



P O D I U M

A D V A N C E D T E C H N O L O G I E S

Race technical report

21R02 - Portimao

Main technical issues

1. Cockpit temperature
2. 2 Clutch failures: mechanical issues and launch auto-enabling needed
3. Rear caliper temperatures
4. Rear brake duct / engine cover scoop interference
5. Wiring loom issues: CAN2 instability, bent pin FIA wheel speed sensor
6. Main fuel pump failure
7. Rear view camera randomly working / display position + sun protection required
8. Steering wheel QD free-play
9. FCY over-speeding
10. Drivers manual incomplete
11. Battery not closing contactors during garage operations
12. FW flap detents not very strong
13. Tyres oven shutting down 3 times during race and before qualify
14. Rear end flexibility: still a lot of damage underneath
15. Driver fit
16. Engine map rotary failing
17. Backup floor transponder high temperature (zircoflex added, need a bit more)

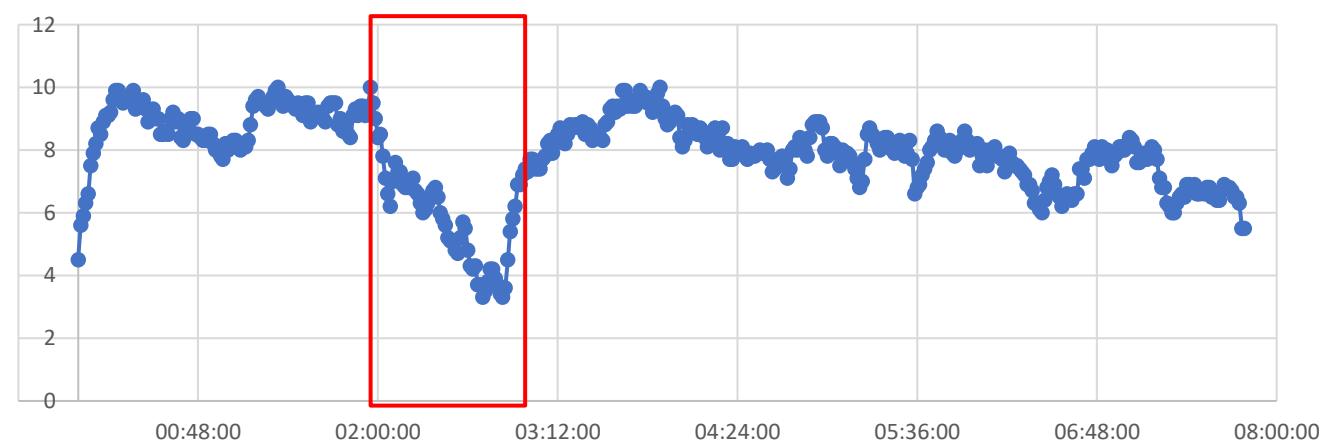
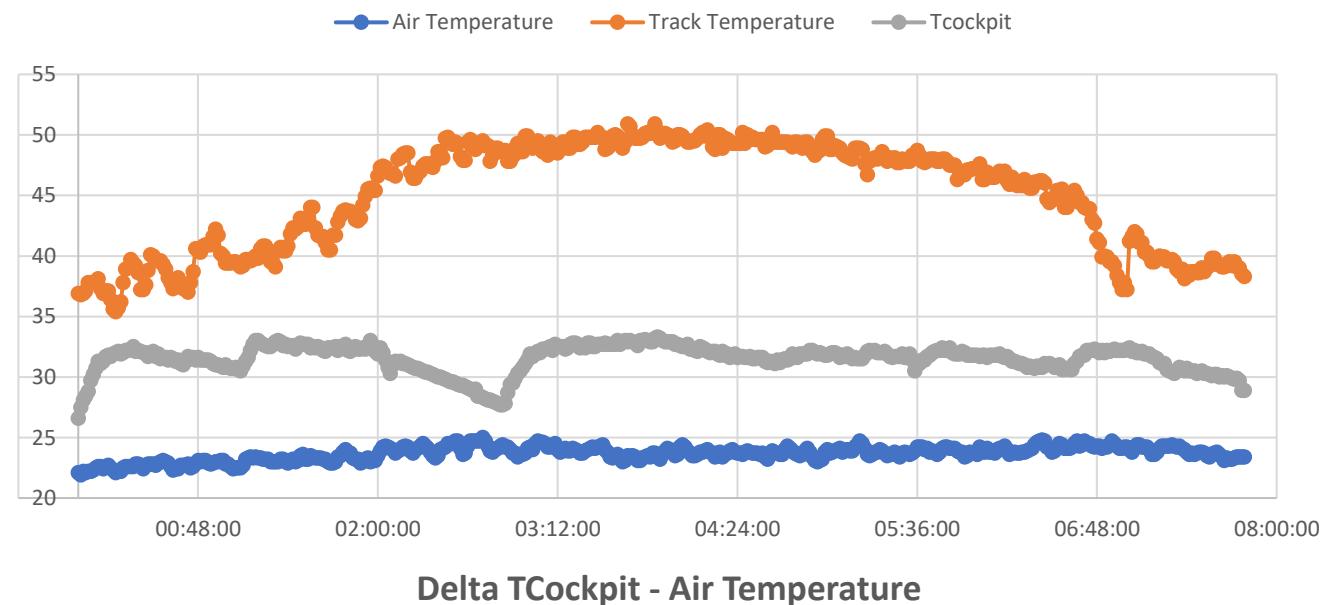
1. Cockpit temperature

