



SMITHERS
P I R A



Test Report

Distribution Testing

UN IBC Performance Tests on 950 litre mild steel bunded IBC for liquids

Report reference: VW0211

Prepared for Andrew Hargreaves
of Fuel Proof Ltd

By Shaun McCallion
Head of Dangerous Goods Testing

16th May 2014

Private and confidential



Ref: VW0211
Page 1 of 5

United Nations Dangerous Goods Intermediate Bulk Container (IBC) Performance Test

Client: Fuel Proof Ltd
Middleton Business Park
Middleton Road
Heysham
LA3 3FH

Purpose of test: Issue of new performance certificate.

Certificate Application No: 8266

Summary

Design type tested:	950 litre mild steel barrel shaped IBC fitted to external framework with forkliftable base, comprising of four uprights providing stacking and top lift facilities. IBC tested for Packing Group II liquids with a maximum relative density of 1.0.
Construction:	Barrel shaped IBC welded to external framework comprising of four uprights, horizontal stiffeners and side frames. Outer bund section comprises forkliftable base which is bolt affixed to inner framework with 8 off M12 bolts.
Filling closure:	2" steel socket with internal thread fitted with 2" bore adapter with reduced end fitted to 2" BSP overfill prevention valve.
Discharge closure:	2 x 1" suction pipes fitted to bulk head with threaded flanges fastened with M12 bolts and fitted with 1" BSP chrome plated brass ball valves. 1 x Ball valve fitted with adapter, hose and reel and hose nozzle.
Pressure relief:	1 x 1½" Lafon ventilation valve located within manway enclosure.

A specimen of the IBC detailed at Appendix A was tested in accordance with the relevant provisions of Part 6.5.6 of Chapter 6.5 of the United Nations Model Regulations, 15th edition. The methods of preparation and test are detailed in the UK Operational Instructions for Test Stations, 6th revised edition, issued under arrangements with the Department for Transport.

The design type sample was tested:

- for liquids of packing group II not exceeding relative density of 1.0
- to a maximum gross mass of 1589.65 kg (at rd. 1.0)
- to an internal pressure of 200 kPa (hydraulic)

The IBC design type was considered to have met the test requirements.

1. Description of design type tested

950 litre mild steel IBC, UN code 31A for Packing Group II liquids of 1.0 density. The IBC is described in the specifications, specification checks, drawings and photographs which are included as appendices to this report.

Test sample details

Number of submitted samples:	1
Date of receipt:	6 th May 2014
Tare weight:	639.65 kg
Nominal capacity	950 litres
Brimful capacity	1027.50 litres
Maximum gross mass:	1589.65 kg

2. Tests performed and preparation

A specimen of the IBC detailed at Appendix A was tested in accordance with the relevant provisions of Part 6.5.6 of Chapter 6.5 of the United Nations Model Regulations, 15th edition. The methods of preparation and test are detailed in the UK Operational Instructions for Test Stations, 6th revised edition, issued under arrangements with the Department for Transport.

The IBC was filled to 98% of brimful capacity with water. Test overloads were calculated on the basis of a nominal capacity fill with a liquid of the maximum relative density to be carried.

3. Vibration Test and results

The filled IBC was subjected to vertical sinusoidal vibration with a peak-to-peak displacement of 25mm \pm 5%. The IBC was restrained to prevent horizontal movement without restricting vertical movement. The frequency of the test was increased until a 1.6mm thick 50mm wide metal shim could be inserted intermittently at least 100mm between the IBC base and the vibration platform.

Test frequency:	3.66 Hz
Test duration:	60 minutes
Test conditions:	23°C, 50% r.h.

Result: No leakage or rupture and no breakage or failure of structural components.

Test date: 13th May 2014

4. Bottom lift test and results

The IBC was loaded to 1.25 times the maximum gross mass by the addition of a superimposed load, then lifted and lowered twice by a fork lift truck from each possible direction of entry.

The fork penetration was 75% of the possible depth and the fork spacing was dictated by the fork channels on the entry face.

Required test loading: 1987.06 kg Applied test loading: 2084.85 kg

Test conditions: 18.2°C, 50.8% r.h.

Result: No permanent deformation which renders the IBC unsafe for transport and no loss of contents.

Test date: 12th May 2014

5. Top lift test and results

The IBC was loaded to twice its maximum gross mass by the addition of steel weights to the structure, lifted until it was just clear of the floor and maintained in that position for five minutes.

Required test loading: 3179.30 kg Applied test loading: 3189.10 kg

Test conditions: 18.2°C, 50.8% r.h.

Method of lift: By each lifting eye welded to corner posts.

Result: No permanent deformation which renders the IBC unsafe for transport and no loss of contents.

Date of test: 12th May 2014

6. Stacking test and results

The IBC, filled to 98% of the brimful capacity with water, was subjected to a superimposed load whilst standing on a smooth, flat and level surface. The load was calculated on the basis of a stack of similar IBCs filled to a maximum gross mass multiplied by a factor of 1.8.

Required test loading: 2861.37 kg equivalent to 1.8 times the gross mass of a stack 2 IBCs high.

Applied test loading: 3734.00 kg Test duration: 5 minutes.

Test conditions: 18.2°C, 50.8% r.h. Test date: 12th May 2014

Result: No permanent deformation which renders the IBC unsafe for transport and no loss of contents.

7. Leakproofness test and results

The IBC was emptied and fitted with air pressure connections applied via the spare suction line and Lafon ventilation valve apertures and the flow was shut down when the test pressure was achieved. Soap solution was applied to the filling closure, the discharge assembly and other areas of possible leakage.

Test pressure: 20 kPa Test duration: 10 minutes

Optional filling closure torque: 20 Nm

The IBC was checked for leakage in two ways:

- a. Application of soap solution to areas of possible leakage.
- b. Monitoring for pressure drop over the test period.

Result: No leakage of air

Test date: 12th May 2014

8. Hydraulic pressure test and results

The IBC was filled with water and pressure applied via the connections used for the air leakage test.

Test pressure: 60 kPa Test duration: 10 minutes

Test pressure: 200 kPa Test duration: 10 minutes

Optional filling closure torque: 20 Nm

Result: No permanent deformation which renders the IBC unsafe for transport and no rupture or leakage

Test date: 12th May 2014

9. Drop test and results

The IBC was filled to 98% of the brimful capacity with water and then dropped onto its end at an angle of 15.6°. Following the impact the IBC was lifted by appropriate means until clear of the floor for a period of five minutes.

Drop height: 1.2 m

Result: No rupture or leakage and no damage which renders the IBCs unsafe to be transported for salvage or disposal.

Test date: 14th May 2014

10. Conclusion

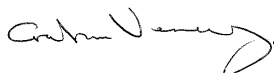
The IBC was prepared as for transport and tested to the relevant provisions of Chapter 6.5 of The UN Recommendations on the Transport of Dangerous Goods, 15th edition.

The design type specified in Appendix A was tested for liquids of packing group II not exceeding a relative density of 1.0 to a maximum gross mass of 1589.65 kg.

The IBC design type was considered to have met the test requirements.

The use of assembly methods, components, materials or dimensions other than those specified herein shall invalidate any approval based on these tests.

Prepared by



G Verney

Senior Packaging Technologist

Date: 16th May 2014

Approved by



S McCallion

Head of Dangerous Goods Testing



0112



SPECIFICATION OF IBCs

Composite IBCs – outer

- (i) UN code : 31A
- (ii) Manufacturer's name and address : Fuel Proof Ltd, Middleton Business Park, Middleton Road, Heysham, LA3 3FH
- (iii) Description : 950Ltr all steel construction IBC for the storage of liquids, housed within a steel bund.
- (iv) Material and grade : Mild steel S275 EN10025
- (v) Method of fabrication : Welded
- (vi) Seams : Welded
- (vii) Dimensions (mm)

	Internal	External
Height	: 742	745, excluding frame 860 (overall)
Max diameter	: 1184	1190 1214 (overall)
Min diameter	:	
Section (non-cylindrical)	: 1538	1546
- (viii) Tare weight (Kg) : approx. 200
- (ix) Finish : Galvanised
- (x) Thickness (mm)

Body	: 3
Base	: supports: 3, fork pockets: 4; side stiffeners: 6
Head	: 4
- (xi) No. of top lift points : 0 on outer. 4 top lifts on inner tank's frame
- (xii) No. of base access directions: 2
- (xiii) No. to be stacked during transport : 2
- (xiv) Remarks : Refer to 950L generator tank drawings, mainly GTV6-A002 and GTV6-A000
Outer and Inner tanks bolt together with 8 off M12 bolts
- (xv) Manufacturer of inner receptacle : Fuel Proof Ltd

Rev 2

Reviewed : March 2011

Next revision : March 2012

Authorised By : Justin Scott, Laboratory Manager



SPECIFICATION OF IBCs

These forms should be accompanied by engineering drawings showing at least general assembly and details of any closures, fittings and fixtures.

Composite IBCs – inner receptacle

- (i) Material and grade : Mild steel S275 EN10025
- (ii) Method of fabrication : Welded
- (iii) Dimensions (mm)

	Internal	External
Height	: 1233, inc. manway	1236, inc. manway 1378 (overall)
Max diameter	: 1174	1180 1240 (overall)
Min diameter	:	
Section (non-cylindrical)	: 894, min point 1390, max point	900, min point 1396, max point 1788 (overall)
- (iv) Brimful capacity (litres) : 1045
- (v) Nominal capacity (litres) : 950
- (vi) Tare weight (Kg) : approx. 395
- (vii) Filling aperture(s) (see general arrangement drawing)

Position	: Top, in manway	Int. diameter	: 2" BSP
		Ext. height	: 64mm
Thread formation	: BSP	No. of starts	: 1
		Thread pitch	: 2" BSP
- (viii) Filling closure(s)

Material and grade	: Cast aluminium	
Type and size	: 2" BSP	
Thread formation and pitch	: Continuous 2" BSP	
Gasket and/or other seal	: Rubber seal	
Closure torque (Nm)	: 20	at ambient temperature
- (ix) Discharge aperture(s) (see general arrangement drawing)

(a) Position	: 2 x top, front	Int. diameter	: 27.3
		Ext. height	: N/A
Thread formation	: N/A	No. of starts	: N/A
		Thread pitch	: N/A

Rev 2

Reviewed : March 2011

Next revision : March 2012

Authorised By : Justin Scott, Laboratory Manager

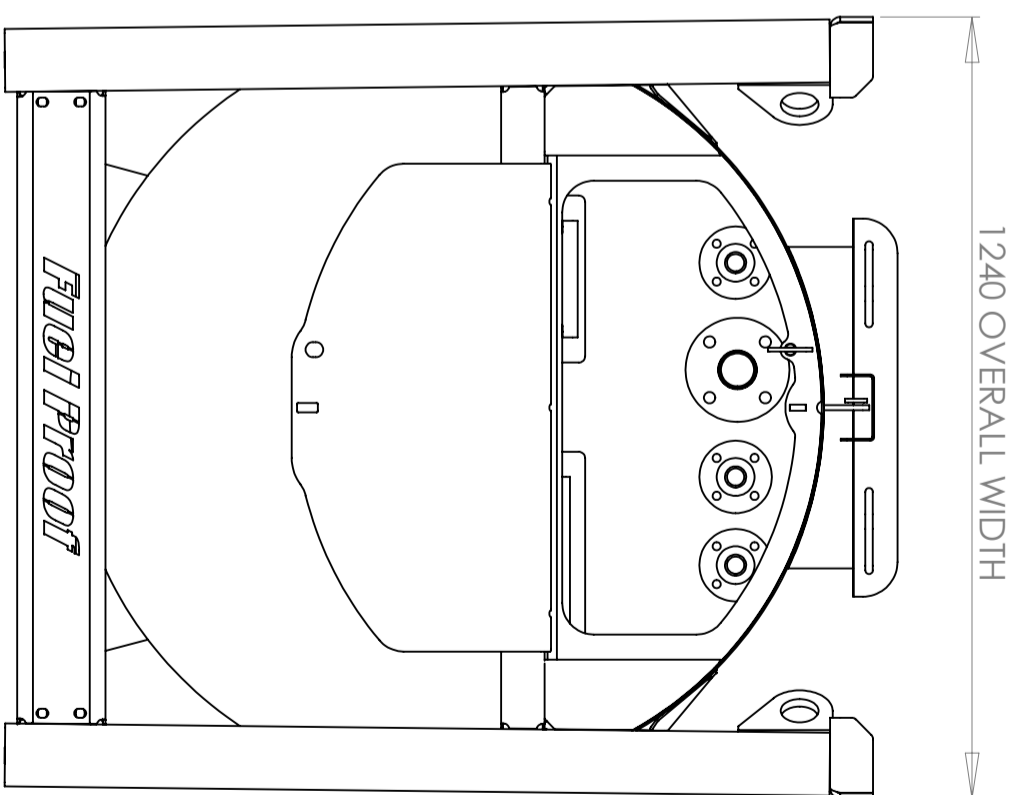
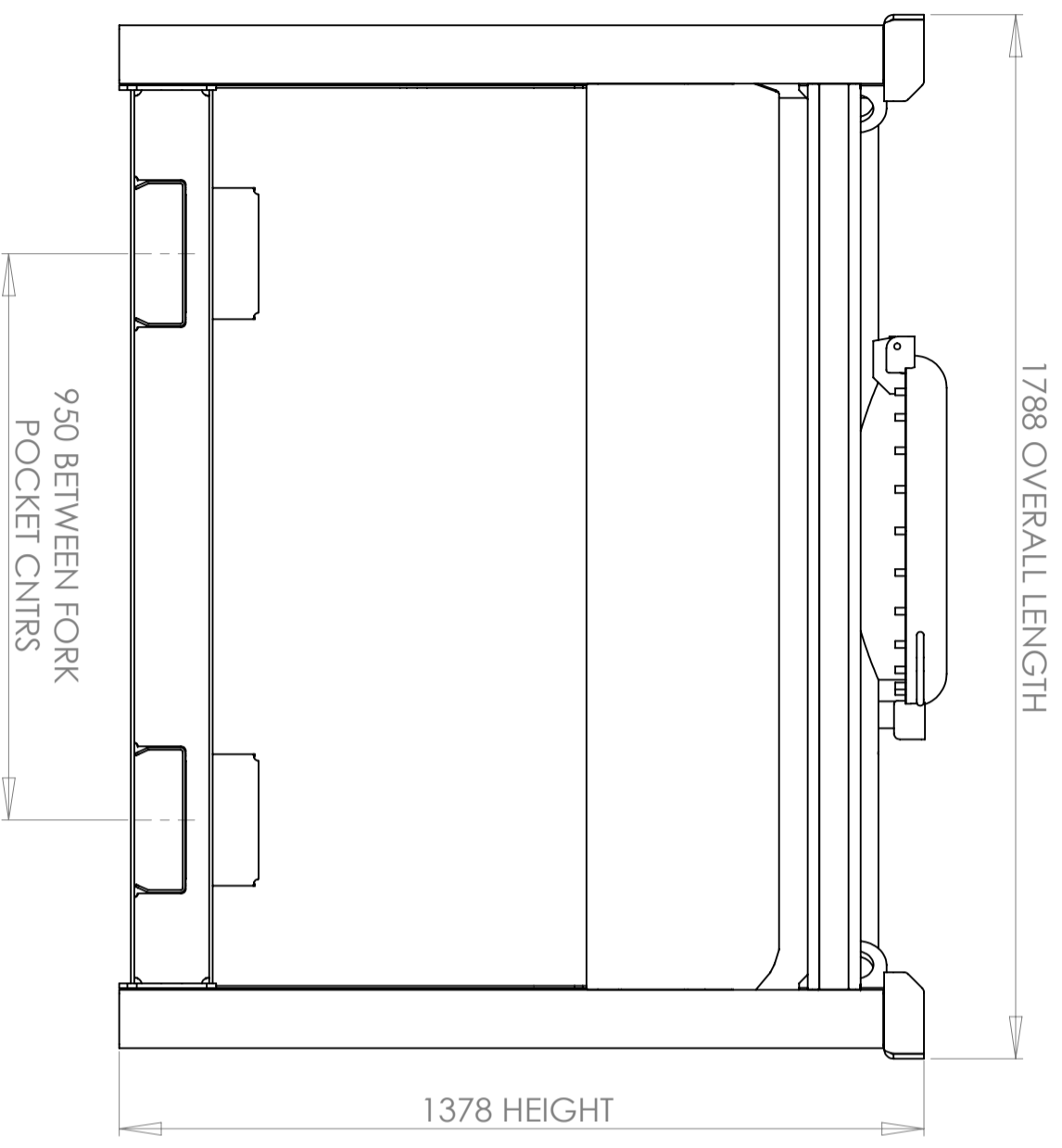


SPECIFICATION OF IBCs

- | | | | |
|--------------------------------|---------------------------------|---|------------------------|
| (b) | Position | : Top, in manway | Int. diameter : 1" BSP |
| | | | Ext. height : 52.5mm |
| | Thread formation | : BSP | No. of starts : 1 |
| | | | Thread pitch : 1" BSP |
| (x) Discharge closure(s) | | | |
| | (a) Material and grade | : Mild steel S275 | |
| | Type and size | : PN16 DN25 threaded flanges, fitted by M12 bolts | |
| | Thread formation and pitch | : N/A | |
| | Gasket and/or other seal | : Rubber gasket | |
| | Closure torque (Nm) | : N/A | |
| | (b) Material and grade | : Chrome plated brass CW617N | |
| | Type and size | : 1" BSP ball valve | |
| | Thread formation and pitch | : Continuous 1" BSP | |
| | Gasket and/or other seal | : PTFE seats and seals | |
| | Closure torque (Nm) | : 20 at ambient temperature | |
| (xi) Minimum thickness (mm) | | | |
| | Sidewall | : 3 | |
| | Top | : 3 | |
| | Base | : 3 | |
| | Manway & attachment nozzles | : 3 | |
| | Stiffeners & frame sections | : 4 | |
| | Manway flange & attachment base | : 6 | |
| (xii) Pressure relief fittings | | | |
| | Number | : 1 | |
| | Type | : 1½" BSP ventilation valve | |
| | Location | : Top of tank, on manway attachment | |
| (xiii) Other fittings | | | |
| | Number | : 4 | |
| | Type | : 1 x PN16 DN25 threaded flange- generator return line
1 x 1½" BSP internal gauge line
1 x 2" BSP optional fill line, capped
1 x 1" BSP blanked socket- spare suction line | |
| | Location | : All positioned as per drawings, all 30mm above max fuel level | |
| (xiv) Remarks | | | |
| | | : Refer to 950L generator tank drawings, mainly GTV6-A001 and GTV6-A000
Outer and Inner tanks bolt together with 8 off M12 bolts | |

These forms should be accompanied by engineering drawings showing at least general assembly and details of any closures, fittings and fixtures.

Rev 2	Reviewed : March 2011	Next revision : March 2012
Authorised By : Justin Scott, Laboratory Manager		



DRAWING STATUS:

THIS DRAWING IS NOT TO BE REPRODUCED WITHOUT
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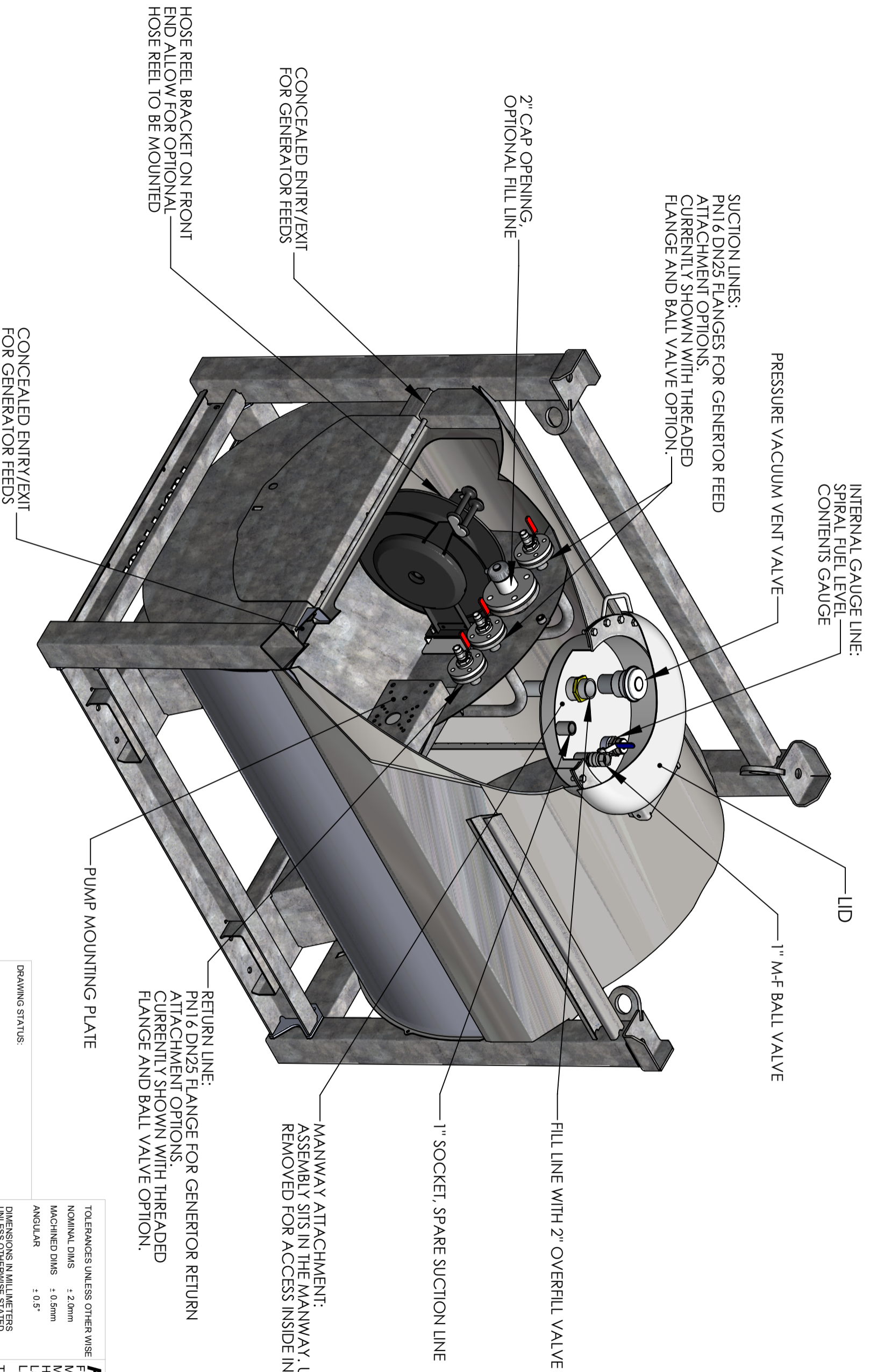
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 Fax: 01524 859681
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TOLERANCES UNLESS OTHERWISE
 NOMINAL DIMS ± 2.0mm
 MACHINED DIMS ± 0.5mm
 ANGULAR ± 0.5°

DIMENSIONS IN MILLIMETERS
 UNLESS OTHERWISE STATED
 REMOVE BURRS & SHARP EDGES
 MACHINE WHERE MARKED
 SURFACE TEXTURE VALUES IN µm

Rev:	Description:	Drawn:	Appv'd:	Chkd:	Date:	Finish:	Material:	Drawn By: H.Upton	Scale:	SHEET 1 OF 3	Revision: C
Title: 950L GENERATOR TANK MAIN ASSEMBLY								Drawing No: GTV6-A000			A3

CUT THROUGH VIEW OF GENERATOR TANK



HOSE REEL BRACKET ON FRONT
END ALLOW FOR OPTIONAL
HOSE REEL TO BE MOUNTED

CONCEALED ENTRY/EXIT
FOR GENERATOR FEEDS

CONCEALED ENTRY/EXIT
FOR GENERATOR FEEDS

PUMP MOUNTING PLATE

RETURN LINE:
PN16 DN25 FLANGE FOR GENERATOR RETURN
ATTACHMENT OPTIONS,
CURRENTLY SHOWN WITH THREADED
FLANGE AND BALL VALVE OPTION.

MANWAY ATTACHMENT:
ASSEMBLY SITS IN THE MANWAY, UNBOLTED &
REMOVED FOR ACCESS INSIDE INNER TANK

1" SOCKET, SPARE SUCTION LINE

FILL LINE WITH 2" OVERFILL VALVE

PRESSURE VACUUM VENT VALVE

INTERNAL GAUGE LINE:
SPIRAL FUEL LEVEL
CONTENTS GAUGE

LID

1" M-F BALL VALVE

SUCTION LINES:
PN16 DN25 FLANGES FOR GENERATOR FEED
ATTACHMENT OPTIONS,
CURRENTLY SHOWN WITH THREADED
FLANGE AND BALL VALVE OPTION.

