



ISSUE 39

Feb/Mar/Apr

2003



TDR REVIEW

TDR Review is a review of an article or evaluation of a product for your Turbo Diesel.

REMINISCE: LAND SPEED RECORD STORIES

re-mi-nisce \rem' - ə - nis' \ v.: to recollect and tell of past experiences.

Monday, October 21, started like any other typical Monday: back to the old routine. A quick listen to the answering machine and a glance at e-mail both yielded some exciting news. Gale Banks and his Project Sidewinder team had set a new land speed record at the 2002 World of Speed.

Notice of the Banks record was cause for reflection. I thought back to my one and only trip to Bonneville in the fall of 1996 with a group from Cummins ReCon. Rather than take the audience through my recollection of those "glory days," I'll refer you to Issue 15, pages 44 through 49. I'm hesitant to tell you how many times I've reread and relived that adventure.

For this issue of the magazine let's focus on the present and on stories of two new land speed holders as well as members of the over 200 mph club, the Chassis Engineering team, and the Banks Sidewinder team.

The Category and Class

Part of the challenge and allure of Bonneville is declaring the class in which your diesel will compete. From my past experience at Bonneville with the production 2500 series truck, we chose the category PS—production/supercharged. This category is intended for coupes, sedans and pickups that meet the requirements of the class and are equipped with factory supercharger systems. With the engine's displacement of 359 cubic inches, our engine class was C. At the time of the successful record run (fall of '96) the PS category was open to gasoline as well as diesel fuel. The PS class was changed to gasoline only in the late 90s and the Cummins ReCon record was erased. Why waste time reminiscing?

Part of the challenge and allure of Bonneville is declaring the class in which you will compete.

Chassis Engineering's "Nuclear Banana" shares the same 359 cubic inch displacement as any other Cummins B-series engine and thus is in a C engine class. Its category is DS for Diesel Streamliner. Steve Mallicoat has penned a report on the Chassis Engineering team starting on page 90.



The Chassis Engineering team.

The Banks Sidewinder has the same displacement, 359 cubic inches, and will be in a C engine class. Its category is DT for Diesel Truck and the brief description from the rules book reads as follows: "This category is intended to represent typical diesel pickup trucks which may be of either American or foreign manufacture. This category is limited up to and including one-ton vehicles. The body must remain unaltered in height, width and contour, with all stock panels mounted in original relationship to each other." Scott Dalgleish has a report on the Banks record starting on page 92.



Banks' Sidewinder at Bonneville.

TDR Review . . . Continued

ENGINEERING: BANKS RUNS FOR THE RECORDS By Scott Dalgleish

en-gi-neer-ing ('en-jə-'nir-ing) *n*: the practical use of science in industry, building and manufacturing.

Driving out and onto the Bonneville Salt Flats one imagines suddenly being placed on a polar ice cap. The landscape is white like frozen snow, with a crunch underfoot to match. Off in the distance the mountains rise above the valley floor. However, you hear the rumble of a highly modified blown and injected V8 engine come to life warming up for its next run and you realize you are in a location like no other on Earth. The allure of Bonneville raises the primal instincts in most, and becomes an addiction for others.

Racing for a land speed record is often a game of "hurry up and wait" not easily endured. The weather was more than kind for this year's October event. In August the heat draws the very life from your lungs, but come fall season (with the rains permitting) and the cool still air that racers love most can prevail. So it was to be for the 2003 World of Speed.

The Banks team arrived Thursday, and in keeping with the traditional Clessie Cummins promotional spirit, a highly modified Dodge Dakota truck with a Cummins HPCR 5.9 liter engine drove in under its own power pulling its support trailer. However, this was no ordinary Dakota, and certainly no ordinary HPCR engine. Mr. Cummins would have been proud. It takes more than a little engineering to obtain over 700 dyno-proven horsepower from a 5.9 liter diesel engine, even if your name is Gale Banks. Based on the popular B-series High Output format, the race engine incorporates many new technologies, including a Holset variable geometry (VG) turbocharger to provide over 50 lbs. of boost and cooling the same with a cold water circulating heat exchanger. You've got to run and tune the beast and there aren't any factory computers available. "No problem, we developed our own," says Banks Engineering's Gale Banks, whose custom software packages are sold under the trade name "OttoMind."