Interventions at the track:

- Insulating material (Zircoflex type 2), added as established before the race.
- Taping behind the windscreen, to close the gap between mono and greenhouse added during FP
- Additional insulation on the sides of the monocoque added before Race
- Sensor bracket extended forward before Race
- Re-routing of bottom air outlet from the fan, to feed the roof outlet

Data from the race

Stop for repair



2. Clutch failures

1st Clutch failure (during FP2):

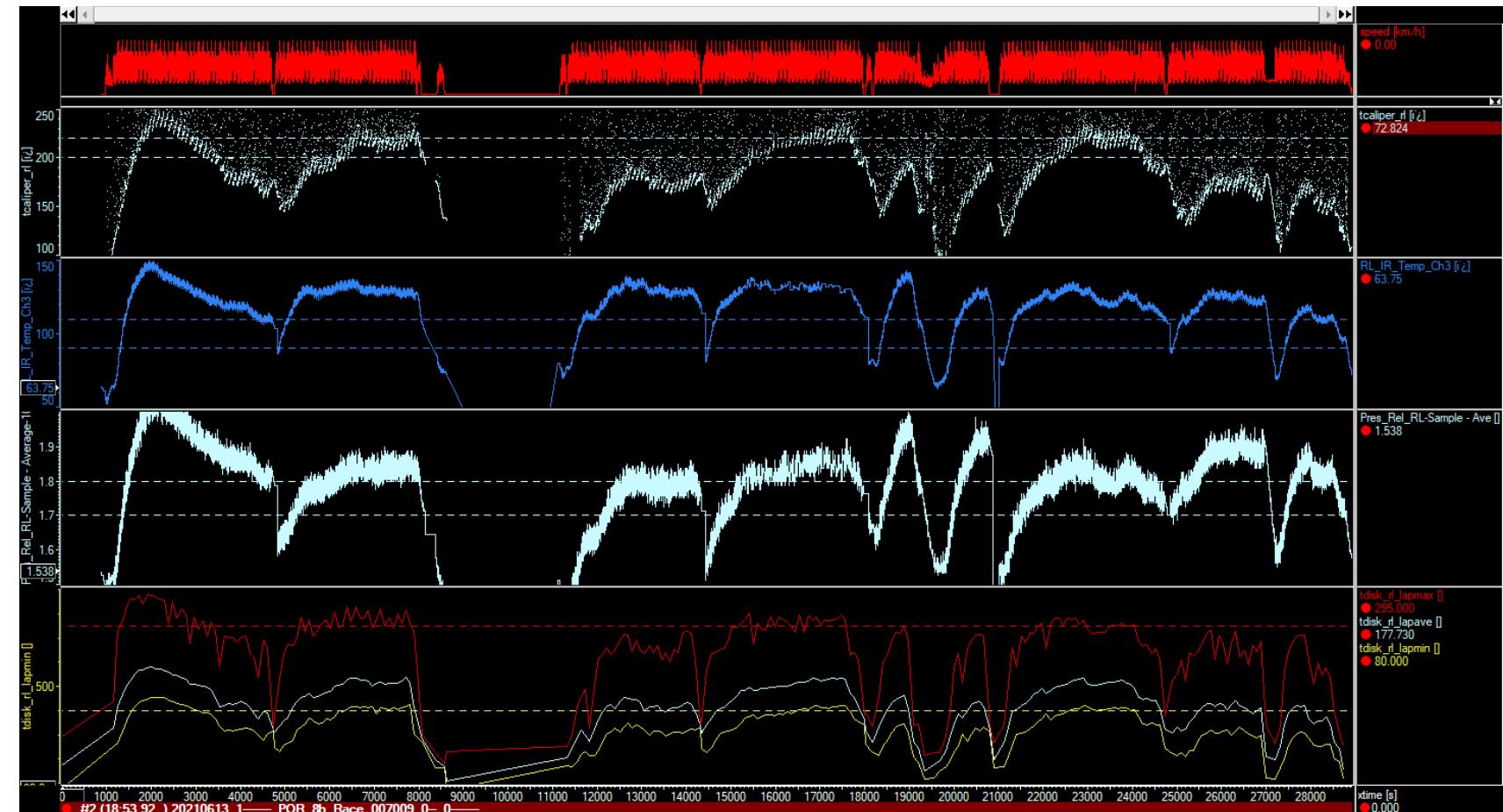
2nd Clutch failure (during race):