2" CAP OPENING,
OPTIONAL FILL LINE

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SURFACE TEXTURE VALUES IN µm

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Rev:	Description:	Drawn:	App'vd:	Chk'd:	Date:	Finish:

Title: **950L GENERATOR TANK
MAIN ASSEMBLY**

Drawing No: **GTV6-A000**

Material: **A3**

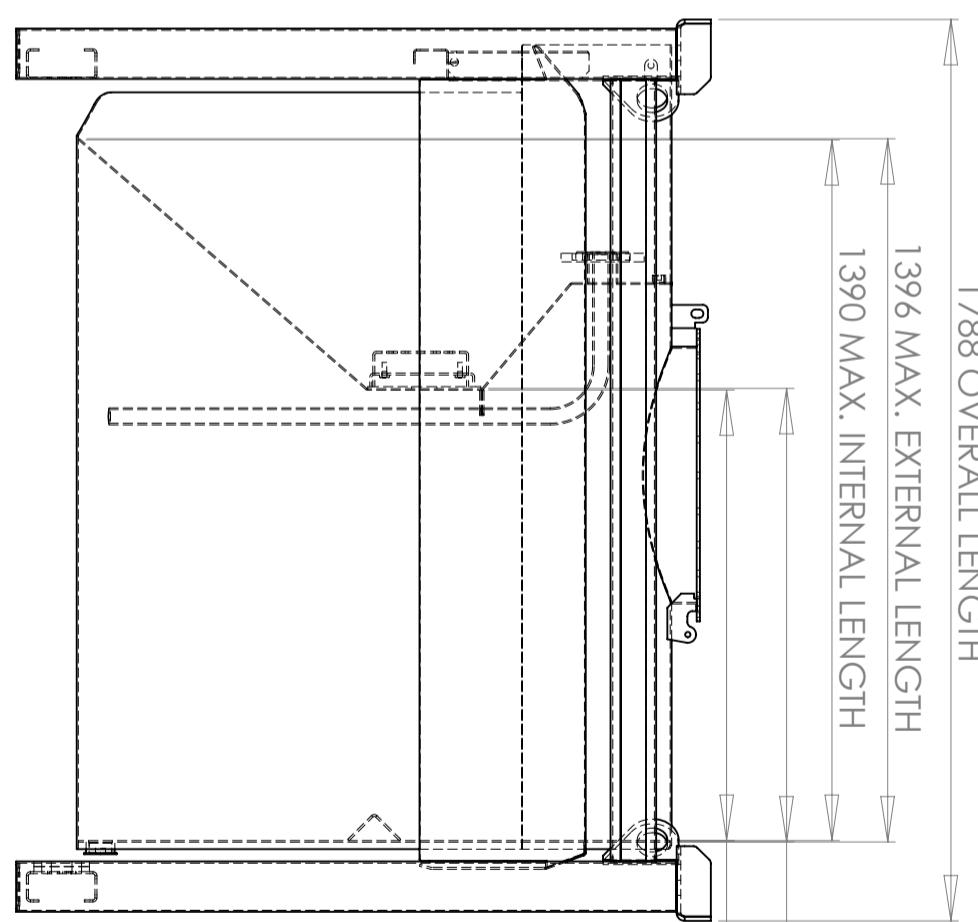
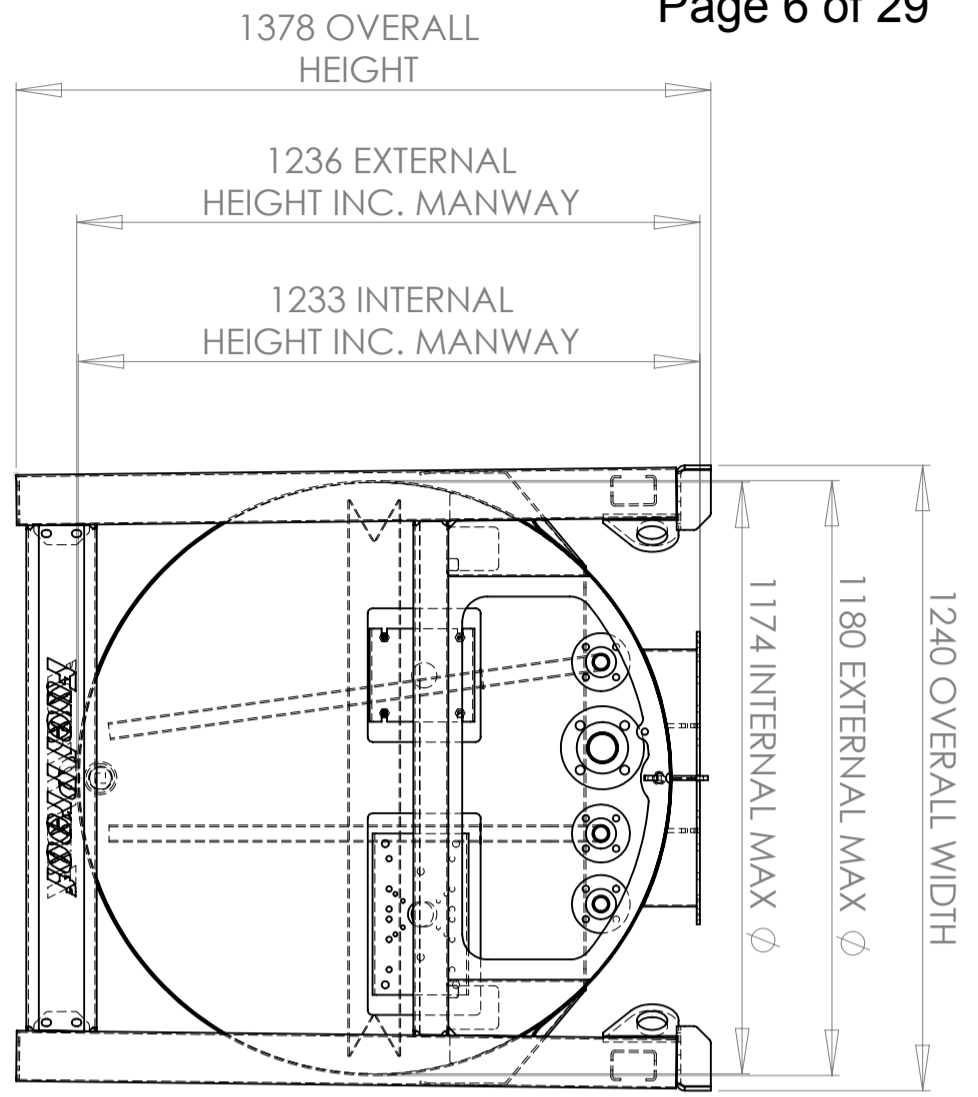
Drawn By: H. Upson

Scale: **SHEET 2 OF 3**

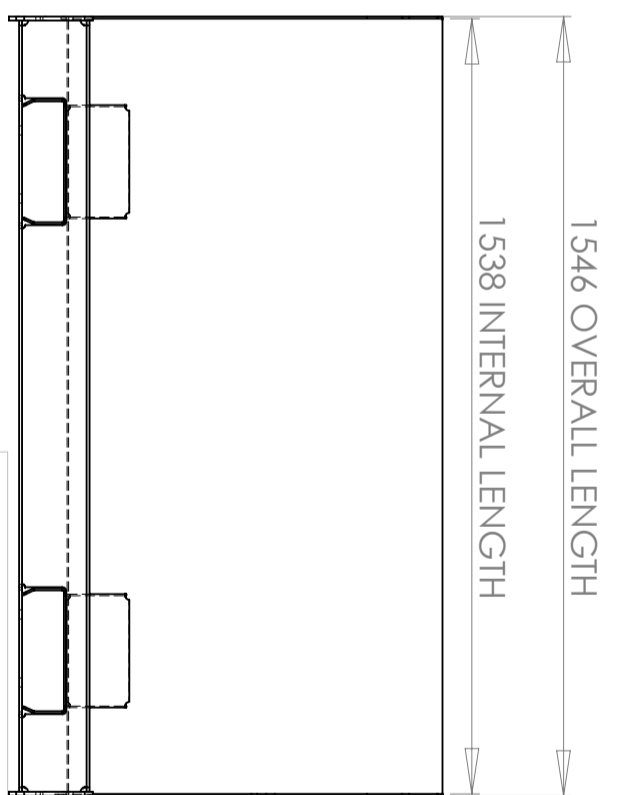
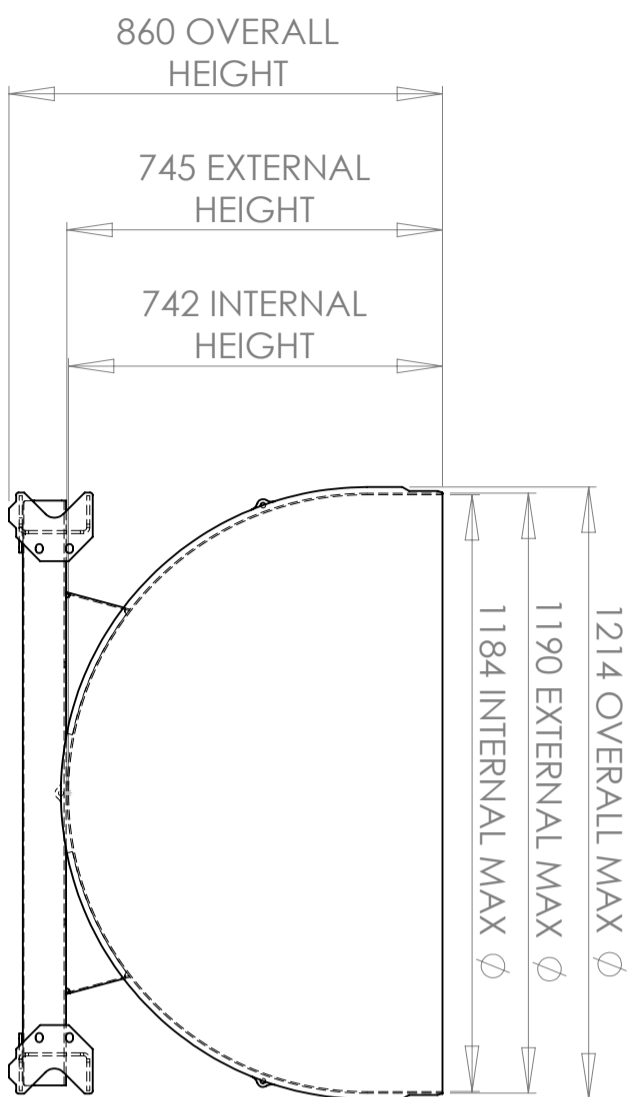
Revision: **C**

- NOTES:**
- GALVANISED INNER TANK ASSEMBLY
 - GALVANISED OUTER TANK ASSEMBLY
 - GALVANISED MANWAY LID
 - ELECTROPLATED MANWAY ATTACHMENT

NOTABLE DIMENSIONS OF THE INNER TANK



NOTABLE DIMENSIONS OF THE OUTER TANK



DRAWING STATUS:

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950L GENERATOR TANK
 MAIN ASSEMBLY

Rev:	Description:	Drawn:	Appv'd:	Chkd:	Date:	Finish:	Material:	Drawn By:	Scale:	Revision:
								H. Uppson		
								GTV6-A000		A3
								SHEET 3 OF 3		C

TOLERANCES UNLESS OTHERWISE STATED
 NOMINAL DIMS ± 2.0mm
 MACHINED DIMS ± 0.5mm
 ANGULAR ± 0.5°

DIMENSIONS IN MILLIMETERS
 UNLESS OTHERWISE STATED
 REMOVE BURRS & SHARP EDGES
 MACHINE WHERE MARKED
 SURFACE TEXTURE VALUES IN µm

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Web: www.fuelproof.co.uk

Title: **950L GENERATOR TANK MAIN ASSEMBLY**
Drawing No: **GTV6-A000**
Revision: **C**

TOLERANCES UNLESS OTHERWISE STATED:
NOMINAL DIMS ± 2.0mm
MACHINED DIMS ± 0.5mm
ANGULAR ± 0.5°

DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED.
REMOVE BURRS & SHARP EDGES
MACHINE WHERE MARKED
SURFACE TEXTURE VALUES IN um.

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A	Removal of blanking plates	H.U	R.H	R.H	22.01.14	
B	Details amended	H.U	R.H	R.H	13.03.14	
C		H.U	D.W	D.W	09.05.14	Material:

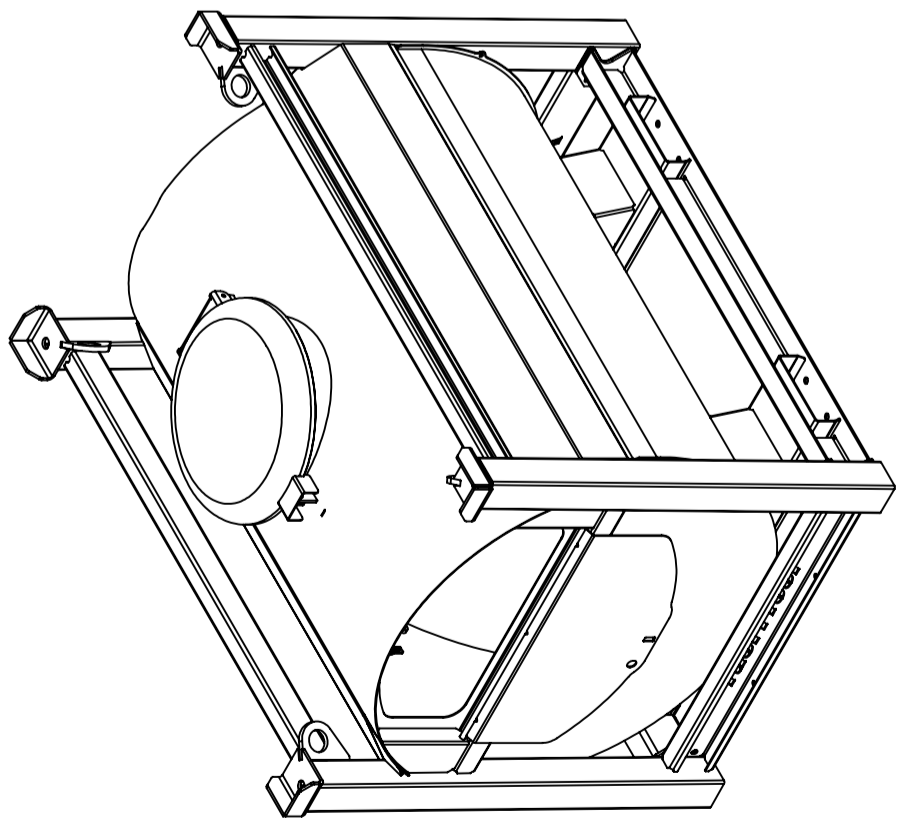
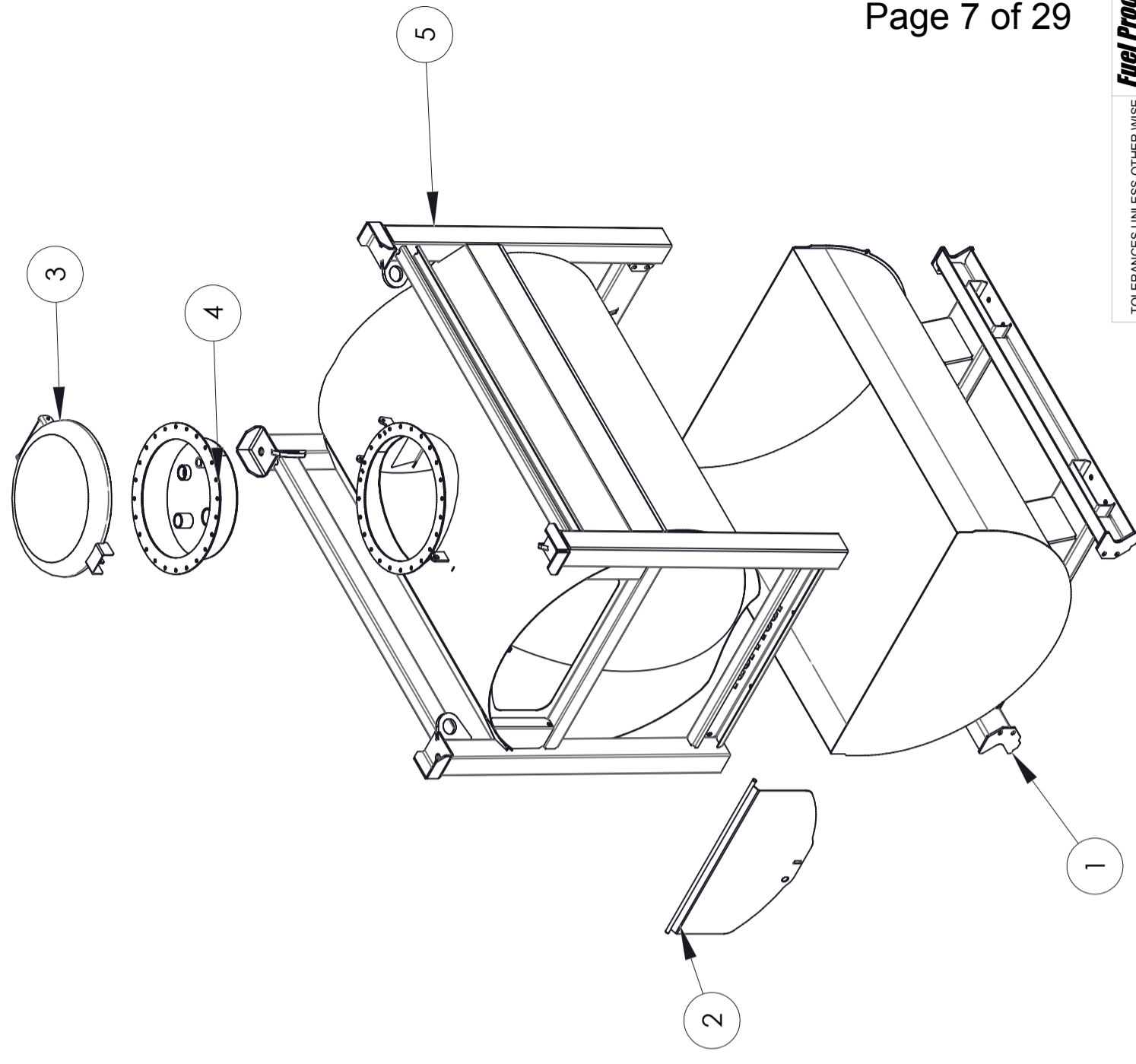
DRAWING STATUS:

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Drawn By: H.Upson

SHEET 1 OF 5

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	GTV6-A002	GENERATOR TANK OUTER ASSEMBLY	1
2	GTV6-A009	GT DOOR ASSEMBLY	1
3	GTV6-A013	GT MANWAY ATTACHMENT LID ASSY	1
4	GTV6-A010	GT MANWAY ATTACHMENT ASSEMBLY	1
5	GTV6-A001	GT INNER TANK AND FRAME ASSEMBLY	1

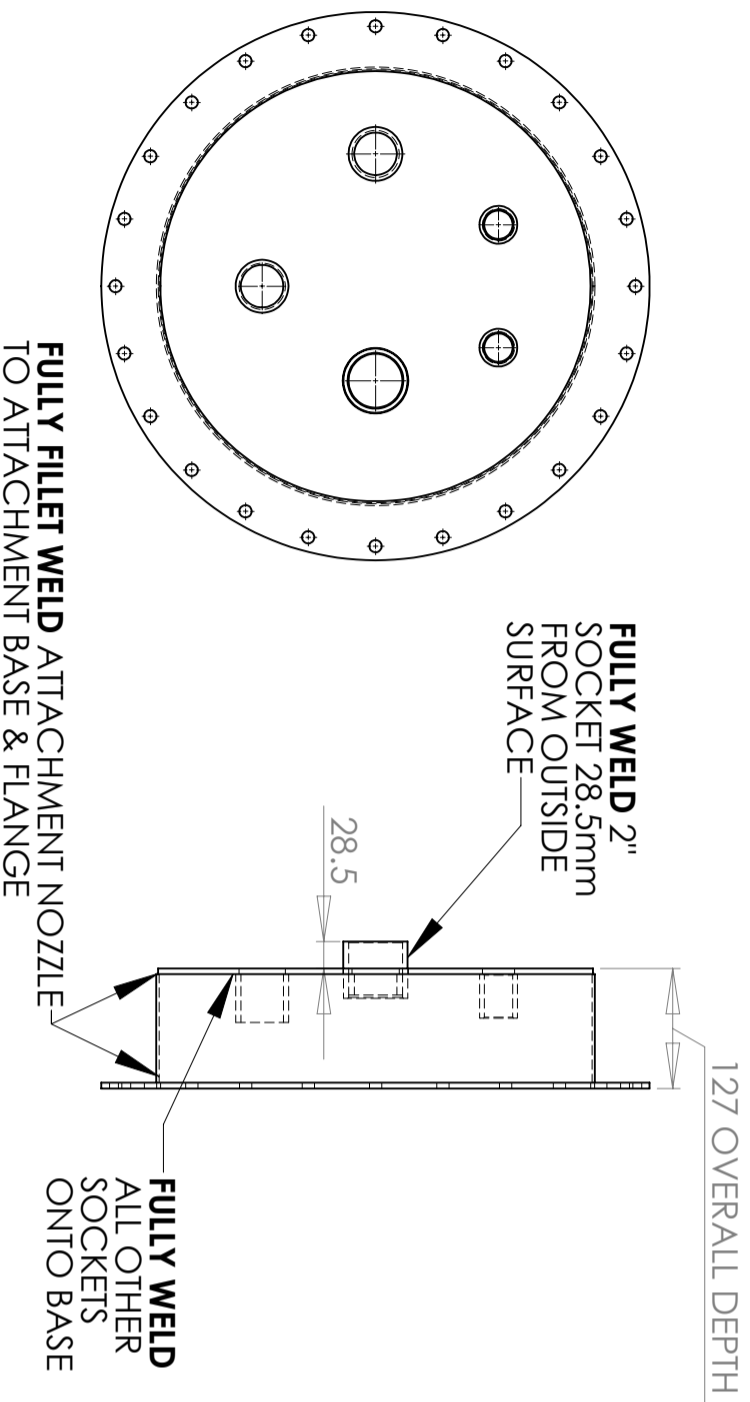
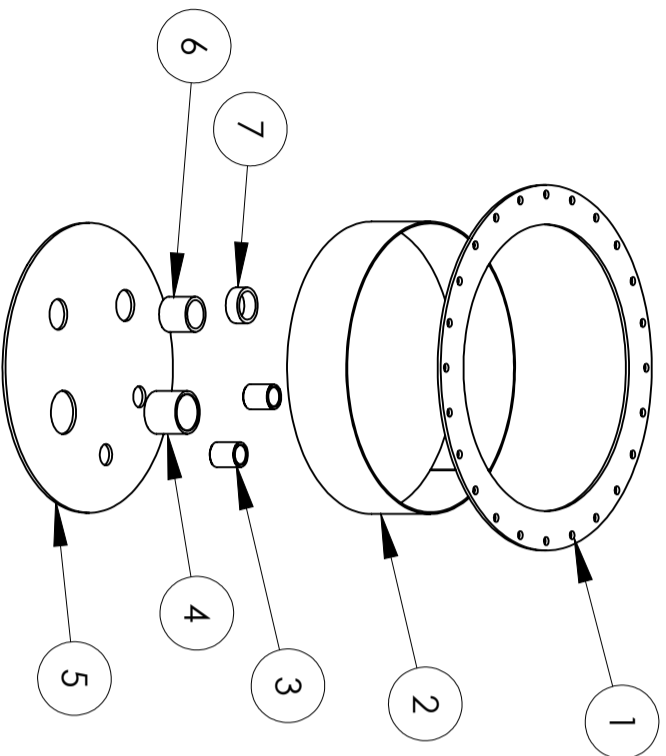


UNEXPLODED VIEW

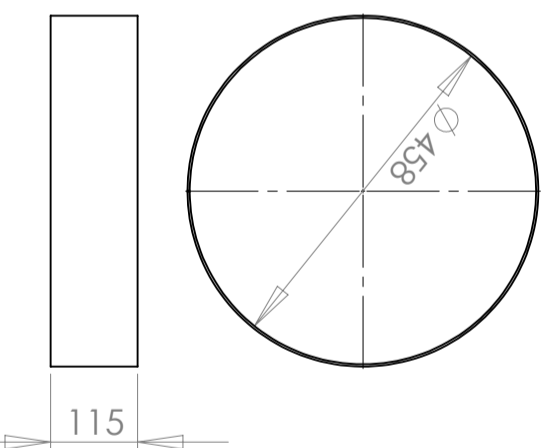
NOTE:
DO NOT FIT DOOR PRIOR TO GALVANISING

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	GTV6-200	GT MANWAY ATTACHMENT FLANGE	1
2	GTV6-201	GT MANWAY ATTACHMENT NOZZLE	1
3		1" SOCKET - 46.5mm LONG	2
4		2" SOCKET, 60mm LONG	1
5	GTV6-202	GT MANWAY ATTACHMENT BASE	1
6		1 1/2" SOCKET 50 LG	1
7	-	1.5" socket, 22mm long	1

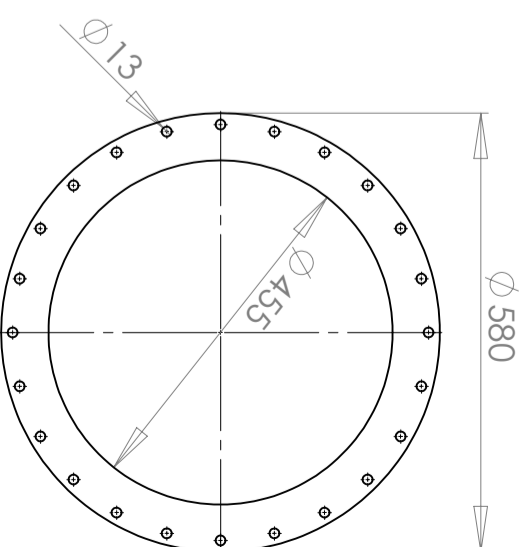
Ref: VW0211
Appendix A
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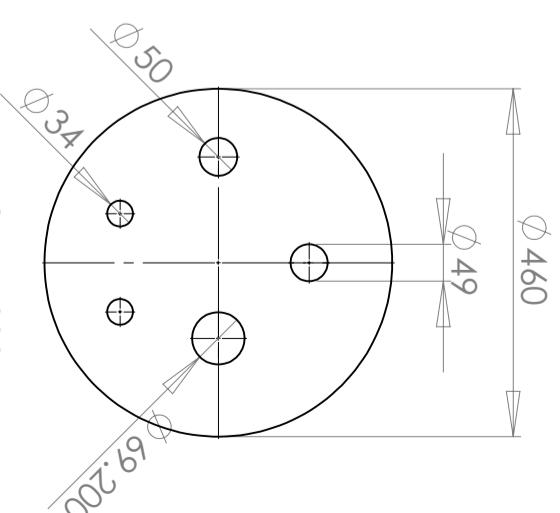
NOTE: MANWAY ATTACHMENT ASSEMBLY TO BE ELECTROPLATED



