

Promising anniversary return



For the first time ever, Aston Martin as a brand was represented in three classes at Le Mans this year. Anne Proffit reports on the development of these cars and their achievements in that race

Following a ninth place (first petrol-powered) overall finish in 2008 during the 76th edition of the 24 Heures du Mans, it was apparent that Aston Martin Racing/Prodrive had a good thing going with the Lola B08/60 coupe penned by Julian Sole.

Aston Martin Racing was looking to move up from its consecutive victories in the LM GT1 category using the DBR9 coupe, and the success provided by Charouz Racing Systems, working in concert with AMR last year provided that impetus.

Game on after the 2008 Le Mans race and Aston Martin Racing began making plans for a three-car assault on The Sarthe in 2009. The Charouz car was sold to Speedy Racing Team Sebah with their intent of running the 24-hour race in 2009.

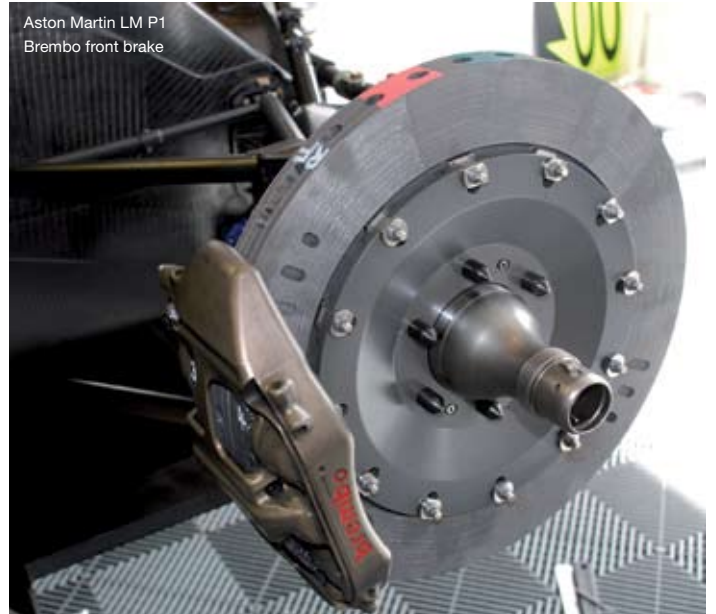
With a year to prepare, the squad began by making their own adjustments to an updated B09/60 Lola coupe so that it would, as George Howard-Chappell put it, look more like an Aston Martin.

He also said the team was looking for some aerodynamic advantages to help them overcome the new rules laid down by the ACO. There was also the matter of accommodating history, which led to some of the design parameters: this was the 50th anniversary of Aston Martin's DBR1 victory in this race in 1959 with Roy Salvadori and Carroll Shelby. Gulf Oil sponsorship dictated the retro colours.

"The essential chassis is exactly the same as last year," Howard-Chappell said. "The core of the bodywork shows that there are one or two pieces that are heavily modified or completely new," from Sole's design. "This is all Aston Martin Racing/Prodrive development. We don't use a wind tunnel," he said. "We use a combination of CFD and straight-line testing to develop the aero. We also use the 7-post rig."

Lola's Sole acknowledged making "some aerodynamic changes due to the rules changes, with the narrower rear wing and the midsection." Lola have completed some aerodynamic adjustments "around the back end of the car; we've done development on the rear end of

Aston Martin LM P1 turned in a good performance finishing in fourth behind the two factory Peugeots and an Audi R15



downforce – according to the rules – than last year,” he said. “We have a smaller wing, and we are about 10 percent down from last year; on the other hand, Aston Martin Racing made a lot of improvements to the Lola car to make it faster than last year’s Lola.”

The Lola B09/60 coupe has a carbon fibre tub and the engine is not fully stressed in this chassis, Howard-Chappell told me. “The majority of the load between the gearbox and the tub is taken with a steel framework around it,” he noted. “It is actually not designed to take all the torsional framework and loads; it is a steel framework around the engine. You have to join suspension parts from the gearbox to the tub; the engine is in between and is not able to take all the torsion and bending.”