- 2 seconds misuse from the driver was sufficient to kill it
 - > material to be investigated
- Misuse due to launch control not enabled to limit engine rpm and torque
 - > possible solution automatic activation when $\text{max(vwheel)} < 10\text{km/h}$ for 3s
- Clutch replacement took about 30m, floor removal and refit + rear brakes bleed took another 30m
 - > need rear brake lines QD to speed up operations

3. Rear caliper temperatures

Rear calipers very hot, needed to run between 63-64 % of brake balance, against a 60 % used by the drivers during Free Practice

- Note correlation with tyre pressure and temperature
- Data only from rear left, rear right sensor not working
- Disc wear front and rear minimal, although a lot of carbon powder was found on front rims
- Rear disc temperature under control (lap max 750-800, lap min 400 °C)
- Rear tyre pressure often above target (1.75-1.80)
- Rear tyre temperature often above target (130°C, best window 90-110°C)
- Need seals rebuild and piston coating check



4. Rear brake duct / engine cover scoop



- Needed to dis-bond and glue again with different orientation, massive interference with 2.6° of rear static camber

[picture needed]

5. Wiring loom issues

Issue #1

The rear left FIA wheel speed sensor was not working, a bent pin on the connector of the bellhousing loom was found.

Production quality issue?

Needs to be added to a sensor checklist

Issue #2

CAN2 line was unstable, causing not shifting at driver request.

The problem became worse and worse during the race.

As a last chance the only accessible loom was replaced during the race (the one from firewall to bellhousing, [fixed on the engine](#)) and the problem was fixed.

Vibration issue, different milage specification or production quality issue? Change CAN cable spec? AV mounts?

Issue #3

Smart antenna communication dropped 2/3 times for a few seconds. From Marelli experience is related to vibration of the antenna itself.

Issue #4

Rear right wheel speed sensor slowly failing last 2 hours of the race. Power at wheel measurement compromised.

Issue #5

TV antenna position must be changed. Pointed out during scrutineering. Position to be agreed with all [TV system supplier, Marelli, FIA].

Issue #6 and #7

Rear damper travel sensor supply instability, RR caliper temperature sensor not working. RL unstable.