**GTV6-201
GT MANWAY ATTACHMENT NOZZLE
S275 MS
3mm THK**



**GTV6-200
GT MANWAY ATTACHMENT FLANGE
S275 MS
6mm THK**



**GTV6-202
GT MANWAY ATTACHMENT BASE
S275 MS
6mm THK**

ALL DIMENSIONS INTERNAL
& ANGLES 90° UNLESS
OTHERWISE STATED

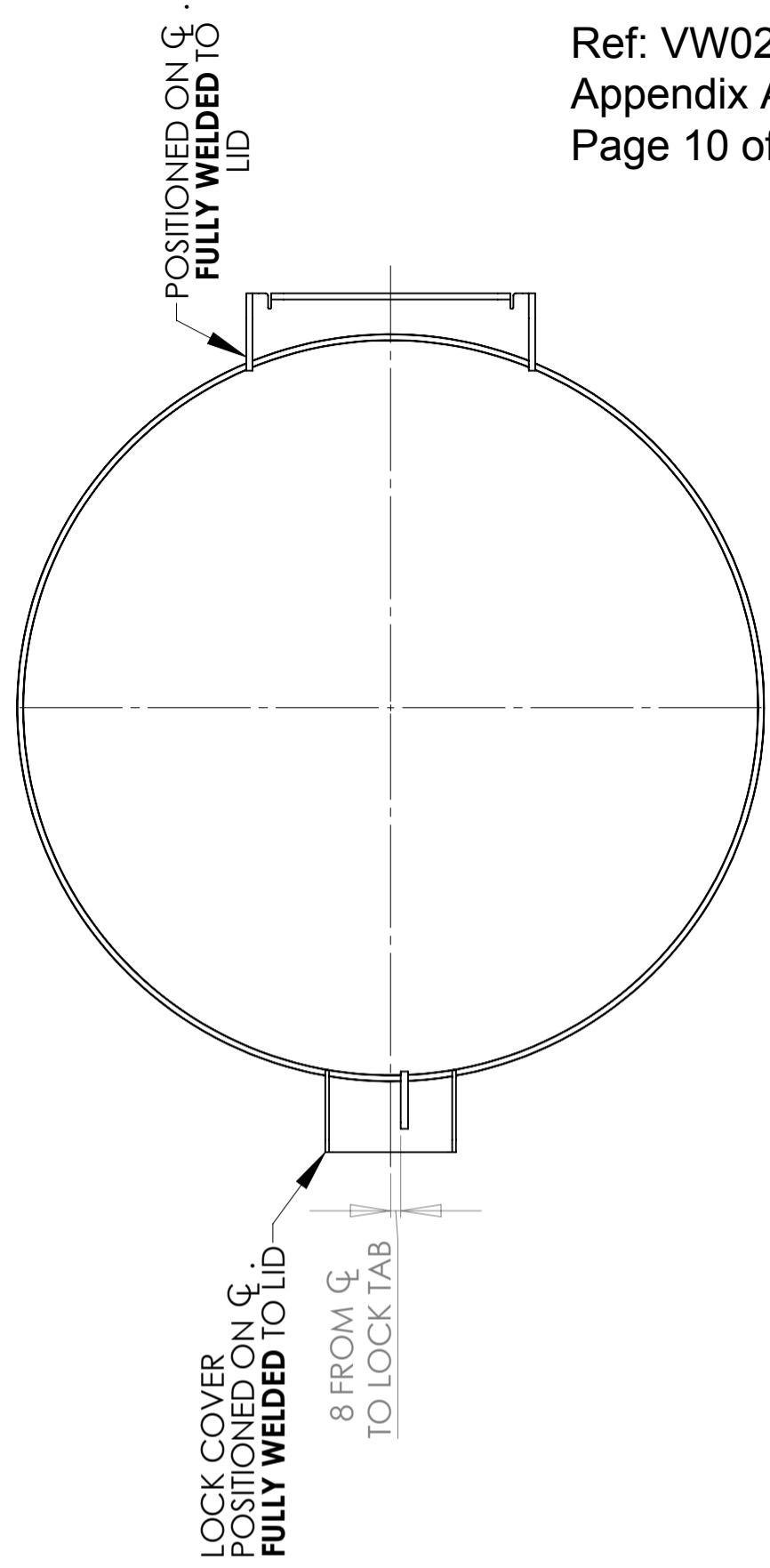
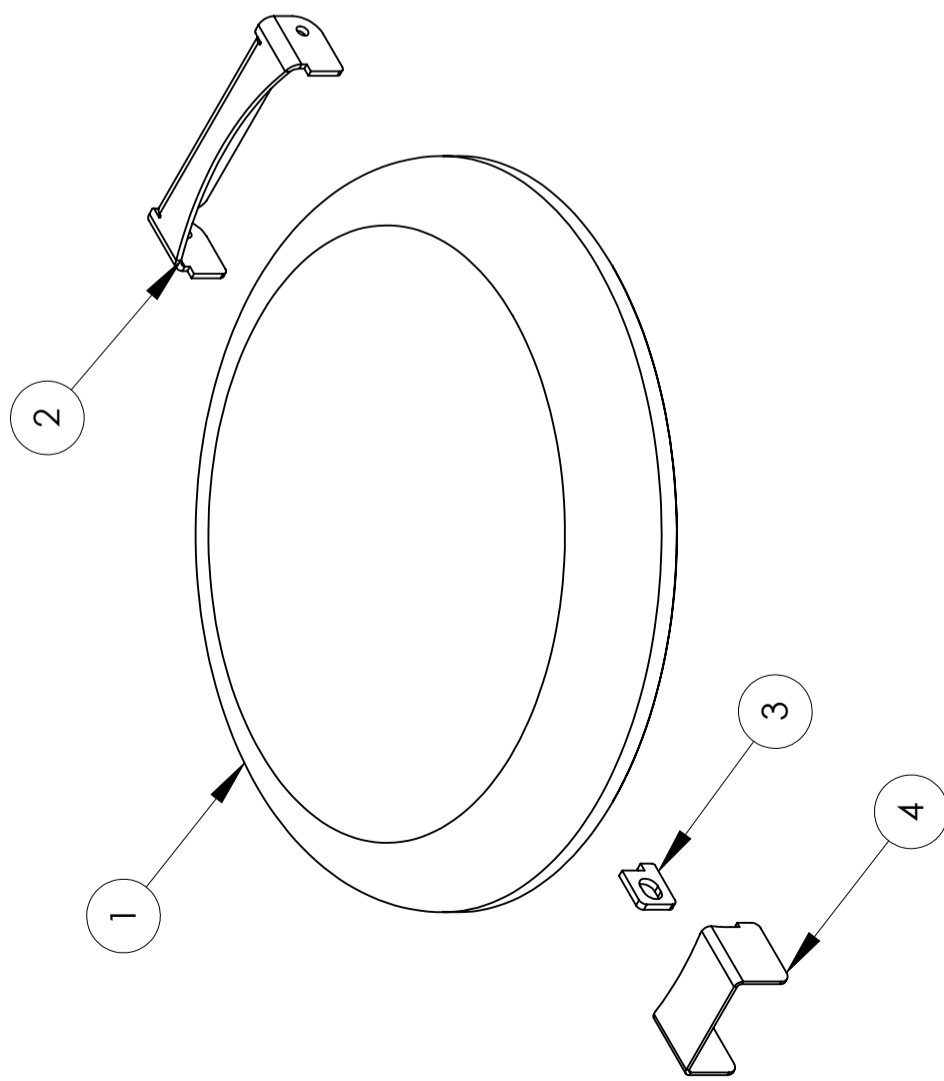
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FOR CONSTRUCTION
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TOLERANCES UNLESS OTHERWISE
NOMINAL DIMS ± 2.0mm
MACHINED DIMS ± 0.5mm
ANGULAR ± 0.5°

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Rev:	Description:	Drawn:	App'vd:	Chkd:	Date:	Finish:	Material:	Drawing No:	Scale:	Revision:
								GTV6-A010	SHEET 3 OF 5	A3 A

ITEM NO.	PART No.	DESCRIPTION	QTY.
1	GTV6-209	GT MANWAY ATTACHMENT LID	1
2	GTV6-207	GT MANWAY ATTACHMENT HINGE	1
3	GTV6-208	GT MANWAY ATTACHMENT LOCK TAB	1
4	GTV6-211	GT MANWAY ATTACHMENT LOCK COVER	1



Ref: VW0211
Appendix A
Page 10 of 29

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Web: www.fuelproof.co.uk

TOLERANCES UNLESS OTHERWISE STATED:
NOMINAL DIMS : ± 2.0mm
MACHINED DIMS : ± 0.5mm
ANGULAR : ± 0.5°

DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED.
REMOVE BURRS & SHARP EDGES
MACHINE WHERE MARKED
SURFACE TEXTURE VALUES IN µm.

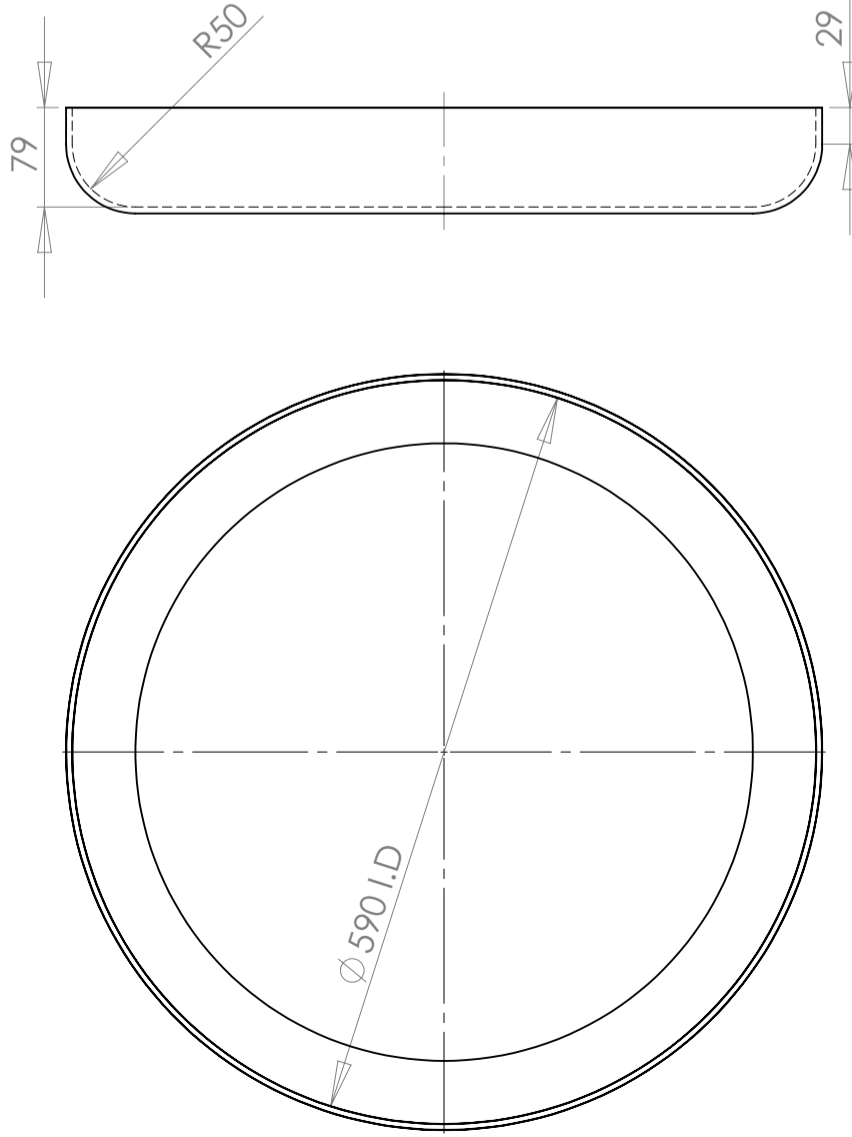
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Drawing No: **GTV6-A013**
Scale: SHEET 4 OF 5
Revision: **B**

DRAWING STATUS: **FOR CONSTRUCTION**

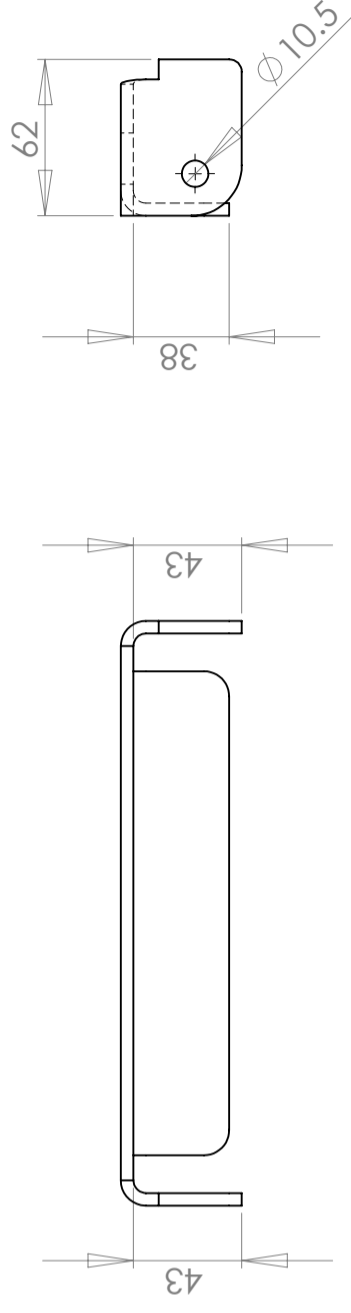
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						Material:
						Drawn By: H.Upson

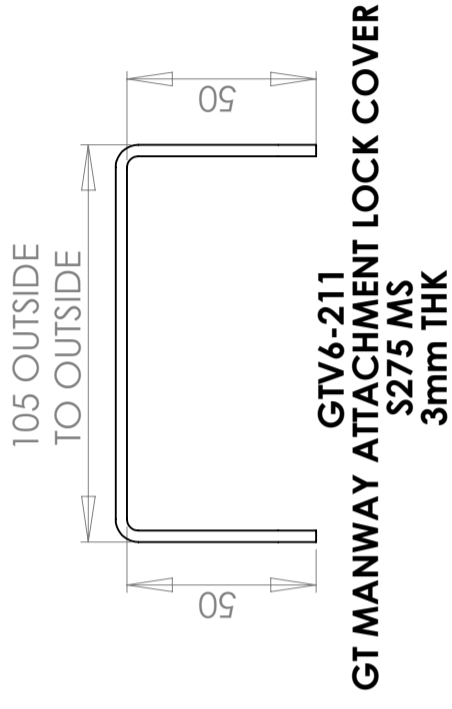
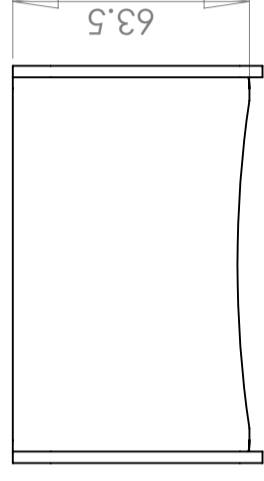
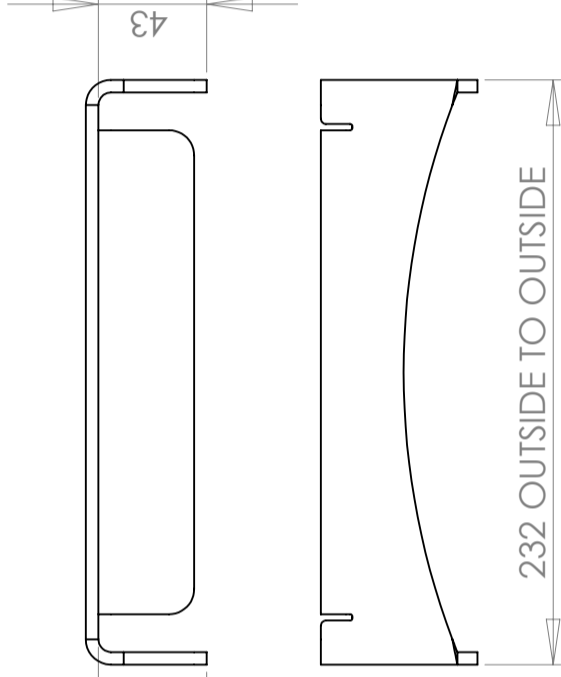
NOTE:
• LID ASSEMBLY TO BE GALVANISED



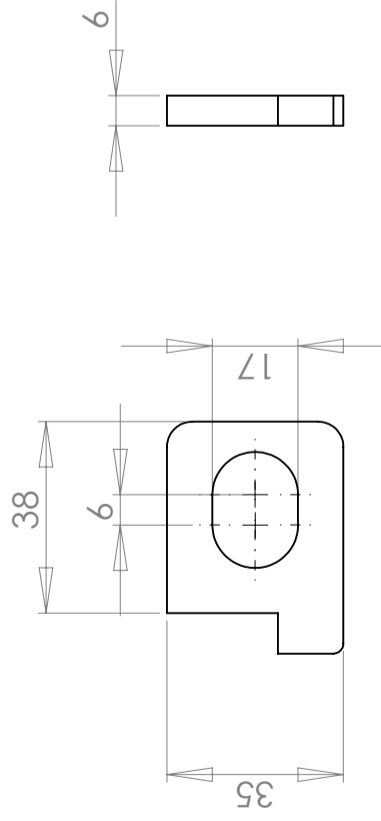
GTV6-209
GT MANWAY ATTACHMENT LID
S275 S275 MS
5mm THK - SPUN TO SHAPE



GTV6-207
GT MANWAY ATTACHMENT HINGE
S275 MS
5mm THK



GTV6-211
GT MANWAY ATTACHMENT LOCK COVER
S275 MS
3mm THK



GTV6-208
GT MANWAY ATTACHMENT LOCK TAB
S275 MS
6mm THK

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 e-mail: info@fuelproof.co.uk
 Web: www.fuelproof.co.uk

TOLERANCES UNLESS OTHERWISE STATED:
 NOMINAL DIMS : ± 2.0mm
 MACHINED DIMS : ± 0.5mm
 ANGULAR : ± 0.5°
 DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED
 REMOVE BURRS & SHARP EDGES
 MACHINE WHERE MARKED
 SURFACE TEXTURE VALUES IN µm

Rev:	Description:	Drawn:	Appv'd:	Chk'd:	Date:	Finish:

Material:
 Drawn By: H.Upson
 Scale:

ALL DIMENSIONS INTERNAL & ANGLES 90° UNLESS OTHERWISE STATED

DRAWING STATUS:
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Title: **GT MANWAY ATTACHMENT LID ASSY**
 Drawing No: **GTV6-A013**
 Revision: **A3**
 SHEET 5 OF 5

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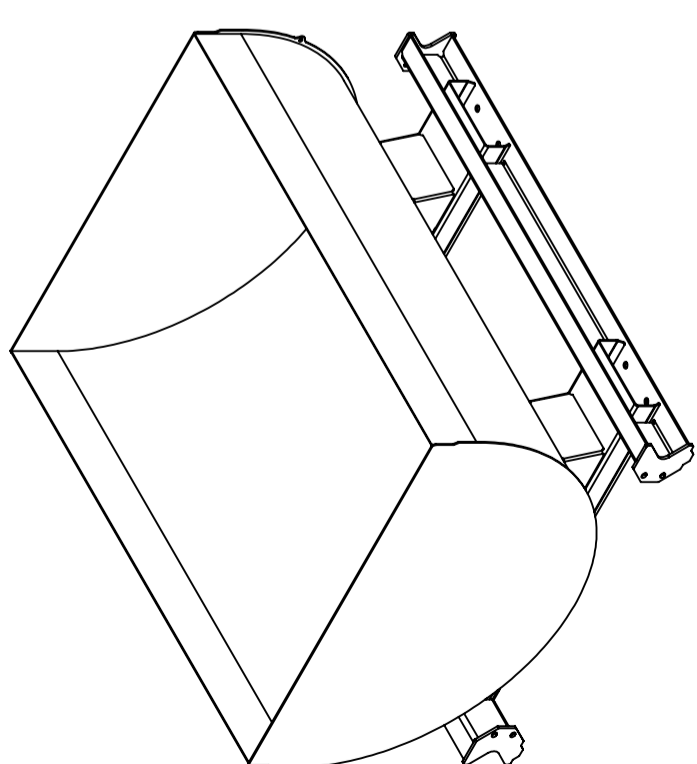
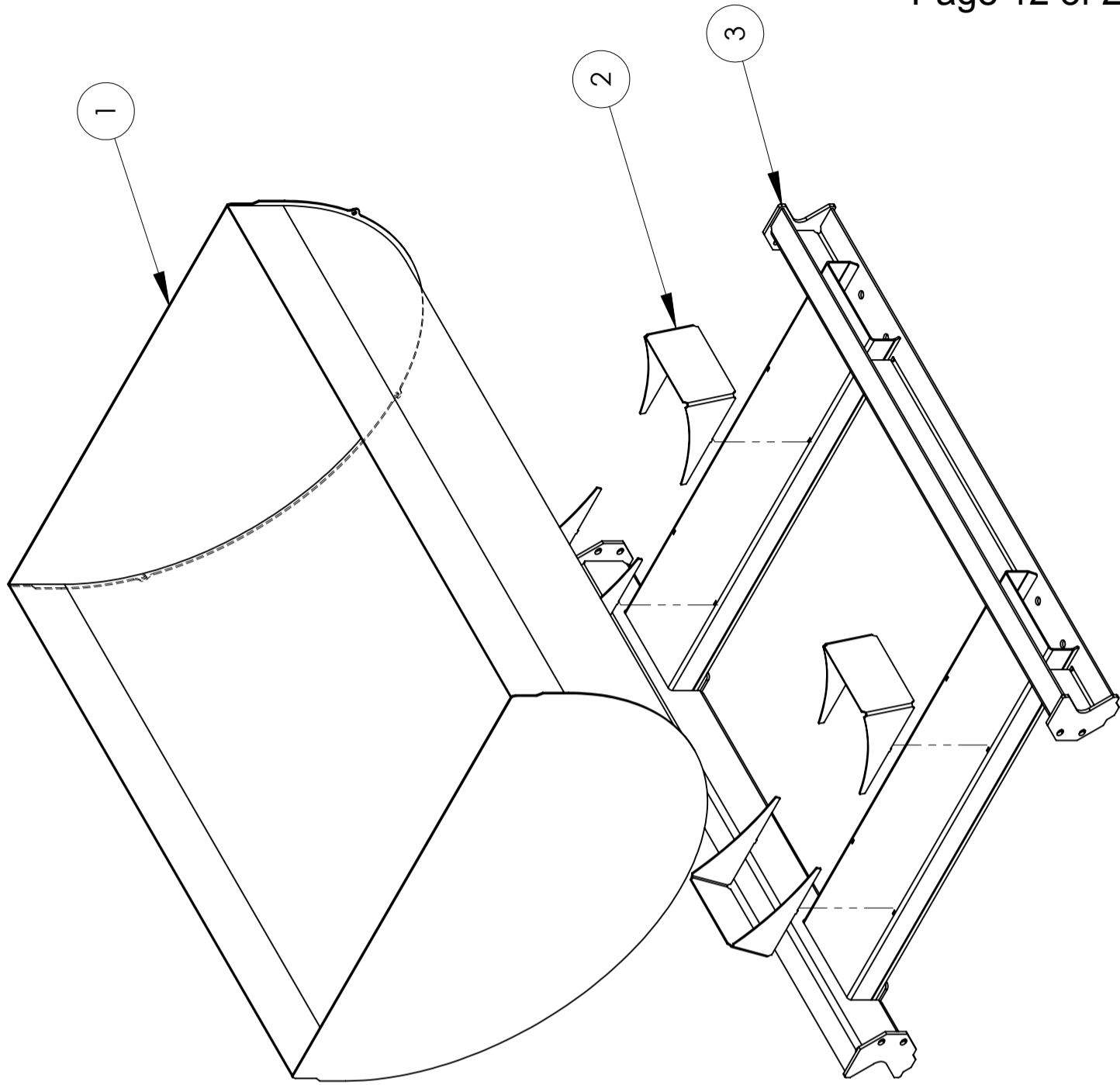
Title: **GENERATOR TANK OUTER ASSEMBLY**
Drawing No: **GTV6-A002**
Scale: SHEET 1 OF 5
Revision: **C**

DRAWING STATUS: **FOR CONSTRUCTION**
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Rev.	Description:	Drawn:	Appv'd:	Chk'd:	Date:	Finish:
A		H.U	R.H	R.H	22.01.14	
B	Removal of hole in rear flat end & overall length Detail update	H.U	R.H	R.H	13.03.14	
C		H.U	D.W	D.W	09.05.14	Material:

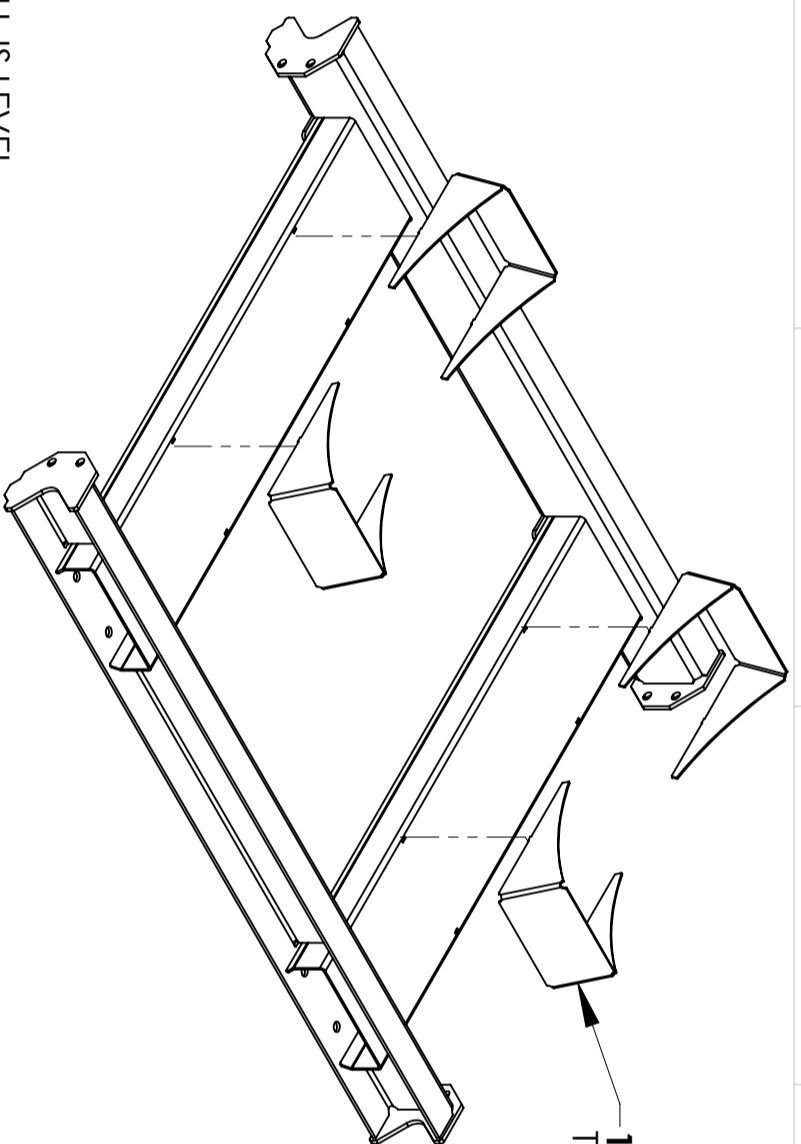
Drawn By: H.Upson

ITEM NO.	PART No.	DESCRIPTION	QTY.
1	GTV6-A004	GT OUTER SHELL ASSEMBLY	1
2	GTV6-402	GT OUTER BARREL SUPPORT	4
3	GTV6-A003	GT OUTER BASE ASSEMBLY	1