The engine Howard-Chappell is speaking about is a homologated version of the V12, 60-degree type DBR9 that was used in the LM GT1 car in 2007-8, where it won the category. This is a longitudinal unit with four valves per cylinder and, new this year, with direct injection. “It is the V12 but the significant development this year is the application of direct injection. It does not change the power band or

the car. This helps the performance in both low and high downforce configurations,” he said.

The easiest way to see the differences between what Lola originally wrought for Aston Martin Racing and what they are running today through their own development, was to look in the garage next door, where the former Charouz Racing Systems Lola was being run by the Speedy Racing Team Sebah in LM P1. It retains fidelity to the Sole design.

“Customers do varying levels of their own development,” Sole allowed. “They take the Lola product and do things to suit their customer base. Everyone is trying to win and they have all got their development strategies, different tweaks they are trying to do to the cars to get the best out of them,” he said.

Driver Tomas Enge, who worked with Charouz driving the Lola B08/60 Aston Martin last year, said the driving characteristics from last year to this are not much different. “We have actually a little less



INSIGHT : ASTON MARTIN

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Drayson Racing's Aston Martin Vantage GT2 #87 car which finished 33rd overall



The #13 Lola Aston Martin (LM P1) finished 14th overall



The business end of the Aston Martin LM P1

ASTON MARTIN VANTAGE – LM GT2

The 77th 24 Heures du Mans marked the first LM GT2 entry for Drayson Racing and two of its three drivers, Sir Paul Drayson and Jonny Cocker. Drayson initially brought the Aston Martin Vantage to American Le Mans Series competition in 2008, campaigning the car using E85 fuel. He elected not to return in 2009 – aside from using Sebring as a Le Mans tune-up – due to his obligations outside motor sport.

The objective for this group, which included Le Mans veteran Marino Franchitti, was to finish the race. They lined up in 44th place in a field of 55 cars, ninth in class for the start.

The Vantage LM GT2 car uses a 4.5 litre V8 engine with approximately 450 horsepower and 550 lb-ft of torque. “We have got a good spread of torque from 4500-7000 rpm,” said Graham Moore, chief engineer for the project. The team had to make minimal revisions to run ACO-supplied E10 cellulosic fuel. “The biofuel is very good and, while the energy in the fuel is slightly lower than normal gasoline, we modify the engine to cope with that by using mapping and a slightly increased fuel tank capacity (110 litres).

The biggest changes for this team came in the realm of engine reliability. “We had some problems with the engine last year,” Moore explained, “and we tried to embark on a program to get it higher up the grid. There has been a lot of effort put into the engine from Prodrive and they sent a dedicated engineer to every race. It’s brilliant for continuity.”

Prior to the race, Drayson Racing embarked on a 24-hour engine test and reported no problems. “At the moment our service life is 5000 km; that can be extended and it is pretty safe. With last year’s engine issues, we can’t suddenly make the step and risk it, so at the moment we are being conservative.”

The only other change to the car are the smaller dive planes on the front of the bumper cover, Moore explained. According to the team, in LM GT2 you are essentially allowed to homologate the nose as a single piece. The dive planes were designed and homologated for the full range of circuits, not just Le Mans. In essence, they are not specifically designed for, or ideally suited for Le Mans’ rather unique characteristics.

Drayson Racing does no tunnel development due to the expense but said the Aston Martin Racing and Prodrive have done some aerodynamic work. “We did a little bit of testing at Paul Ricard earlier in the year; that’s been about it. As a team, we don’t do any aero development. We pay for that.”

The Aston Martin Vantage LM GT2 race car uses twin wishbone suspension front and rear with adjustable Koni dampers from Prodrive. They can play around with spring rates, Moore told me. There is a single front anti-roll bar, but no third spring. ▶

the engine characteristics very much; the significant change is a small gain in fuel consumption,” always useful on such a long course as Le Mans.

Using standard port injection in 2008, Howard-Chappell noted the earlier version Lola was able to run 11 laps on the allowable 90 litres. This year’s developed engine/chassis combo netted a regular 12 laps on E10 fuel specified by the ACO, showing the move to direct injection paid the expected dividends.

Aston Martin Racing has a long-term agreement with Michelin for tyres; they use BBS forged magnesium wheels because “they are another great partner.” The 18-inch rims are 14 inches wide at the front and 15 inches wide at the rear. Aston Martin Racing was regularly able to achieve three stints on its Michelin tyres during the Le Mans 24-hour race.

