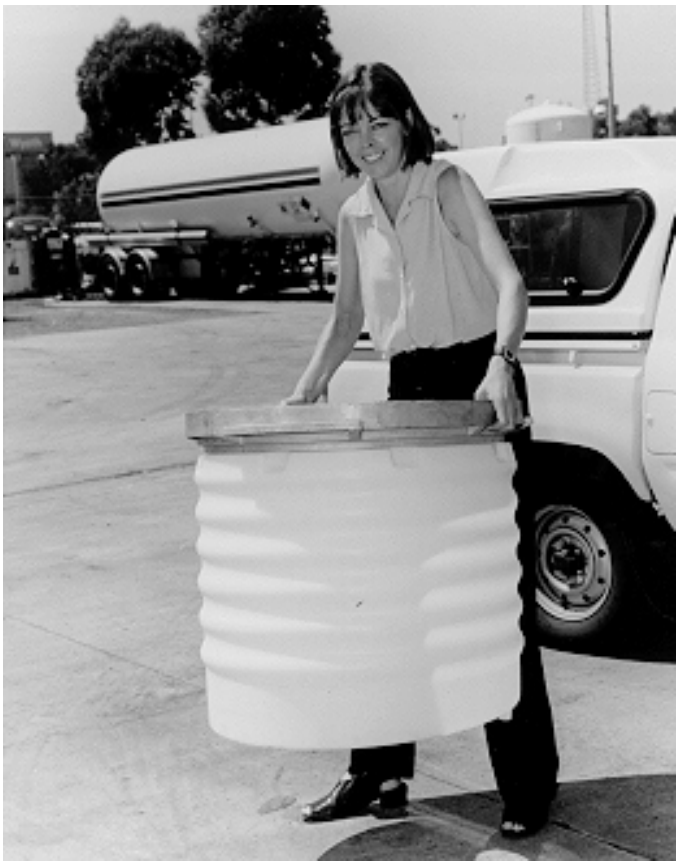
TECH TALK # 56

HYDRANT PITS



APPLICATION & CONSTRUCTION

↑CARTER 4X4 PIT VALVE↑

Hydrant Pits are generally used to house and protect the underground Hydrant Valve at airports.
They can also be used for a low point drain or high point vent assembly
They must comply with certain standards set out by some oil companies.

The dimensions of the hydrant pit are determined by the dimensions of the hydrant pit valve.
The top face of the hydrant valve should be maximum 105mm below the rim of the pit to ensure the couplers can connect to the valve This is all explained in detail in the manual.

Air BP specifies the maximum pit depth to be 740mm and the minimum clearance between the bottom of the lid and the top of the valve to be 25mm.

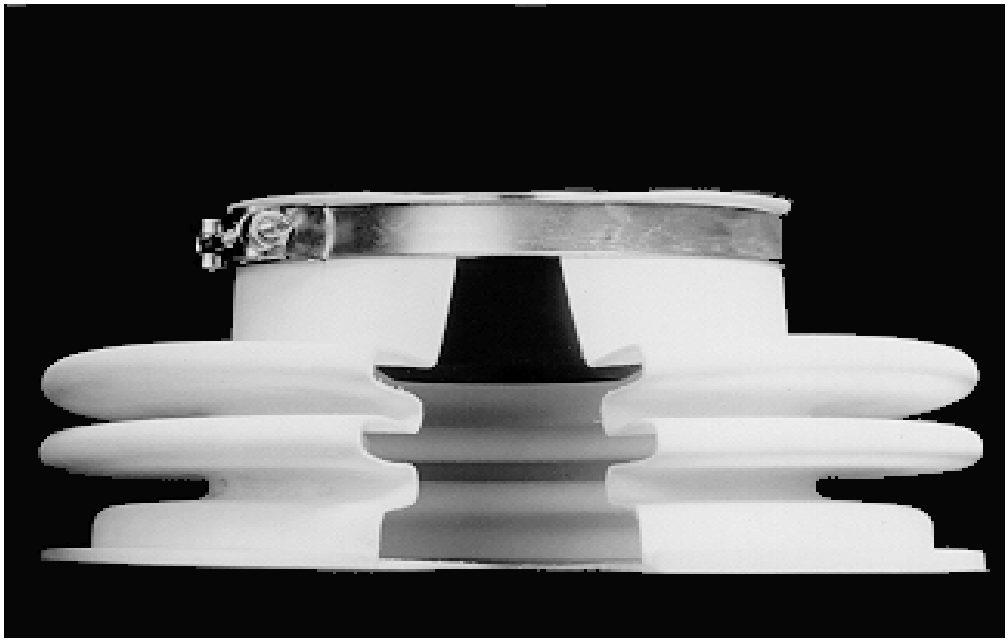
The 24" pit is fabricated in 2 different heights. The model with the 6" bellows is higher than the model with 4" bellows to allow space for the 6" to 4" reducer required to mount the valve.

Originally hydrant valves were all 6" and therefore riser flanges were also 6". Some companies are keeping to the old standards and specify 6" riser pipes while others have moved on to 4" risers to accommodate the current style 4" hydrant valves.
This is why Liquip has both sizes available.

