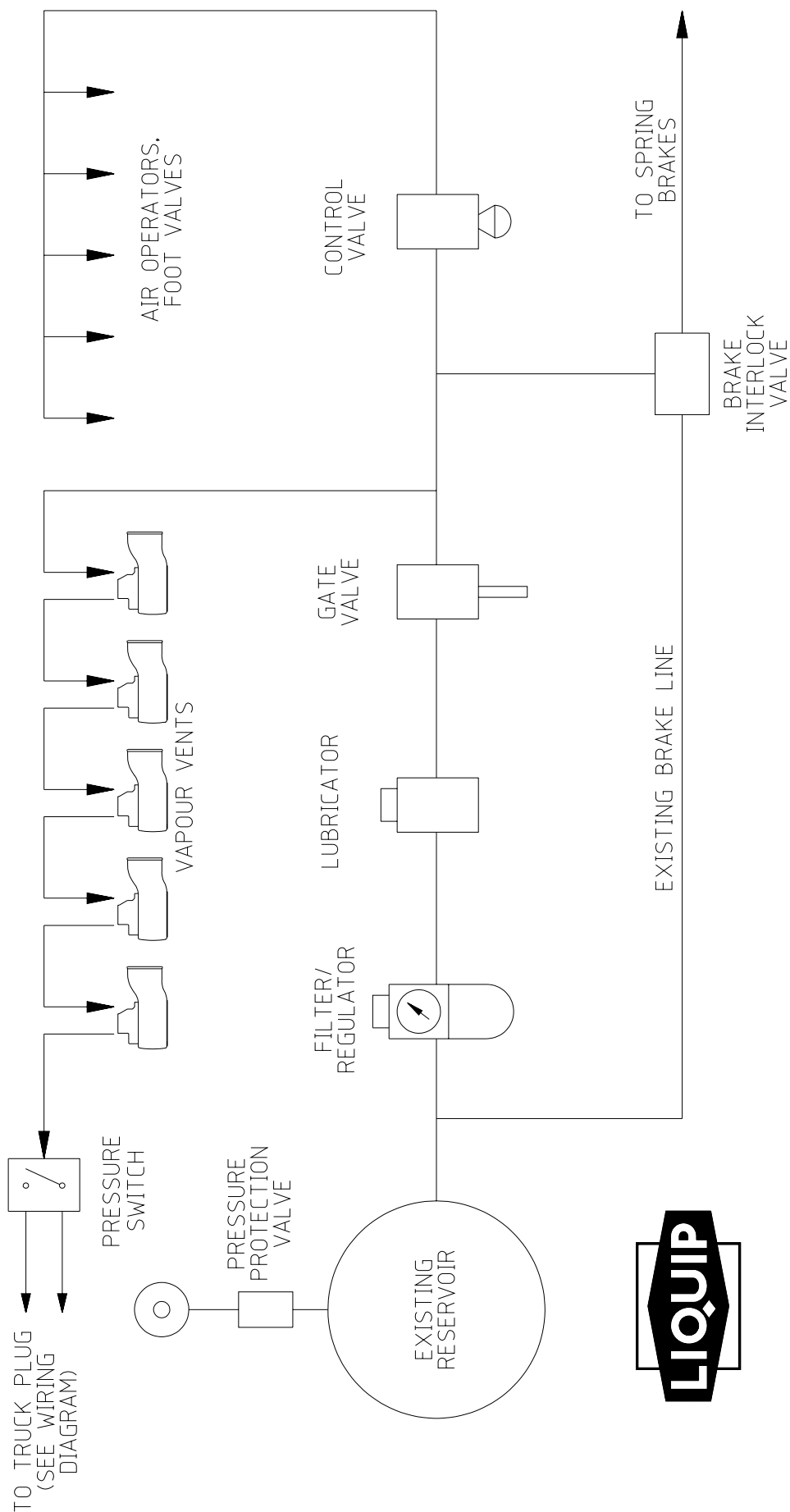
Issue: C



X1151000

Issue: C

VAPOUR RECOVERY AIR CIRCUIT - BASIC SYSTEM



X1151100

Issue: C

VAPOUR RECOVERY AIR CIRCUIT - SEQUENTIAL SYSTEM