Suspension on the car is a double wishbone arrangement using Koni dampers. The damper development occurs at Prodrive. The AMR Lola has an anti-roll bar at the front and no third spring for this race. “We have the option but we are not using it at this time,” Howard-Chappell said. “We are not using it because a third spring takes a reasonable amount of development to get it right and we haven’t had the time or the resources to get it fully sorted yet. It has had its complications – for a very small gain. Currently, in the programme, it isn’t worth it.”

Brakes are full carbon, with vented discs of 380 mm supplied



by Brembo, while the calipers use six pistons front and rear and pads with optimal usage in excess of 300 degrees C. “Braking performance is excellent with no fade or pedal performance change,” Howard-Chappell said.

Aston Martin Racing uses a six-speed, semi-automatic, pneumatically actuated paddle-operated Xtrac gearbox with a triple-plate carbon clutch, the latter used by the drivers only to enter and exit the pits.

Howard-Chappell acknowledged torsional rigidity is “pretty good” and that weight distribution with driver aboard is “more rearward biased than we would like. We

have got a road-based V12 in the back, so you don’t get ideal weight distribution. It is what we live with,” he conceded. “The weight distribution does not vary a lot with the fuel load. The fuel cell is behind the driver so it is pretty close to the middle of the car.”

The cockpit is fairly driver-friendly, according to Darren Turner, who piloted the #008 racer. “Everything on the steering wheel is easy but the switch panel requires a bit of a reach to get to it, so you do all those functions on the long straights,” he explained.

“We have to make sure we know where every switch is on the steering wheel and panel – there’s tons of them – and there is a 50 Euro fine if we don’t get it right!” The Lola Aston Martin is fitted with air conditioning to assure controlled temperatures of 32 degrees, as mandated by the ACO.

“Communication with the pits is excellent, in fact the radio this year has been better than any year I’ve been here,” Turner said. “I have been working with my engineer now for five years or so, so he knows I don’t like to talk on the radio and he keeps his chat to a minimum. I can use one word and he understands it; it works really well.”



The #13 Lola Aston Martin in the pits at Le Mans

ASTON MARTIN VANTAGE – LM GT2

BBS magnesium 18-inch rims and Michelin tyres are “part of the package” from Aston Martin Racing and Prodrive. The chassis is made of aluminium because the road car dictates that construction. The engine is semi-stressed in the chassis, Moore told me.

Their test programme included the initial outing at Ricard “for our top speed baseline,” the trip to Sebring where they had engine difficulties that relegated the team to 19th place and a DNF. A test on the Le Mans Bugatti circuit to test parts after Sebring was the final tune-up.

Drayson Racing uses Brembo cast iron discs and aluminium calipers (six pots front/four rear) with Project Mu pads. The disc diameter is 13 inches front and 15 inches rear with a thickness of 1-1/4-inch and 1-3/8-inch respectively. The brakes are not drilled but they are ventilated with dedicated ducting and internal vanes.

“Brake performance has improved over the past six months. We have worked very hard on pedal feel to make sure all three drivers are comfortable and happy with the setup,” Moore declared. Although they had hoped to go 18 hours before effecting pad change, the move was made on the team’s ninth (of 23 stops) in order to overcome a long pedal. Eventually, the left front caliper was changed 17 hours in after drivers complained of a long pedal and the caliper change remedied that problem. This was done at the same time as the car’s faulty alternator was replaced on its 14th stop.

The gearbox has the standard road casing for an Aston Martin Vantage using Holinger gears; it’s a sequential six-speed. Diameter for the 3-plate AP clutch is 200 mm and it is made of sintered metallic material, Moore informed me. The differential is an Aston Martin part.

Torsional rigidity measurements are performed by Prodrive. “You take an aluminium chassis and put a steel cage in it, and there are quite some interesting ways of fixing it because you can’t weld it,” Moore said. “That is all taken care of in how the roll cage is fixed to the chassis.”