24" pits are generally used to house the hydrant valves and 18" pit are generally used as the low point drain or high point vent housing

The "Polypit" body is made of high density UV stabilised non conducting polyethylene with a working temperature range from -20°C to +200°C
Inner and Outer Lid and Rim are fabricated in Aluminium grade AA601.

Pit body has a sloped bottom to ensure any liquid inside the pit is collected on one side. This enables quicker detection of any small leaks and also easier cleaning of any liquid caught in the pit.



Pit body has integral bellows to accommodate the riser pipe. The bellows provide seamless alignment of the pit body and riser pipe.

A clamp is provided with the pit to fasten the bellow to the riser pipe

Sealing between bellows and riser flange is by means of o-ring. (Riser flange must have o-ring recess)

The seamless construction allow the pit body (24”) to retain 45 litres of liquid before the liquid level reaches the bellows. This would be the first possible leak point.
The design of the bellow allows for variable depths of the riser flange face from the pit rim. (up to 50mm). Surplus can be trimmed off.

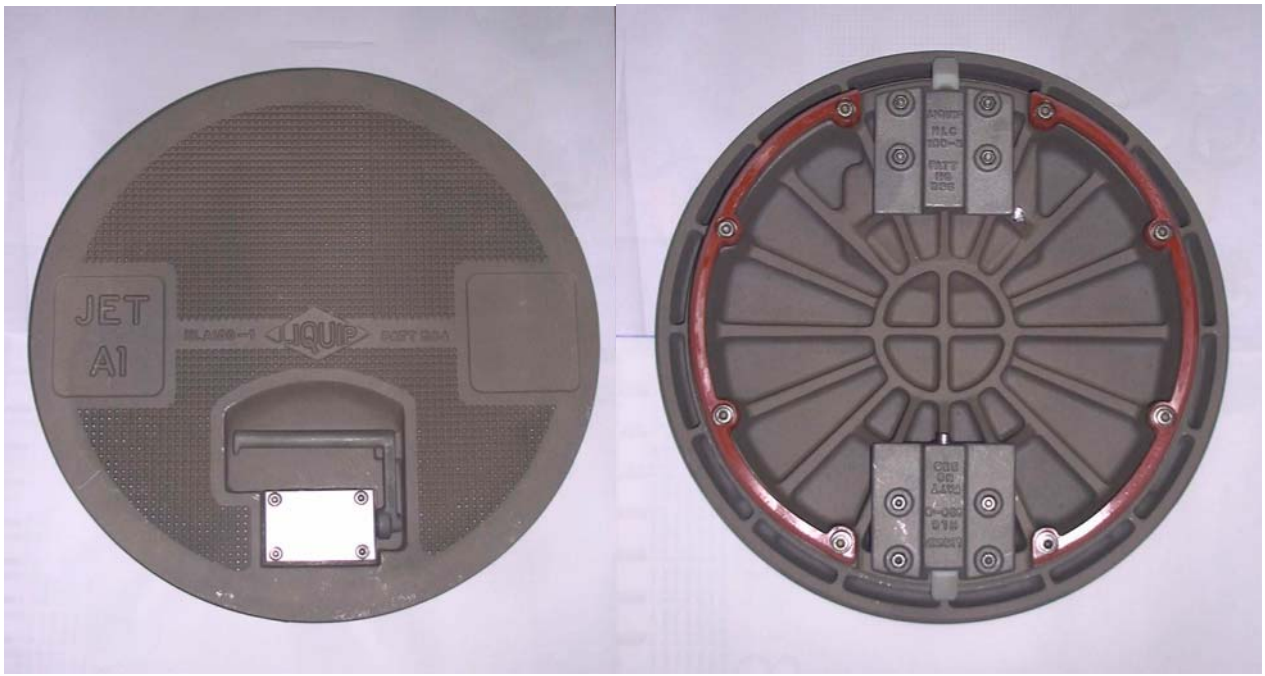
HLA100 LIGHTWEIGHT ALUMINIUM LID

The HLA100 is the lightest Pit lid known to us which can still withstand the excessive forces and weights exerted by commercial aircraft as set out in some specifications

It has an automatic self latching feature with single latch mechanism. Anti-Slip top

The HLA100 is designed to be interchangeable with the previous model composite pit lids, HLC100 & HLC120
It is not interchangeable with the old style aluminium lids.

HLA100 fits both the 18” pit and the 24” pit as the 24” pit has an “outer lid”. The outer lid on 24” pits can also easily be removed when a larger access area is required for maintenance purposes.



AVAILABLE MODELS

PART NO	DESCRIPTION
HPA200	24” Polypit, Lightweight Aluminium Lid, 4” Bellows
HPA250	24” Polypit, Lightweight Aluminium Lid, 6” Bellows
HPA100	18” Polypit, Lightweight Aluminium Lid, 4” Bellows
HPA150	18” Polypit, Lightweight Aluminium Lid, 6” Bellows

HPA Pits without bellows are available to special order. Mainly used by Shell .

