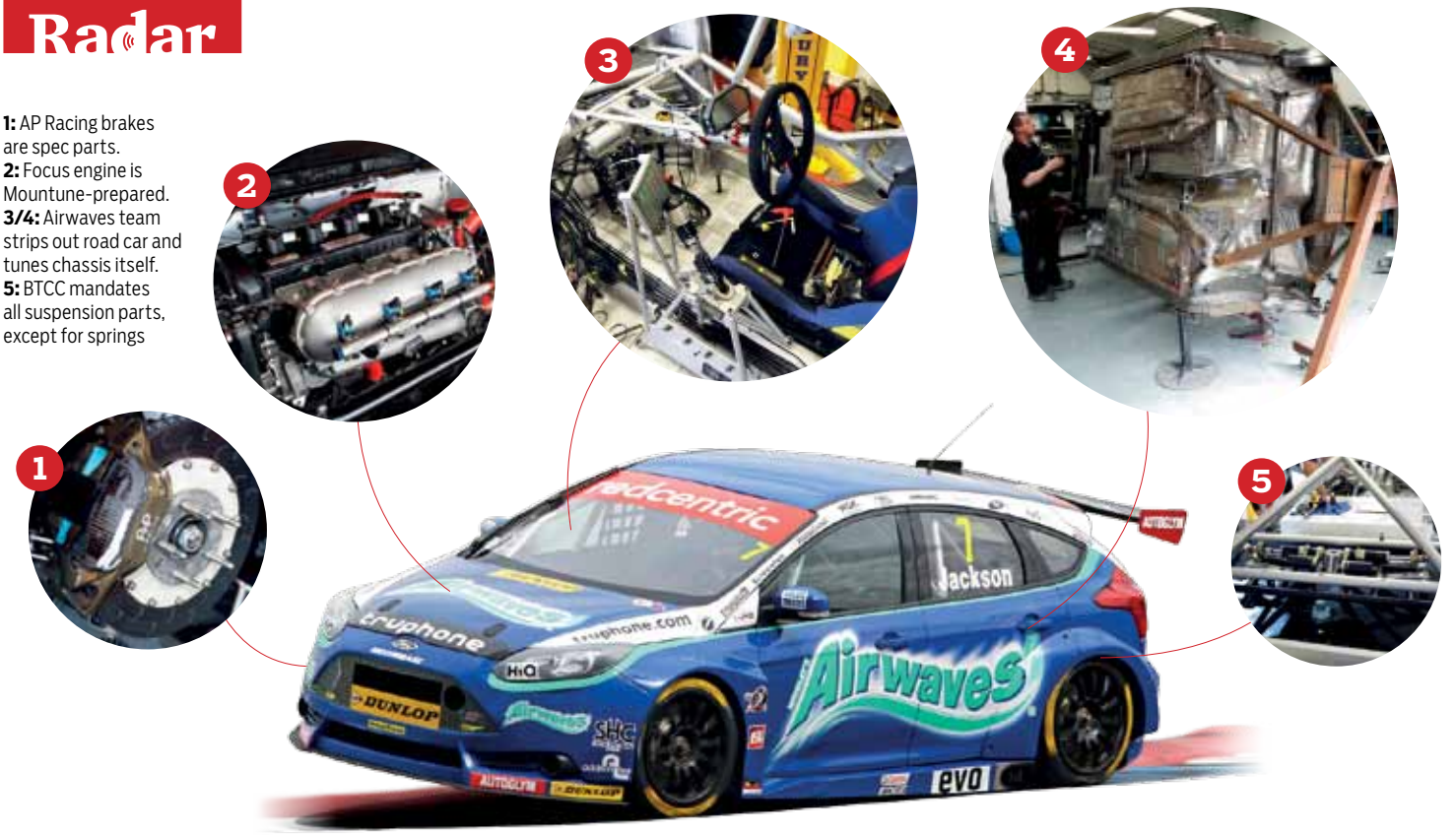

1: AP Racing brakes are spec parts.
2: Focus engine is Mountune-prepared.
3/4: Airwaves team strips out road car and tunes chassis itself.
5: BTCC mandates all suspension parts, except for springs

Low-cost BTCC rules spark surge in race car engineering

Airwaves Racing is part of a wave of independent teams developing their own tin-top racers

Words: Dan McCalla

THE FIRST THING you notice when watching this year's British Touring Car Championship is the large number of varied machines fighting it out at the front. It's a far cry from just a few years ago, when two or three models tended to dominate every event.

In the main, this change is down to the BTCC's Next Generation Touring Car (NGTC) regulations, fully rolled out for 2013, with ten different makes of car having already appeared. To cut the cost of competing, these rules mandate the use of a vast array of standardised parts, including the gearbox, brakes, clutch, wishbones, electronics, turbo, wheels and tyres.

Oly Collins, team manager of the Airwaves Racing outfit that developed the two Ford Focus racers it runs for Mat Jackson and Aron Smith, says that while the NGTC regs seem restrictive, there's still scope for teams to innovate: 'The chassis is derived from a standard road car, so there's plenty of engineering needed to turn that into a race car chassis because there are always compromises needed in the conversion and you have to pick the right ones. Also, while the wishbones and subframe are NGTC parts, dampers are free choice, so there's a huge range of damper lengths you can use, and that can have a big effect on performance. There's a lot less for us to work with, but more that we can do within what we're allowed to develop.'

'WHILE THE NGTC REGS SEEM RESTRICTIVE, THERE'S STILL SCOPE FOR INNOVATION'

Under NGTC rules there remains some freedom in engines, although they must all be four-cylinder 2-litre turbo units. Teams can take the 'spec' powerplant made available to all teams by Swindon Engines, or can use an alternative, provided it comes from the parent group of the car in question. Airwaves Racing uses a Ford EcoBoost engine tuned to over 300bhp by Ford specialist Mountune Engineering. But with a series-wide rev limit of 7000rpm in place, there's little to choose between engines: through the speed trap at the season opener at Brands Hatch at Easter, the fastest NGTC car was just 5.9mph up on the slowest.

NGTC has not only kept the current cars fast (lap times are close to those of the vastly more expensive Super Touring machines of the late 1990s) but has allowed small privateer teams to develop their own racers. Airwaves is a good example of this, having previously only run 'off-the-shelf' cars in the BTCC, British GTs and Porsche Carrera Cup since being formed as Motorbase Performance in 2004. According to Collins, the development and build cost of Airwaves' first NGTC Focus was around £300,000 – more than the cost of buying a used car in the outgoing Super 2000 spec. But he expects costs to reduce significantly over the coming years as knowledge is improved and cars and parts become freely available.

He also says that self-building gives teams extra pride when their vehicles succeed: 'It took about 1000 man-hours to build our first [NGTC] car, which made its debut at Snetterton last August. It won its first race at Silverstone last October, and to take a car from scratch to winning a BTCC race does feel extra special.'