



PERFORMANCE
MOTORSPORT



EVENT SUMMARY



PREDATOR RACE SUMMARY

KALGOORLIE DESERT RACE 2022

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PROFORMANCE MOTORSPORT HISTORY

Based in Perth Western Australia Performance has been manufacturing a range of drivetrain components for off road racing vehicles for more than 20 years.

Company Owner and Driver Scott Bryce has been competing in Off Road Racing since 1987 winning Dozens of Sand Drag Championships, Hill Climb Championships, State Championships and Club Championships in his innovative and unique vehicles.

Choosing to manufacture all his own components, Scott has always rocked tradition by developing and building his own vehicles with hand made components instead of purchasing components from USA like most competitors of fabrication shops.

Scott introduced the First 4WD Trophy Truck into Australia in 2004 before the concept was adopted and competitive in USA.

PREDATOR OVERVIEW

The predator V8 Buggy is a new 4X4 concept vehicle that once again rocks tradition with its 4WD concept.

50% lighter than his previous 4X4 trophy truck, the Predator V8 4X4 buggy has more wheel travel and much more technology than Scott's other vehicles.

Performance manufacture and sell the Predator Buggy as a FLAT PACK DIY kit globally with resellers in various locations around the world.

Performance CAD Design and Manufacture more than 90% of the components for each Predator Buggy In House on their very own CNC machines including:

- Differentials
- CV Joints
- Axles
- Electric Brakes
- Transfer Case
- Hubs
- Gears
- Suspension
- Steering Rack
- Chassis
- Brake Rotors
- A Arms



THREE SPRINGS RACE CANCELLED

Our team had hoped to take the predator to the Three Springs Off Road race in late September without her body panels, for her first on track competition, however due to flooding, the race was cancelled.

The Three Springs race was a Local Race with no television or live feed and would have been the perfect opportunity for some more “testing” before we entered a major national championship race.

With the Three Springs race cancelled, we only had one race in 2022 where we could test the Predator to in 2022 – the FINAL ROUND of the Australian Off Road Championship – Kalgoorlie Desert Race.

Taking the Predator to this HUGE and PUBLIC event with thousands of spectators, live stream, media crews, tv screens and helicopter footage meant we needed to have her body panels fitted before we could show her off to the “world”.

It was a scary thought to take our Prototype to a NATIONAL round and compete against 100 of the countries fastest and most competitive race cars with out more than a few hundred kms of testing on sand dunes and small farm properties.

PRE RACE PREPARATIONS

Knowing we needed body panels for the race (who wants to see a naked car driving around), we had a massive task ahead of us as body panels can take hundreds of hours of CAD DESIGN, CNC Mould Production, Mould Polishing, Panel Production, Panel Painting etc...

With a Top Ten Shootout held under lights on the Thursday Night, we needed to have a set of awesome Spot Lights and we worked closely with the Team at ULTRAVISION to get a set of bad ass 180W Australian Made LED Spot Lights fitted to the Predator, hoping to make it into the TOP TEN and have a dive in the dark !!

Leading up to the race, our team worked day and night for 2 solid weeks to CAD design and fabricate the “Polished” Stainless Steel body moulds. We rushed the moulds to the guys at “WA Race Car Fibreglass” a week before the race and they worked day and night for three solid days over a long weekend to fabricate the fiberglass body panels.

We collected the panels on a Sunday and commenced to fit the 45 individual body panel mounts to the chassis then paint the panels and apply all the stickers and logos, finishing the panels only a day before we needed to depart for the race.

We need to send a huge thanks to Steve Hall at CAD CUT for his assistance in rushing through the sheet metal for our body panel moulds and body panel mounts and another huge thank you to John at WA RACE CAR FIBREGLASS for working all weekend to get us our first set of prototype panels in time for the race.

Everything was on plan and on schedule for our team to depart Perth for the 700KM trip to Kalgoorlie at 6 am on Tuesday

LITHIUM BATTERY FAILURE

Monday Evening (12 hours before departure) we gave the chassis a wash down to remove all the fiberglass dust from trimming and fitting the panels, and then we began the task of polishing all the shiny painted panels, applying all the logos and stickers and bolted the panels onto the Predator.

Midnight Monday (6 hours before departure) we then finishing off the Rally Safe Wiring Loom installation however, when we went to load the predator into the trailer, the Lithium battery was dead (completely open circuit)

After investigation and discussions with the battery manufacturer,. It seems the Lithium battery is NOT WATERPROOF and was full of water, hence the internal BMS (Battery Monitoring System) had shorted out with the water and the battery was 100% dead.