ACCESSORIES

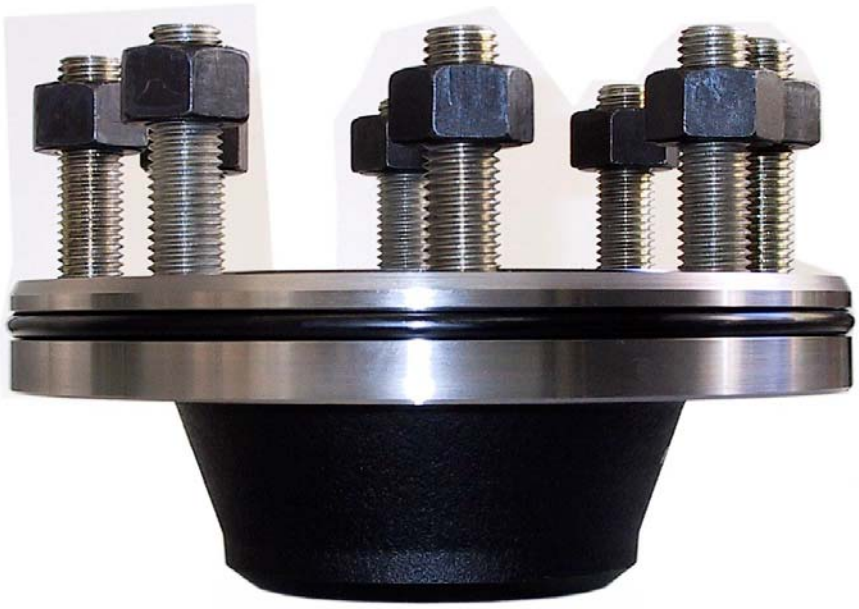
HLC200-11 Bonding Kit
Required to Provide electrical continuity between riser pipe/valve and Pit Lid

HLC200-12 Riser Flange Kit, 4”, with fasteners, O-ring & Gaskets

HLC250-12 Riser Flange Kit, 6”, with fasteners, O-ring & Gaskets

The riser flanges are based on ANSI 300lb RF flanges and are specially machined by Liquip to suit the bellows and the hydrant valves.
Drill pattern is ANSI 150lb or ANSI 300LB, to suit drilling on hydrant valve.
Holes are drilled and tapped blind holes.
Riser flange has o-ring groove to provide sealing with bellows.
Bottom of flange has drilled and tapped hole for bonding kit. (Pit rim also has drilled and tapped hole for other end of bonding wire)

HLC200-12



WEIGHT COMPARISONS

Conventional Steel Pit with Lid, 18”	± 115 kgs
Conventional Steel Pit with Lid, 24”	± 158 kgs
Conventional Aluminium Lid	± 25 kgs
Liquip Lightweight Aluminium Lid, HLA100	± 13 kgs
Total Weight of HPA200 (24” Pit, 4” Bellows)	± 755 kgs
Total Weight of HPA250 (24” Pit, 6” Bellows)	± 85.0 kgs
Total Weight of HPA100 (18” Pit, 4” Bellows)	± 32 kgs
Total Weight of HPA150 (18” Pit, 6” Bellows)	± 32 kgs

ADVANTAGES

- Pit body much lighter in weight than competitors pits. The pit body be easily lowered into the pit by 2 people with little risk of injury associated with handling of heavy equipment.
- Pit lid much lighter in weight than competitors pit lids with no compromise on strength. Little risk of back injury of operators when lifting the lid.
- Non-corroding materials, No extra load on Cathodic Protection system.
- Superior sealing arrangement
- Sloped Bottom to allow easier removal of any liquid caught in the pit and also allows quicker detection of any small leaks as liquid build up is all on one side..
- Competitive prices compared to conventional steel pits.
- Integral bellows is seamless and will hold 45 litre (on 24” pit) of liquid before possibility of leaks.

COMPETITORS

Carter Ground Fuelling

- Fibreglass body, Cast aluminium lid
- Allows for side pipe entry as well as bottom pipe entry
- Hinged Lid (Frequent cause of leaks)
- Many models available

Dabico

- Makes a fibreglass pit
- Bottom entry and Side entry available
- Hinged Lid

Warner Lewis

Avery Hardoll

Also makes a lightweight aluminium lid. Pit Body is carbon steel. Pit has inner body welded direct to riser pipe and seal bellows near top of pit. Not a very successful design according to some users.

Competitor’s Disadvantages

- Hinged lid not acceptable in some places. Difficult to seal and can limit range of movement of hydrant cart and hose when open because of height.
- Side entry is mainly specified in US to reduce depth of hydrant lines in ground. Side entry increases depth of pit if pit is to hold a certain amount of liquid before first possible leak point. Overall size if pit with side entry is much larger than bottom entry

STANDARDS

There is no worldwide standard for aviation pits. Each Oil company has there own standard and in some airports the standards are determined by Joint User groups.

