Lotus Sport – Fitting Instructions

70ltr ‘FIA Approved’ FT3 ‘FUEL CELL’

Application Specific to Lotus Sport S2 Exige ‘Cup’ Vehicles with Toyota 2ZZ-GE Engines

Difficulty

OVERVIEW

This fuel cell sits in the same location as the standard tank, uses the carry over fittings and standard fuel pump. It holds 70 litres nominally. Internally it has three baffles running to 80% of the height of the tank, each with two fuel apertures at the bottom between chambers. The 'fuel pump' chamber additionally has 2 x TF331 trapdoors, to hold fuel close to the pump. The fuel pump operates as normal with the level/float giving correct indication (you will find that the fuel level gauge will not move for a period on a full tank of fuel – this is normal, as a proportion of the fuel will be above the pump)

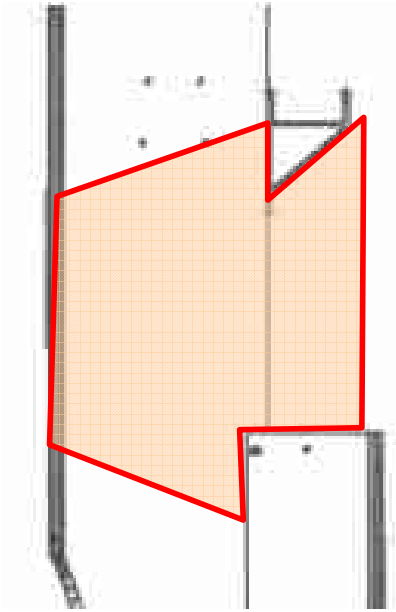
The fuel cell is made from ATL 810-C material in accordance with FT3 1999 specification and includes yellow foam in all chambers except in fuel pump chamber, 4x6 top plate with filler neck and vent. As manufactured it is FIA Approved.

Fuel Cell - Full tank running times (full throttle, track only – dependant upon ambient conditions, driver, track, & vehicle)

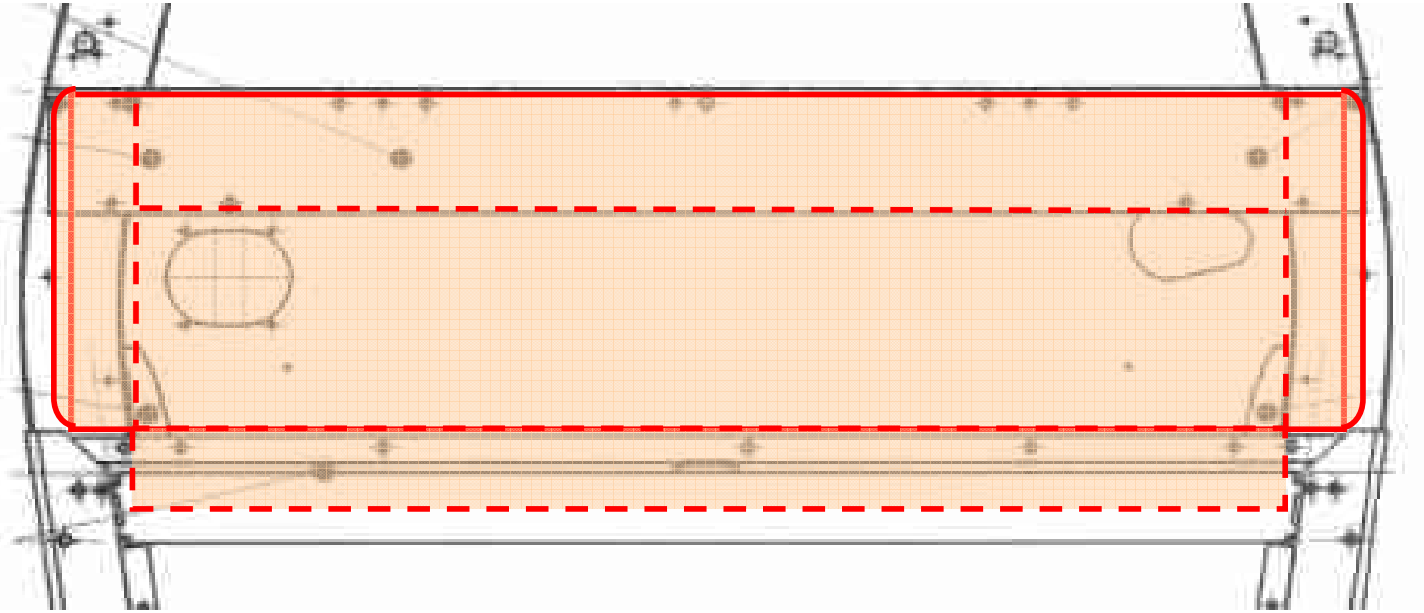
Exige S2 Cup 240 (70ltr fuel cell)	~ 80 minutes
Exige S2 Cup 240 (standard tank)	~ 45 minutes

