In 2009, Meggitt Aircraft Braking Systems’ total braking system—which included its pioneering electric braking technology—was selected by Bombardier for its C-Series airliner.

A year later, the value of the contract was extended when Bombardier selected Meggitt Sensing Systems’ next generation tyre pressure indicating system (TPIS). The product is the result of a divisional collaboration that responds to the aerospace industry’s increasing concerns about several high profile catastrophic accidents relating to incorrect tyre pressure inflation.

Designed to provide a 20% fuel burn advantage over current aircraft in its class, C-Series is the first single-aisle aircraft to adopt Pratt & Whitney’s revolutionary PurePower® PW1000G geared turbofan engine and to use advanced materials and composites widely. Meggitt Sensing Systems’ tyre pressure monitoring system adds to the aircraft’s technological sophistication, providing flight and maintenance crews with remote real-time tyre pressure data.

After calculating temperature-compensated tyre pressure, anomalies will be indicated via the aircraft’s engine indication and crew alerting system (EICAS) system before take-off and landing, enabling flight crews to make informed safety-critical decisions. Ground crews will be alerted to the requirement to inflate a given tyre correctly via the aircraft’s health and monitoring system, reducing the frequency of manual pressure checks and extending tyre life as operators maintain correct pressure levels more easily. Tyre pressure data is transmitted across the stationary axle-to-rotational wheel interface using Meggitt’s short-distance wireless technology, making the product lighter and more reliable than previous generation TPIS systems. Jim Valentic, Vice President, Commercial Aircraft Marketing, Meggitt Aircraft Braking Systems is optimistic about the product’s prospects: “Tyre pressure indicating systems will be favourably received by more and more aircraft manufacturers for new aircraft designs and we are meeting this need by expanding Meggitt’s overall penetration of ATA chapter 32 [landing gear] systems.”

C-Series has attracted 90 firm orders and booked options for an additional 90 aircraft.

Meggitt Aircraft Braking Systems pioneered electric brakes and remains the first and only company to have successfully tested them on a commercial demonstrator aircraft in 2008 with no hydraulic back-up. Its system integration capability is mature, based on a simulation and modelling capability that is probably the industry’s most advanced. Meggitt Sensing Systems has a first-class capability in monitoring the condition of rotating machinery in aerospace and energy markets. Its systems deliver the most detailed image of engine condition achieved to date. In a press statement, Chief Executive Terry Twigger commented: “By combining these capabilities, we have presented a compelling new offer to this longstanding Meggitt customer, expanding our level of integration and scope of work in line with our product strategy in this market.”

Two Meggitt divisions have joined forces to extend the group’s presence on Bombardier’s C-Series, the promising programme of innovative 110 to 130-seat narrow-body airliners poised to capture market share in short-haul travel.

Maintaining correct tyre pressure, which deflates through temperature variations and the impact of landing and braking, is a matter of safety and effective aircraft economics. A burst tyre has been described as a rubber bomb releasing the energy of four to five sticks of dynamite that can result—if it needs to be said—in loss of control and the risk of catastrophic fire and engine damage. At best, tyres operating at incorrect pressures become degraded before their time.

Our tyre pressure monitoring system can be used to ensure that line maintenance procedures are fully and accurately carried out to avoid the very serious dangers associated with under-inflated tyres. At the same time, it will reduce the cost of maintenance associated with tyres exhibiting poor wear and tear after use at sub-optimal pressures.

A burst tyre has been described as a rubber bomb releasing the energy of four to five sticks of dynamite.

Alan Kaufman, Vice President of Aerospace Group Sales for Meggitt Sensing Systems
FACT FILE

1. Air Transport Association-controlled and published chapter numbers provide a common referencing standard for all commercial aircraft documentation for pilots and engineers. ATA Chapter 32 encompasses landing gear.

2. Meggitt’s Aircraft Braking Systems equips Bombardier’s entire fleet of over 1500 CRJ Series of commercial jets, the Q400 and Q400 NextGen advanced turboprop digital brake control system, business jet braking equipment on the Learjet 60 XR and the Challenger 605 aircraft and the total braking system for Challenger 850, 870, 890 business jets.

3. Meggitt’s integrated electric braking system (Ebrake®), the first to fly successfully with no hydraulic back-up, includes nose and main wheels, compact electric actuators and 48 associated control system elements. The system deploys Meggitt’s lightweight, longer lasting NuCarb® carbon heatsinks.

4. Electric braking provides fully integrated brake control and anti-skid protection including emergency and parking brake functions by combining brake-by-wire control technology with electro-mechanical brake actuation. Its development follows the aircraft industry’s gradual adoption of electric technology to develop more fuel-efficient aircraft with lower emissions. Electric braking is also expected to increase dispatch reliability and reduce unscheduled maintenance costs. The elimination of hydraulic fluids reduces the risk of leaks and associated fires.

5. Meggitt Sensing Systems’ condition monitoring equipment lowers the cost of owning high-value assets by enabling owners to plan appropriate maintenance according to the real condition of a piece of equipment rather than as a standard operating procedure at a given point in its lifecycle.

6. The health monitoring techniques Meggitt Sensing Systems evolved for aero-engines can be extended to many sub-systems including landing gear, avionics and environmental control. It shares this vision with Cranfield University’s Integrated Vehicle Health Monitoring (IVHM) Centre of Excellence, which Meggitt is supporting with Boeing (Phantom Works), BAE Systems and Rolls-Royce.

Above: Bombardier’s C-Series low fuel burn narrow-body aircraft deploys the latest technologies including Meggitt’s electric brake and next generation tyre pressure monitoring system.

For further information about Meggitt Aircraft Braking Systems and Meggitt Sensing Systems, take our e-tour on www.meggitt.com