USA has their own standard to which all US airports must comply. A new requirement will be introduced later in 2004 stating the amount of fluid the pit box must hold before the first possible leak point.

Air BP UK has written their own specifications
Examples of Air BP requirements:

- Suitable to contain hydrant valve or low point drain or high point vent valve
- Prevent any spillage of product from the pit entering the ground
- Prevent ground water or rain from entering the pit
- Allow for relative movement between the hydrant riser pipe and the concrete apron
- Isolate hydrant riser from loading on pit box
- Avoid contamination of product within the riser or pit valve through ingress of dirt, water or other means.
- Permit aircraft and vehicle traffic to pass directly over the pit cover.
- Riser flange must be 6” ANSI 300 RF. Holes should be drilled and tapped right through

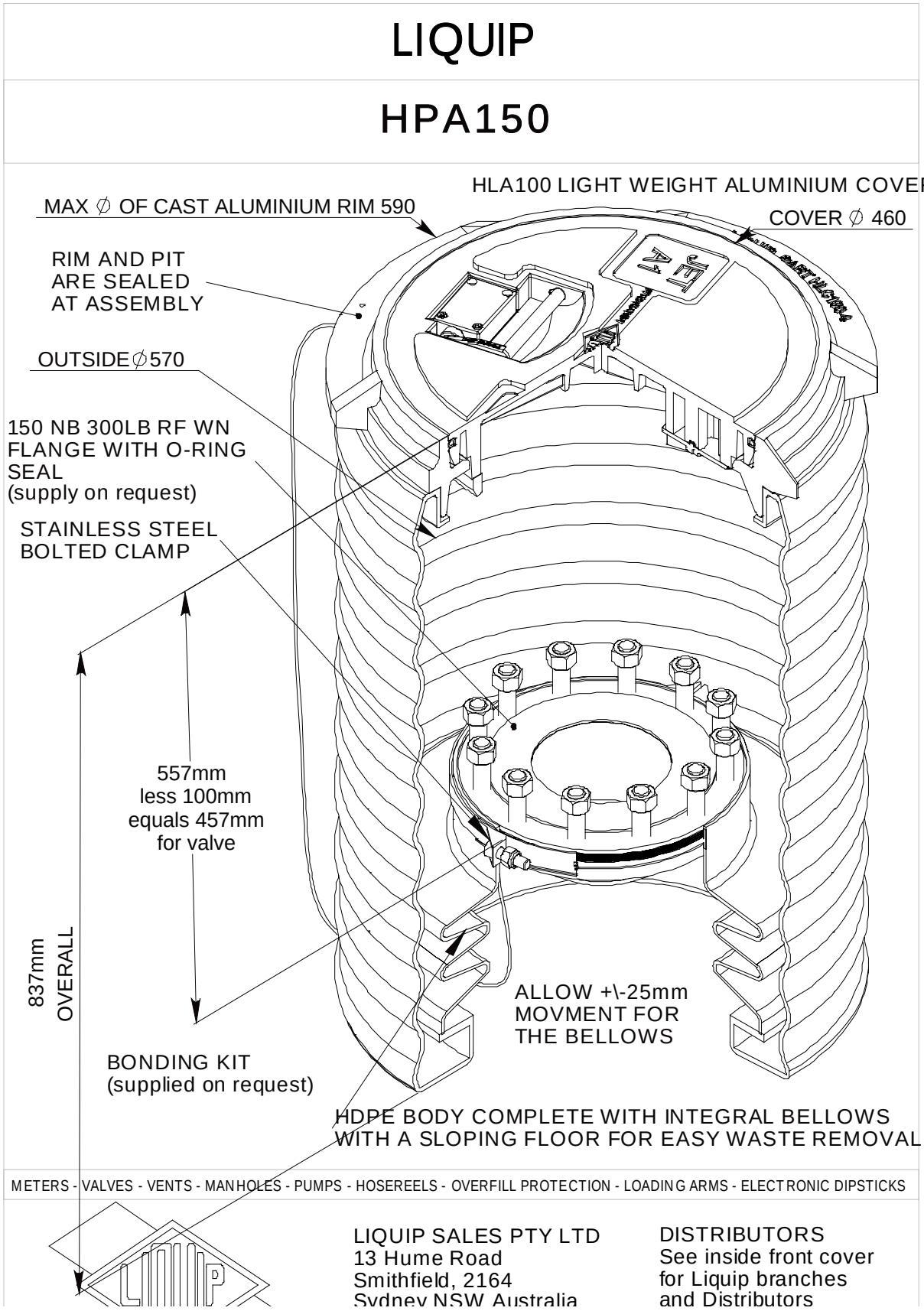
USER REFERENCE LIST

LOCATIONS:

▪ Sydney
▪ Melbourne
▪ Perth
▪ Darwin
▪ Townsville
▪ Brisbane
▪ Coolangatta
▪ Cairns
▪ Proserpine
▪ Hamilton Island
▪ Alice Springs
▪ Various RAAF Bases
▪ Port Moresby PNG
▪ Cook Islands
▪ Fiji
▪ Tonga
▪ Vanuatu
▪ Kuwait
▪ Western Samoa
▪ Auckland
▪ Wellington
▪ Christchurch