SECOND LITHIUM BATTERY FAILURE

We rang around multiple battery shops on Tuesday morning trying to find alternate batteries with similar dimensions with no success and ended up purchasing Two (2) of the same lithium batteries that failed the night before due to water ingress.

After applying 10-20 layers of race tape over every point where water and dust could possibly enter the new Lithium battery and damage the sensitive internal electronic BMS (Battery monitoring system), we were absolutely shocked when the brand new battery would not start the Predator and would NOT accept a charge from a 240V Lithium Charger.

After more discussions with the battery manufacturer, it seems that the battery had been sitting on the shelf at the battery retailer for too long and the voltage had been allowed to drop sufficiently to permanently damage the sensitive lithium cells.

After applying more race tape over all the openings of the Third Lithium battery, we installed the battery and FINALLY, 12 hours after we were ready to leave, the Predator Fired and Came back to life.

Unfortunately, we now only had ONE battery and NO SPARE and no where in Kalgoorlie to purchase another should the ONLY one we have fail like the others have. We departed for the race and arrived in Kalgoorlie on Wednesday morning after an overnight stop over half way between Perth and Kalgoorlie.



DAY 1 RECONNISSANCE

We drove the 125km track in a Hire Car with a Hand Held GPS to create waypoints and record all the jumps and cautions on the track. It took our team more than 3 hours to drive the 125 km track in a Street Registered Hilux, with typical speeds of 20 kph over the bumps and whoops and average speed of only 40 KPH (it was a rough track indeed)

We transferred all the way points from our Handheld GPS into the Predator GPS and headed into town for the Show and Shine Street Party.

DAY 1 SHOW AND SHINE

The street party was amazing with 100 shiny and beautifully prepared race cars and 200 immaculate race bikes on display. It seemed half of the town had come to see all the cars and bikes and they were treated to an Extreme Freestyle Motocross Show where the riders performed backflips for the massive crowd.

We chose the street party to “unveil” the brand new body panels and we kept the predator under a cover until a live video where we showed the world our Predator with body panels for the first time.

The predator certainly caught loads of attention with hundreds of people coming over to see her up close and personal for the firsts time.

It was amazing to hear all the positive feedback about our Symetrical Components and the reduction of spare parts needed at a race. The reduction in spare parts was a HUGE topic of discussion with every race car driver that came to see our creation.

The stealth fighter sharp body lines and shiny purple panels were certainly a hit with the families and kids.

Not everyone loved our “stealth shaped” body panels and social media went crazy with a mixture of LOVE and HATE comments about our “very different” looking body shape.

We reminded all our social media fans, that just like a Trophy Truck or Class 1 buggy, there are hundreds of body shapes that can be fitted to the Predator and the body panel shape is 100% up to the customer.



DAY 2 PROLOGUE (QUALIFYING)

We left the start line excited that the Predator was finally on a race track, but nervous that the ENTIRE world was watching our new Prototype Vehicle on track for the first time via Live Feeds and Social Media.

As the 5 timing lights went out, we revved the engine and dropped the clutch, headed into the 125 KM prologue circuit snapping through four gears before even hitting the first corner.

The Predator was simply amazing on the bumps and whoops and at the incredible speeds we were travelling at we were looking forward to a top ten qualifying time so we could use our brand new ULTRAVISION 180W Spot Lights in the Top Ten Shoot out at night time.

ALTERNATOR FAULT

Unfortunately, after less than a minute into qualifying, we started seeing Low Battery Voltage Warning alarms on both the Motec 12" Dash and the Motec 7" Dash/Logger.

The low battery warning warnings continued every 30 seconds or so... Low voltage 11.0V, followed by 10.0V, then a 9.0V Warning then at 8.0V, the lithium battery internal BMS (Battery Monitoring System) shut the battery down and the Predator came to a gently rolling stop with two (2) choppers and film crew circling our crippled buggy.

It was heart breaking that after 18 months of hard work to design and CNC Machine more that 1400 individual components, that a battery was the cause of our DNF (did not finish) for the Prologue.



FLAT BATTERY AFTER 10 MINUTES?

Lithium Race Car Batteries are amazing and light weight and provide incredibly high cranking amps, however they have very little storage capacity and will only run our ignition, helmet blower, lights, fuel pumps and massive radiator fans for a few minutes, hence the battery went flat so quickly after the alternator failed and stopped charging the battery.