Fuel Cell – Weights

70ltr fuel cell	~ 5.6 Kg
Standard production steel tank	~ 12.8 kg



CHASSIS SIDE VIEW



CHASSIS UNDERSIDE VIEW

WARNING / NOTES

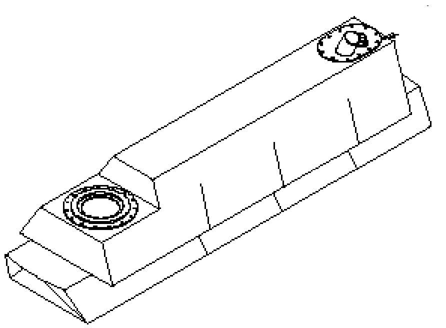
- **THIS FUEL CELL IS FOR TRACK USE ONLY.**

- **MAJOR SANCTIONING BODIES SUCH AS FIA, HAVE RECOGNISED THAT FUEL CELLS ARE AFFECTED BY OZONE, ULTRAVIOLET, AGEING, AND THE CHEMICAL ACTION OF GASOLINE AND RACING FUELS. HENCE, A FIVE YEAR LEGAL LIFE SPAN HAS BEEN SET ON ALL FUEL CELLS. THE RUBBER BLADDER PORTION OF YOUR FUEL CELL SYSTEM MUST BE REPLACED WITHIN 5 YEARS OF ITS MANUFACTURE DATE.**

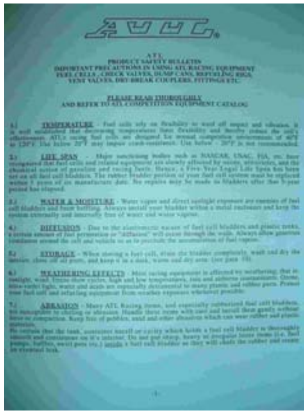
- Gasoline, as well as other flammable materials and liquids (adhesives, solvents, etc.) and the vapours they produce are extremely dangerous. Be sure to read and follow the instructions. Failure to do so can result in property damage, bodily injury, or death.
- Take all reasonable precautions to guard against safety.
- This fuel cell is designed for the use of hydrocarbon gasoline only!
- The fuel cell may experience minor swelling when subjected to fuel.
- Due to the elastomeric nature of fuel bladders, a certain amount of vapour permeation or “diffusion” will occur. Always allow generous ventilation around the cell/vehicle so as to preclude the accumulation of fuel vapours.
- Water vapour and direct sunlight (UV) exposure can adversely affect fuel bladders.
- Keep the system externally and internally free of water and water vapour.
- When storing a fuel cell, drain the bladder completely, drained, dried out, close off all ports, and keep it in a dark, dry, cool environment.
- Fuel cell “capacities” are expressed herein as nominal values.
- Please be sure to study ATL’s Product Safety Bulletin #DS-381 before installing or using any ATL product.
- Remember, improper selection, installation or use can cause personal injury, property damage or death. Don’t take unnecessary risks.
- Your fuel cell should be serviced at least once a year. Most importantly, the bladder should be inspected for any fuel leaks or blistering. Any damage or broken components should be repaired or replaced before use.
- All fuel cells should be static ground during refuelling and during use on a track.
- Never use a PVC tube for refuelling. It will create enough static build up, causing a spark.
- Check specific series regulations to confirm that installation of fuel cell meets requirements (although that fuel cell is FIA approved the installation may have to vary between regulations)
- Do not over-fill or top-off your vehicle tank, which can cause gasoline spillage.
- Avoid prolonged breathing of fuel vapours. Use fuel only in open areas that get plenty of fresh air. Keep your face away from the nozzle or container opening.
- Never siphon fuel by mouth nor put fuel in your mouth for any reason. Fuel can be harmful or fatal if swallowed. If someone swallows gasoline, do not induce vomiting. Contact a doctor or and emergency medical service provider immediately.
- Keep fuel away from your eyes and skin; it may cause irritation. Remove fuel-soaked clothing immediately.

KIT CONTENTS

1 x 74ltr Fuel Cell

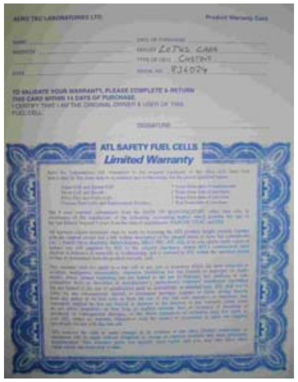


1 x Product Safety Bulletin



1 x Warning Documentation

1 x Product Warranty Card



1 x Certificate of Compliance


ATL SAFETY FUEL CELLS

CERTIFICATE OF COMPLIANCE

Aero Tec Laboratories Ltd. certify to the original purchaser of this new ATL FUEL CELL that it conforms with FIA FT3-1999 specifications.