There are several hundreds of varying types of Liquip hydrant pits in use around the world, fitted since early 1990’s

DIAGRAMS


LIQUIP
HPA150
HLA100 LIGHT WEIGHT ALUMINIUM COVER
MAX ∅ OF CAST ALUMINIUM RIM 590
COVER ∅ 460
RIM AND PIT
ARE SEALED
AT ASSEMBLY
OUTSIDE∅570
150 NB 300LB RF WN
FLANGE WITH O-RING
SEAL
(supply on request)
STAINLESS STEEL
BOLTED CLAMP
557mm
less 100mm
equals 457mm
for valve
837mm
OVERALL
ALLOW +\-25mm
MOVMENT FOR
THE BELLOWS
BONDING KIT
(supplied on request)
HDPE BODY COMPLETE WITH INTEGRAL BELLOWS
WITH A SLOPING FLOOR FOR EASY WASTE REMOVAL
METERS - VALVES - VENTS - MANHOLES - PUMPS - HOSEREELS - OVERFILL PROTECTION - LOADING ARMS - ELECTRONIC DIPSTICKS
LIQUIP SALES PTY LTD
13 Hume Road
Smithfield, 2164
Sydney NSW Australia
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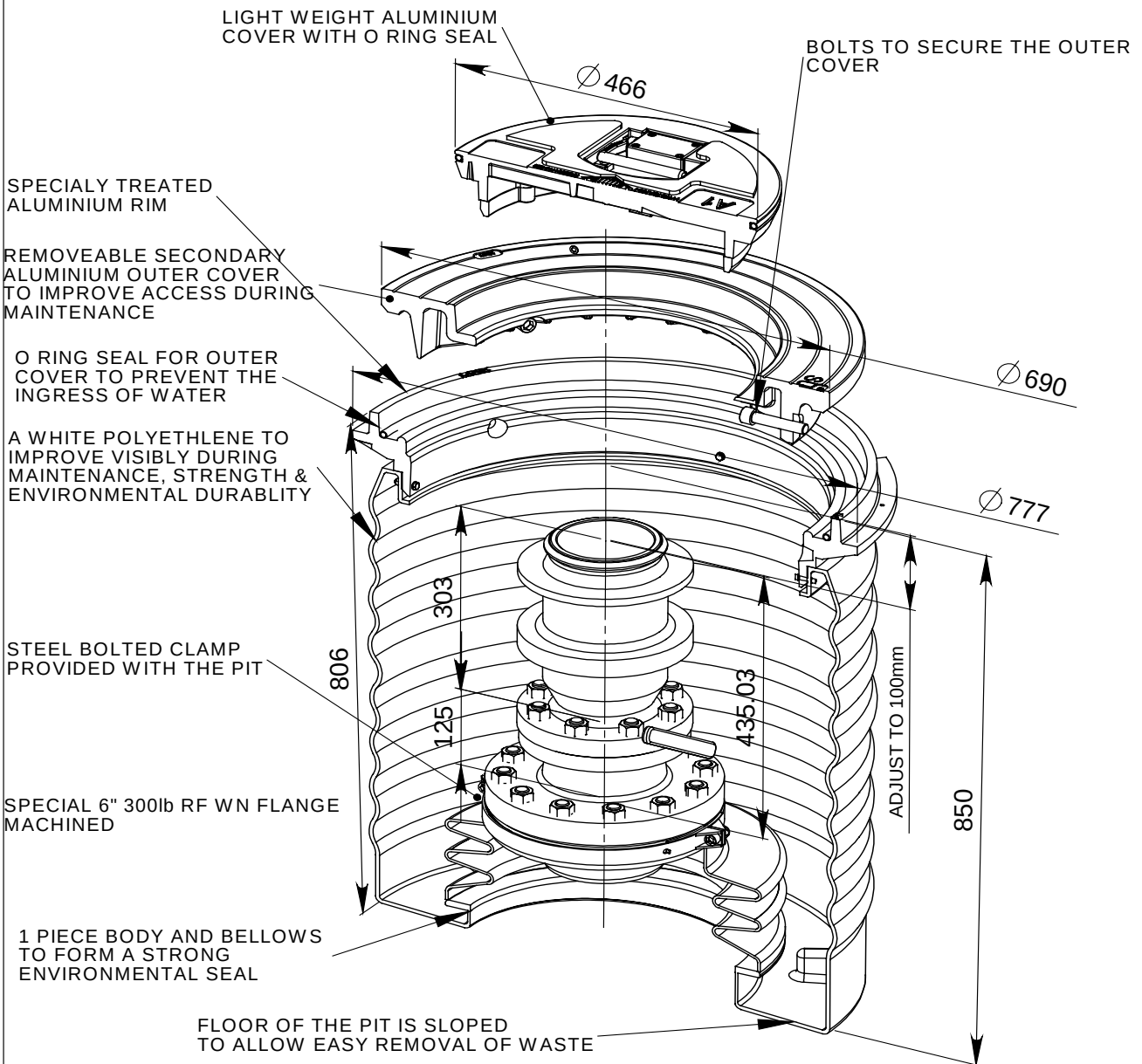
LIQUIP