REASON FOR ALTERNATOR FAILURE

Instead of competing in the Top Ten Shootout and using our ULTRAVISION LED LIGHTS, we spend the night investigating the reason for the alternator failure.

Our investigation into the Alternator Fault showed that the alternator had OVERHEATED and the windings were “cooked” but why ?

While Lithium Race Car Batteries are light weight, and can provide Amazing Cranking AMPS, one disadvantage is that they will ALSO accept being charged at the same rate that they can be discharged.

This means that a Lithium Battery that is partially discharged can pull 100% of the alternator charging capacity at IDLE. A vehicle alternator is NOT designed to produce 100-200 amps at idle as the fan is only designed to cool the alternator at higher speeds, where the higher currents are more typically for lead acid batteries.

When we were sitting in the staging line for 30 minutes, we chose to turn the engine off and on only having the engine running when we needed to move the Predator buggy further along the line towards the starting line.

Looking at the data from the motec system, it is obvious that the lithium battery was discharged heavily every time we started the predator engine and the short running time each time we moved the vehicle was not sufficient to charge the lithium battery. As we progressed further towards the start line, we allowed the engine to run for longer durations, but only at idle and the lithium battery was pulling 150 amps from the alternator at idle with almost no cooling due to the low alternator fan speed.

By the time we left the starting line, the alternator had burned itself up and was no longer charging.

There are numerous videos and tech articles about Lithium Batteries pulling heavy currents at idle and damaging vehicle alternators.



DAY 3 SECTION ONE

The organizers seeded us in position 61 for the first section and armed with a replacement (Used) alternator and a fully charged Lithium battery, we chose to leave the engine running for the entire 30 minutes or so while we sat in the starting line of vehicles approaching the start line.

The timing lights went out once again and we again hit the gas pedal and started our 125 KM lap. The Predator was again simply amazing, with the 30 Inches of Travel soaking up all the bumps, jump and whoops like a Trophy Truck!!

With our 40,000 plus Social Media Fans watching all over the world, thousands of local spectators scattered around the track and the entire world watching on the live stream, we really wanted to finish each of the three 125 KM sections so we chose to drive at around 80% race pace.

We planned to maintain our "Safe" 80% pace until we entered the fastest and flattest section of the 125KM lap – the LAKE.

As we entered the lake section and saw dozens of vehicles, shade tents and hundreds of people scattered for 2-3 kms around this fast flat section.

With so many spectators and cameras, we decided to give the crowd 100% RACE SPEED around the lake, drifting the predator in 5th and 6th gear on the rev limiter, around the 4 long corners, pulling 198 KPH (124 MPH) while in a 4 wheel drift for what felt like 20-30 seconds on the longest corner.

The engine was strong and the 4X4 allowed us to DRIFT the predator around EVERY corner of the lake – it was simply amazing !!!

While the vehicle was amazing on the rough and whoops and slid well under 100% throttle, we started to feel one small issue on the slower corners and 80% cornering speeds – BODY ROLL !!



EXCESSIVE BODY ROLL

When we raced our 4X4 Trophy Truck, the vehicle weighed 2,200 Kgs (4,850 lbs) and the spring rates were very high. With such high spring rates and a very low roll center due to the A ARM front and rear, and super wide 13,5" tyres, our 4X4 TT cornered like a drift car with very little body roll.



With the predator being only 1,150 Kgs (2,530 lbs) (without fuel) the spring rates are very very soft (we actually use the stock Springs from a Can Am X3 4 seater) the amount of spring compression caused by rolling force during cornering were significantly higher than our previous 4X4 Truck.



The narrow Tensor Tires do exactly as we need, they BITE hard during acceleration just as we wanted them to do, but driving at only 80% pace (not sliding), we were not "drifting" around corners like we would in our TT and with the Tensor Tires biting instead of sliding and the unusual spring compression in the corners, we experienced way more body roll than we expected.

The commentators noticed it, the spectators noticed it, and we noticed it at slower speeds!

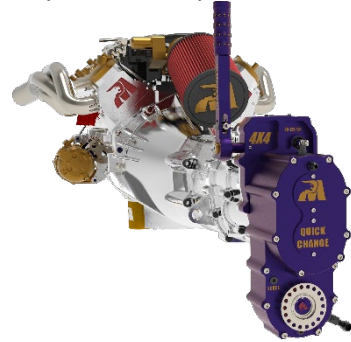
We have a few sway bar options for customers and we will have a lot less body roll next race.

