

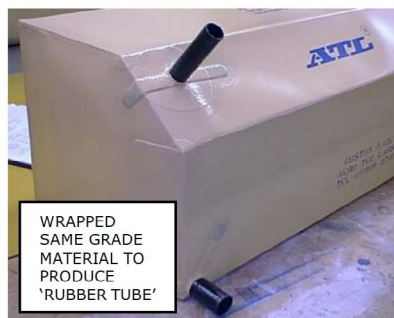
IMPORTANT INFORMATION FROM ATL SAFETY FUEL CELLS FOR HISTORIC RACE CARS, CLASSIC BOATS AND VINTAGE AIRCRAFT

1.) REPLACING AN OLD OR DETERIORATED FUEL BLADDER

- a.)** Remember, modern fuel bladder materials are much tougher and less flexible than the old “bag tanks”. Replacement bladders may not conform exactly to your vintage tank or fuel cell “bay”. Sometimes, these new bladders end up an “approximation” of the original geometry, so a little volume may be lost.
- b.)** If you are sending ATL an old bladder or fuel tank as a pattern, be sure to drain it and clean it thoroughly inside and out before shipping. Package it well to avoid dents, punctures or other damage.
- c.)** Old-fashioned rubber nipple/tube fittings and flexible fill necks are no longer legal. To comply with modern day bladder tank regulations e.g. FIA, NASCAR, SCCA, etc., metallic fittings and nut-ring flanges must be used. Motorsports governing body, the FIA, allows some flex-necks and rubber cross-overs if they are made from the same grade (or higher) fuel bladder material. These are much safer, but not quite as pliable or clampable as the old soft rubber tube connections.



ORIGINAL STYLE RUBBER NIPPLE



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METALLIC PIPE AND NUT RING FLANGE ASSEMBLY

- d.)** It may not be feasible to install modern fittings, necks, flanges etc. in precisely the same location as on an old bladder. However, ATL will make every effort to locate these ports as close as possible to the original orientation. Please try to cluster your fittings (fill, vent, return, outlets etc.) on the same plate rather than scattering them over the surface of the bladder. Clustering is neater, cheaper and safer!

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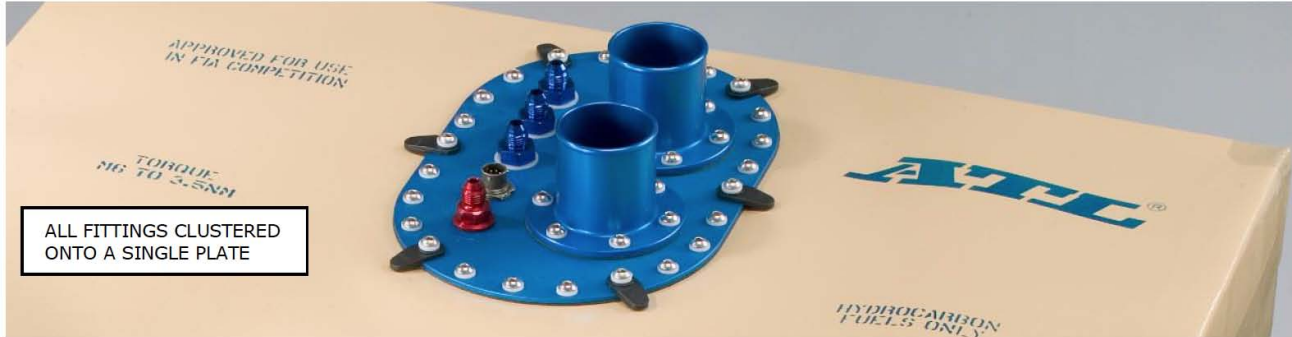
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e.) It is sometimes difficult to secure accurate dimensions from an old shrunken or rotted fuel bladder! ATL always takes time to allow for good judgment and acceptable compromises in measuring an amorphous shape. However, if you must have an absolute duplicate with no deviations, then a precise build-drawing will be necessary from the customer. Such drawings are generally produced by digitizing the interior surface of the original metal tank, container, fuselage, wing, hull or bladder bay.

2.) FITTING A NEW ATL FUEL BLADDER

a.) Please read all of Section 1.

b.) ATL is primarily a fuel bladder manufacturing company, but we do maintain an Engineering and Fabrication Workshop as a customer convenience to help fit or "integrate" a new ATL bladder into the original location. However, if absolute originality and authenticity is essential to you, we recommend sending the tank and bladder to a specialized race restoration shop for integration.



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c.) Adapting a bladder to an existing aluminium or steel fuel tank may require removing the original tank fittings, baffles, fill tubes etc. and boring the tank wall so that the bladder fittings can protrude through. Also, a tank access hole is necessary through which to install the bladder. Interior tank surfaces must be smooth, clean and continuous to prevent abrading the rubber bladder.



d.) As in paragraph 1d, it may be necessary to orient fittings somewhat differently, from original, i.e. fill necks cannot be located over the edge or corner of a fuel bladder. If the original fill neck is large enough, it may be possible to locate the ATL bladder fill pipe and modern style fill cap inside and underneath the original cap.

e.) Upon completion, your original tank will now function as a "container" for the bladder to facilitate mounting in the car. Most likely, the old tank will not be a sealed vessel as the bladder fittings will project through the tank's wall. Rigid attachment of the bladder flanges and fittings to a tank is not recommended as this practice limits bladder flexibility and deformability in an accident. ATL recommends its "frangible" break-away tabs to support the bladder within its surrounding tank.