Weight distribution for the Vantage is pretty close to 50/50 and, with drivers who weigh within one-half kilo of one another that distribution becomes more even. The engine is behind the front wheels and the transmission is in the back, so weight transfer is “pretty good,” Moore said. There is some ballast on the passenger side of the car to make certain the team makes its 1195-kilogram minimum weight.

While the Drayson Racing Aston Martin Vantage rides lower than the road car, the fuel tank is high, which can cause the car to get a bit lazy under full tank conditions, driver Jonny Cocker told me.

Wheel rates vary from 100-250 Newton’s/mm (this covers front and rear) and downforce at 150 mph is about 1900 pounds. “This is the first time we have had the proper sensors on the car, so we have got some figures to measure for ourselves,” Moore

Drayson Racing’s Aston Martin Vantage GT2 #87 car at speed



ASTON MARTIN VANTAGE – LM GT2

explained. “We can do some computations on drag; we have to do something to guesstimate what gearing we need.” The team brought a second gearbox with optional gearing but any change was a major operation.

Aero split from front to rear is 40/60 and the team is still trying to properly measure it. “We will make aero changes via the rear wing position, its angle, its height and the gurney flap to find the minimum downforce we can run to assess top speed versus aero in the corners. We are looking for the best balance because we are slower than the Porsche.

“This is a very balanced car,” said Cocker. “It has a front engine but if you see, the engine is almost behind the front axle so it is really a mid, front-engine car. Our car is strongest in high-speed corners and at corner exits with the torque that we have got. We have to carry a lot of brake into the apex and then just try to rotate the car on the brake using as little lock as possible, obviously,” he explained.

“Our car has really good traction and that allows us to use the engine power more. As a downside, we hit an aero wall, especially on a circuit like this with high-speed straights. We can get up to 250 km/h a lot quicker than the other LM GT2 cars but that is the point where the aero robs the power of our engine,” Cocker said.

There are seven positions on the Drayson Racing Aston Martin Vantage’s traction control with position #3 as “our regular usage,” Cocker told me. “We have wheel speed sensors and the traction control helps us conserve tyre wear in the dry and get power down in the wet. We expect,” he said, “to get two stints from the Michelin dry tyres.”

Because the engine is stronger than it had been during the 2008 ALMS campaign, Cocker feels it is “absolutely critical where we change gears. You really do feel when you drop off the fork. The engine is fairly lazy and quite torquey and you need to keep an eye on rpm and try and mind the shift lights.”

Cockpit comfort in this GT car has been an issue. “Last year we were seeing high 60-degrees C in the car, which is pretty crazy,” Cocker said. “We now have air conditioning and a lot of air flowing through the car, which was a bit of a problem last year. We have a huge amount of insulation, which is enough to keep the engine temperatures outside the cockpit. It is an aluminium bulkhead, which heats up very quickly. The manifolds are only 2-3 mm from the bulkhead right next to your feet!”

The team had to upgrade the pedals from the wooden blocks they were using (otherwise the pedals might have burned from the inherent heat of the car!). “Now it is more manageable so we are able to survive.” The brake balance can be adjusted front to rear but these are only small adjustments. “We might tweak it twice during a stint, maximum.”

Despite running well for much of the event – despite the brake and alternator woes – Drayson Racing had to abandon competition after nearly 22 hours. They completed 272 laps, made 23 pit stops and changed tyres 10 times. There was one triple stint on tyres and one where the team went 41 laps on a single set of Michelin medium rubber.

Electrical problems halted the Drayson team’s progress with slightly more than two hours to go, as Cocker was on the Mulsanne straight. “I was going full throttle and then there was no power in the car. It basically switched itself off so I coasted as far as I could.” Without radio communication at that point, Cocker spoke with Moore by cell phone “to make sure we got everything done exactly as needed. We did but it didn’t make any difference, unfortunately.” Drayson Racing was classified 11th in LM GT2 despite its DNF.

ASTON MARTIN VANTAGE SUPPLIERS

Dampers: Koni
Wheels: BBS
Oil: Mobil 1 (not a sponsor)
Cooling system: standard AM
Radiator: Prodrive
Discs and Calipers: Brembo
Pads: Project Mu
Clutch: AP
Gearbox: AM
Fuel cell: ATL

The changes drivers can effect within the cockpit amount to brake balance, power steering, engine map and traction control. The traction control has seven options, keyed in the pits. Although he would prefer to drive a car that does not have traction control, Enge understands that it is a good tool “so we don’t overdrive the tyres. If we go through the corner and we slide the front a little bit we are at the edge of the tyre.”