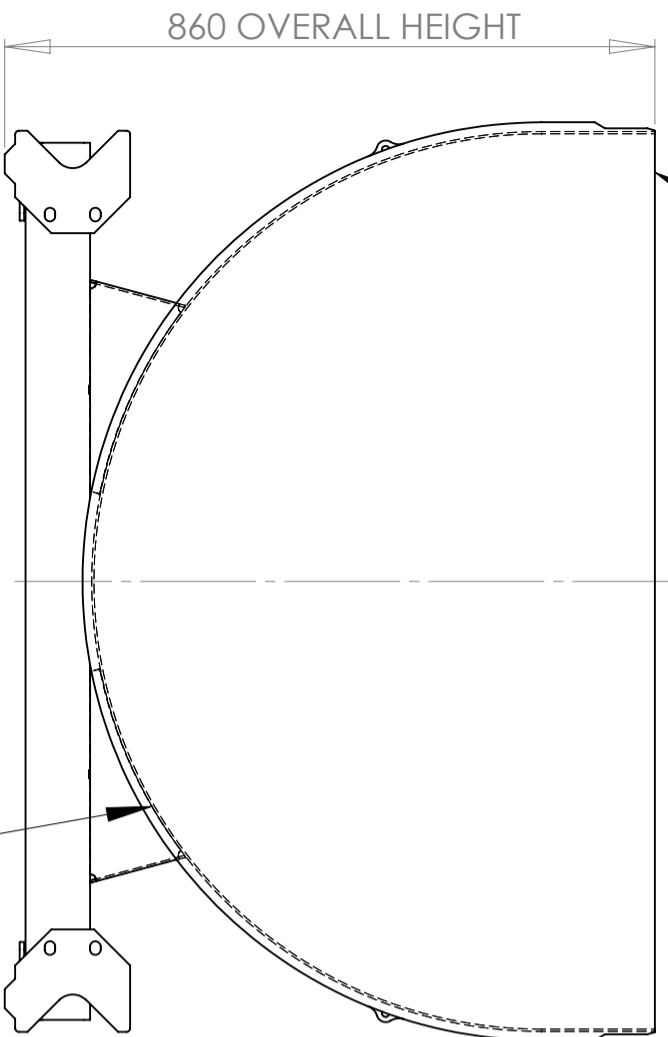
UNEXPLODED VIEW

NOTE: ASSEMBLY TO BE GALVANISED



1. USE TABS ON 4 OFF GT OUTER BARREL SUPPORTS TO LOCATE ONTO BASE. **FULLY WELD** INTO POSITION

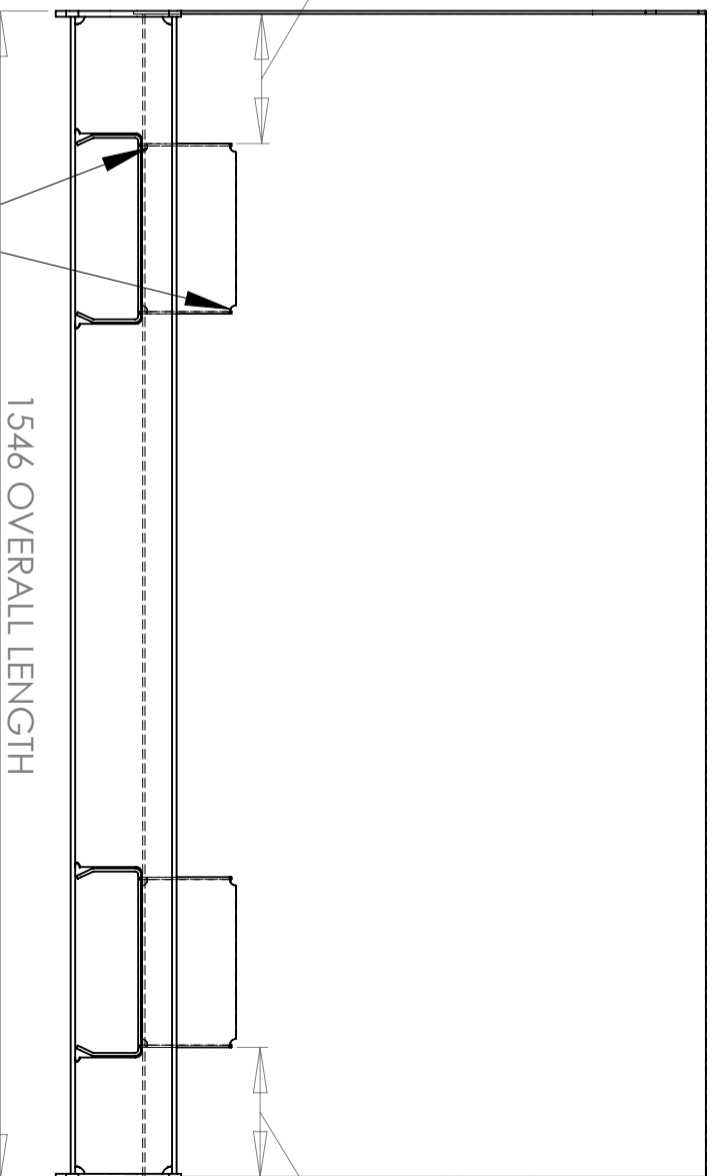
2. ENSURE OUTER BARREL SHELL IS LEVEL



860 OVERALL HEIGHT

4. FULLY FILLET WELD OUTER BARREL ONTO SUPPORTS

3. 181.5mm FROM SUPPORT TO BARREL FRONT EDGE



1546 OVERALL LENGTH

3. 181.5mm FROM SUPPORT TO BARREL REAR EDGE

NOTE: HOLES IN CORNERS OF SUPPORTS FOR GALVANISING, SHOULDNT BE WELDED OVER

DRAWING STATUS:

FOR CONSTRUCTION

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TOLERANCES UNLESS OTHERWISE SPECIFIED
 NOMINAL DIMS ± 2.0mm
 MACHINED DIMS ± 0.5mm
 ANGULAR ± 0.5°

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 LA3 3FH

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 Fax: 01524 859681
 e-mail: info@fuelproof.co.uk
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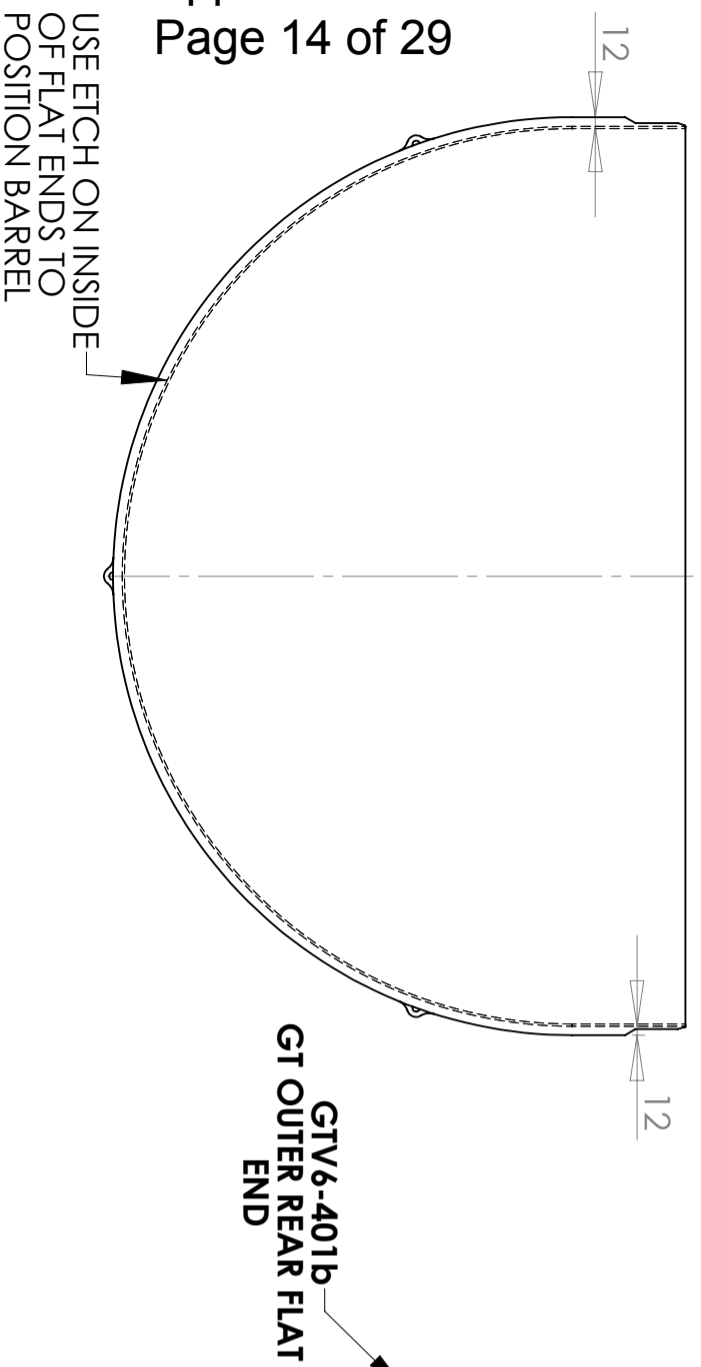
Rev:	Description:	Drawn:	Appvd:	Chkd:	Date:	Finish:

Dimensions in millimeters unless otherwise stated. Remove burrs & sharp edges machine where marked. Surface texture values in µm.

Title:
GENERATOR TANK OUTER ASSEMBLY

NOTE:
ASSEMBLY TO BE GALVANISED

Material:		Drawing No:	GTV6-A002	Revision:	A3
Drawn By:	H. Upson	Scale:		SHEET 2 OF 5	C



GTV6-401b
GT OUTER REAR FLAT
END

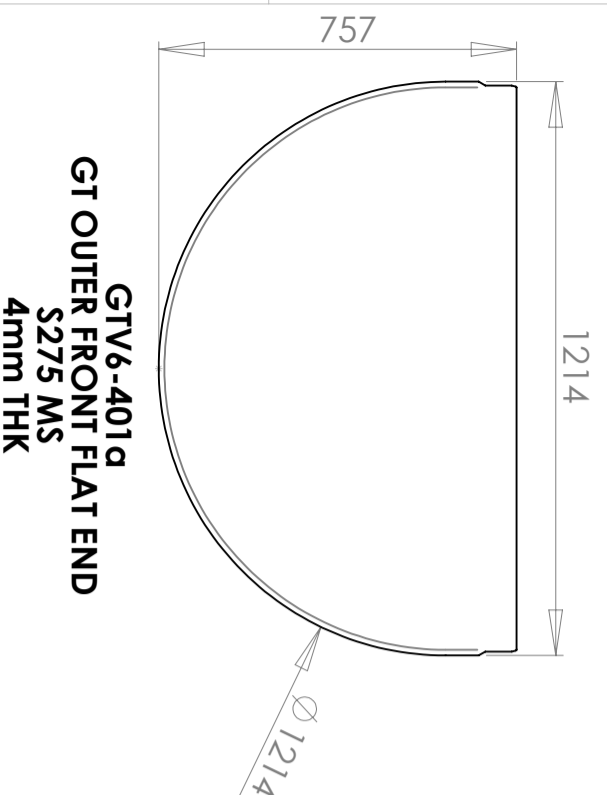
GTV6-400
GT OUTER BARREL

GTV6-401a
GT OUTER FRONT
FLAT END

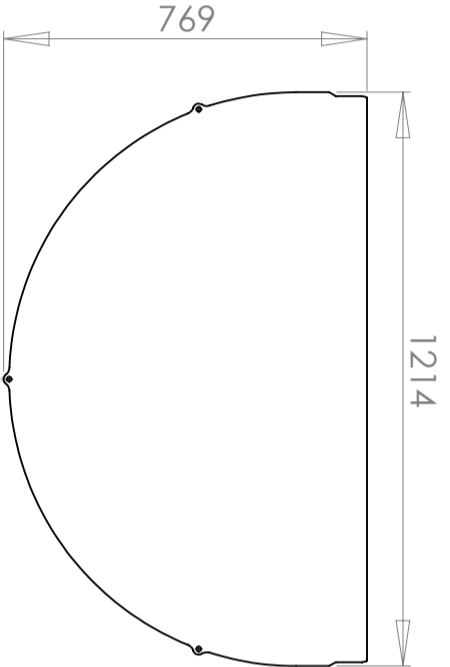
DETAIL A
SCALE 1 : 2

1546 OVERALL LENGTH

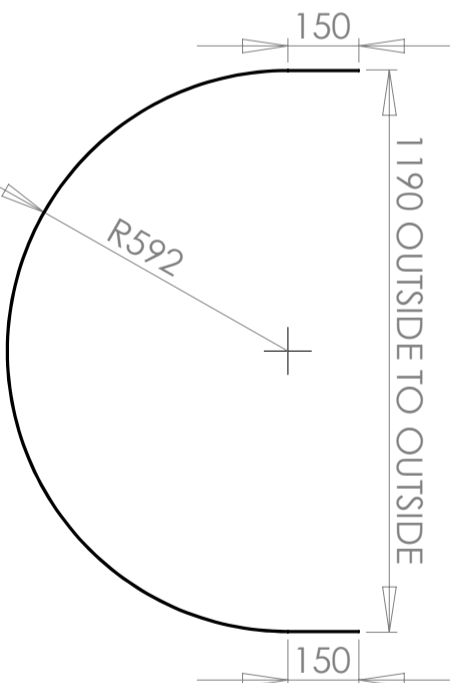
COMPONENTS



GTV6-401a
GT OUTER FRONT FLAT END
S275 MS
4mm THK



GTV6-401b
GT OUTER REAR FLAT END
S275 MS
4mm THK



GTV6-400
GT OUTER BARREL
S275 MS
3mm THK

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DRAWING STATUS:

Rev:	Description:	Drawn:	Appv'd:	Chkd:	Date:	Finish:

Title: **GT OUTER SHELL ASSEMBLY**

Drawing No: **GTV6-A004**

Scale: SHEET 3 OF 5

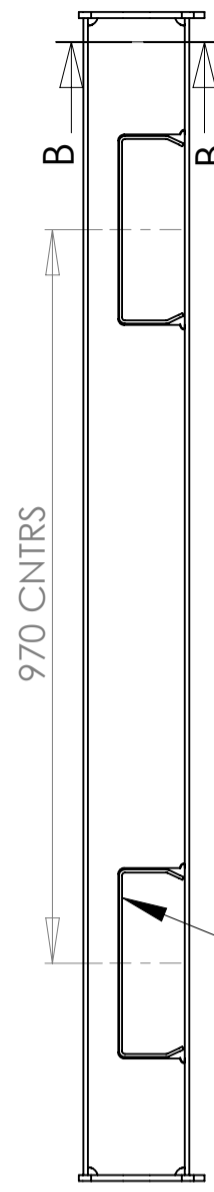
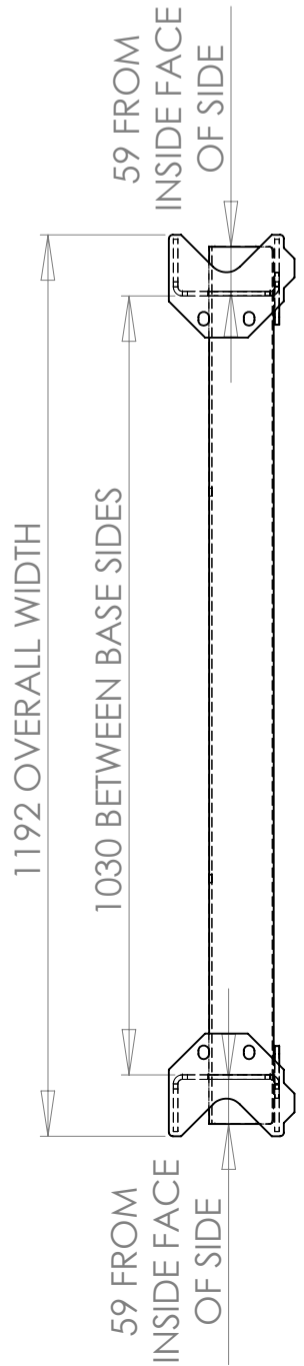
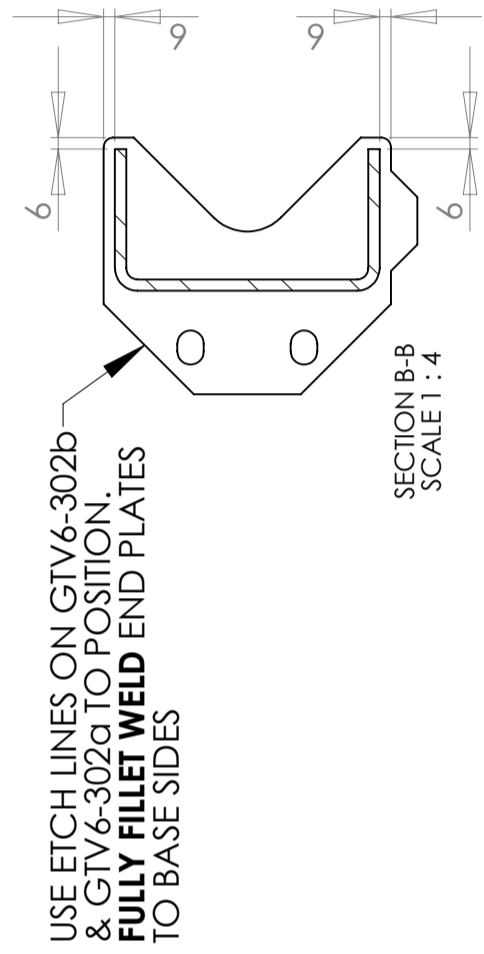
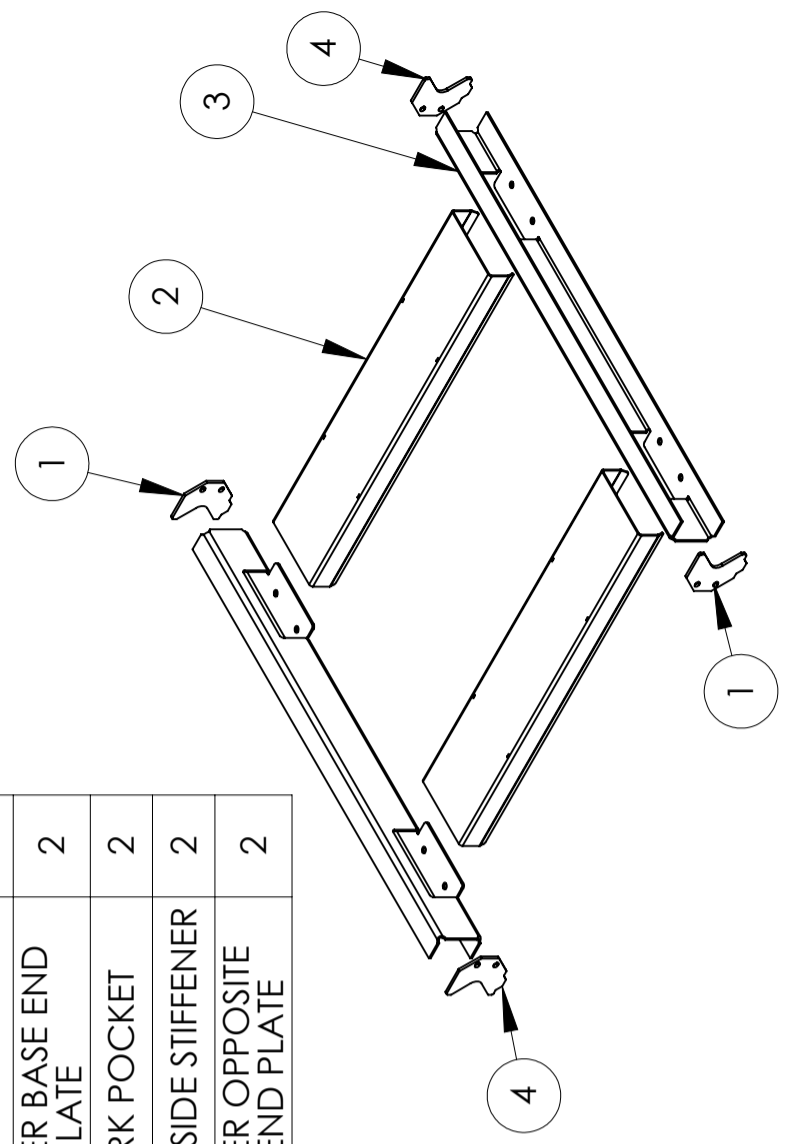
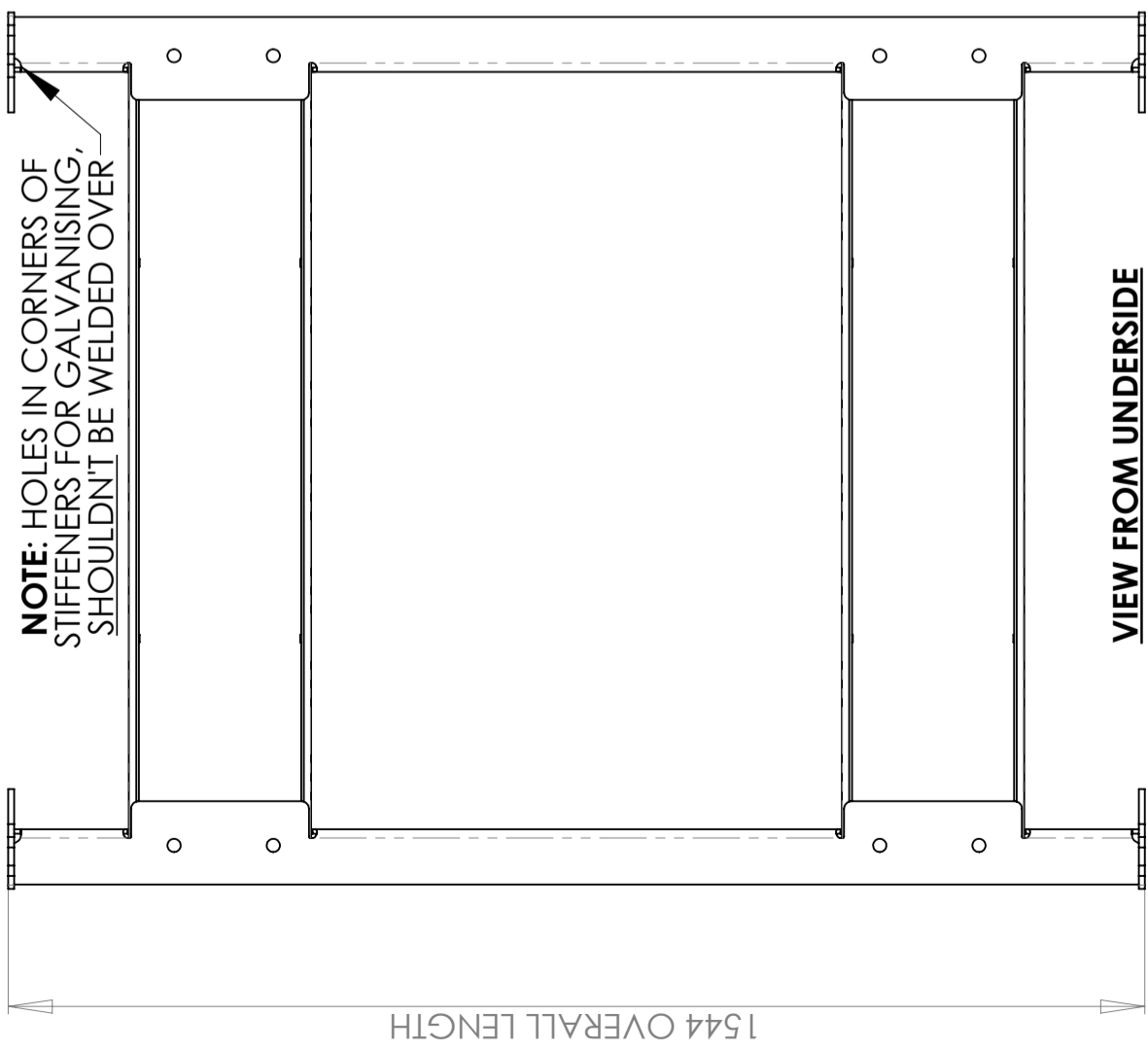
Revision: **A3**
C

ALL DIMENSIONS INTERNAL & ANGLES 90° UNLESS OTHERWISE STATED

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Title: GT OUTER BASE ASSEMBLY	
Drawing No: GTV6-A003	Revision: A3
Scale: SHEET 4 OF 5	Drawn By: H.Upson

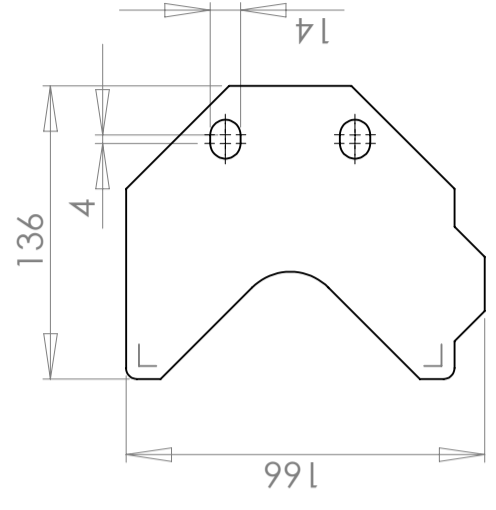
ITEM NO.	PART No.	DESCRIPTION	QTY.
1	GTV6-302a	GT OUTER BASE END PLATE	2
2	GTV6-301	GT FORK POCKET	2
3	GTV6-300	GT OUTER SIDE STIFFENER	2
4	GTV6-302b	GT OUTER OPPOSITE BASE END PLATE	2



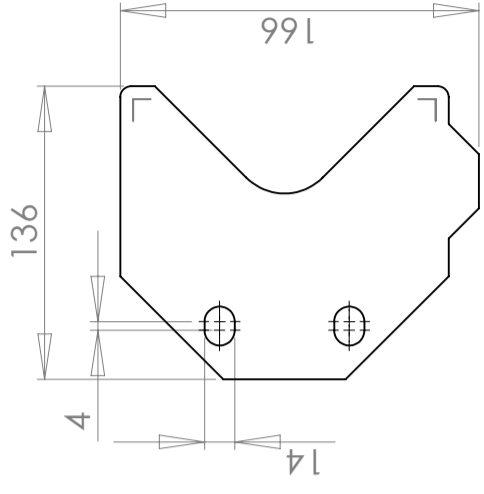
DRAWING STATUS: **FOR CONSTRUCTION**
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Rev:	Description:	Drawn:	Appv'd:	Chk'd:	Date:	Finish:

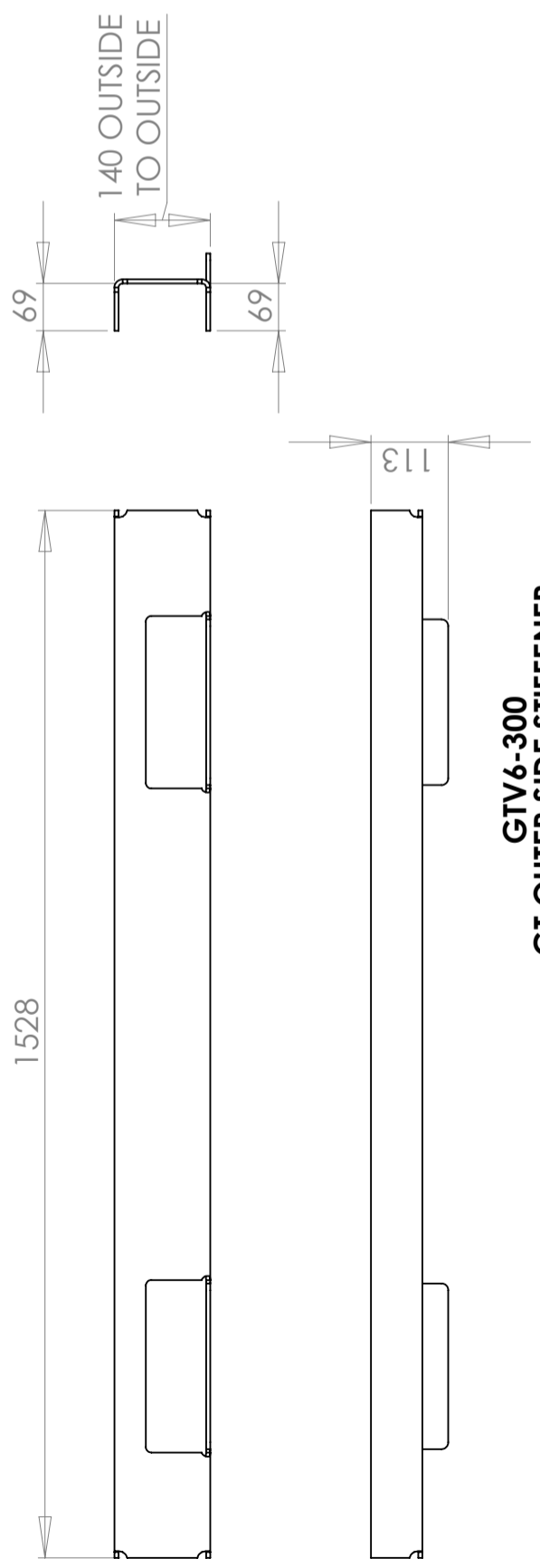
Fuel Proof Fuel Proof LTD Middleton Business Park Middleton Road Heysham Lancashire LA3 3FH Tel: 01524 850685 Fax: 01524 859681 e-mail: info@fuelproof.co.uk Web: www.fuelproof.co.uk	TOLERANCES UNLESS OTHERWISE STATED NOMINAL DIMS : ± 2.0mm MACHINED DIMS : ± 0.5mm ANGULAR : ± 0.5°	DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED REMOVE BURRS & SHARP EDGES MACHINE WHERE MARKED SURFACE TEXTURE VALUES IN µm.	Title: GT OUTER BASE ASSEMBLY Drawing No: GTV6-A003 Scale: SHEET 5 OF 5
	Revision: B		Drawn By: H.Upson