This certificate shall become Null & Void if the Fuel Cell has been subjected to accident, negligence, disassembly, alteration, abuse, misuse, improper installation, or unsuited uses.

007621

AERO TEC LABORATORIES LTD.

DATE of Manufacturing Oct 2005
TYPE of Cell CUSTOM
SERIAL No 836024
ORIGINAL Capacity
AUTHORISED SIGNATURE
DATE 07 OCTOBER 2005

REDUCED to
With No ATL volume
displacement blocks
AUTHORISED SIGNATURE
DATE

1 x Chassis Sticker (tamper proof)


RACING FUEL CELLS

FIA Standard: FT3-1999
Homologation Number: ATL 810-C
Manufacturer: Aero Tec Laboratories Ltd
Serial Number: 836024
NOT VALID AFTER: OCTOBER 2010

Aero Tec Laboratories Ltd, 1 Patriot Drive, Rooksley, Milton Keynes, MK13 8PU, England
Tel: +44 (0)1908 351700 Fax: +44 (0)1908 351750
e-mail: atl@atltd.com web: www.atltd.com

Note: Additional parts may be included or required dependant upon condition of existing fuel tank and fuel pump, i.e. Fuel Pipe Clip (A120L6012S)

Part Number: ALS3T0009F
Version: 1

FUEL CELL

PROCESS SHEET

For Use in FIA Competitions (on rear face)

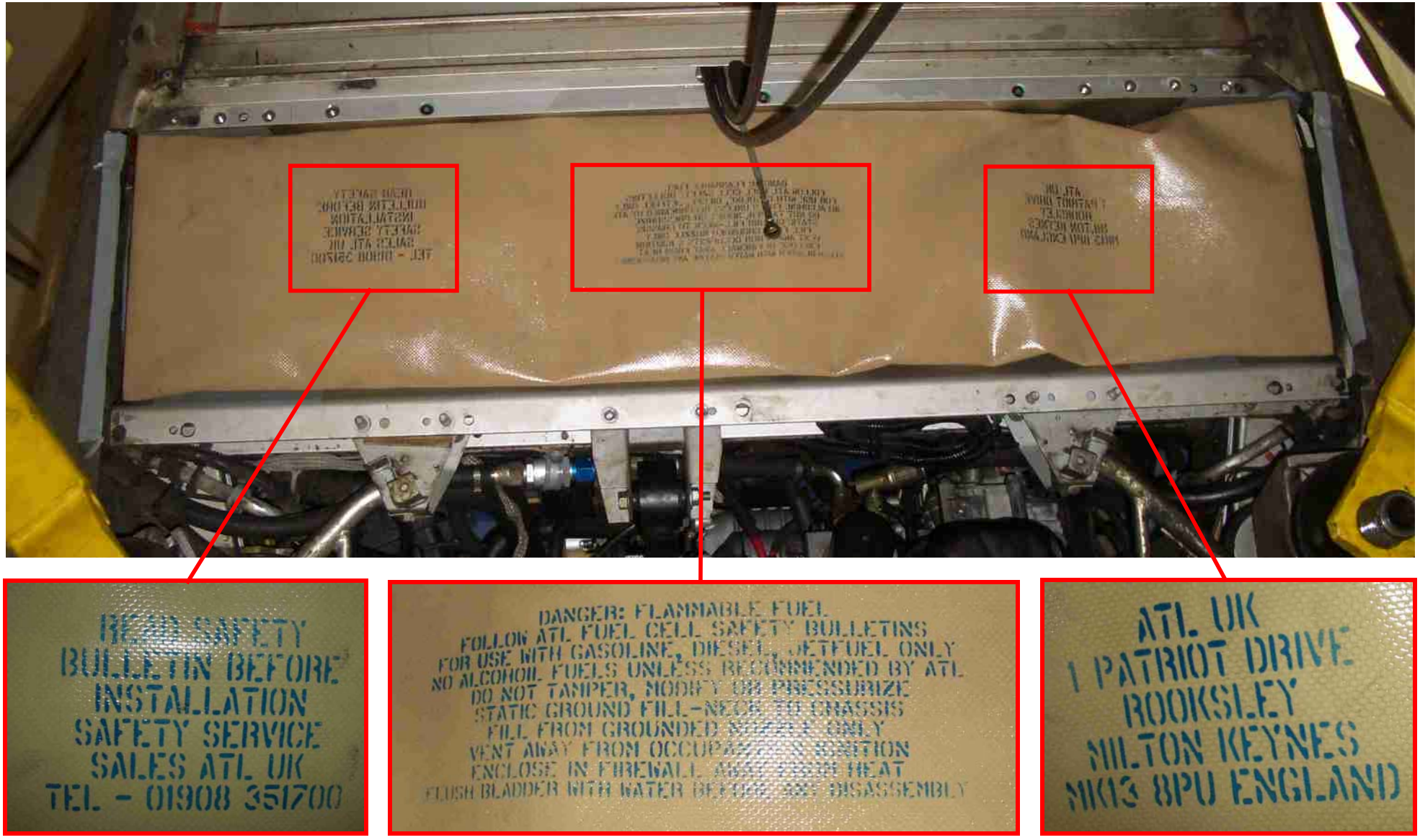
Torque Tightening Instruction

Track Use Only Label

Fuel Cell Fuel Type Use Instruction

Please pay attention to the highlighted regions. These areas indicate important safety information