3.) BUILDING A NEW ALUMINUM CONTAINER IN LIEU OF AN OLD FUEL TANK.

a.) Constructing a new metal "container" specifically to receive a bladder is preferable to adapting a bladder to the original gas tank. Containers can be supplied by the customer or by ATL.

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- b.)** The fabricated container may take on a new shape or duplicate the old tank's configuration. Sometimes these containers are built smaller in volume, since vintage races are frequently shorter than those for which the car was originally intended.
- c.)** The fabricated container should be of 1.60mm (0.063") minimum aluminium welded or riveted and designed with a removable top, bottom or side to install the foam-filled bladder. For Rally and Off-Road, we would recommend 2.30mm (0.090") or thicker.
- d.)** All interior surfaces of the container should be clean, smooth and continuous to avoid bladder abrasions. All weld penetration needs to be covered over to protect the fuel bladder skin.
- e.)** Flanges and fittings should ideally not be located closer than 50mm (2") from any edge or corner of the container. All fittings should enter and exit from the bladder's top surface if possible.
- f.)** Larger containers may require external reinforcements or bracketing to support the fuel load and to provide a rigid mounting to the race car frame. Consult your race preparation shop, boat yard or aircraft approval body on matters of structural adequacy like this.

4.) GENERAL INFORMATION

a.) *In order of preference, ATL can accept any of these inputs to aid in reproducing a fuel bladder:*

i.) CAD solid model (.step, iges) of finished bladder (nominally 3mm thick) and fittings, but contact ATL Sales at time of order.

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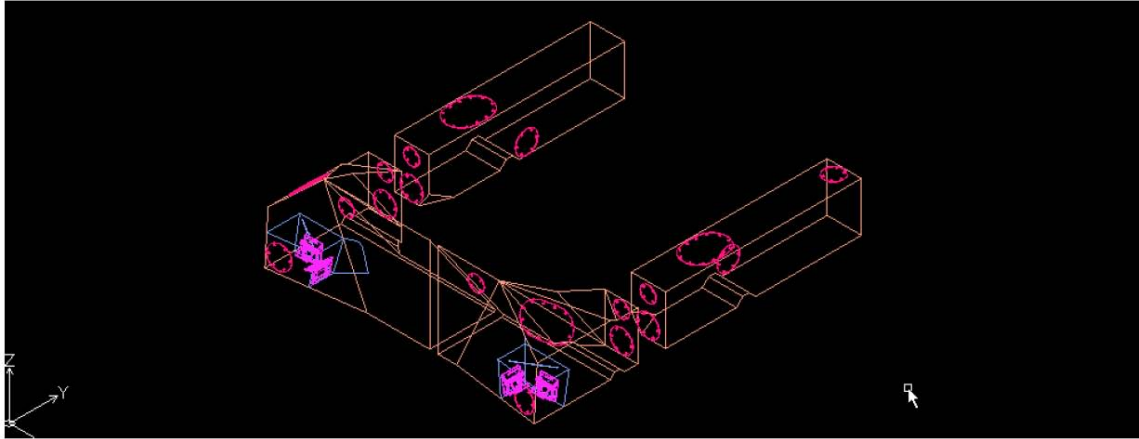
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- ii.) CAD solid model showing interior surface of cavity or metal tank.
- iii.) Mechanical drawing of bladder with accurate dimensions, angles and fitting locations.
- iv.) Hand sketch or drawing depicting all dimensions, angles and fitting locations.
- vii.) New container approximating original tank and including one removable access panel for bladder insertion.
- vi.) Original fuel tank, cleaned, baffles removed and with access panel for bladder insertion.
- vi.) Original bladder if reasonably complete.

b.) A specification is also helpful in defining the finished fuel cell product:

- i.) Type of bladder material (consult ATL Sales Engineer).
- ii.) Foam baffling requirements.
- iii.) Internal surge tanks, vanes, sumps, weirs, trap doors, baffles etc.
- iv.) Fuel pick-up(s) size and location.
- v.) Accessories such as return lines, level gauges, fuel pumps, fuel filters, etc.
- vi.) Quick-fill valves, vent valves, dry-break refuelling equipment, pressure-vacuum reliefs etc.
- vii.) In-tank fuel pump(s), pressure regulators, electrical connectors, and break-away valves.
- viii.) Stencilling or markings such as part #, team name, tech data, capacity, safety warnings etc.



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c.) When ordering, these conditions apply:

- i.)** Pre-payment is required with each order.
- ii.)** Applicable certifications such as FIA/FT3, FIA/FT3.5, FIA/FT5 to be discussed at time of enquiry.
- iii)** For full ATL Inc Terms and Conditions, please see DS 574 ([here](#))

**For more details on ATL's Fuel System Product Range, please log onto
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Safe driving, boating or flying!*



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