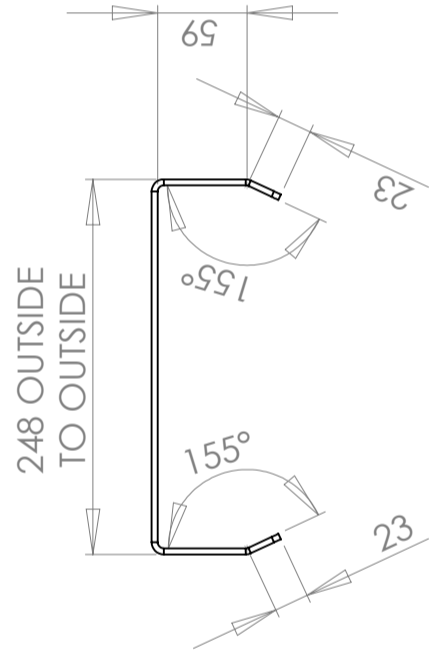
GTV6-302a
GT OUTER BASE END PLATE
S275 MS
8mm THK



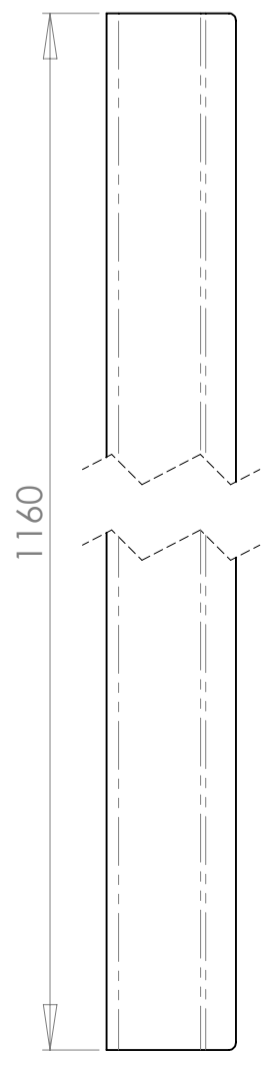
GTV6-302b
GT OUTER OPPOSITE BASE END PLATE
S275 MS
8mm THK



GTV6-300
GT OUTER SIDE STIFFENER
S275 MS
6mm THK



GTV6-301
GT FORK POCKET
S275 MS
4mm THK



GTV6-402
GT OUTER BARREL SUPPORT
S275 MS
3mm THK

ALL DIMENSIONS INTERNAL
& ANGLES 90° UNLESS
OTHERWISE STATED

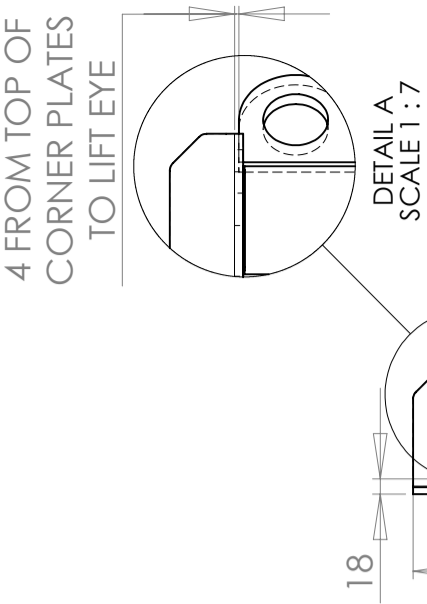
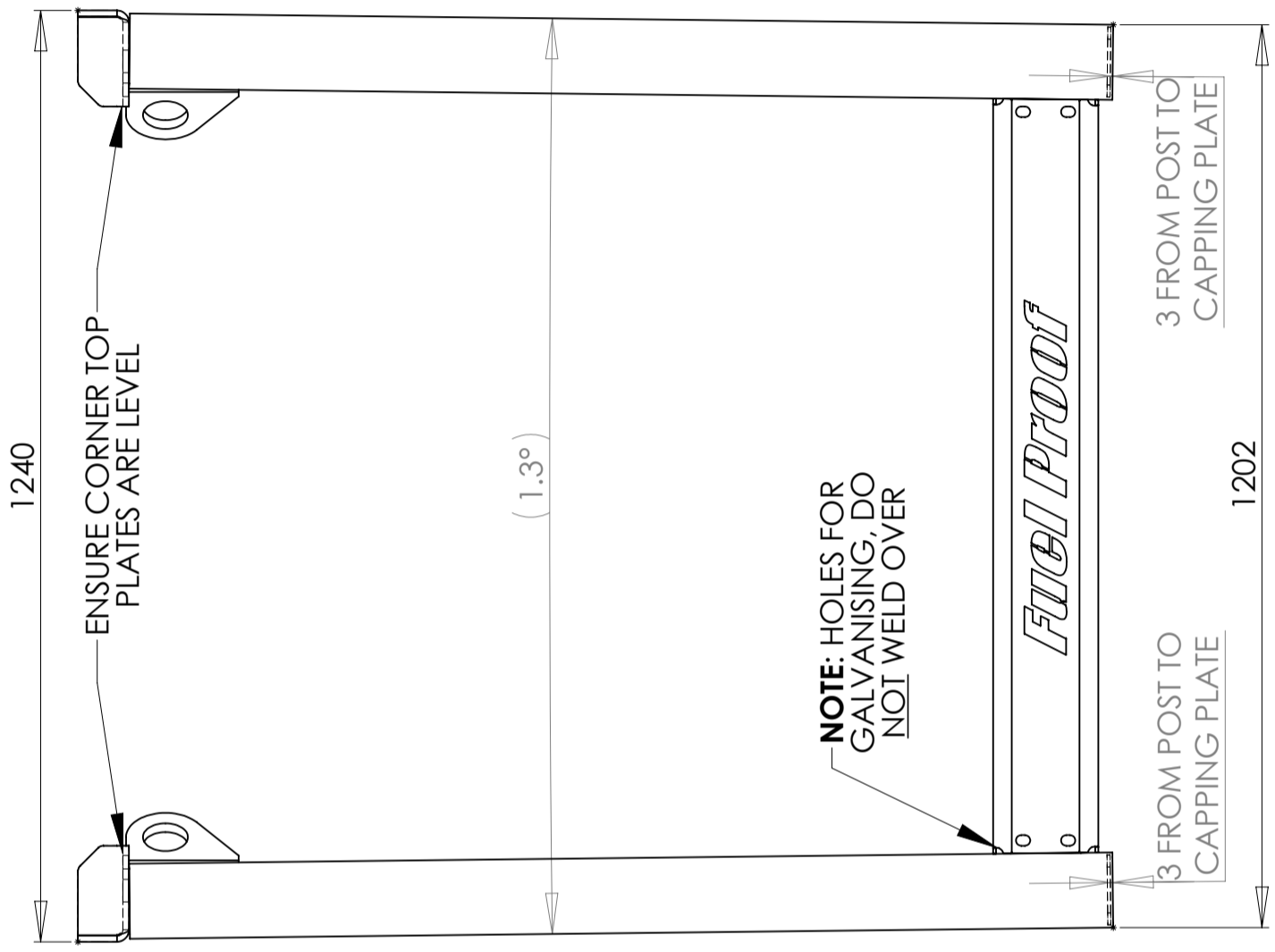
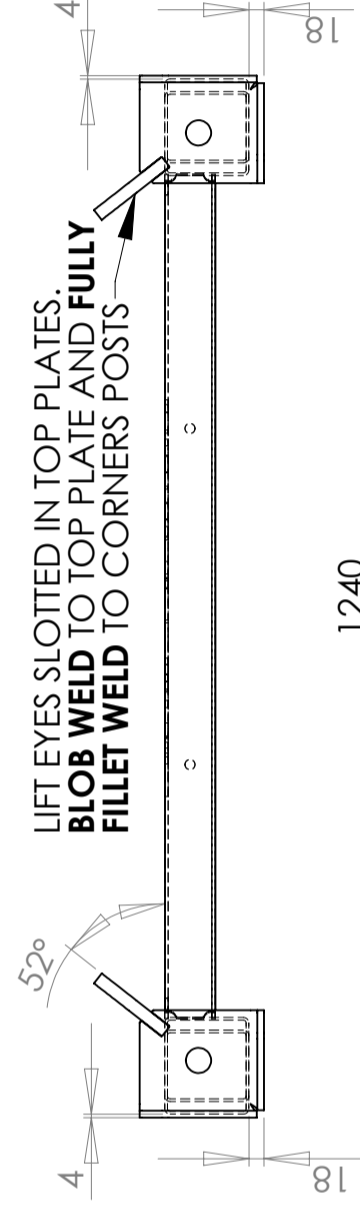
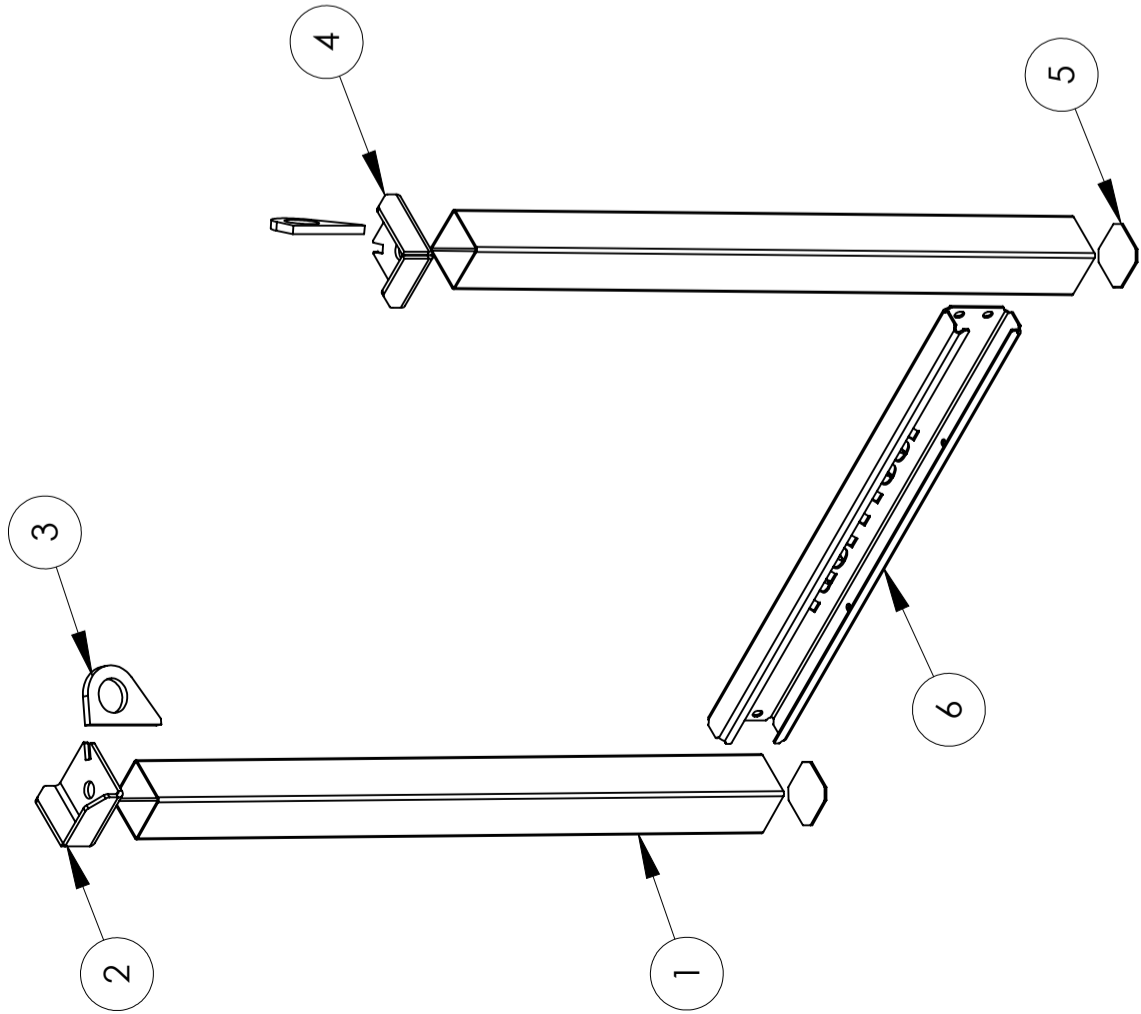
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Rev.	Description:	Drawn:	Appv'd:	Chk'd:	Date:	Finish:

ASSEMBLY STAGE 1

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	GTV6-102	GT CORNER POST	2
2	GTV6-106b	GT CORNER TOP PLATE	1
3	GTV6-107	GT LIFT EYE	2
4	GTV6-106a	GT CORNER TOP PLATE	1
5	GTV6-109	GT CORNER POST CAPPING PLATE	2
6	GTV6-105	GT END FRAME STIFFENER	1



Ref: VW0211
Appendix A
Page 18 of 29

ALIGN STIFFENER
FLUSH WITH REAR
FACE OF CORNER
POSTS.
GRIND ANY WELDS
FLUSH.

Fuel Proof
Fuel Proof LTD
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Fax: 01524 859881
e-mail: info@fuelproof.co.uk
Web: www.fuelproof.co.uk

TOLERANCES UNLESS OTHERWISE STATED
NOMINAL DIMS ± 2.0mm
MACHINED DIMS ± 0.5mm
ANGULAR ± 0.5°

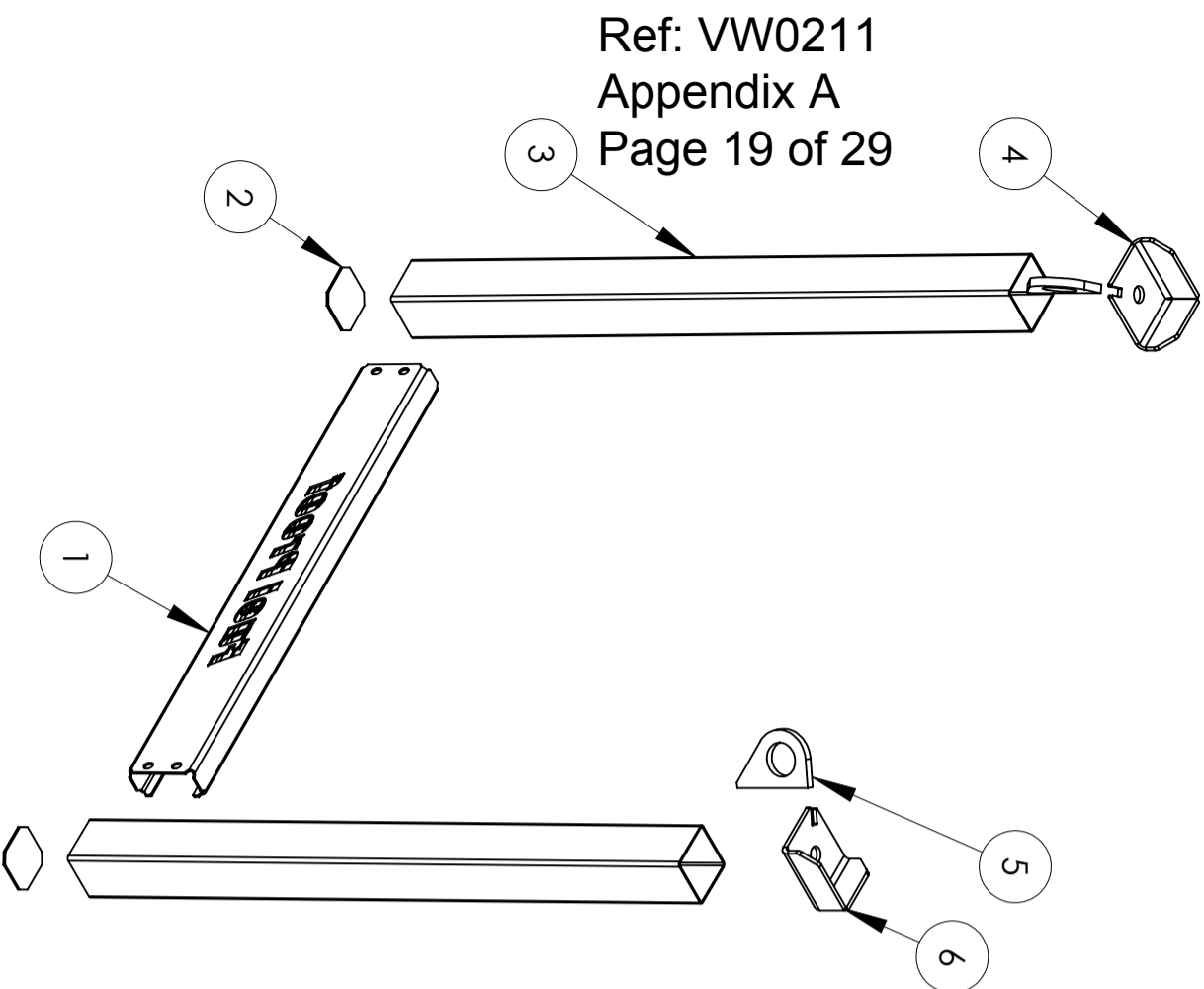
DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED
REMOVE BURRS & SHARP EDGES
MACHINE WHERE MARKED
SURFACE TEXTURE VALUES IN µm.

DRAWING STATUS:
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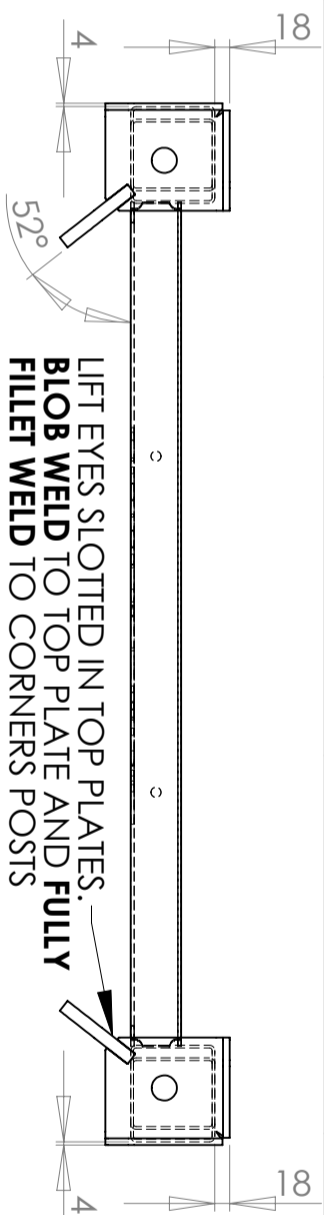
Rev:	Description:	Drawn:	Appv'd:	Chk'd:	Date:	Finish:
Title: GT FRONT FRAME ASSEMBLY						
Drawing No: GTV6-A005						
Scale: SHEET 2 OF 8						
Revision: A						
Drawn By: R.PILKINGTON						

ASSEMBLY STAGE 2

ITEM NO.	PART No.	DESCRIPTION	QTY.
1	GTV6-105	GT END FRAME STIFFENER	1
2	GTV6-109	GT CORNER POST CAPPING PLATE	2
3	GTV6-102	GT CORNER POST	2
4	GTV6-106a	GT CORNER TOP PLATE	1
5	GTV6-107	GT LIFT EYE	2
6	GTV6-106b	GT CORNER TOP PLATE	1

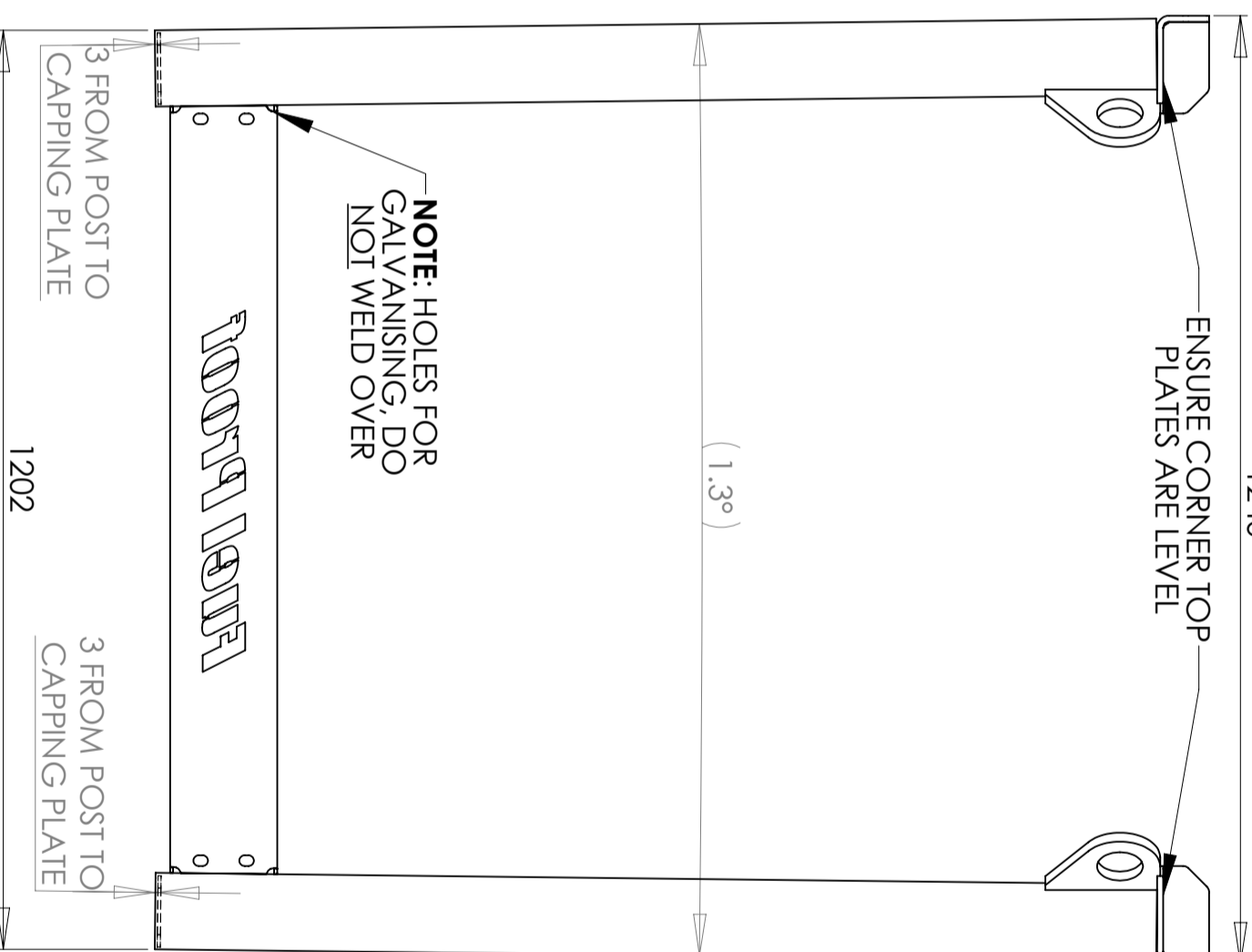


Ref: VW0211
Appendix A
Page 19 of 29



4 FROM TOP OF
CORNER PLATES
TO LIFT EYE

DETAIL B
SCALE 1 : 7



ALIGN STIFFENER
FLUSH WITH REAR
FACE OF CORNER
POSTS.
GRIND ANY WELDS
FLUSH.

TOLERANCES UNLESS OTHERWISE STATED
NOMINAL DIMS ± 2.0mm
MACHINED DIMS ± 0.5mm
ANGULAR ± 0.5°

Fuel Proof
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Rev: Description: Drawn: Appvd: Chkd: Date: Finish:

Rev:	Description:	Drawn:	Appvd:	Chkd:	Date:	Finish:

Title: **GT REAR FRAME ASSEMBLY**

Drawing No: **GTV6-A006**

Material:

Scale:

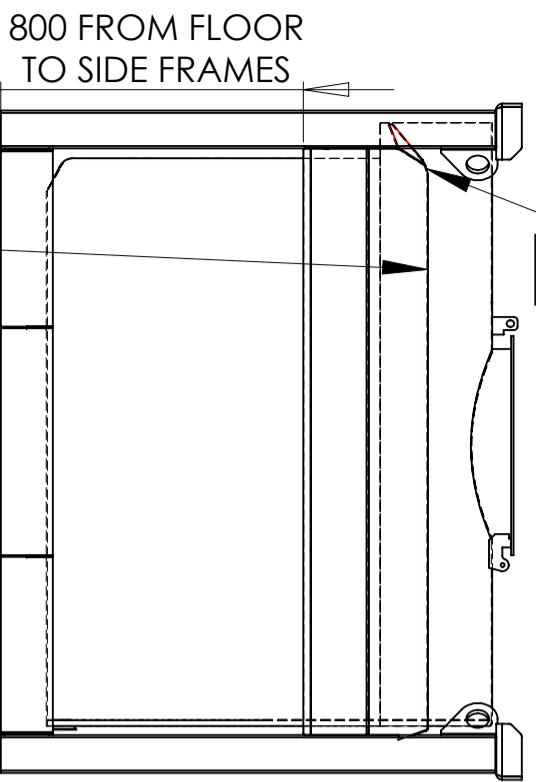
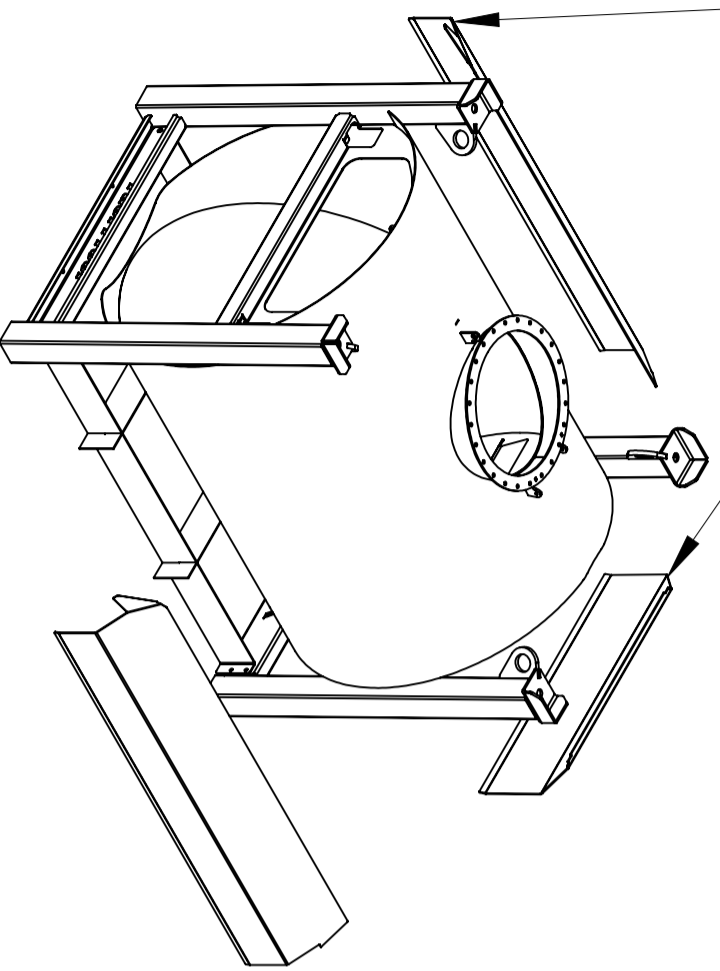
Drawn By: R.PILKINGTON

Sheet: **3 OF 8**

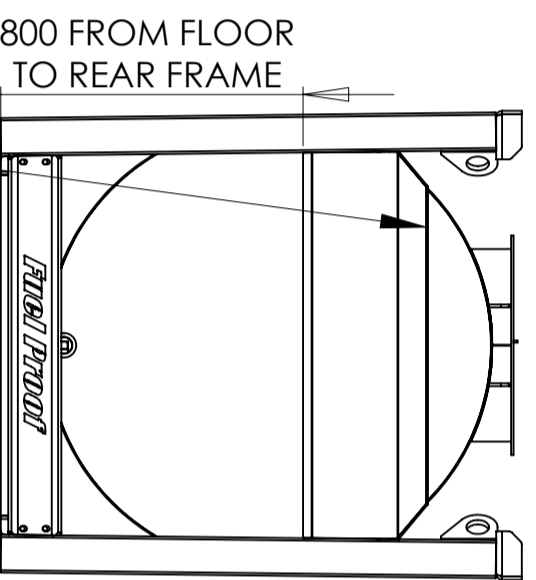
Revision: **A**

ASSEMBLY STAGE 4

1. SLIDE SIDE FRAMES DOWN AROUND BARREL TO POSITION BETWEEN CORNER POSTS. **FULLY WELD** TO BARREL & CORNER POSTS
2. SLOT IN REAR FRAME BETWEEN SIDE FRAMES & CORNER POSTS. **FULLY WELD** TO INNER REAR END, BARREL, CORNER POSTS & SIDE FRAMES.