Fuel Cell Dating Label, (states FIA Approval Number, Manufacturer, Serial Number, End of Life Date)


READ SAFETY
BULLETIN BEFORE
INSTALLATION
SAFETY SERVICE
SALES ATL UK
TEL - 01908 351700
DANGER: FLAMMABLE FUEL
FOLLOW ATL FUEL CELL SAFETY BULLETINS
FOR USE WITH GASOLINE, DIESEL, JETFUEL ONLY
NO ALCOHOL FUELS UNLESS RECOMMENDED BY ATL
DO NOT TAMPER, MODIFY OR PRESSURIZE
STATIC GROUND FILL-NECK TO CHASSIS
FILL FROM GROUNDED SOURCE ONLY
VENT AWAY FROM OCCUPANTS & IGNITION
ENCLOSE IN FIREWALL AWAY FROM HEAT
FLUSH BLADDER WITH WATER BEFORE ANY DISASSEMBLY
ATL UK
1 PATRIOT DRIVE
ROOKSLEY
MILTON KEYNES
MK13 8PU ENGLAND

Part Number: ALS3T0009F
Version: 1

FUEL CELL

PROCESS SHEET

TOOLS REQUIRED

• LOTUS SERVICE MANUAL (A120T0327J) • TOYOTA SERVICE MANUAL RM733E • TOYOTA SERVICE MANUAL RM929E • VEHICLE SUPPORT RAMP • FUEL DRAIN CAN • RATCHETS • SPANNERS – ASSORTED • ALLEN KEYS - ASSORTED • PHILLIPS HEAD SCREWDRIVER • FLAT BLADED SCREWDRIVER	• BOILING WATER TO SOFTEN HOSE ENDS • SOCKETS - ASSORTED • CRAFT KNIFE • CIRCLIP PLIERS • MASKING TAPE • WD40 • DUCT TAPE • MALLETS • HACKSAW OR SUITABLE CUTTING TOOL • PAINT PEN	• CLEAN WORKING BENCH AND AREA • TORQUE WRENCH • EXTENSION BARS

INSTRUCTIONS

NOTE 1: ALL BOLTS SHOULD BE TORQUED CORRECTLY – SEE LOTUS SERVICE MANUAL FOR STANDARD PART OR TORQUE REFERENCE IN THIS DOCUMENT.
NOTE 2: ALL BOLTS TORQUED SHOULD BE PAINT MARKED.
NOTE 3: ENSURE ALL NESSECARY SAFETY PRODECURES ARE FOLLOWED.

WARNING

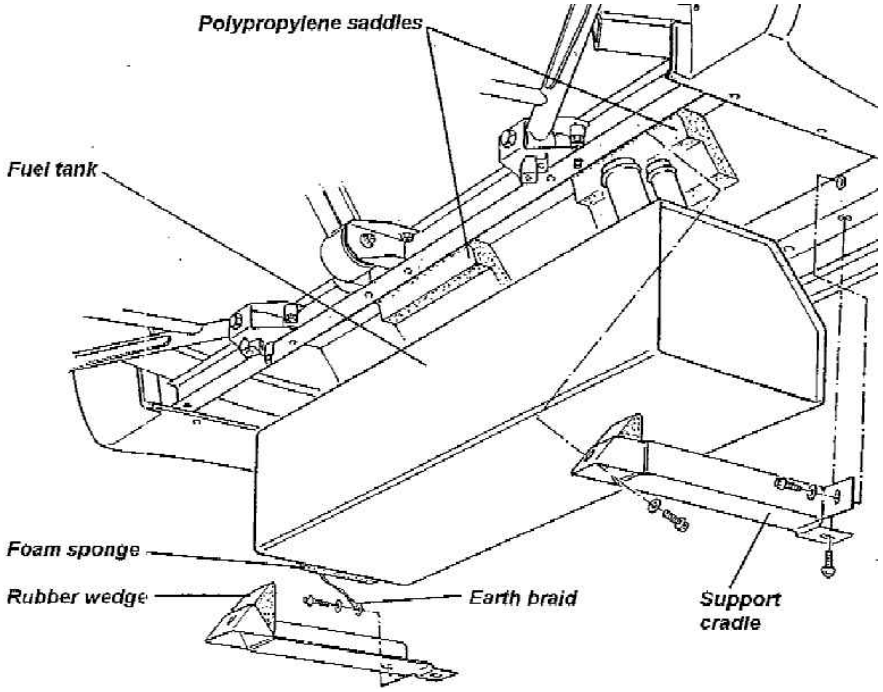
! DO NOT ATTEMPT TO DO THIS MODIFICATION WITH THE ENGINE RUNNING OR WHEN THE ENGINE IS HOT.
! TAKE ALL NECESSARY PRECAUTIONS TO GUARD AGAINST FIRE AND EXPLOSION RISK WHEN DEALING WITH FUEL AND FUEL VAPOUR.