HOT TRANSFER CASE

We have run Tilton Oil Pumps and Oil Coolers in our 4X4 TT for almost 10 years of competition with no issues.

Our TT and Predator use coolers for:

- Engine Oil
- Rear Differential
- Front Differential
- Transfer Case
- Holinger Transmission



The diffs and transfer cases each use a 12V Oil Pump to pull oil from the component and push it through a cooler. We are experimenting with a smaller, lighter oil pump for the Predator in an effort to save weight.

60 Kms into our 125KM lap, the transfer case oil pump began to stop intermittently and with no oil being sent up to the oil cooler the and the transfer case temperature rose above our warning temperature of 120 Degrees C

We were forced to reduce speed to about 40-50% of typical race speed for some of the remaining 60 kms of the Lap (driving like grandma going to church), watching the temp rise and fall as the oil pump would run for a few minutes then stop for a few minutes.

It was indeed frustrating to be forced to drive so slowly every time the Transfer Case temp went sky high, but we really wanted to finish so we pushed on, driving slow when we needed to cool the transfer case down!

SHOWING OFF TO HELICOPTERS

With only 3 kms left of our 125 km lap, we saw two choppers start filming our entry to the spectator area and we decided to once again give it full 100% for the cameras.

We ignored the flashing warning signals on the Motec Dash and had a blast screaming through the whoops at speed and slamming into the deep now heavily rutted corners

We were having so much fun until, we launched the Predator Sideways into a HUGE whoop on a sharp corner (SHOWING OFF ON CAMERA) and we bent a rear track rod (Strange indeed).

The bent track rod allowed the cv to pop the circlip off the end of the Axle, and we finished the last 1-2 kms with the right rear wheel toed out and the axle loose, flopping around for all to see!

Lesson Learned - Don't show off when the choppers are filming you

Anyway, we finished the First Section of Day 3 – what a fantastic day we all had !!



BENT TRACK ROD – WHY ?

Our crew kept asking each other why the track rod had bent so easily, and then like a light bulb going off, we all remembered that we had rolled the predator during a “test session” 4 weeks earlier and bent the right rear upper arm

The crew had replaced the Upper Rear Arm but we never noticed a damaged/bent track rod after the roll.

The track rod was obviously damaged weeks before the KDR event and would never have bent in a corner like it did if the rod had not been previously bent in a roll over weeks before !

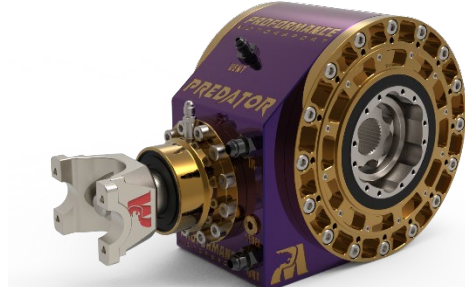


OVERNIGHT REPAIRS

One of the features of the Predator is that each corner of the vehicle is 100% symmetrical with all the other corners.

We only need to carry one component in our spare parts box to fix any corner of the vehicle:

- One Spare Shock
- One Spare Axle
- One Spare Upper Arm
- One Spare Lower Arm
- One Spare Inner CV
- One Spare Outer CV
- One Spare Brake Caliper/Rotor
- One Spare Hub



The crew installed a brand new track rod and a new outer CV joint as we had all the spares on the trailer (being symmetrical, we had all the spares we needed on hand) and a new Oil Cooler Pump.



DAY 4 SECTION TWO

The start of Section Two was embarrassing!

Our owner and driver Scott Bryce preaches to our customers not to perform 7000 RPM Clutch Launches on any of our Diffs, being the Dana 30, DANA 44, Dana 60 or the monster DANA 80.

Unfortunately, with all the media watching, the helicopters flying over head, Scott stalled the Predator on the start line, and in a panic over revved the engine on the second attempt and blew the rear diff on the start line doing a 7000 RPM LAUNCH – exactly what he tells everyone else not to do !

Scott was forced to drive the Predator using only Front Wheel Drive knowing we could install a new diff for section three.

The crew installed a new Diff ready for the start of section Three



DAY 4 SECTION THREE

Any new Gearbox or Differential needs to be run in driving at light loads, allowing the component to be heated up and cooled down for a few hundred kms. After a few hundred kms, the oil is typically changed and the diff is ready for full load use.