HPA250 HYDRANT PIT



X550203 ISSUE A

PIT SHOWN WITH A TYPICAL PIT VALVE AND EMERGENCY SHUT OFF VALVE

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

LIQUIP SALES PTY LTD
13 Hume Road
Smithfield, 2164
Sydney NSW Australia
Phone: (02) 9725 1055
Fax: (02) 9725 1252

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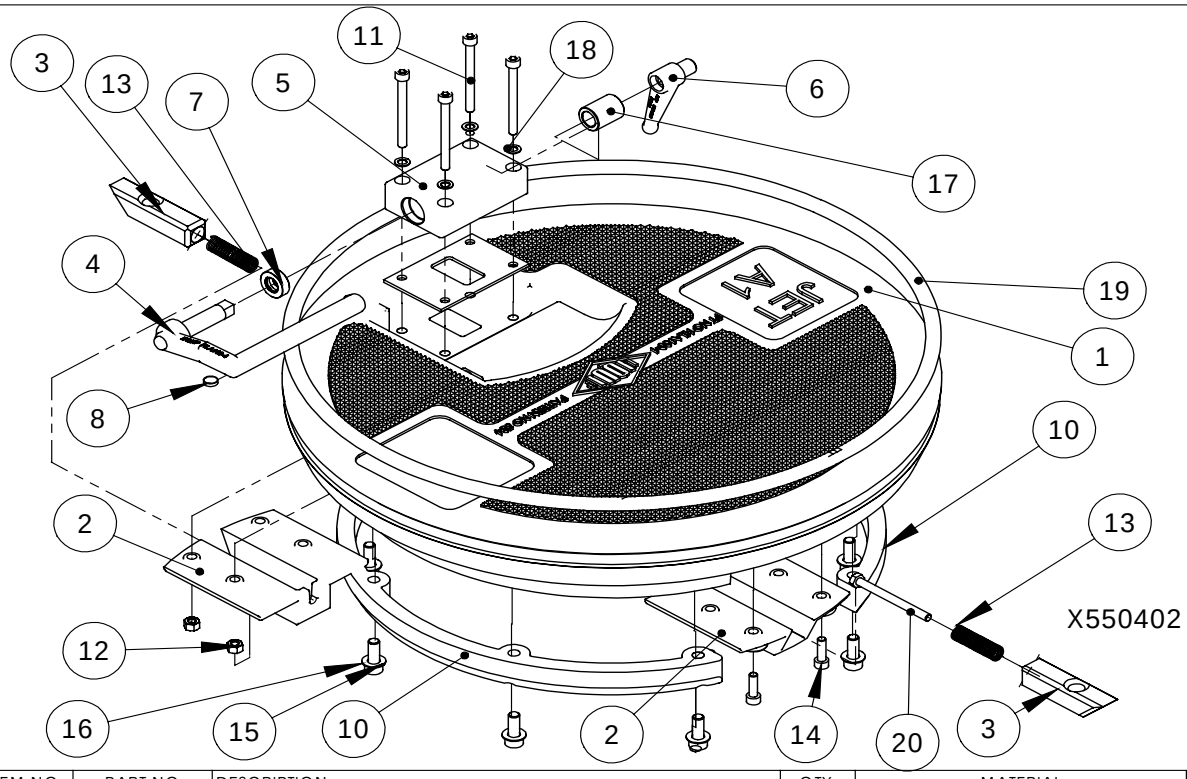
LIQUIP

HLA100 ALUMINIUM HYDRANT COVER



ITEM NO.	PART NO	DESCRIPTION	QTY.	MATERIAL
1	HLA100-1	BODY PIT HYDRANT 18"	1	Alum
2	HLC100-3	BODY LATCH SIGLE COVER COMPOSITE	2	CAST ALLUMINIUM
3	HLC100-6	LATCH SINGLE STYLE HYDRANT COVER COMPOSITE FIBRE	2	NYLON NATURAL
4	HLA100-4	HANDLE OPERATING HYDRANT	1	CAST STAINLESS STEEL GRD CB7CUI
5	HLA100-2	HOUSING HANDLE HYDRANT ALUMINIUM LIGHT WEIGHT	1	Alum
6	HLC100-8	LEVER OPERATING LATCG LOCK HYDRANT COVER	1	CAST STAINLESS STEEL 304L
7	7509	SEAL LIP GACO MI050087	1	Nitrile
8	4643	SEAL DISC NEOPRENE	1	NEOPRENE DURO 60
9	7510	GASKET	1	NEOCORK
10	7186	BUFFER HYDRANT COVER	2	CAST POLYEURETHANE
11	6606	CAPSCREW METRIC	4	ST STEEL
12	4398	NUT METRIC	4	ST STEEL
13	6100	SPRING S/S HYDRANT COVER LOCKBODY	2	STAINLESS STEEL
14	6533	CAPSCREW METRIC	4	ST STEEL
15	6582	CAPSCREW METRIC	8	ST STEEL
16	5340	WASHER FLAT	8	ST STEEL
17	HLA100-3	BUSH LATCH HOUSING HANDLE	1	ACETAL COPOLYMER
18	4358	WASHER FIBRE M6	4	FIBRE
19	HLA100-5	O-RING (TUBE 8mm I.D 1.5mm WALL THICKNESS 1172mm LONG)	1	NEOPRENE
20	6477	BOLT METRIC	1	ST STEEL