READ ALL INSTRUCTIONS THOROUGHLY BEFORE COMMENCING WORK AND ENSURE ALL COMPONENTS ARE PRESENT. IF IN ANY DOUBT, CONSULT A LOTUS DEALER BEFORE UNDERTAKING THE WORK.

Part Number: ALS3T0009F
Version: 1

FUEL CELL

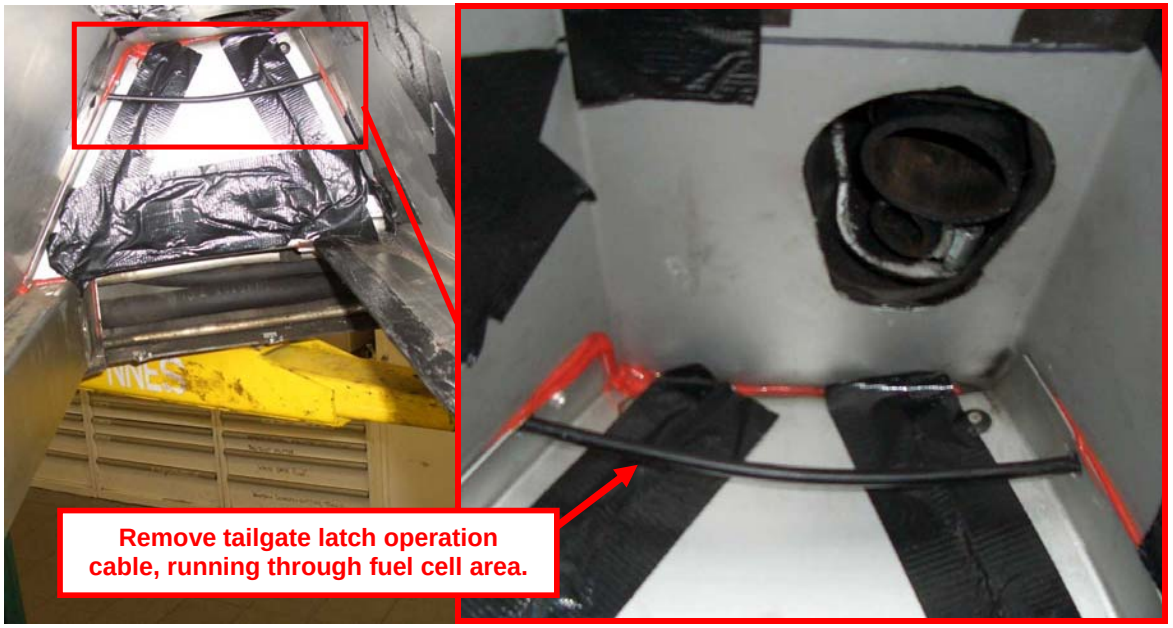
PROCESS SHEET



SEQ	ACTIVITY – REMOVE EXISITING TANK
10	Read all fuel cell literature supplied with the cell!
20	Following instructions in Lotus Service Manual (A120T0327J), Toyota Service Manual (RM733E) and Toyota Service Manual (RM929E).
30	Drain fuel from vehicle or run down the fuel to minimum levels.
40	Remove fuel tank filler hose and breather clips on the upper side of the tank.
50	From the fuel pump access aperture disconnect the quick connect fuel pipe, the fuel feed pipe and the pump electrical connector.
60	Place the car a 'two post' vehicle lift and secure.
70	Remove vehicle under tray and diffuser.
80	Disconnect handbrake cable from the callipers.
90	Disconnect cross gate and selector cables from gearbox.
100	Remove shear panel from vehicle, and the 'ground' wire.
120	Remove the fuel tank from the vehicle, and place on suitable work surface.
130	Remove the fuel pump from the fuel tank and set aside. This will be used in the new fuel cell. Please check fuel and parts for condition. Keep braided earth strap, as this will be used later.

CAREPOINT		QUALITY STANDARD
20	Be careful to take the necessary precautions when handling fuel and fuel vapours. Do not take any risks!	
30	Any damage or broken components should be repaired or replaced before use.	

