

RUAG Australia - Excellence in Landing Gear Systems



RUAG Australia's primary lines of business - maintenance, repair and overhaul (MRO), precision manufacturing, metal processing and research and development of advanced repair technologies - come together to create a unique and highly valuable offering to the Australian aviation sector.

Centre of excellence for traditional maintenance, repair and overhaul of landing systems

RUAG Australia's excellence in the maintenance, repair and overhaul of landing systems - which includes the undercarriage, wheels, braking system and attachments - has been exemplified with their successful F/A-18 and AP-3C programs.

The Royal Australian Air Force (RAAF) was experiencing asset availability issues on their F/A-18 fleet landing system, primarily caused from corrosion damage, with similar issues experienced by the US and Spanish Air Forces.

With the experience and technical skill of RUAG Australia, a refurbishment program was developed to restore the entire fleet's undercarriage, wheels and brakes to a serviceable baseline. RUAG Australia developed and authorized over 300 deviations under their AEO authority. This included the design and manufacture in-house of replacement components where required.

The resulting benefit to the customer was simple - increased asset & aircraft availability - with the savings from this project alone estimated at over AUD\$4m.

The success of the F/A-18 program led to a

similar refurbishment program on the AP-3C Orion landing system. Corrosion was again identified as a main source of concern. The main and nose landing gear assemblies are stripped down and assessed for damage, with repair schemes developed for any out of scope repairs.

The AP-3C landing system was quickly and efficiently returned thanks to the company's complementary capabilities and dedication to addressing the customer's needs.

Making the next generation of fighter jet

The F-35 Joint Strike Fighter

program required the right blend of precision manufacturing expertise, capability and equipment to produce the next generation of fighter jet. RUAG Australia stood out with a truly unique offering, combining extensive manufacturing and metal finishing capability, including non-destructive testing, precision machining to 0.00005", assembly and testing.

RUAG Australia was acknowledged as a natural fit for precision manufacturing of components for landing gear and the weapons bay drive door actuator program, stretching back to the System, Design & Development phase in 2004.

RUAG Australia has manufactured over 20,000 F-35 components since then, including landing gear retract, downlock and damper actuators across all three aircraft variants, and are the global sole source for a selection of these actuators.

To allow successful delivery to the global program, RUAG Australia's precision manufacturing capability was required for the matched sleeve and slide sets. The maximum allowed diametrical clearance was 0.000030".

These contributions have required coordination with companies in four separate states and a willingness to collaborate, culminating in the most complete Australian solution possible for the customer.

Additive manufacturing to support the entire landing gear system

Additive manufacture is increasingly being referred to as the third industrial revolution, where three dimensional complex shapes

can be built layer by layer through material deposition. There is a genuine need to restore worn/damaged profiles to their original shape and original design integrity.

RUAG Australia adopted two Additive Technologies as innovative enabling sustainment technologies, these being Supersonic Particle Deposition (SPD), also known as Cold Spray, and Laser Additive Deposition (LAD).

SPD involves accelerating metal powder particles in a supersonic gas flow to impact a solid surface and cause plastic deformation, thus bonding with the underlying material. LAD uses a laser beam to form a melt pool on a metallic substrate, into which powder/wire is fed, to form a deposit that is fusion bonded to the substrate. The required geometry is built up layer by layer.

RUAG Australia is a major industry research centre and a world leader for the development of powder deposition technologies for defence applications. RUAG Australia pioneered the application of both SPD and LAD as part of innovative repair solutions and were a significant contributor to the development of MIL-STD-3021 (Cold Spray).

The successful applications of SPD to date include geometry restoration of helicopter transmissions and F/A-18 Landing Systems: specifically Wheels, Brakes, Swivel Assembly Housings, Brake Carriers, Axle Hydraulic Swivel Joints and Drag Brace Outer Tubes. Many other applications are currently in work including aircraft wheel recovery, high strength steel component recovery and the replacement of chrome.

Partner of Choice

RUAG Australia are firmly committed to the quality and reliability required for excellence in landing systems. This means concentrating not only on their success in traditional MRO - as with the F/A-18 and P-3 undercarriage, wheels and braking systems - but also on manufacturing landing gear components for the next generation of aircraft. Being at the forefront of new technologies to support the entire landing gear system is only natural as RUAG Australia seeks the best possible solution for their partners, re-affirming their position as the Partner of Choice for their customers.