Prior to the 24-hour race, Howard-Chappell felt confident with both the downforce and drag on the trio of Aston Martin Racing entries. “All



The Aston Martin LM P1 rear wing endplate



George Howard-Chappell



ASTON MARTIN LM P1 SUPPLIERS

Dampers: Koni
Wheels: BBS
All lubricants: Gulf
Cooling system: AMR
Brakes: Brembo
Clutch: AP – 3 plate
Gearbox: Xtrac
Fuel cell: ATL

the work we've done on the aero development and simulation coupled with a test at Monza two weeks before coming here, were to set up the car for Le Mans. We are pretty happy with the results."

Aerodynamic changes applied for Le Mans include lower downforce and lower drag, Howard-Chappell told me. "We have gone to more conventional settings. The car tends from more or less neutral to a slight bit of understeer. Running the production V12 engine means we have slightly more rear weight bias on distribution and a higher centre of gravity than we would like. This is the compromise of running a production engine, but it is very important to Aston Martin because it is part of their marketing process."

Given the choice, Howard-Chappell would have preferred to call for a "30-hour test every two or three weeks but we don't have the money to do that." In preparation for Le Mans, the Aston Martin Racing team competed in the two LMS races prior to the 24-hour classic, at Barcelona and Spa. The results were encouraging: the team was victorious – in the absence of any diesel competition – at Barcelona, and took third place at Spa against the returning Peugeot diesel team.

The results at Le Mans exceeded last year's, thanks to a fairly faultless run for 24 hours by the Gulf-liveried #007 car driven by Enge, Jan Charouz and Stefan Mucke. The trio finished in fourth place overall – and in class – again the first petrol-powered race car to the chequered flag. There was only a single tyre puncture and a small problem with headlamps that spoilt the progress through 373 laps, nine behind the lead Peugeot.

The #008 car, after running as high as third, suffered a night



Side view of the Aston Martin LM P1 #008 finished 13th overall



The Jet Alliance Aston Martin LM GT1 #66 car finished 31st overall

JET ALLIANCE – LM GT1

Jet Alliance president Lukas Lichtner-Hoyer purchased an Aston Martin DBR9 LM GT1 racer from Aston Martin Racing/Prodrive in 2006 and updated it to 2008 specifications over the winter, incorporating the new ACO regulations.

"It has an F-spec engine," he told me. "There were no changes since 2008. Prodrive did the adaptations and worked on the aero for this high speed challenge in Le Mans.

"Prodrive is like a jukebox," Lichtner-Hoyer remarked. "Throw them money and they help you."

Having thrown them money, Jet Alliance's team received the services of three Aston Martin Racing/Prodrive engineers for the Le Mans classic: one engine builder, one telemetry expert and an engine engineer to help them through the race.

Running a package that mirrors the class-winning car from the last two years (BBS wheels/Michelin tyres, Brembo brakes), Jet Alliance came up with a car that has 48/52 weight distribution, a six-speed sequential Xtrac gearbox and Koni dampers. The engine is not a structural part of the car, Lichtner-Hoyer said.

In a depleted six-car LM GT1 field, the Jet Alliance Aston Martin DBR9 coupe grabbed the final podium spot. Admittedly succeeding through attrition, the blue car was 31st of 32 finishers, 88 laps behind the winning Peugeot.

collision with a GT car and ended up 13th overall while the #009 failed to finish after an accident in the 18th hour. As for the standard Charouz Lola Aston Martin, it soldiered on to 14th place, finishing on the same lap as #008.

"I have to say how impressed I have been with the reliability of the car," Enge said. "We had no real problems at all from start to finish, which is an amazing achievement for such a tough race. Team-mate Charouz recovered from a Thursday qualifying accident that necessitated a lengthy rebuild: "Conditions during the race were extremely tough, with several incidents and safety car periods, but we managed to get through it thanks to some excellent team work. Mucke noted: "Compared to last year our performance gap to the diesels is a bit smaller but the rules still do not allow us to compete on equal terms."

