

AUSSIE INVADER 5R FACT SHEET

Revision 1 – October 2011



Project Facts:

Planning and Design: 11 years (started 1998)
Estimated Construction Time: 3 – 4 years (started June 2009)
Total Projected Cost: A\$4 million (estimated)
Project Leader: Rosco McGlashan OAM (Driver)

Performance:

Acceleration: 0 to 1,000mph (1,609km/h) in 20 seconds
Max. Speed: 1,641 km/h (1,030 mph or mach 1.30 at MSL, 35 C⁰ ambient)
Max. Horizontal Acceleration Limit: +3.2g, -3.2g (governed by wheel traction)

Car/Chassis

Chassis Length: 12.3m (40') minus nose cone
Car Length: 16.5m (52')
Empty Mass: 6.363 tonnes (6.263ton)
All Up Mass (AUW): 9.163 tonnes (9.018 ton)
Chassis Tube Spec: 914 mm dia., 9.5mm wall, Steel Grade C350 LOF (AS 1163)
Yield Stress: 350 MPa
Tensile Strength: 430 MPa
Modulus of Elasticity: 200 GPa

Engine/Motor

Type: Rocket - Liquid Fuel - Bio Kerosene and Liquid Oxygen (LOX)
Ignition: Non hypergolic i.e. the fuel requires chemical ignition.
Manufacturer: Rocket Lab Ltd (NZ)
No: One motor only (on chassis centre line – angled 0.5 degrees nose down)
Max. Thrust: 275kN (62 000 lbs/f),
Max. Power Output: 149,200 kW (equivalent to 200,000 hp)
Fuel Consumption: 800 kg (0.7873 ton) of Bio Kerosene in 25 sec
Oxidiser Consumption: 2,000 kg (1.978ton) of LOX in 25 sec
Max LOX Tank Pressure: 4.14MPa (600psi)
Fuel and Oxidiser Pressurised by Helium Gas at: varies between 2.76 MPa to 4.14 MPa (400-600psi)
Fuel and Oxidiser Pressure at the Motor: 2.62 MPa (380 psi)
Max Exhaust Gas Temp: approx. 2,000 °C

Wheels

No of Wheels: 4 (two nose wheels – side by side), two rear
Track: Front - 450mm (17.7") Rear - 2,400mm (94.5")

Note: This sheet will be updated in parallel with updated vehicle specifications and due to ongoing development, these facts could change as Aussie Invader 5R is constructed.

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Diameter: 900mm
Width: 200mm
Material: Solid one piece hand forged Aluminium Alloy 2014AT6
Mass: 140kg each (309 lbs)
Max Designed RPM: 10,000 (tested to 10,500)
UTS: 483 MPa
Density: 2.8g/cm³
Modulus of Elasticity: 72.4 GPa
Yield Point: 414 MPa
Wheel Bearings: TBA - Under final investigation and selection

Stopping/Braking

Natural Wind Resistance/Wheel Drag: From max speed 1,609 km/h (1,000 mph) - 0
Rear Air Brake: Deployed below 3g (at approx. 1,100 km/h)
Parachutes: High speed chute from 480 km/h (300 mph) to full stop
Low speed chute from 320 km/h (200 mph) to full stop
Electro-magnetic Brakes: Actuated from 290 km/h (180 mph)
Emergency Brake: Hydraulic ram/foot

Suspension/Dampening

Front: Compressed rubber suspension unit for the nose bogey
Steering Movement: +/- 5 degrees
Max Suspension Travel: 25mm (1")
Rear: Solid fixed axle - 125mm diameter steel - no suspension travel

Aerodynamics

Coefficient of Drag (C_D) sub sonic: 0.25
Coefficient of Drag (C_D) supersonic: 0.8
Max. Net Drag: (air plus wheel drag) at 1,609 km/h = Thrust = 275 kN (62,000lb/f)
Shock Wave Drag: or "pounding drag" experienced between the ground and underside of supersonic vehicles could be as much as wheel drag.

The Course/Track (for record attempt)

Location: A very large dry lake (location to be confirmed)
Number of Runs: 2 within an hour in opposite directions (FIA requirement)
Overall Length: 28km (17.5miles) for full speed 1,000 mph run
Run Up: 5.15km (3.2miles)
Measured Record Distance: 1 mile (1.609 km)
Slow Down: 10km (6.2miles) estimated
Extra Run-off Length: 3km (1.9 miles) estimated

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