6. Fuel pump failure



Main fuel pump was found failed before FP1.

No clear explanation for this, needed to remove the engine to access the fuel pump.

1. Too much, unwanted, garage running time:

Warning for “fuel pump forced” was added on dashboard.

2. Implement home checklist could have spotted the issue before leaving for the track?

Check operation, start-up current and lap average current.

7. Rear view camera



1. Sun protection is needed, fabricated something at the track.
2. Often the display is black, seems randomly when the engine is running, not worked for most of the race.

Installation or product quality issue? Check with Michael Schlemmer.

3. The display is too far from the driver head, they cannot view clearly in it. Need to move it, new position TBD.
4. Any angle adjustment possible? Drivers comment “can only see the rear wing”.

8. Steering wheel QD free-play



Car to be checked if stickers for free play reduction were installed.

Add to car 709 job-list for Monza.

9. FCY over-speeding



Over-speeding on downhill.

Need testing for proper calibration at 80km/h.

10. Drivers manual incomplete



Need to add procedures in addition to the commands description as it is now.

11. Battery not closing contactors



3 times during pit garage operations the battery was not closing contactors when switching on the main switch on the dashboard.

Needed to unlock with smartphone app.

Another unlock possibility seem to be removing and re-fitting the signals connector on the battery body.

Need to find a more reliable solution / change battery.

12. FW flap detents not very strong



Need to check if front end of 709 had the last spec installed.

If yes, an improved solution would be useful.

The FWFL seem to not have moved on its own, but the detent strength seem to degrade relatively quickly.

FWFL adjuster still need the travel limiter spacers to be installed. Add to 708 and 709 job-list for Monza.

13. Tyres oven shutting down



It happed 3 times during the race, and also before the qualify.

Need to investigate from Joest side, and have a quick system to inform the tyre guy(s).

14. Rear end flexibility



Still a lot of damage underneath, with very minor wear under the main floor, suggesting that the rear end is going lower than the main floor.

1. Skid-blocks solution is already being implemented, but also a solution to stiffen the overall structure is needed.
2. Suggestion to change the Kevlar skids on the main floor for machined wood-like ones, as being done for the rear-end.
3. Need to organize the availability of a carbon repair guy at the race events.

15. Driver fit

From Richard Westbrook report:

Cockpit temperature could always be improved and will always help the driver but the biggest issue is air flow and not enough of it reaching the drivers head.

The two vents behind the steering wheel need to be re-routed and I would suggest one is blown to the sensor and the other is blown directly into the drivers helmet via a helmet attachment like everyone uses in IMSA.

Would really like to swap the wash and pit speed buttons as the wash button is in a priority area of the wheel and we never use it. Difficult to locate the pit speed button when you are not directly looking at the wheel especially somewhere like Portimao where it is a busy last sector

Would like a smaller brake pedal face for the “right foot braking” car. We all need it. Still not sure if we were overlapping the pedals in the race due to the foot rest location so I need Mateo to look through the data in the race to confirm this before we make any changes to the foot rest. Going forward it would be good to have an overlap alarm on the dash.

Main performance issues



1. Tyre pressure and temperature management
2. Traction control
3. Gearshift and blip calibration: dog-to-dog on short-shift and not blipping correctly with ALS
4. Tyre preparation: need the tyre watch system functional for Monza (**PC could get wet?, does it need to stay near the tents? screen share with REs?**)
5. Aero balance: U/S FP1, O/S FP3, ok in qualy and race (slightly O/S)
6. Ride height management, stiffness and damping considerations

Items for testing before Monza (IF)



1. Cockpit temperature
2. Automatic launch control enabling / clutch management during launch?
3. Launch with high grip
4. Anti-stall on launch configuration/driver procedure/display messages
5. FCY speed control
6. Blip on downshift with ALS
7. Traction control
8. Engine auto-kill for pitstop
9. Accelerator pedal maps
10. Gearbox cut times for short-shift
11. ALS/Acceleration transition
12. Power closed loop control improvement



P O D I U M

ADVANCED TECHNOLOGIES