You cannot install a brand new differential gear set into a car or 4X4 and then pull a caravan for 200 Kms – it will explode – the new diff gears needs to be “run in”

With a brand new diff that had not been run in, we took off from the start finish line very gently, and drove at 50-60% pace hoping not to damage the diff.

We are sure that the competitors and spectators were looking forward to another clutch drop off the start line and a snapping through the gears to the first corner, but we drove off nice and easy hoping to run in the gears for the first few kms then increase speed after perhaps 10 kms.

Unfortunately even at 50-60% pace protecting the new diff, desert racing is EXTREMELY hard on components and the rear diff oil temp immediately began to rise above acceptable limits, indicating the rear diff pump was not pushing oil to the cooler, in the same manner that the transfer case failed the day before.

With the oil pump not pushing oil to the cooler and the rear diff getting extremely hot, we made the decision to retire the Predator and pull up at a checkpoint that was near an access track that would allow us to drive back to the pits under escort at the completion of the race.

We thought it was better to stop in the comfortable shade of a checkpoint and be able to drive the predator home than continue and possibly damage the rear diff to the point we cannot drive her back home and would need to be recovered/towed 120kms back to the pits.

At the completion of section three, we drove the Predator the entire way back at low speeds to the Pits and into our trailer without assistance or towing.

DAY 4 TROPHY PRESENTATION

We may not have won the event outright or even finished all the sections, but we walked away with smiles all round and a couple of trophies to remind us of this awesome event !!



FRONT PAGE NEWS

The Predator made it onto the Front page of the Kalgoorlie Miner Newspaper – Exciting indeed !

Kalgoorlie Miner

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Pictures: Carwyn Monck



ON CLOUD NINE

Brent Johnson and Steven Hosking kick up a cloud of red dust as they race around the 125km course during the 2022 Kalgoorlie Desert Race on Saturday, while, inset, Scott Bryce and Aleen Haddad get airborne.

MORE DESERT RACE PICTURES IN SPORT



New Super Pit fleet drives surge

NEIL WATKINSON

Northern Star's new open-pit truck fleet is fully commissioned and helping the company achieve its material movement targets at the Super Pit.

The company told the ASX last week commissioning of the new Caterpillar 793F haul trucks was completed in the June quarter, and combined with more operator personnel becoming available allowed KCGM to increase open-pit movements in the September quarter by 29 per cent compared to June.

Northern Star said the 20.5 million tonnes moved equated to an annualised rate of 82Mtpa, with the month of September achieving an annualised rate of 97Mtpa.

The company said these rates were firmly in its target range of 80Mtpa-100Mtpa until the 2026 financial year — a target Northern Star chief operating officer Simon Jessop said was a “strategic goal”.

The Kalgoorlie Miner reported in August last year that 39 Caterpillar 793F haul trucks would be

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Golden action at radio auction

CARWYN MONCK

Kalgoorlie-Boulder residents including beneficiaries and sponsors celebrated the launch of the Rotary Club of Boulder's 37th annual online radio auction on Friday.

The Murphy Boyden launch party was hosted at Kalgoorlie Overland Motel and gave attendees the chance to preview this year's auction items before bidding went live at 8pm.

Online radio auction committee chair Stuart Fleming told the Kalgoorlie Miner last week the Rotary club had received strong support from the local mining and business community.

“We've got some gold nuggets that have been donated this year and an amazing donation from JLK Artistry, Julianne has done a great job in making a ring and a pendant,” he said.

“We've got tickets to some events in Perth — I think Michael Buble tickets, vouchers for online stuff and plenty of service vouchers from local vendors.

“We are getting some

CONTINUED PAGE 4



SUMMARY

Our crew are so proud of the Predator and the way it handles the bumps and whoops – its light, fast and fun to drive.

It slides well under full loads, however when driven lightly and the tires grip, we are experiencing too much body roll – time to fit those sway bars we have sitting ready to go !

Weight saving is critical for the Predator and by using non traditional components we have managed to reduce the weight of our Predator by 50% compared to our previous 4X4 Trophy Truck, however some of the “alternative” light weight components we have purchased for our prototype have been the cause of another component failing we will replace these items with an alternative component before our next competition/race including:

- Oil Pumps
- Lithium Battery

What a race – what a weekend – a huge thanks to the organizers of the event – it was like being at DAKAR for 4 days – simply amazing and well run event !