Volume 1, Issue 2
June 2009

The Australasian Society for Motorsports Medicine and Rescue

Contents

Race control

Welcome to the second issue of the ASMMR newsletter. I hope it finds you all well with exciting motorsports events to look forward to. I hope also that the first issue of this newsletter was of use to the broad community.

This month, topics for discussion include race car fire suppression systems and an acknowledgement of the H1N1 “swine flu” virus and its recently appointed pandemic status.

In future editions I hope to be able to include invited articles and the beginnings of collected evidence. There may also be provisions for linking up project ideas with interested investigators.

Good luck

Matthew Mac Partlin

Rescue review

Fire during a race event is an immediate threat to both competitors and track officials. Depending upon circumstances, spectators and other track-based staff, such as photographers, may be involved. As noted in last months review, burns were historically the leading cause of driver mortality. This has changed over the years with improvements in vehicle safety design and race suit technology. Cars are constructed with firewalls built around significant flashpoints, fuel cells protecting the tank from the effects of an impact and, in certain categories, separation points that allow the engine, gearbox and rear suspension to break free of the chassis with significant impacts. Race suits, including glove and boot design, along with insulating under-layers, buy precious extra seconds that

allow competitors to disconnect themselves from communication and hydration lines and exit the vehicle with minimum injury.

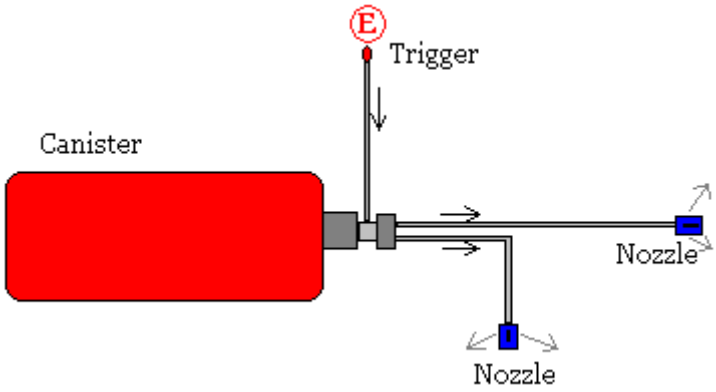
While prevention is certainly better than cure, once a fire has begun anything that widens the rescue window and assists with recovering an intact competitor is welcome. Fire suppression systems add to the above armamentarium of fire protection and it is worth understanding a bit about them as they are a common discussion point in rescue service safety briefings.

Fire suppression system requirements in Australia are covered by Schedule H of the CAMS 2009 Manual of Motor Sport. Any car involved in a speed event must be equipped with an accepted form of fire suppression device. The minimum level is a handheld dry powder extinguisher. Though the cheapest option, disadvantages include difficulty accessing the unit in a hurry and, despite the 25G load requirement for the bracket, the canister may become a 10 pound projectile in a collision.

Among the professional and semi-professional systems, 'plumbed-in' systems are typically required. The exact configuration differs between categories, but the model is relatively standard throughout.

Plumbed-in fire suppression systems are essentially composed of:

- a canister of a fire suppressing substance
- a triggering system to release the suppressant
- a system of tubing directing the suppressant to specific danger points
- specific nozzles for the suppressant used
- a gauge to display the quantity of suppressant in the canister



The fire suppressant

The two most commonly used suppressants are either an oxygen depleting gas (Halon 1211 and 1301, DuPonts FE-36) or a fire-suppressing, water-based foam. The foam leaves a residue, which the team mechanincs will complain about (ignoring the scorched earth cockpit) but is cheaper and more convenient for teams to recharge. The foam-water mix is contained in the main canister. A side canister with compressed CO2, when fired, causes the foam to expand through the tubing to the nozzles.

The oxygen depleteing gases are colourless, odourless and electrically neutral and require only a 5 – 8% concentration mix with air to suppress a fire. The gas does not displace oxygen, but rather reacts chemically to prevent combustion. Despite human safety claims, concerns remain regarding their use in enclosed cockpits, and Halon gases are not approved for use by CAMS.

The triggering system

Also known as the actuator, the triggering system is what releases the suppressant. Actuating mechanisms may be a simple as pulling a loop or pushing a button that is located at a convenient position for the driver on the dashboard. A second trigger is often located externally for closed cockpit cars to give ready access to rescuers. These triggers are typically demarcated by a red E on a white background, enclosed in a red circle. More complex actuators have been developed to account for the incapacitated driver. An example would included heat actuated suppression systems in American stock cars, that are set to fire well above race condition cabin temperatures, but well below the heat of a fire. Some modifications to the vehicle structure are often made to prevent false firing.

Whatever the actuator, firing the trigger results in the piercing of a soft metal cover by a metal spike which results in the discharge of the fire suppressant material.

The tubing

The tubing directs the suppressant to target areas. It may be aluminium, for easy shaping, or steel, for durability in impacts. There are three main targets of interest; the fuel cell, flash points in the engine bay and the cockpit. The first two target ignition sources and may completely suppress a fire. The third targets the driver and, while it provides additional escape time, it is associated with a bigger subsequent fire if the source is not also targeted. Often only two targets are selected, but all three may be targeted.

The nozzles

The nozzles are designed to give maximum coverage to the target area and are specific to the suppressant material; a slit for foam and three conical apertures for oxygen depleting gases, directed at the target.

Maintenance

Handheld dry-powder units have expiry dates and must be changed then, or if discharged. Plumbed-in units require a full inspection and canister replacement every 2 years.