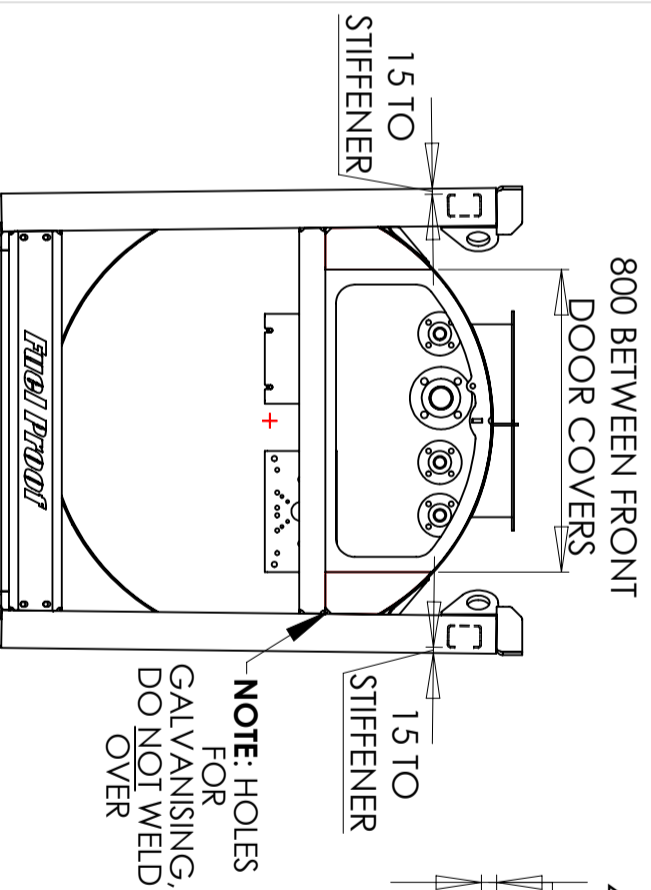
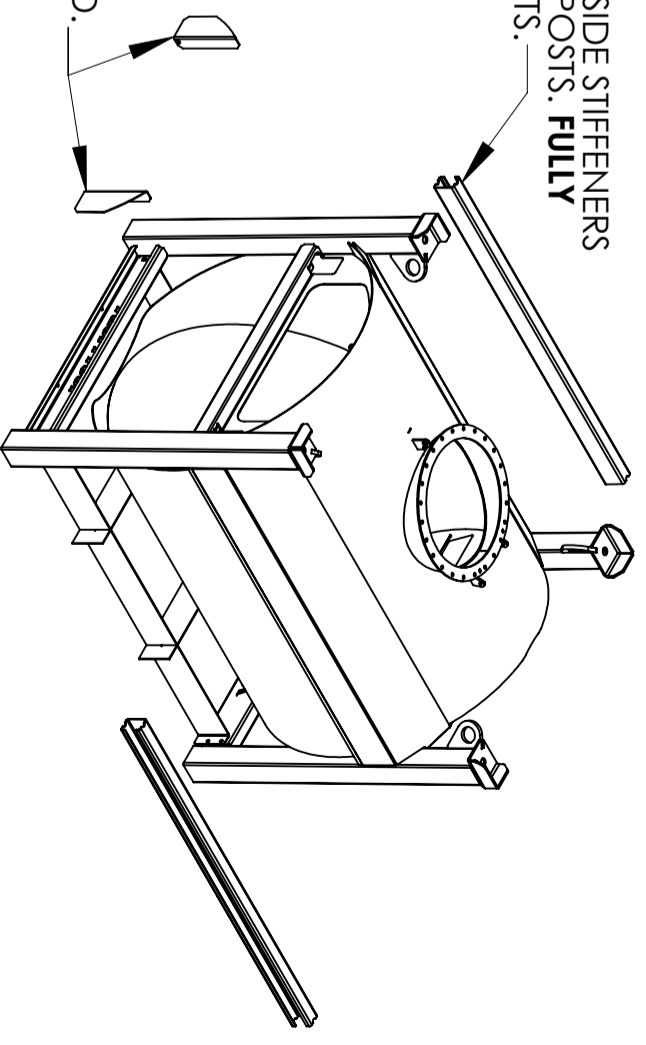
POSITION SIDE FRAME, **FULLY WELD** TO BARREL & CORNER POSTS. SAME FOR OTHER SIDE FRAME.



POSITION REAR FRAME, **FULLY WELD** TO INNER REAR END, BARREL, CORNER POSTS & SIDE FRAMES

ASSEMBLY STAGE 5

1. POSITION UPPER SIDE STIFFENERS BETWEEN CORNER POSTS. **FULLY FILET WELD** TO POSTS.
2. POSITION FRONT DOOR COVERS AGAINST DOOR END. **FULLY WELD** TO DOOR END, BARREL & CORNER POSTS.



3. FINALLY, REMOVE JIG.

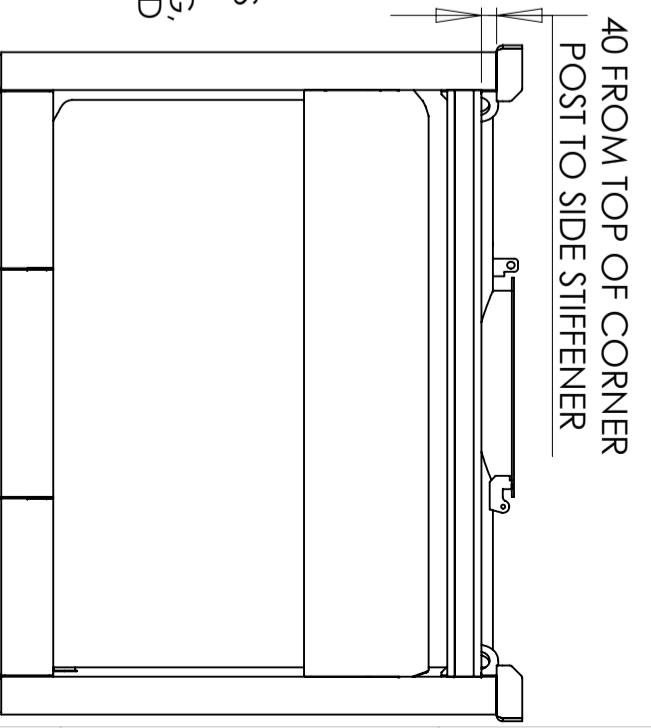
- NOTE:**
- INNER TANK & FRAME ASSEMBLY TO BE GALVANISED AFTER GALVANISING, 1.5" PLUG WELDED TO SOCKET TO SEAL INNER TANK BELOW THE MAX. FUEL LEVEL

DRAWING STATUS:

FOR CONSTRUCTION

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Rev:	Description:	Drawn:	Appv'd:	Chk'd:	Date:	Finsh:



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NOMINAL DIMS : 2.0mm	
MACHINED DIMS : 0.5mm	
ANGULAR : 0.5°	
<p>DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED REMOVE BURRS & SHARP EDGES MACHINE WHERE MARKED SURFACE TEXTURE VALUES IN µm</p>	

Title: **GT INNER TANK AND FRAME ASSEMBLY**

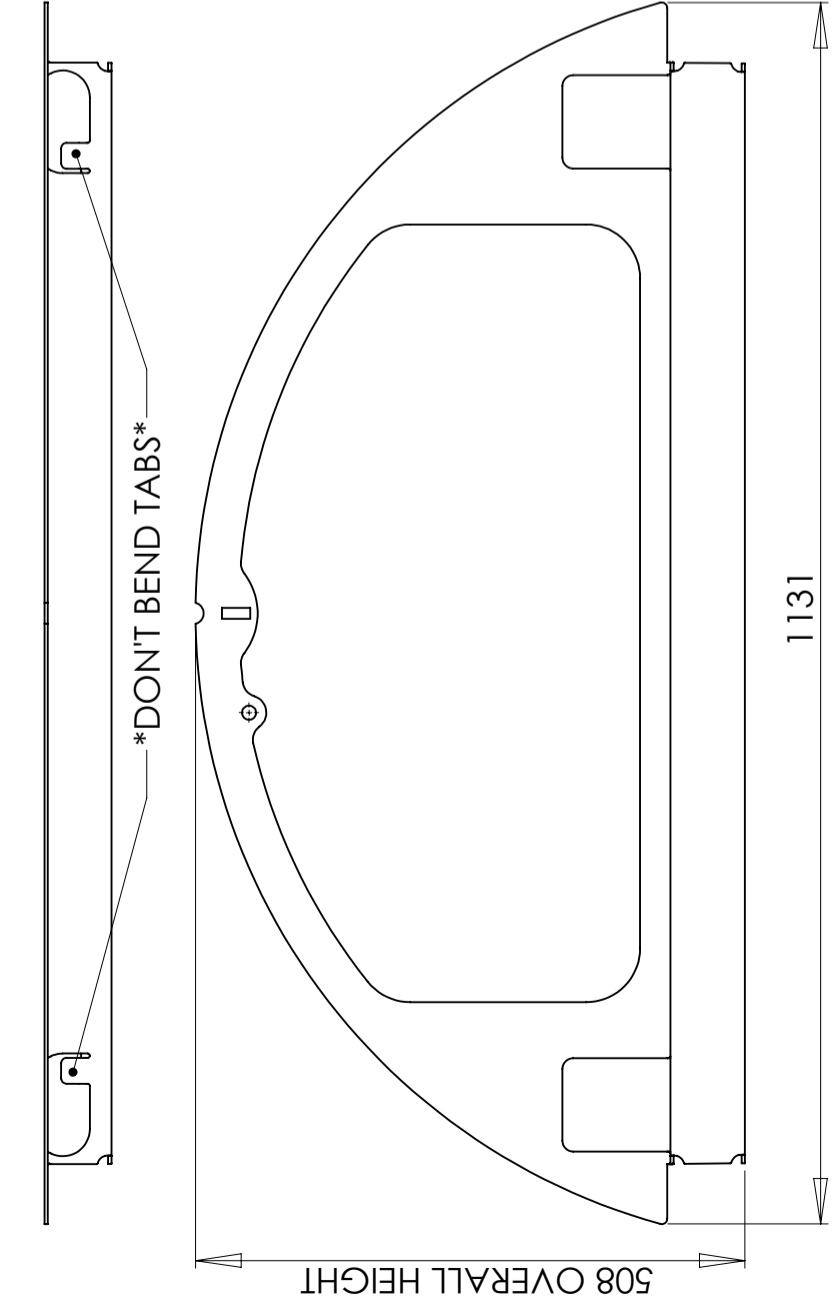
Drawing No: **GTV6-A001**

A3

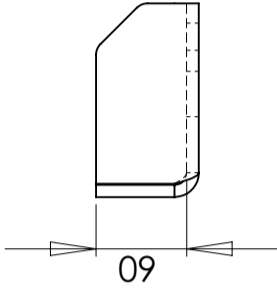
Drawn By: R.PILKINGTON

Scale: SHEET 5 OF 8

Revision: **B**

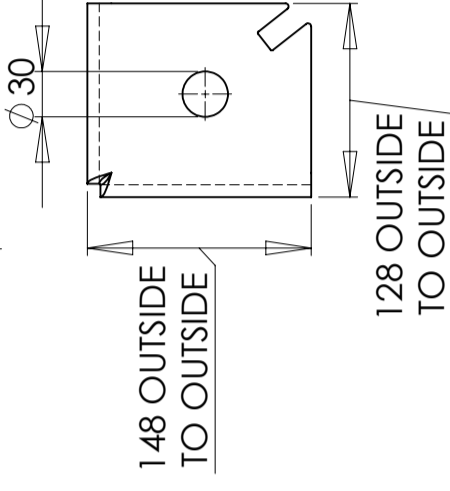


**GTV6-010
GT DOOR END
S275 MS
3mm THK**

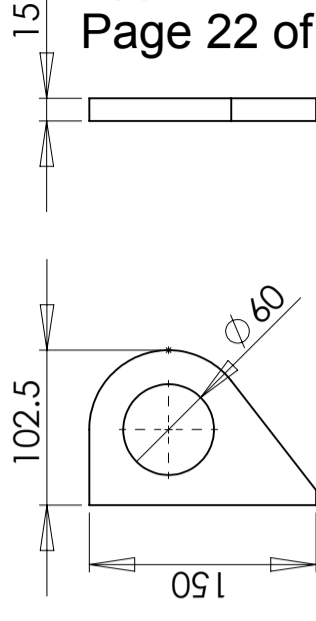


**GTV6-106b
GT CORNER TOP PLATE
S275 MS
8mm THK**

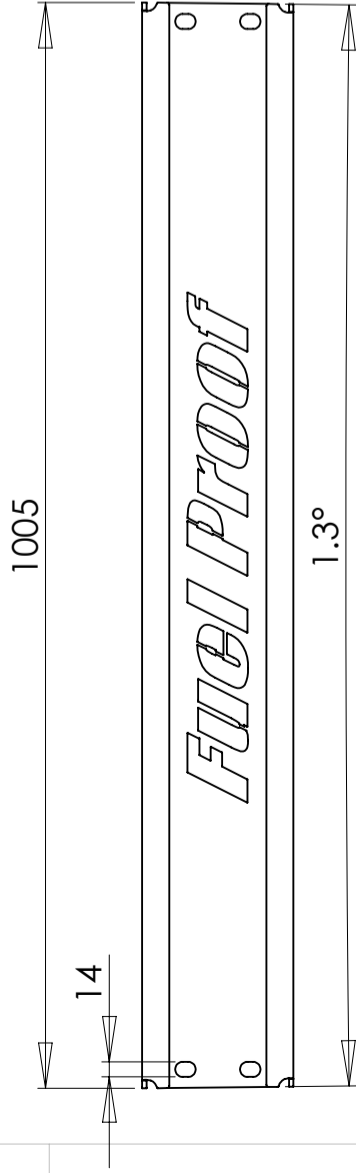
****FOLDED OPPOSITE HAND
FOR GTV6-106a****



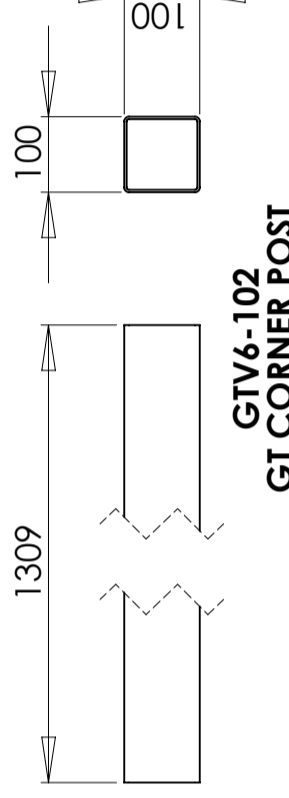
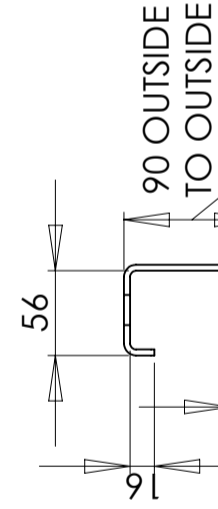
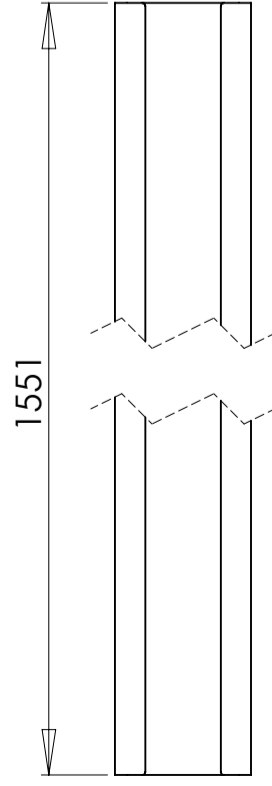
**GTV6-107
GT LIFT EYE
S275 MS
15mm THK**



**GTV6-105
GT END FRAME STIFFENER
S275 MS
4mm THK**



**GTV6-108
GT UPPER SIDE STIFFENER
S275 MS
4mm THK**



**GTV6-102
GT CORNER POST
S275 MS
100 x 100mm BOX SECTION**

ALL DIMENSIONS INTERNAL
& ANGLES 90° UNLESS
OTHERWISE STATED

Ref: VW0211
Appendix A
Page 22 of 29

TOLERANCES UNLESS OTHERWISE STATED
NOMINAL DIMS ± 2.0mm
MACHINED DIMS ± 0.5mm
ANGULAR ± 0.5°

DIMENSIONS IN MILLIMETERS
UNLESS OTHERWISE STATED
REMOVE BURRS & SHARP EDGES
MACHINE WHERE MARKED
SURFACE TEXTURE VALUES IN µm

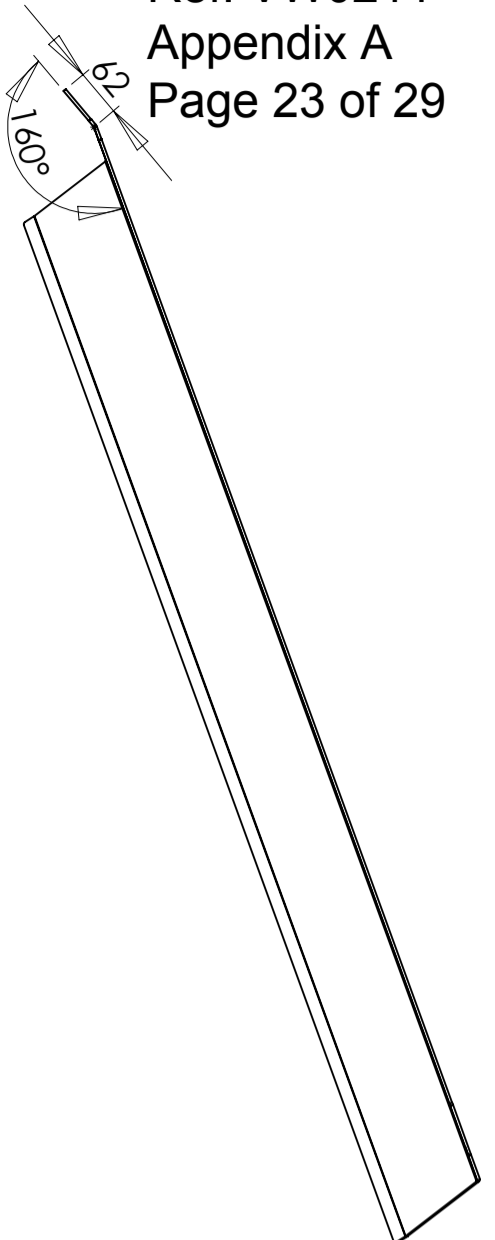
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Fuel Proof LTD
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Tel: 01524 850685
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e-mail: info@fuelproof.co.uk
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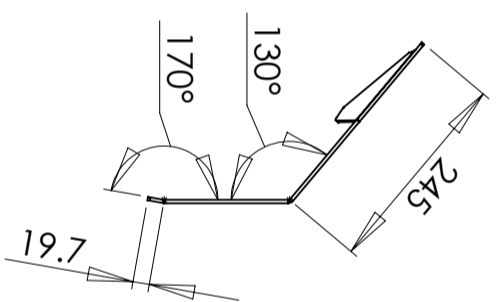
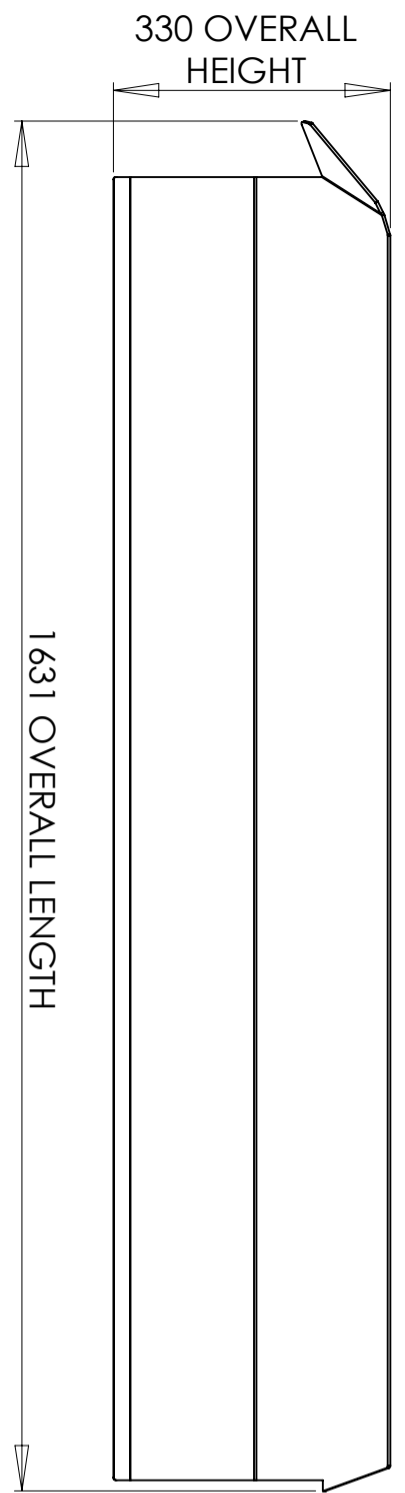
Rev:	Description:	Drawn:	Appv'd:	Chk'd:	Date:	Finish:
						Material:
						Drawn By: R.PILKINGTON

Title:	GT INNER TANK AND FRAME ASSEMBLY
Drawing No:	GTV6-A001
Scale:	SHEET 6 OF 8
Revision:	A3
	B



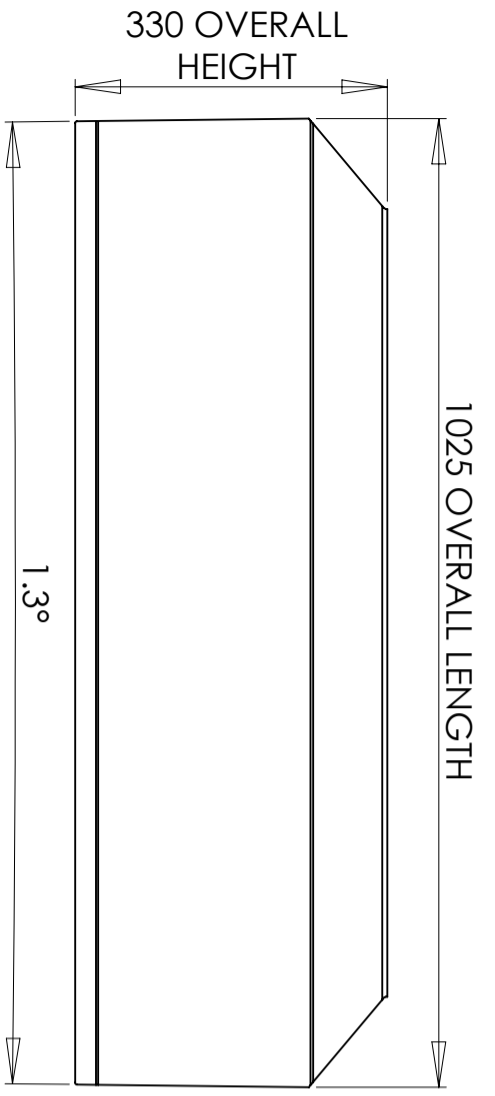
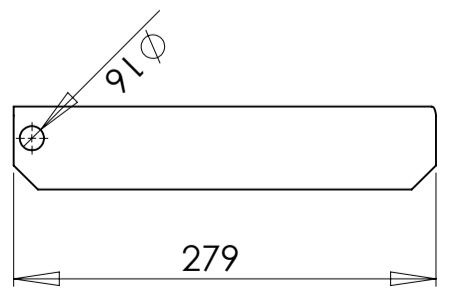
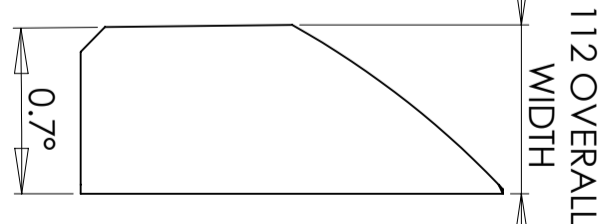
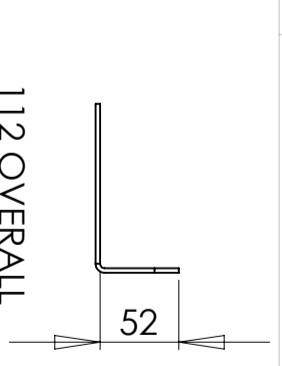
GTV6-005a
GT SIDE FRAME
S275 MS
4mm THK