In Cummins racing tradition . . . the truck towed its support trailer with Gale at the wheel.

And develop he did. Even the factory representatives from both Cummins and Holset were taken back with the results obtained by the team at Banks Engineering. But the engine is just half of the story. The Dodge Dakota, which appears stock and is in fact street legal (currently registered in California), contains one of the finest examples of custom chassis work displayed at the Salt Flats this year. Hats-off to Sheldon Tackett, chassis fabricator and crew chief. This truck (project named Sidewinder) has it all: a four-link, quick-change rear end; tubular "A" arms with adjustable coil-over shocks; and power rack-and-pinion steering. And if the front and rear 13" six-piston Wildwood brakes need a little assistance slowing the Sidewinder, just pull the parachute.

Engineering Excellence

The truck is a model of engineering excellence. The truck was developed not only for the land speed record attempt, but also to compete in future street, drag and road course events. The team at Banks also did an exact job of documenting the components and sub-systems that went into the Sidewinder project. As an example the following is from the Banks website (www.bankspower.com) and discusses turbocharger control electronics.

"Electronic control coupled with variable geometry within the turbocharger provides the means to optimize boost and turbo shaft speed for maximum turbo diesel performance.

"Optimum boost and turbocharger shaft speed are crucial for peak performance and throttle response. The variable geometry technology of the Holset HY55 turbocharger now allows these parameters to be controlled. Since the turbocharger is capable of such sudden changes in shaft speed, only electronic control offers the quick response time necessary to vary the turbine inlet geometry to maintain peak boost without encountering a dangerous turbocharger overspeed condition, which could result in a failure. The Banks VGT controller automatically controls the variable geometry of the turbocharger for optimum boost pressure



The variable ring nozzle in the Holset HY55 turbocharger must be carefully controlled to prevent unintentional overspeed operation of the turbo. Only electronic controls can respond with the necessary speed.

TDR Review Continued

The team lined up on the east end of the track on Saturday morning, October 19, to make yet another FIA run, this time to break the 200 mph barrier. With the track cleared, the heat exchanger full of ice, and the starter's final check to make sure Don was properly secured, the Cummins powered Sidewinder quietly, yet authoritatively, sailed down the track at 216.034 mph. The return run, which appeared just as effortless, was clocked at 218.539 combined for an average of 217.314 mph, breaking the previous FIA record they had set just the day before! Don Alexander, now with just four Bonneville runs in his racing career of 30 years, had become a life member of the Bonneville 200 mph club, an honor that many pursue their entire racing lives.

But the team from Banks wasn't finished just yet. The same afternoon, during an effort to capture a BNI record for the world's fastest pickup (diesel or gas), the 5.9 Cummins diesel cranked a 217.212 mph (unofficial top speed 222.139), to be backed up with a run the next day of 209.954. The resulting average speed record was 213.583. It is interesting to note that the "slow" 209.954 mph run through the speed traps was done while coasting. Part way through the run the pinion gear had twisted off.

The Sidewinder had successfully completed numerous runs at the Salt Flats and earned records for the BNI Class C/DT at 217.314 and BNI Class "Any Pickup" at 213.583. Ask anyone in attendance at Bonneville and they'll tell you that it takes years and years of preparation, often frustration, and re-attempts to accomplish a single class record. The Banks group and project Sidewinder were able to accomplish their goals in their first attempt. Congratulations to the Banks Sidewinder team.

Engineering: the practical use of science in industry, building, and manufacturing! We'll look for more examples of Banks' engineering prowess in future land speed records and competitive events where the Sidewinder competes.

Banks Power, engineering excellence!

Scott Dalglish



The Banks Sidewinder at the SEMA show.



The man who crafted the current LSR record holder . . . Sheldon Tackett.



Just a fine haze . . .
"No smoke required for the record holder Banks Sidewinder."



A look at the truck while at Banks' race shop.