SEQ	PART NUMBER	PART DESCRIPTION	QTY	F/C	TORQUE	TOOLING
10	A120T0327J	Lotus Service Manual				
10	RM733E	Toyota Service Manual				
10	RM929E	Toyota Service Manual				



SEQ	ACTIVITY – RELOCATE LATCH & CABLE
10	Remove cockpit tailgate operations latch and bracket
20	Disconnect the cable from the latch and remove the cable from the fuel cell area vicinity (as indicated)
30	The cable should be moved so that it runs ‘over the top’ of the chassis through the plastic bulkhead and to the latch/handle.

CAREPOINT		QUALITY STANDARD
10	It is the general recommendation for road based - track use only vehicles, to relocate the latch and cable mechanism. However, an alternative is to remove the mechanism completely from the vehicle and fit ‘bonnet’ style pins to secure the tailgate/engine cover.	

SEQ	PART NUMBER	PART DESCRIPTION	QTY	F/C	TORQUE	TOOLING
10						
10						
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Part Number: ALS3T0009F
Version: 1

FUEL CELL

PROCESS SHEET

SEQ	ACTIVITY – PREPARE AREA
10	Remove approximately 5-10mm of materials from the inboard side of the fuel hose aperture on the chassis
20	Clean all internal surfaces make sure free from dirt or deposition.
30	**REMOVE ALL BOLTS, NUTS AND PROTRUSIONS INTO THE FUEL CELL AREA**
40	**PLACE 'DUCT TAPE' OVER ALL OBTRUSIONS, ALL SHARP EDGES AND CORNERS.**

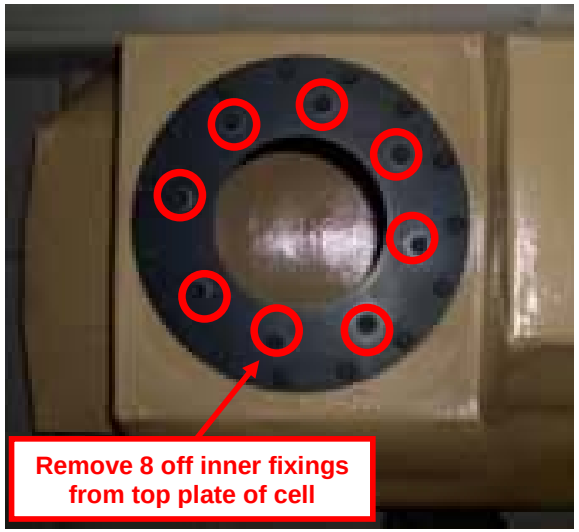
CAREPOINT	QUALITY STANDARD
20 **IT IS IMPERATIVE THAT THE AREA WHERE THE NEW FUEL CELL WILL BE INSTALLED IS FREE OF ANY OBSTRUCTIONS, SHARP EDGES, POINTS, BOLT HEADS AND THREADS. THE COMPLETE INNER AREA SHOULD BE SMOOTH WHEN YOUR HAND IS RUN ACROSS THE SURFACE. ANY OBTRUSION ONTO THE FUEL CELL WILL DAMAGE THE FUEL CELL.**	
30 Take care to cover all sharp edges, corners and obtrusions with tape.	
20 If absolutely necessary replace with 'button' type head bolts on the inner surface)	

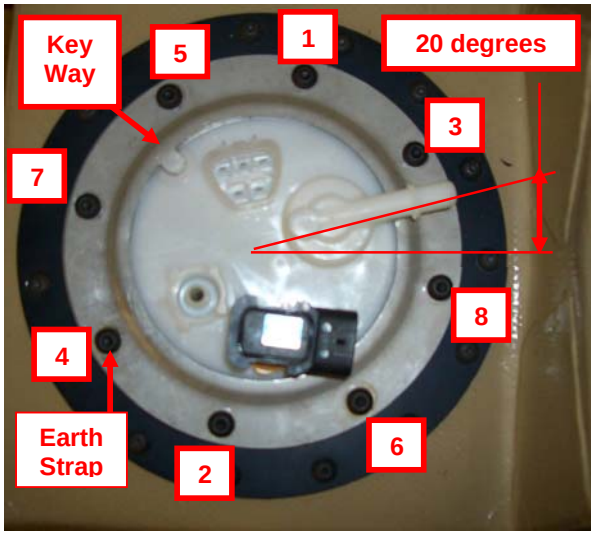
SEQ	PART NUMBER	PART DESCRIPTION	QTY	F/C	TORQUE	TOOLING
10						

Part Number: ALS3T0009F
Version: 1

FUEL CELL

PROCESS SHEET





SEQ	ACTIVITY – FUEL PUMP INSTALLATION
10	Place the fuel pump into the fuel cell top plate, with the orientation shown nozzle should be 20degrees from pictorial horizontal.
20	Place the plastic over ring on top
30	Then the metal nut ring, ensuring that the 'key' locks into place on the fuel pump (indicated)
40	Insert the 8off fixings, and loosely hand tightening in the torque tightening sequence shown, inserting the earth strap to #4 as indicated
50	Follow the torque tightening sequence shown, and paint mark when correct torque has been reached. See torque tightening instructions on tank. Making sure that the earth strap is attached (previously removed from existing fuel tank)