****FOLDED OPPOSITE HAND
FOR GTV6-005b****

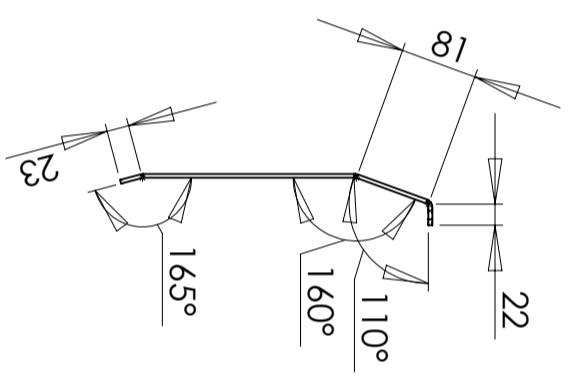


GTV6-011a
GT FRONT DOOR COVER
S275 MS
3mm THK

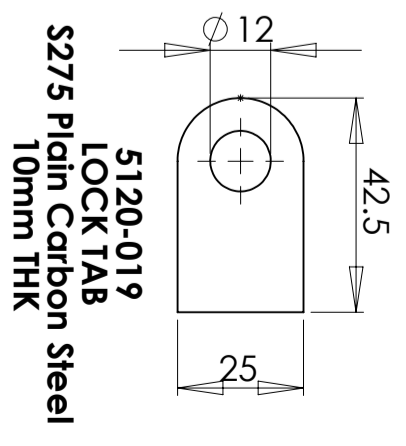
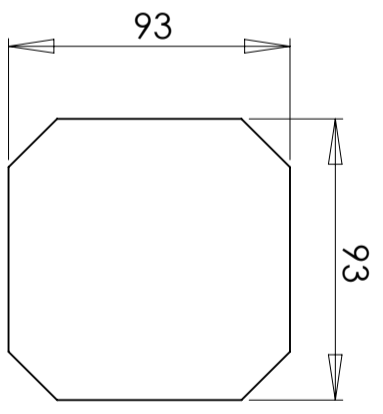
****FOLDED OPPOSITE HAND
FOR GTV6-011b****



GTV6-007
GT REAR FRAME
S275 MS
4mm THK



GTV6-109
GT CORNER POST CAPPING PLATE
S275 Plain Carbon Steel
4mm THK



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TOLERANCES UNLESS OTHERWISE
NOMINAL DIMS : 2.0mm
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ANGULAR : 0.5°

DIMENSIONS IN MILLIMETERS
UNLESS OTHERWISE STATED
REMOVE BURS & SHARP EDGES
MACHINE WHERE MARKED
SURFACE TEXTURE VALUES IN µm

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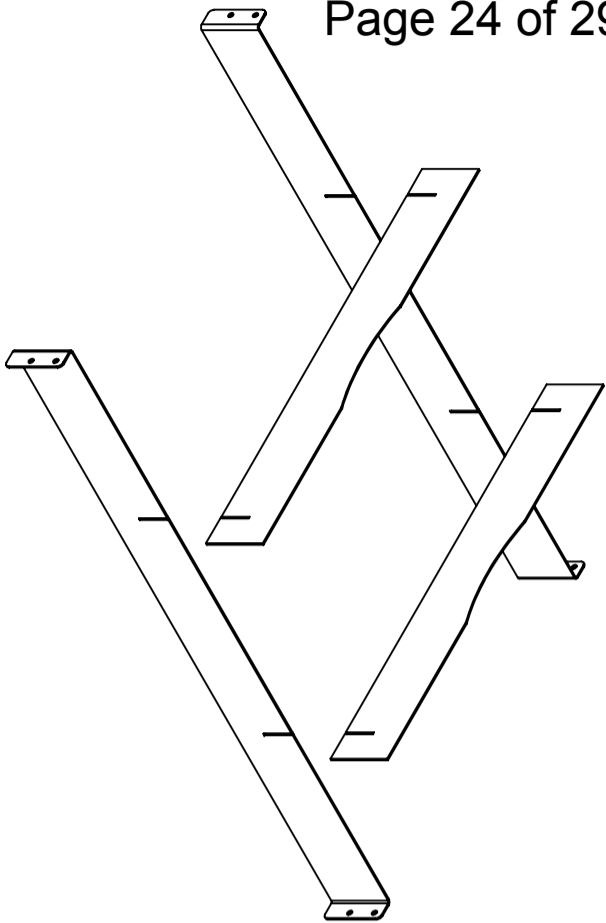
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							GT INNER TANK AND FRAME ASSEMBLY
						Material:	Drawing No:
						Drawn By: R.PILKINGTON	GTV6-A001
						Scale:	Revision:
							A3
							B

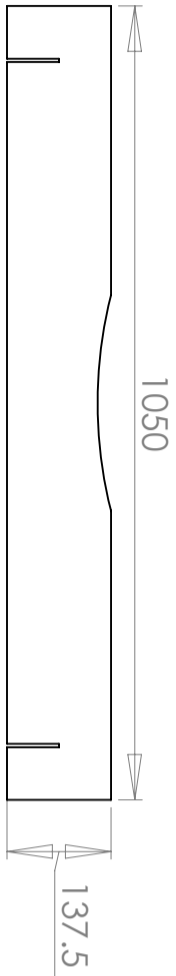
ALL DIMENSIONS INTERNAL
& ANGLES 90° UNLESS
OTHERWISE STATED

ITEM NO.	PART No.	DESCRIPTION	QTY.
1	GTV6-JIG-001	SIDE SUPPORT	2
2	GTV6-JIG-002	TANK SUPPORT	2

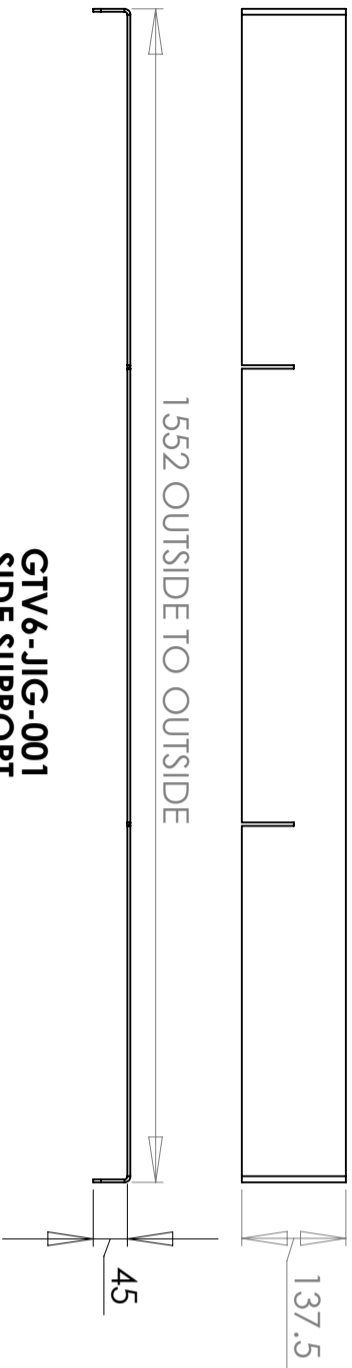
Ref: VW0211
Appendix A
Page 24 of 29



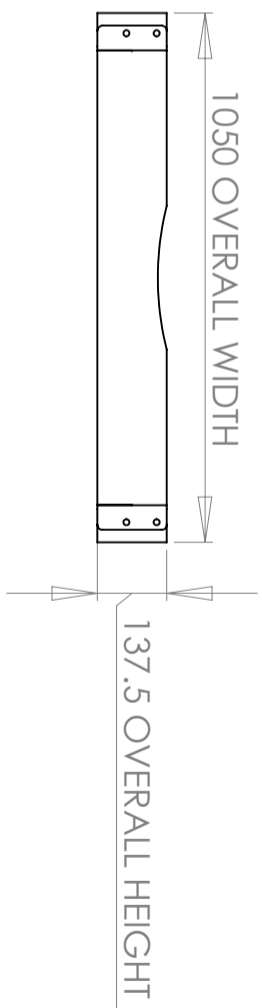
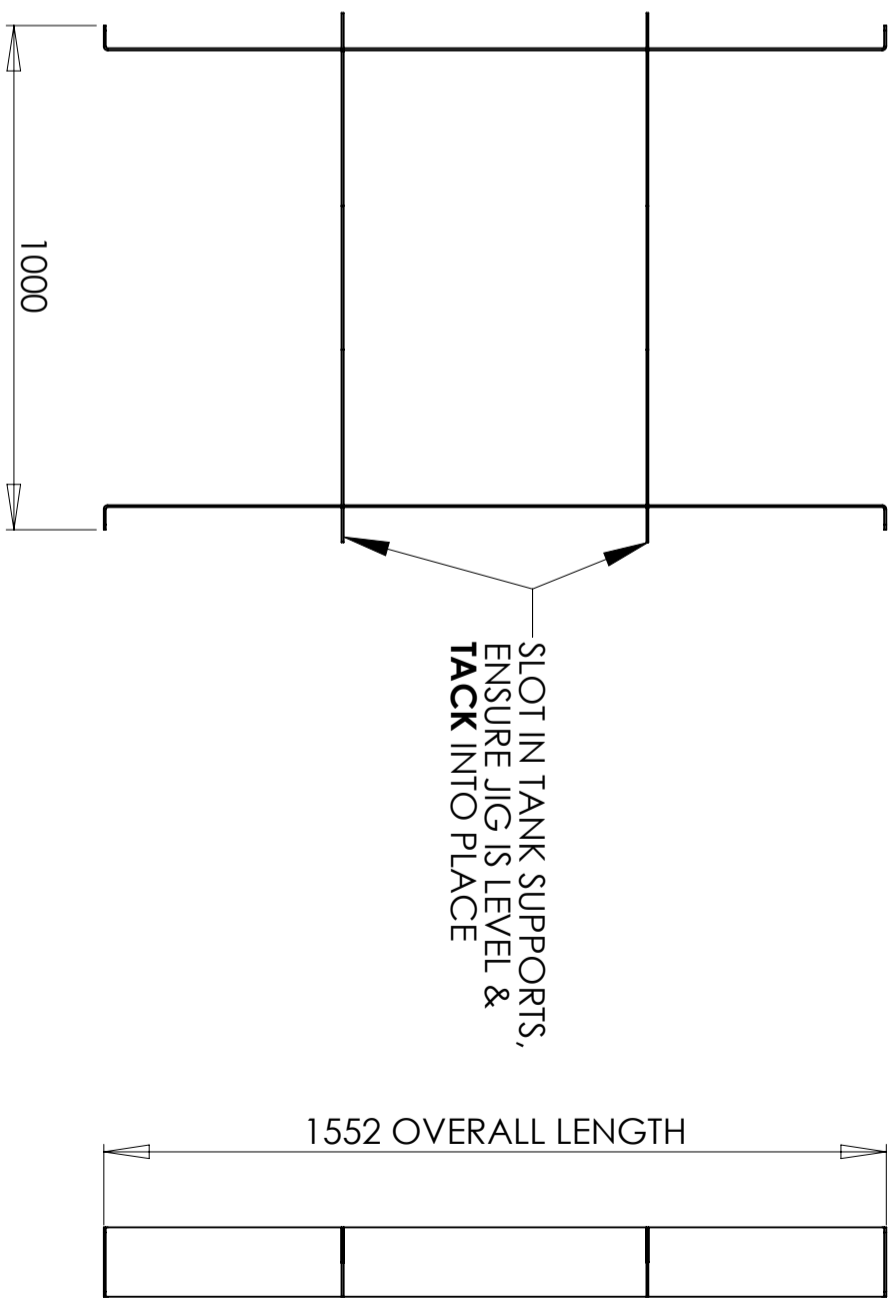
COMPONENTS



**GTV6-JIG-002
TANK SUPPORT
S275 MS
4mm THK**



**GTV6-JIG-001
SIDE SUPPORT
S275 Plain Carbon Steel
4mmTHK**



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TOLERANCES UNLESS OTHERWISE STATED
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MACHINED DIMS ± 0.5mm
ANGULAR ± 0.5°

DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED
REMOVE BURRS & SHARP EDGES
MACHINE WHERE MARKED
SURFACE TEXTURE VALUES IN µm

Title: **GT INNER TANK POSITIONING JIG**

Drawing No: **GTV6-JIG**

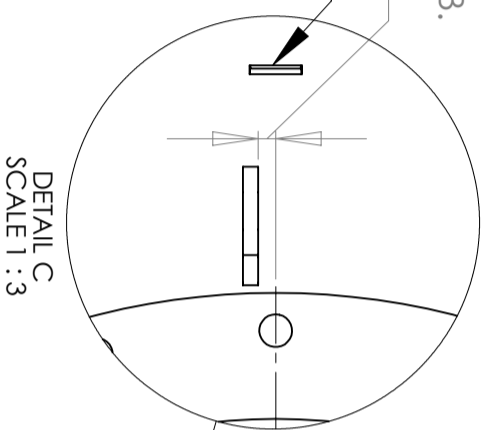
Scale: SHEET 8 OF 8

Revision: **A3**
A

ALL DIMENSIONS INTERNAL & ANGLES 90° UNLESS OTHERWISE STATED

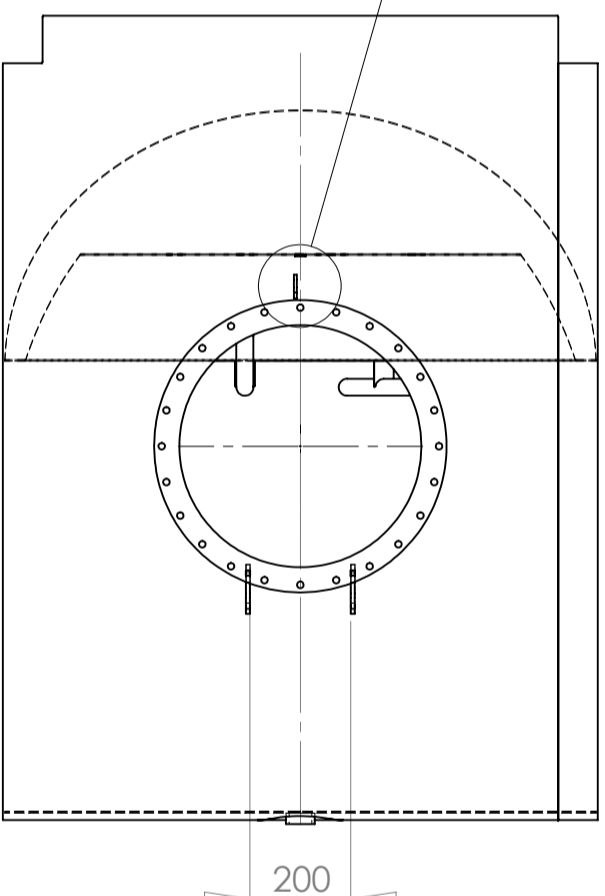
7 FROM TANK ϕ TO LOCK TAB.
USE ETCH TO POSITION.

TAB IN FRONT END



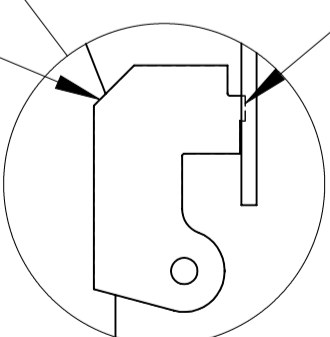
TO POSITION FRONT END ASSEMBLY:

1. USE TAB AT TOP OF FRONT END ASSEMBLY AND INSERT INTO RECTANGULAR CUT-OUT AT TOP OF BARREL.
2. PIVOT FRONT END ASSEMBLY ABOUT TAB & POSITION INTO BARREL



NOTE: BEFORE POSITIONING MANWAY NOZZLE ONTO BARREL:
USE RECTANGULAR CUT-OUTS IN MANWAY FLANGE TO POSITION HINGES. **BLOB WELD & THEN GRIND FLAT** ON MANWAY FLANGE TOP SURFACE.
ONCE MANWAY IS WELDED ONTO BARREL, TACK HINGES TO BARREL.

NOTE: GAPS FOR GALVANISING SHOULDNT BE WELDED OVER



DETAIL B
SCALE 1 : 3

14 FROM END OF BARREL TO REAR END

FULLY FILLET WELD REAR END INTO BARREL

38 FROM MANWAY NOZZLE TO LOCK TAB

FULLY FILLET WELD FRONT END ASSEMBLY INTO BARREL OVERLEAF

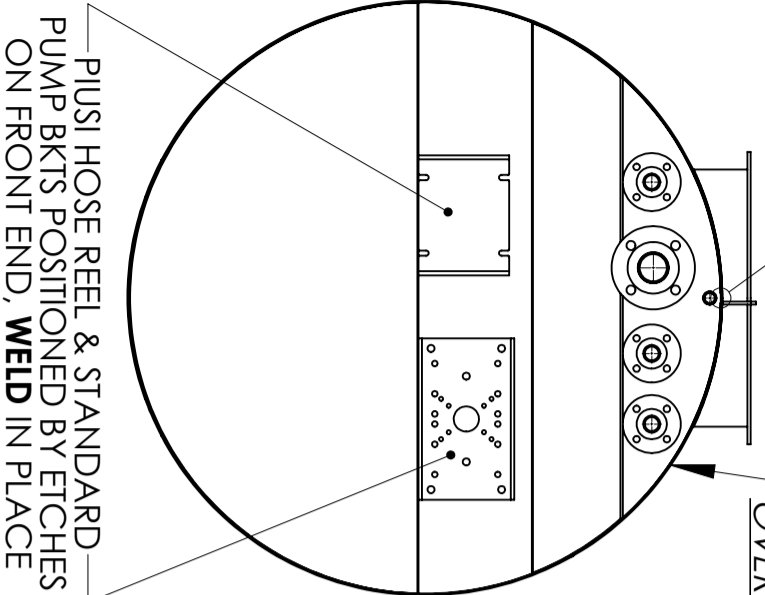
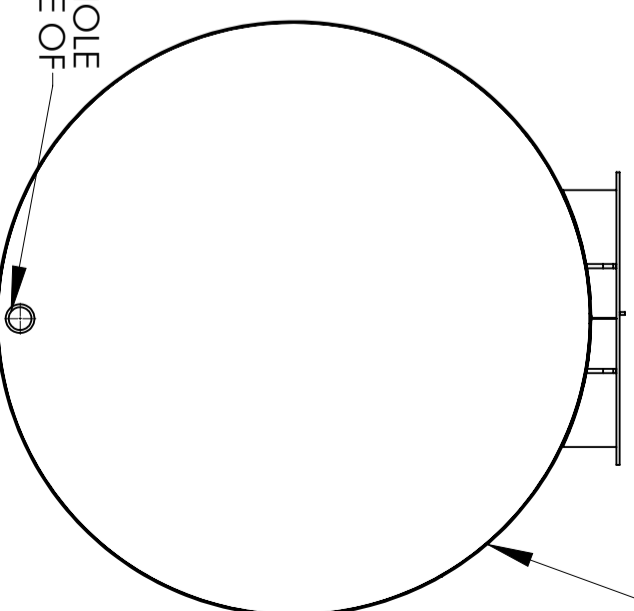


ENSURE THIS PART OF FLAT END IS VERTICAL

6 FROM SCALLOP ON BARREL EDGE TO LOWER EDGE OF FRONT END

1.5" socket, 22mm long
PLUG WELDED IN AFTER GALVANISING

ENSURE HOLE IS AT BASE OF FLAT END



PLUS HOSE REEL & STANDARD PUMP BKTS POSITIONED BY ETCHES ON FRONT END, **WELD** IN PLACE

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UNDER CONSTRUCTION

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Material:

Drawn By: R.PILKINGTON

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MACHINED DIMS : 0.5mm
ANGULAR : 0.5°

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Title: **GENERATOR DEVELOPMENT- INNER TANK**

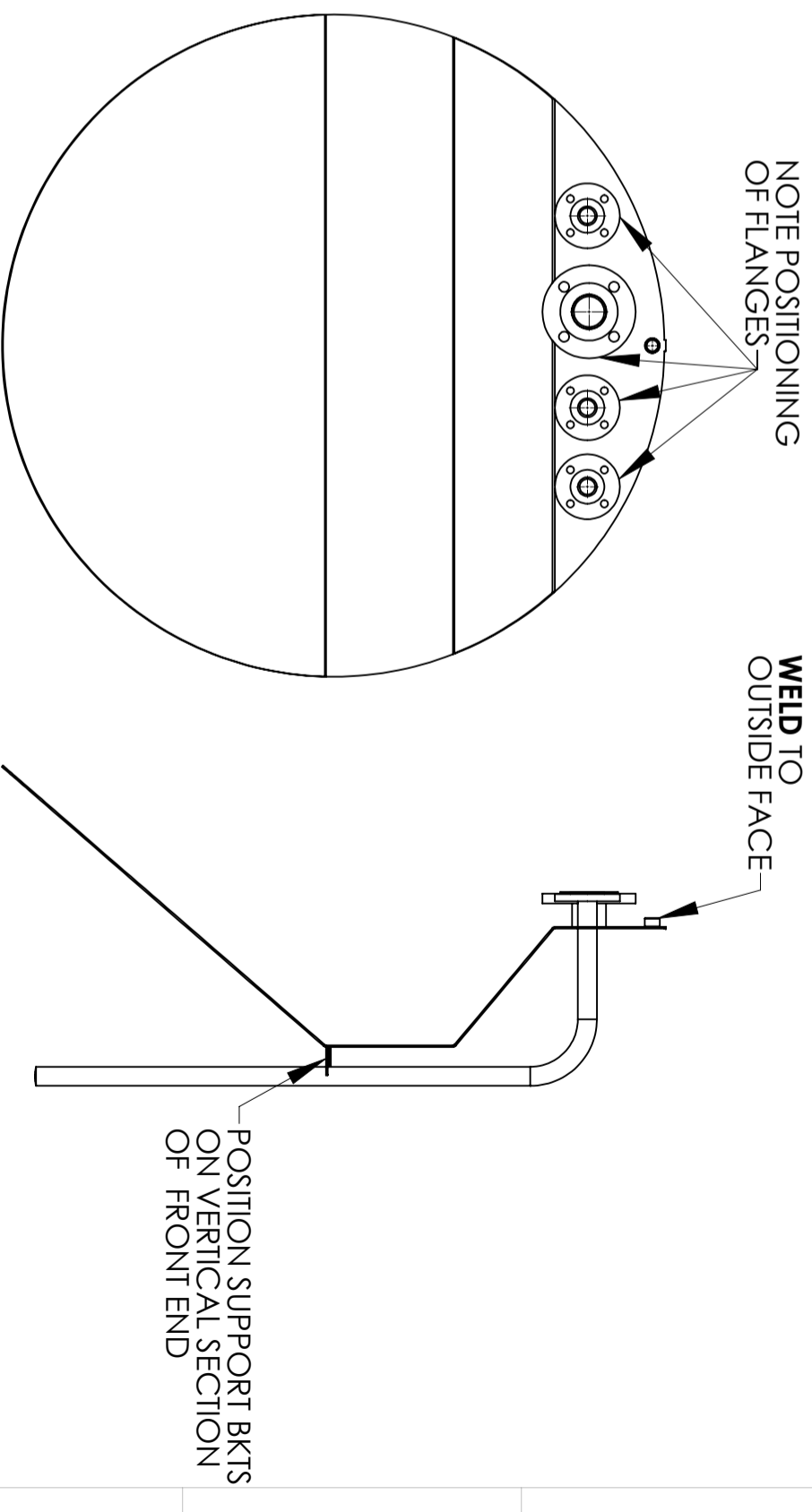
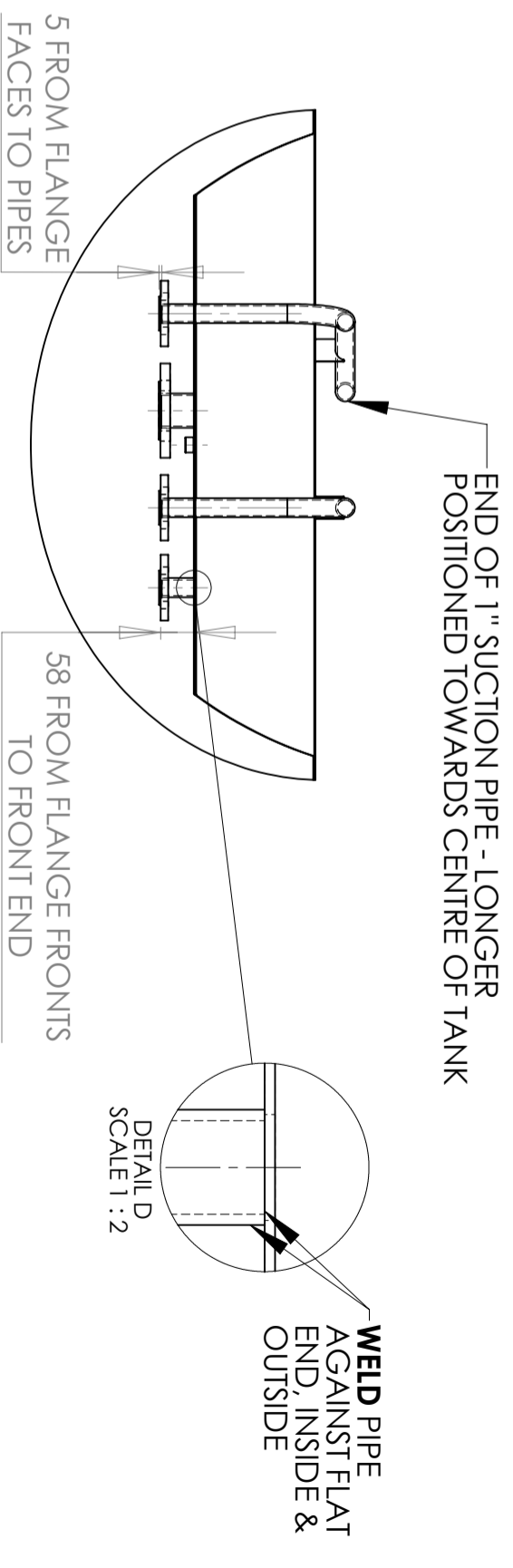
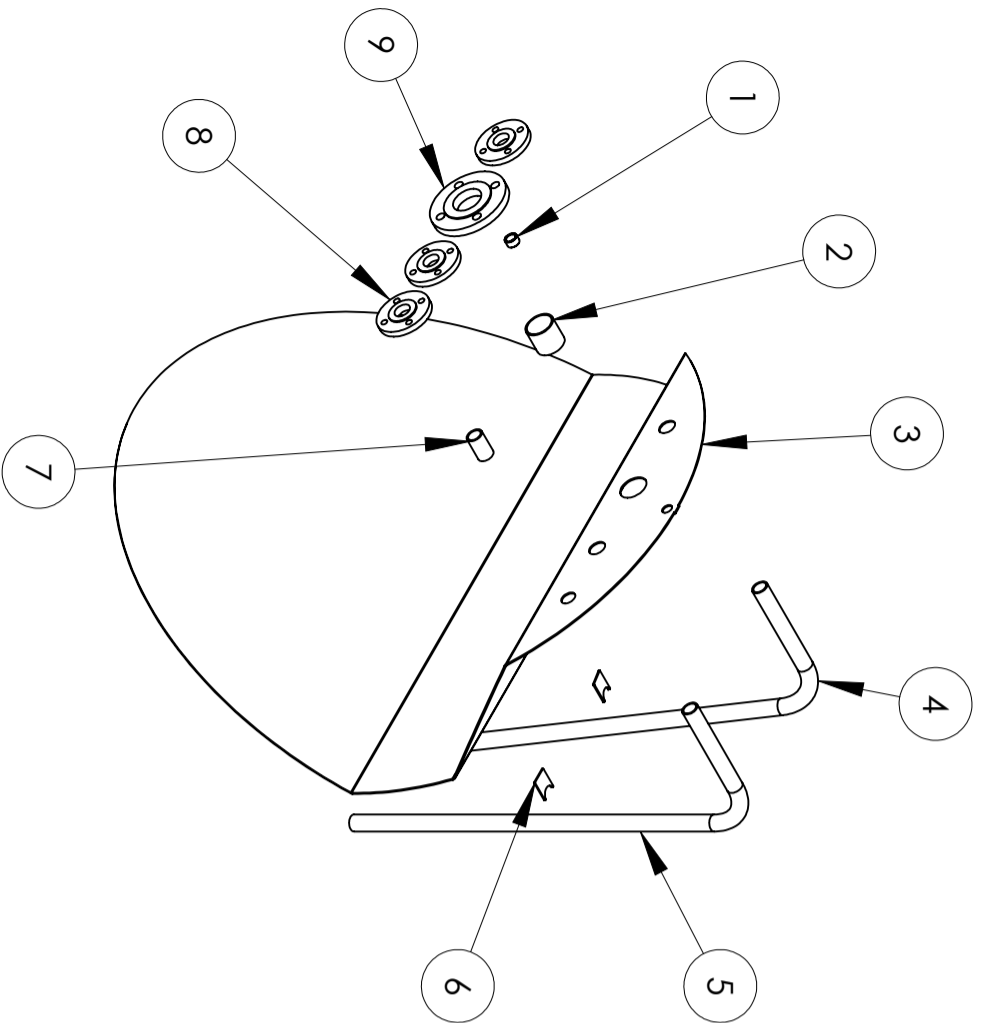
Drawing No: **GTV6-A007**