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

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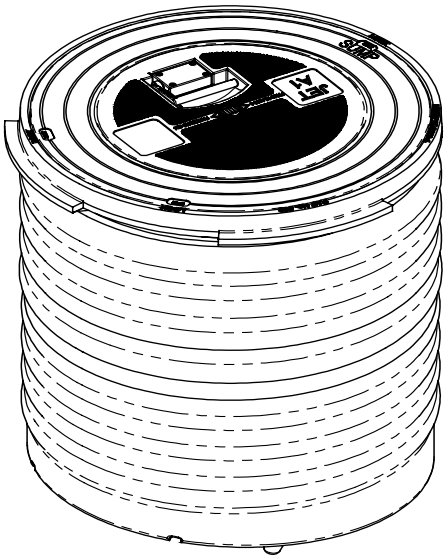
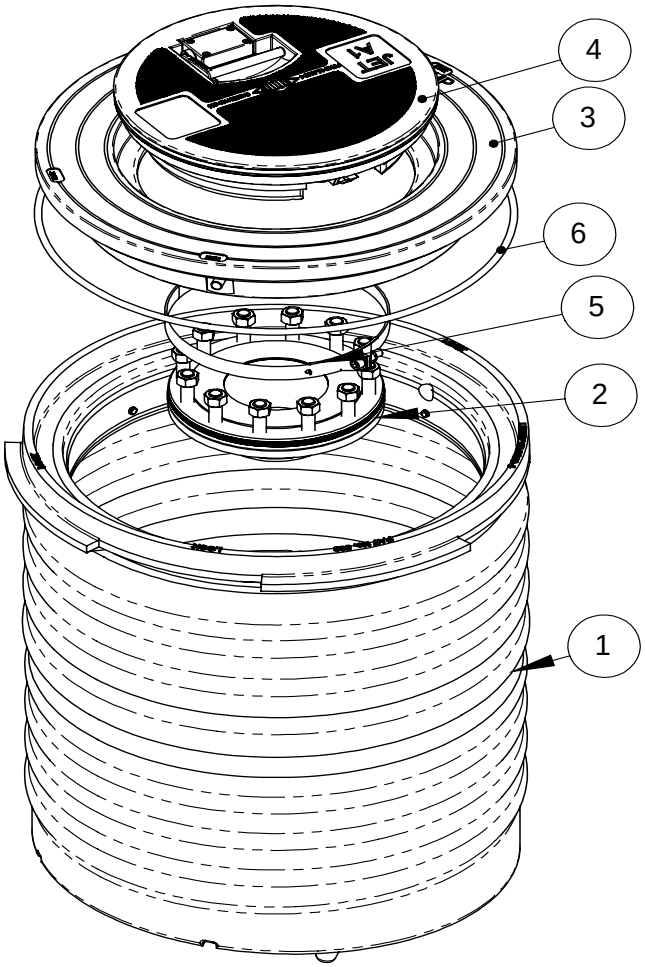
HPA250 HYDRANT PIT DATA SHEET



ASSEMBLED VIEW



EXPLODED VIEW

X551703 ISSUE A

ITEM NO.	PART NO	DESCRIPTION	QTY.	MATERIAL
1	HLC250	BODY ASSEMBLY 600mm C/W BELLOWS & ALUMINIUM RIB	1	POLYEHYLENE
2	HLC250-12	KIT FLANGE FOR 150mm BELLOWS	1	SEE PARTS LIST
3	HLC200-3	OUTER LID ASSEMBLY 450 x 600mm	1	ALUMINIUM
4	HLA100	COVER HYDRANT 450mm ALUMINIUM	1	SEE PARTS LIST
5	HLC150-10	CLAMP FOR 150mm BELLOWS HLC150	1	SEE PARTS LIST
6	HLC200-10	SEAL FOR OUTERLID HYDRANT PIT	1	NEOPRENE DURO 45