Discharge failure

Causes include:

- Empty canister – failure to check guage
- Safety pin not removed – the trigger often has a safety pin in place to prevent accidental discharge during maintenance. This should be removed by the driver or team to arm the trigger prior to entering the track
- Severed trigger
- Battery powered actuators are required to have a power source separate from the main battery, which is often designed to come away in a collision. Failure to comply may result in discharge failure
- Ruptured tubing
- Crimped tubing
- Blocked nozzle; eg mud in an off-road vehicle

At the end of the day, if there is an immediate threat of fire and there is an at risk competitor, find the big red E and activate the trigger.

Recent race results

Formula One

Seven stages completed

Next event: 19 - 21 June, Silverstone

1 Jenson Button Brawn-Mercedes 61 2 Rubens Barrichello Brawn-Mercedes 35 3 Sebastian Vettel RBR-Renault 29 4 Mark Webber RBR-Renault 27.5 5 Jarno Trulli Toyota 19.5 6 Timo Glock Toyota 13 7 Nico Rosberg Williams-Toyota 11.5	8 Felipe Massa Ferrari 11 9 Fernando Alonso Renault 11 10 Kimi Räikkönen Ferrari 9 11 Lewis Hamilton McLaren-Mercedes 9 12 Nick Heidfeld BMW Sauber 6 13 Heikki Kovalainen McLaren-Mercedes 4 14 Sebastien Buemi STR-Ferrari 3	15 Robert Kubica BMW Sauber 2 16 Sebastien Bourdais STR-Ferrari 2 17 Giancarlo Fisichella Force India-Mercedes 0 18 Adrian Sutil Force India-Mercedes 0 19 Nelsinho Piquet Renault 0 20 Kazuki Nakajima Williams-Toyota 0

Hmmm … there's a definite pattern emerging.

World Rally Championship

Six stages completed

Next event this weekend, 10-14 June, Acropolis Rally, Greece

1. **S. LOEB 55** 2. M. HIRVONEN 38	7. M. WILSON 15 8. F. VILLAGRA 9	12. C. ATKINSON 4 13. C.

3. D. SORDO 31	9. M. OSTBERG 5	RAUTENBACH 3
4. H. SOLBERG 21	10. S. OGIER 5	14. K. AL-QASSIMI 3
5. P. SOLBERG 20	11. E. NOVIKOV 4	15. U. AAVA 1
6. J-M LATVALA 19		

V8 Supercars

Next event: 19 - 21 June, SKYCITY Triple Crown, Hidden Valley Raceway

1. Jamie Whincup 1044	11. Russell Ingall 572	21. Greg Murphy 387
2. Will Davison 948	12. Steven Richards 519	22. Todd Kelly 363
3. Steven Johnson 753	13. Cameron McConville 510	23. Tony D'Alberto 336
4. Garth Tander 723	14. Jason Richards 504	24. Michael Patrizi 324
5. Lee Holdsworth 723	15. Alex Davison 480	25. Jason Bargwanna 288
6. Craig Lowndes 675	16. Paul Dumbrell 462	26. Jack Perkins 282
7. Rick Kelly 627	17. Jason Bright 420	27. Marcus Marshall 273
8. Fabian Coulthard 606	18. Michael Caruso 417	28. Dale Wood 264
9. Shane Van Gisbergen 600	19. David Reynolds 414	29. Dean Fiore 231
10. Mark Winterbottom 573	20. James Courtney 389	30. Tim Slade 201

MotoGP

After 6 events

Next event: 27 June Assen, Netherlands

1 Casey STONER Ducati Marlboro Team 90	8 Loris CAPIROSSI Rizla Suzuki MotoGP 38	14 Mika KALLIO Pramac Racing 19
2 Jorge LORENZO Fiat Yamaha Team 86	9 Chris VERMEULEN Rizla Suzuki MotoGP 37	15 Nicky HAYDEN Ducati Marlboro Team 13
3 Valentino ROSSI Fiat	10 Randy DE PUNIET	16 Niccolo CANEPA

Yamaha Team 81 4 Dani PEDROSA Repsol Honda Team 57 5 Andrea DOVIZIOSO Repsol Honda Team 56 6 Marco MELANDRI Hayate Racing Team 48 7 Colin EDWARDS Monster Yamaha Tech3 45	LCR Honda MotoGP 34 11 James TOSELAND Monster Yamaha Tech 3 26 12 Toni ELIAS San Carlo Honda Gresini 23 13 Alex DE ANGELIS San Carlo Honda Gresini 21	Pramac Racing 10 17 Sete GIBERNAU Grupo Francisco Hernando 8 18 Yuki TAKAHASHI Scot Racing Team MotoGP 8

H1N1 update

The H1N1 "swine flu" was recently formally labelled a pandemic, meaning that there is documented evidence of human-to-human transmission in two or more different countries. The threat level is higher in Southern hemisphere countries, as they are coming into their standard flu season at the moment.

As yet, there is no vaccine and Australia has insufficient Tamiflu stocks to treat the entire population. Health measures have been upgraded to their highest level (Level 6) and the focus of management has been shifted from containment to harm reduction. This may yet include the cancellation of mass gathering events. To date, no major events have been called off and wait await developments.

In the meantime, standard infection control procedures continue to be promoted. There is relevant information in the latest edition of CAMS Speedread and on local government and WHO websites.

Caught by the cameras

A Le Mans airborne spectacular! Looks like it has been dropped from a 6th floor balcony.