Scale: SHEET 2 OF 5

Revision: **A3**

B

ITEM NO.	PART No.	DESCRIPTION	QTY.
1	GTV6-015	0.5" SOCKET, 15mm LONG	1
2	GTV6-009	2" PIPE GT INNER FRONT END	1
3	GTV6-016b	1" SUCTION PIPE - LONGER	1
4	GTV6-016b	1" SUCTION PIPE	1
5	GTV6-024	33.7" SUCTION PIPE SUPPORT BKT	2
6	GTV6-016a	1" RETURN PIPE	1
7		PN16 DN25 TYPE 101B SLIP-ON FLANGE	3
8		2 INCH FLANGE, PN16 DN50 TYPE 101B	1
9			



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TOLERANCES UNLESS OTHERWISE STATED
NOMINAL DIMS : 2.0mm
MACHINED DIMS : 0.5mm
ANGULAR : 0.5°

DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED
REMOVE BURRS & SHARP EDGES
MACHINE WHERE MARKED
SURFACE TEXTURE VALUES IN µm

Title: **GT FRONT END ASSEMBLY**

Drawing No: **GTV6-A015**

Material:

Drawn By: **R.PILKINGTON**

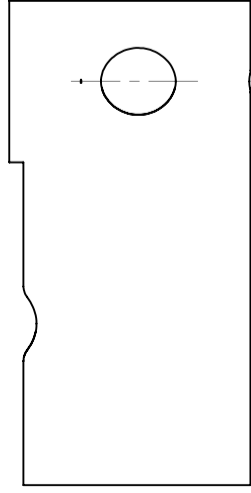
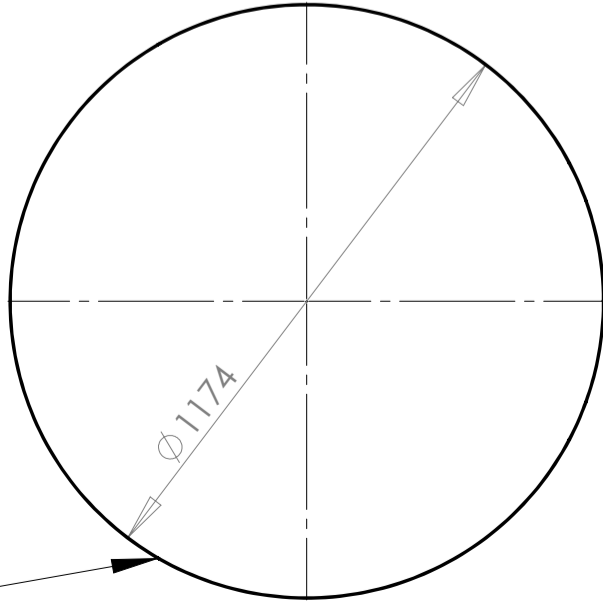
Scale:

Revision: **B**

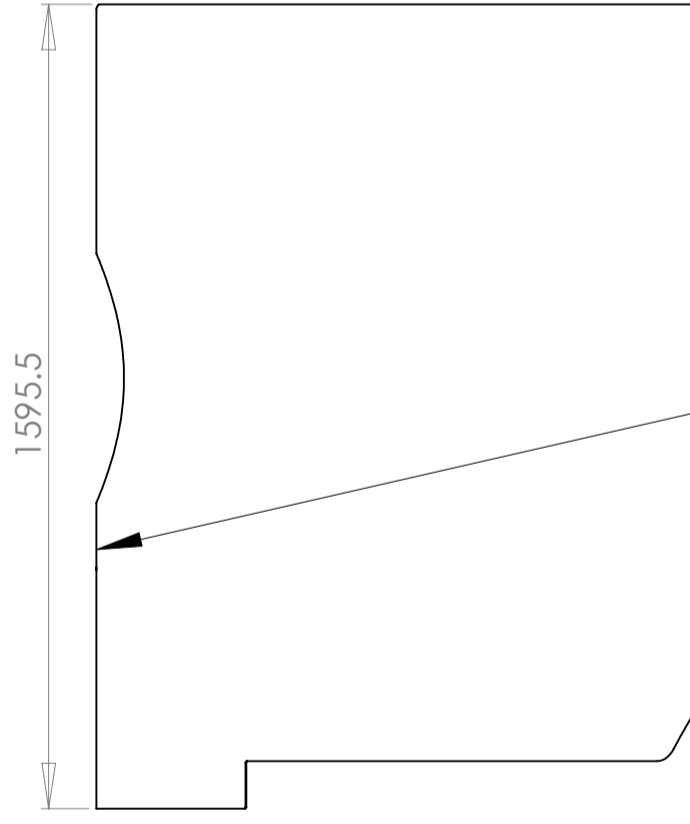
SHEET 3 OF 5

A3

**** DO NOT TACK WELD BARREL SEAM AFTER ROLLING****

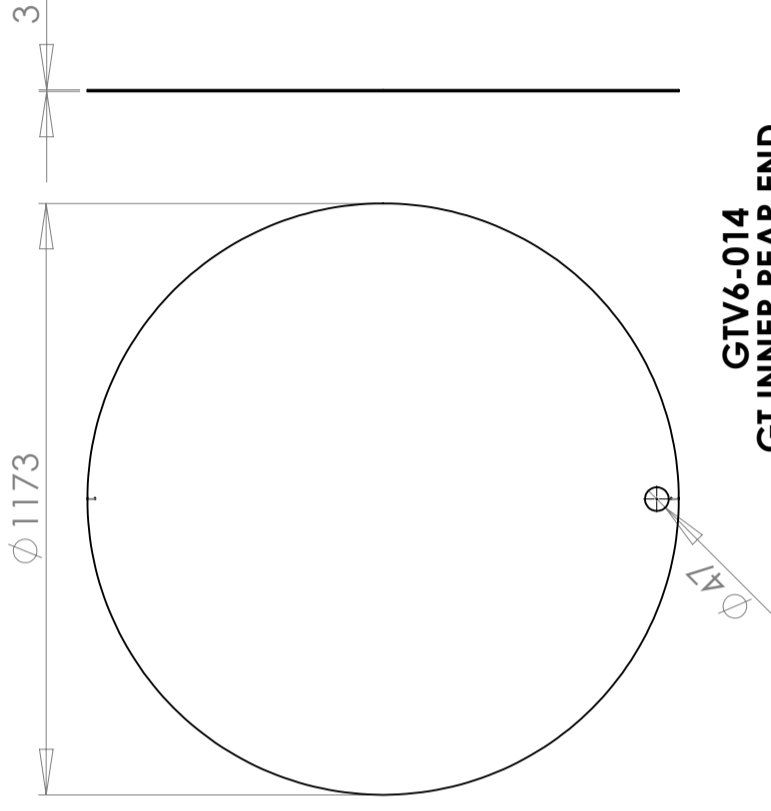


FLAT PATTERN
SCALE 1 : 50

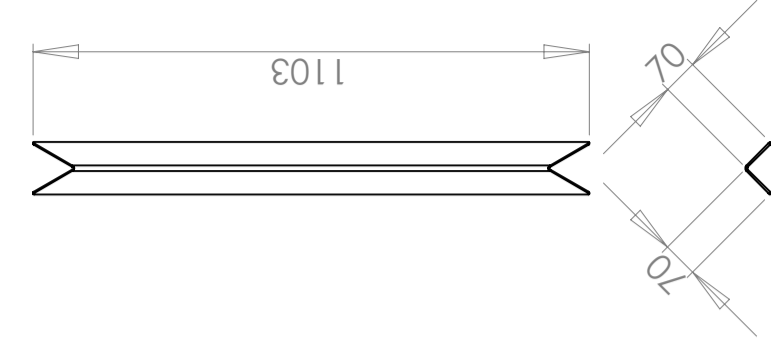


ENSURE ETCHINGS ARE ON OUTSIDE OF BARREL

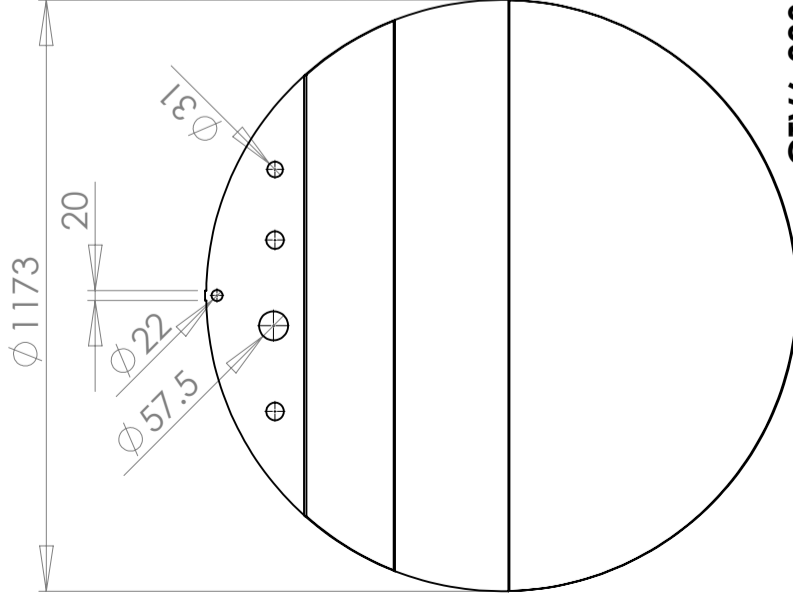
**GTV6-001
GT INNER BARREL
S275 MS
3mm THK**



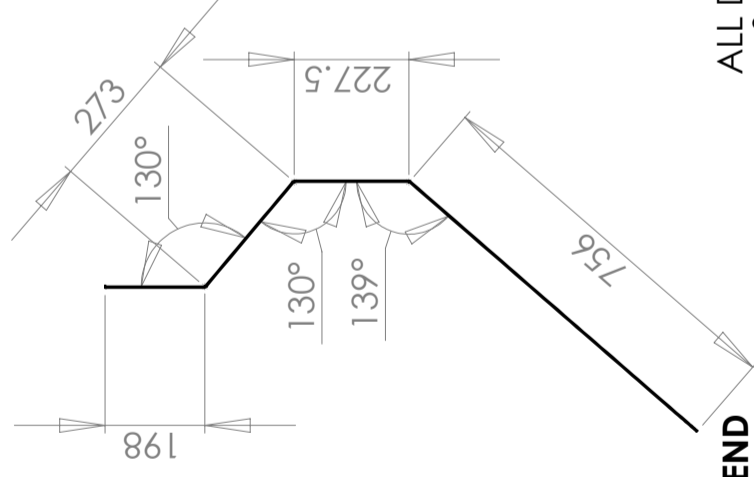
**GTV6-014
GT INNER REAR END
S275 MS
3mm THK**



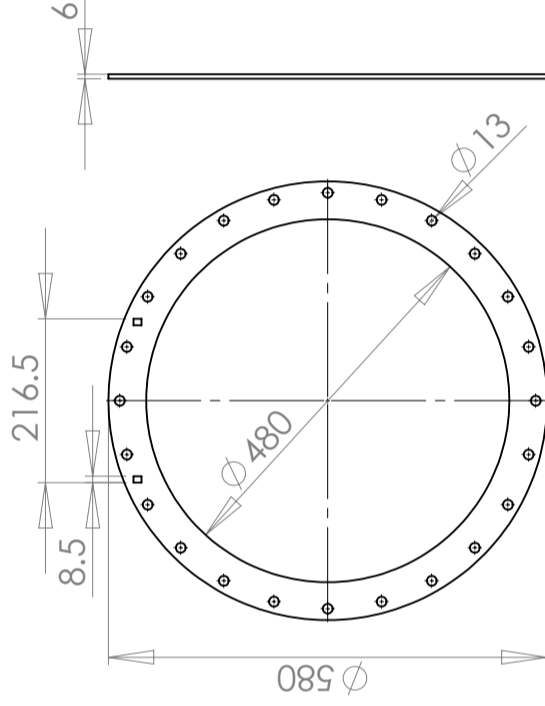
**GTV6-029
REAR FLAT END STIFFENER
S275 MS
4mm THK**



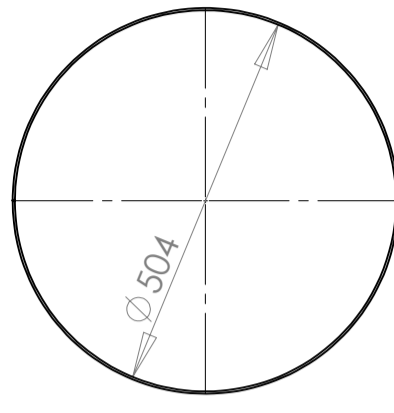
**GTV6-009
GT INNER FRONT END
S275 MS
3mm THK**



**GTV6-021
GT MANWAY FLANGE
S275 Plain Carbon Steel
6mm THK**



**GTV6-004
GT MANWAY NOZZLE
S275 MS
3mm THK**



Ref: VW0211
Appendix A
Page 28 of 29

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TOLERANCES UNLESS OTHERWISE SPECIFIED			
NOMINAL DIMS	: ± 2.0mm		
MACHINED DIMS	: ± 0.5mm		
ANGULAR	: ± 0.5°		
DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED. REMOVE BURRS & SHARP EDGES MACHINE WHERE MARKED SURFACE TEXTURE VALUES IN um.			
Title: GENERATOR DEVELOPMENT- INNER TANK		Drawing No: GTV6-A007	
Scale: SHEET 4 OF 5		Revision: B	

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		Drawn By: R.PILKINGTON	

ALL DIMENSIONS INTERNAL & ANGLES 90° UNLESS OTHERWISE STATED

**PERFORMANCE TESTS OF PACKAGINGS FOR DANGEROUS GOODS
PACKAGING SPECIFICATION CHECK**

Test Ref. VW0211
Appendix B
Sheet 1 of 3

External bund & Inner IBC

- (i) UN code : 31A
- (ii) Description : 950 litre mild steel barrel shaped IBC welded to external framework comprising four uprights, horizontal stiffeners and side frames. Outer bund section comprises forkliftable base which is bolt affixed to inner framework with 8 off M12 bolts.
- (ii) Material and grade : Mild steel throughout.
- (iii) Method of fabrication : Welded sections and bolt affixed inner and outer sections.
- (iv) Seams : Welded.
- (v) Dimensions (mm)
 - External
 - Length : 1786 mm (inclusive of stacking locators on uprights)
: 1595 mm (length of IBC body)
: 1548 mm (length of bund body)
 - Width : 1240 mm (inclusive of stacking locators on uprights)
: 1180 mm (diameter of IBC body)
: 1214 mm (width of bund body)
 - Height : 1378 mm (inclusive of stacking locators on uprights)
: 1240 mm (IBC height inclusive of manway)
 - Tare weight (Kg) : 639.65 kg (inclusive of all fittings)
 - Brimful capacity : 1027.50 litres
- (vi) Finish : Mild steel.
- (vii) Thickness (mm)
 - Outer body barrel : 3.016 mm
 - Outer body front and rear ends : 4.002 mm
 - Inner body barrel : 3.007 mm
 - Inner body front and rear ends : 3.002 mm
 - Side frame : 3.979 mm
 - Rear frame : 4.003 mm
 - Outer side stiffener (base) : 6.000 mm
 - Upper side stiffener : 3.956 mm
 - End frame stiffener : 3.964 mm
 - Compartment door : 3.014 mm
 - Fork channels : 4.001 mm
 - Lifting eye : 15.000 mm
 - Base end plate fastener : 8.035 mm
 - Corner post top plate : 8.007 mm
 - Manway flange : 5.990 mm
 - Manway attachment flange : 5.960 mm

PERFORMANCE TESTS OF PACKAGINGS FOR DANGEROUS GOODS PACKAGING SPECIFICATION CHECK

Test Ref. VW0211
Appendix B
Sheet 2 of 3

- | | | |
|--------|------------------------------------|--|
| (viii) | No. of top lift points | : Four, welded to each corner upright. |
| (ix) | No. of base access directions | : Two, access from front and rear with full width fork channels. |
| (x) | No. to be stacked during transport | : Two, facilitated with corner post top plates. |
| (xi) | Remarks | : Drawings submitted agreed. |

Closure systems & fittings – Internal IBC

- | | | |
|-------|--|--|
| (i) | Filling aperture(s)
Type
Position
Diameter
Number | : 2" steel socket with internal thread.
: Within manway enclosure.
: 2"
: 1 |
| (ii) | Filling closure(s)
Material
Type and size

Gasket and/or other seal
Closure torque (Nm) | : Galvanised steel.
: 2" bore adapter with reduced end fitted to 2" BSP overfill prevention valve.
: PTFE
: N/A |
| (iii) | Discharge aperture(s)
Type
Position
Diameter
Number | : 1" suction pipes fitted to bulk head.
: Top of bulk head within control compartment.
: 1"
: 2 |
| (iv) | Discharge closure(s)
Material
Type and size

Gasket and/or other seal
Torque | : Mild steel
: PN16 DN25 threaded flanges fastened with M12 bolts and fitted with 1" BSP chrome plated brass ball valves. Ball valve fitted with adapter, hose and reel and hose nozzle.
: Rubber gaskets
: 20 Nm |
| (v) | Pressure relief fittings
Type
Position
Diameter
Number | : 1½" Lafon ventilation valve.
: Within manway enclosure.
: 1½" BSP
: 1 |

**PERFORMANCE TESTS OF PACKAGINGS FOR DANGEROUS GOODS
PACKAGING SPECIFICATION CHECK**

Test Ref. VW0211
Appendix B
Sheet 3 of 3

(vi) Other fittings

Type : Optional filling aperture comprising 2" threaded flange fitted with 2" cast aluminium cap with rubber gasket.
Position : Top of bulk head within control compartment.
Diameter : 2" BSP

Type : Generator return line comprising 1" threaded flange fitted with 1" BSP chrome plated brass ball valve with 2" cast aluminium cap with rubber gasket.
Position : Top of bulk head within control compartment.
Diameter : 1" BSP

Type : Internal gauge line comprising 1½" BSP socket fitted with spiral fuel level with PTFE seal.
Position : Within manway enclosure.
Diameter : 1½" BSP

Type : Spare suction line comprising 1" BSP socket fitted with 1" BSP steel plug with PTFE seal.
Position : Within manway enclosure.
Diameter : 1" BSP

Type : Spare 1" BSP socket fitted with 1" ball valve with PTFE seal.
Position : Within manway enclosure.
Diameter : 1" BSP

Type : Manway attachment flange, nozzle and base fitted to top of IBC flange with 24 x M12 bolts and Nyloc nuts.
Position : Central on top.
Diameter : 580 mm external diameter. 480 mm internal diameter orifice. Fitted with 580 mm attachment flange with 455 mm internal diameter.
Flange thickness : 6 mm
Gasket : Rubber gasket.

Type : Pump and hose reel brackets fitted to bulk head.
Position : Within control compartment below flanges.

(xii) Remarks : Drawings submitted agreed.

PERFORMANCE TESTS OF PACKAGINGS FOR DANGEROUS GOODS

PHOTO APPENDIX

Appendix C
Test Ref. VW0211
Sheet 1 of 5



950 litre mild steel IBC submitted for performance tests



End view of IBC showing corner post



Base view



Bolted attachment for outer and inner sections



Fork channel



Stacking plate at top of corner post

PERFORMANCE TESTS OF PACKAGINGS FOR DANGEROUS GOODS

PHOTO APPENDIX

Appendix C
Test Ref. VW0211
Sheet 2 of 5



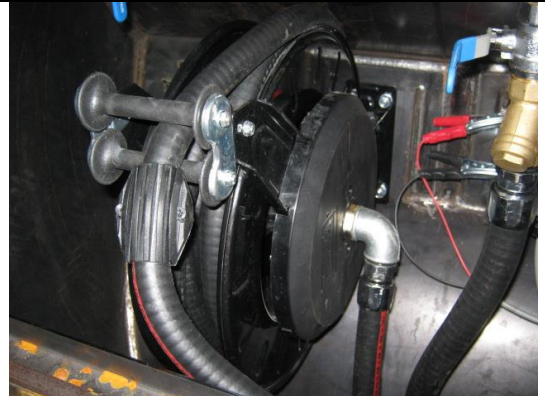
Barrel support at base



View of control compartment end



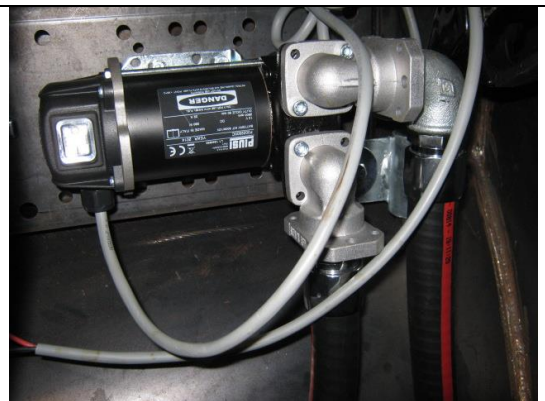
Compartment door opened



Hose reel fitted to bulk head



Hose nozzle holster



Pump fitted to bulk head

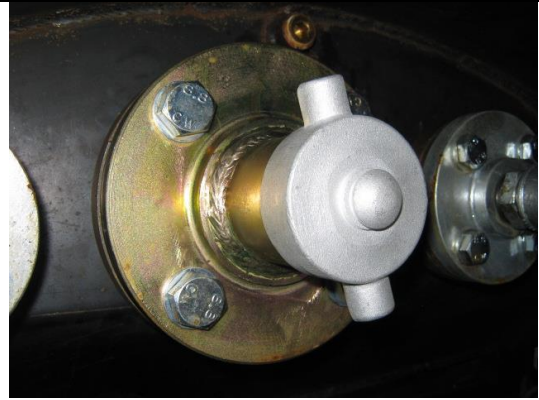
PERFORMANCE TESTS OF PACKAGINGS FOR DANGEROUS GOODS

PHOTO APPENDIX

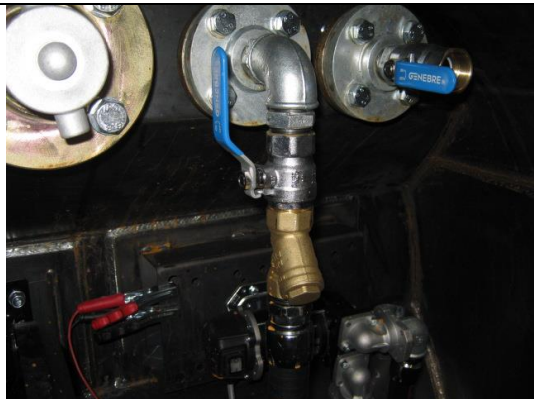
Appendix C
Test Ref. VW0211
Sheet 3 of 5



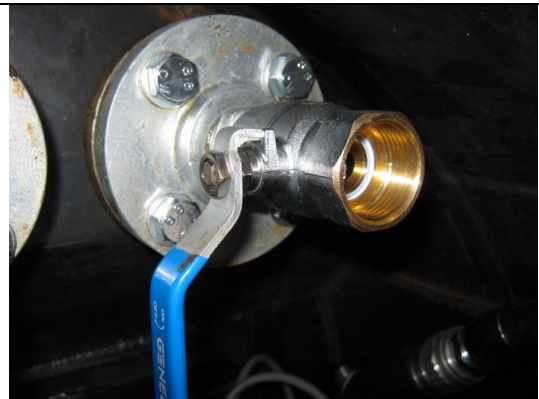
Suction line, located LHS of bulk head



Optional filling line



Discharge line fed to hose



Return line, located RHS of bulk head



Manway and fittings



Rubber gasket sandwiched between flanges

PERFORMANCE TESTS OF PACKAGINGS FOR DANGEROUS GOODS

PHOTO APPENDIX

Appendix C
Test Ref. VW0211
Sheet 4 of 5



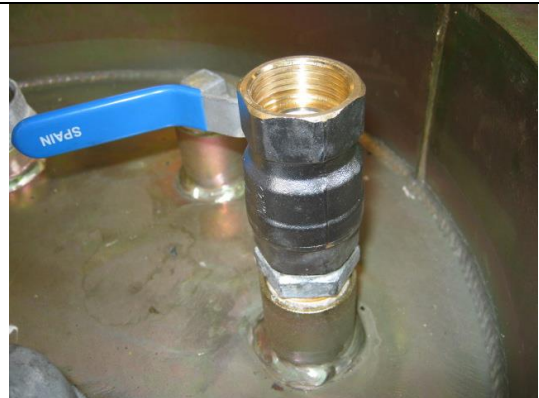
Filling line connected to 2" BSP overfill prevention valve



Lafon ventilation valve



Internal gauge line



Spare ball valve fitting within manway enclosure



Spare suction line within manway enclosure



IBC vibration test

PERFORMANCE TESTS OF PACKAGINGS FOR DANGEROUS GOODS

PHOTO APPENDIX

Appendix C
Test Ref. VW0211
Sheet 5 of 5



Bottom lift test



Top lift test



Stack test



Drop test