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

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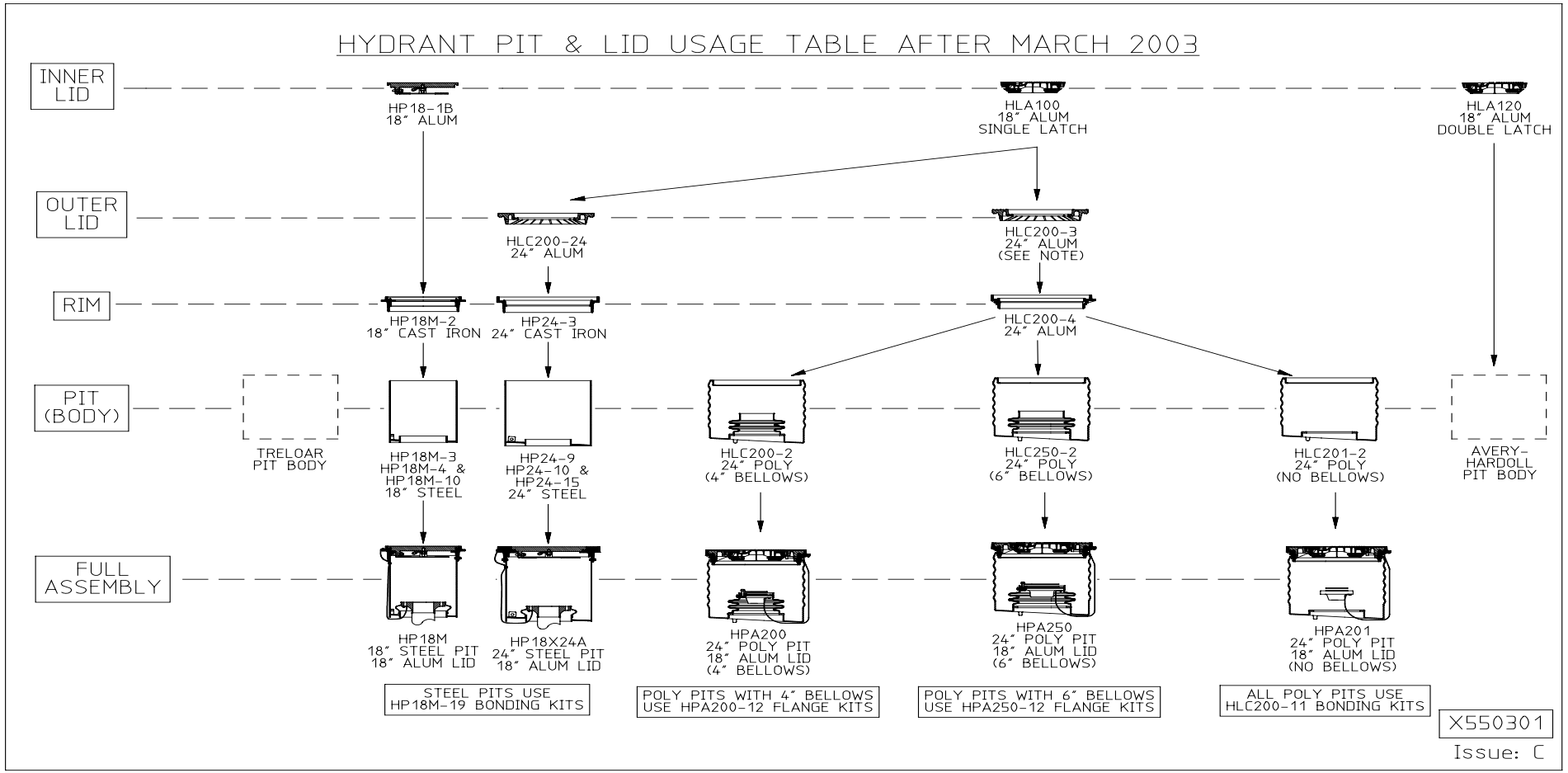
HYDRANT PIT & LID USAGE TABLE AFTER MARCH 2003
INNER LID
OUTER LID
RIM
PIT (BODY)
FULL ASSEMBLY
HP18-1B 18" ALUM
HLA100 18" ALUM SINGLE LATCH
HLA120 18" ALUM DOUBLE LATCH
HLC200-24 24" ALUM
HLC200-3 24" ALUM (SEE NOTE)
HP18M-2 18" CAST IRON
HP24-3 24" CAST IRON
HLC200-4 24" ALUM
TRELOAR PIT BODY
HP18M-3 HP18M-4 & HP18M-10 18" STEEL
HP24-9 HP24-10 & HP24-15 24" STEEL
HLC200-2 24" POLY (4" BELLOWS)
HLC250-2 24" POLY (6" BELLOWS)
HLC201-2 24" POLY (NO BELLOWS)
AVERY-HARDOLL PIT BODY
HP18M 18" STEEL PIT 18" ALUM LID
HP18X24A 24" STEEL PIT 18" ALUM LID
HPA200 24" POLY PIT 18" ALUM LID (4" BELLOWS)
HPA250 24" POLY PIT 18" ALUM LID (6" BELLOWS)
HPA201 24" POLY PIT 18" ALUM LID (NO BELLOWS)
STEEL PITS USE HP18M-19 BONDING KITS
POLY PITS WITH 4" BELLOWS USE HPA200-12 FLANGE KITS
POLY PITS WITH 6" BELLOWS USE HPA250-12 FLANGE KITS
ALL POLY PITS USE HLC200-11 BONDING KITS
X550301
Issue: C