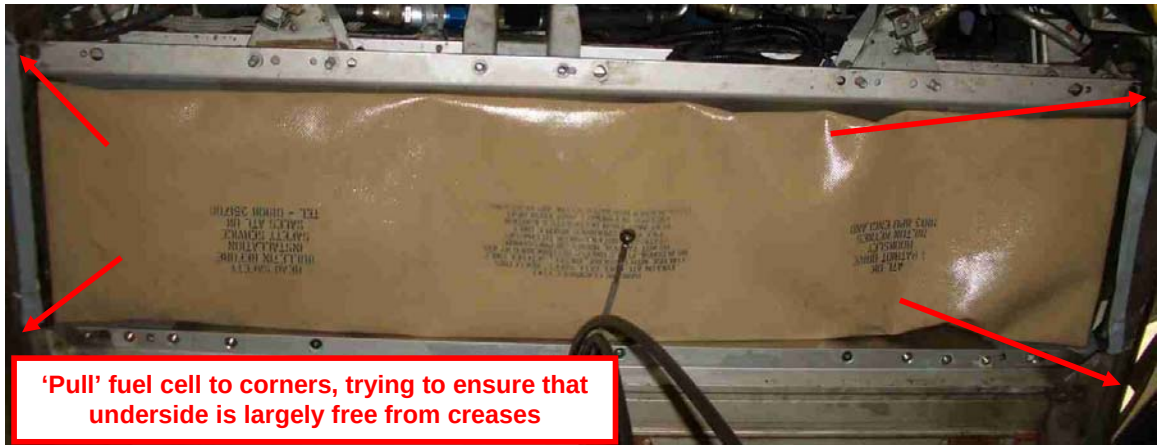
CAREPOINT	QUALITY STANDARD

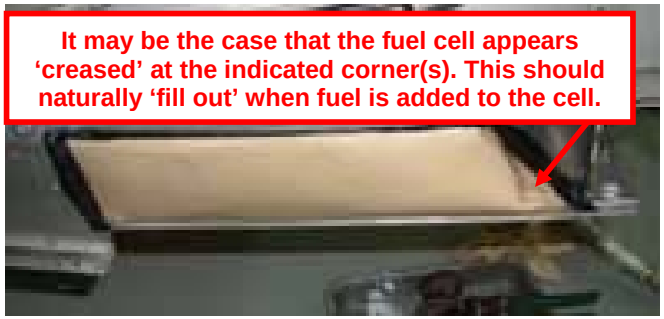
SEQ	PART NUMBER	PART DESCRIPTION	QTY	F/C	TORQUE	TOOLING
50	N/A	Torque / Tooling Reference	8	-	3.5Nm	Torque wrench

Part Number: ALS3T0009F
Version: 1

FUEL CELL

PROCESS SHEET





SEQ	ACTIVITY – FUEL CELL INSTALLATION
10	Offer the fuel cell up towards the chassis.
20	Connect the 'quick connect to tank pipe' confirm that it has clicked home and is secure.
30	Connect the fuel feed pipe confirm that it has click home and is secure
40	Connect the fuel pump electrical connector and confirm that it has click home and is secure
50	Begin to insert the 'pump' side of the fuel cell first pressing it into the upper corners and over the chassis lower rail lips front and rear.
60	Offer the 'filler' side up, and press into the corners, and again over the chassis lower rail lips (front and rear)
70	Reconnect Fuel filler hose and fuel breather hose fitting new retaining clips.
80	
90	
100	
120	

CAREPOINT		QUALITY STANDARD
10	The intricate design of the bag tank means that the physical installation of the fuel cell can be a delicate operation, generally necessary to be completed by two people.	
20	If necessary, 'lubricate' the inner surface of the chassis area to ease installation.	
50	The tank when seated corrected will appear into 'pop' into position.	
60	Please ensure that the fuel cell does not 'curl' up on itself as it progresses over the chassis rail lips.	

SEQ	PART NUMBER	PART DESCRIPTION	QTY	F/C	TORQUE	TOOLING
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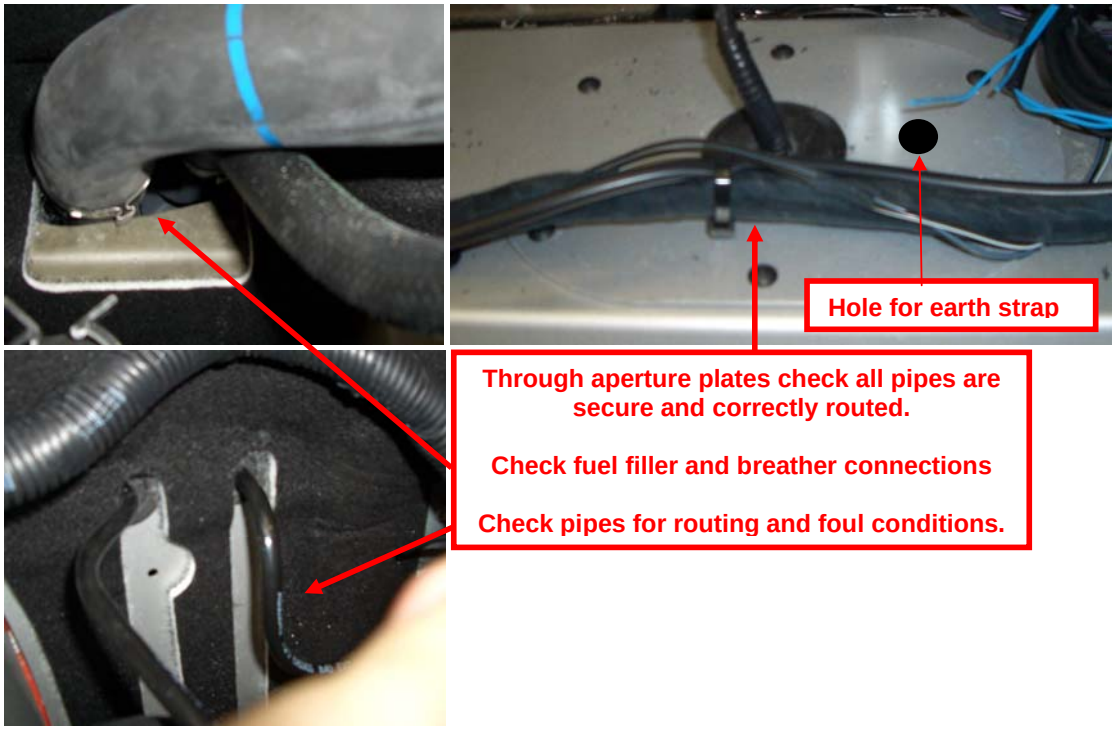

SEQ	ACTIVITY – FINALS
10	Drill a hole in the access aperture to feed the earth strap through, insert a rubber grommet to seal.
20	Feed the earth braid strap up through the hole in 'access aperture' and secure to the main roll hoop via a suitable fixing, ensuring that the connection is secure and earthed.
30	Check that all hoses, clips, connectors and fixings have been correctly installed, and that no damage has occurred during the installation.
40	Check all fuel lines for leaks.
50	Check all fuel lines for fouling, rubbing or any interference.
60	If satisfactory and correct, add 10litres of fuel to the fuel cell via the normal filling method.
70	Turn on engine and idle for 5mins, checking for any fuel leaks, fuel pickup issues and other abnormalities. Rectify any issues.
80	If satisfactory and correct, refit all the ancillary components removed initially, shear panel, handbrake cable, gear selector and cross gate cables, under tray.
90	Safety check the vehicle before allowing out of the workshop.

CAREPOINT		QUALITY STANDARD
50	You will be able to hear the fuel pump running and 'picking' up the fuel	
60	Never drive the vehicle without the shear panel and under tray in position.	

SEQ	PART NUMBER	PART DESCRIPTION	QTY	F/C	TORQUE	TOOLING
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SEQ	ACTIVITY – CHASSIS STICKER
10	**IT IS IMPERATIVE THAT THE TAMPER PROOF CHASSIS LABEL IS STUCK INSIDE THE COCK PIT OF THE CHASSIS.**
20	Clean surface (area as indicated) with suitable fluid.
30	Remove backing of tamper proof chassis sticker
40	Adhere to chassis, making sure that no bubbles are underneath, press firmly to the corners.

	CAREPOINT	QUALITY STANDARD
10	It is recommended that if the vehicle is fitted with a Lotus Sport chassis plate, that it is fixed in the same region. Must be clearly visible	
10	Label only refers to specific serial number and as such must never be removed as long as the vehicle is fitted with the corresponding fuel cell.	

SEQ	PART NUMBER	PART DESCRIPTION	QTY	F/C	TORQUE	TOOLING
10						
10						

Disclaimer

Lotus accepts no liability for any direct, indirect or consequential damage or loss (including as a result of negligence) arising from the application of these fitting instructions by any person. For the avoidance of doubt, this does not affect your statutory rights and Lotus does not exclude liability (if any) to you for death or personal injury arising out of Lotus' negligence.

Please note that the fitting of any Lotus approved part(s) by anyone other than a Lotus approved engineer may invalidate the vehicle warranty.