

REBUILD . RELIVE . REDISCOVER

REWIND

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Words by Eli Solomon — Photos by Paul Khoo © Eli Solomon

UNIVERSITY OF LE MANS

While podium contenders Audi and Peugeot were strategising for the season finale of the Six-Hour Intercontinental Le Mans Cup at the Zhuhai International Circuit in China, a group of university students were frantically rebuilding their Le Mans Prototype race car after an off-track excursion in practice.



Worried faces were evident in the pit garage and it was only Thursday practice in Zhuhai. Tokai University Professor Yoshimasa Hayashi, 72, paced up and down the garage waiting for news to filter back from the circuit. The mechanics, most of whom looked underaged, understood what they were up against. This was the deep end, the real world outside the confines of university lecture halls, and they had barely settled down after scrutineering.

A dismal-looking LMP1 Oreca was wheeled back into the garage some time later bearing evidence of an off-track excursion in smog and rain that ripped out one side of the car. Backs against the wall, the clock rapidly ticking away for the final six-hour ILMC race of the year, the lads were in for an all-nighter to rebuild the mangled wreck. The odds now were heavily stacked against them making the grid for qualifying. Was their race over before it had even begun?

Standing back, we gave them a wide berth as the garage was turned into a multi-bed operating theatre for bodywork and torn suspension. Behind the pit garage, there was frantic activity. Few outsiders have the privilege of witnessing the commotion that takes place behind closed doors. Never count a team out, and certainly not one led by Professor Hayashi. What would it take to have the car rebuilt in time for qualifying?

CAMARADERIE

An American, a local resident who runs a machine shop at the circuit, darts off with one of the broken wishbones. Frenchman Lucien Monté, here with the Hope Polevision Racing Oreca Formula Le Mans entry, steps forward to offer assistance. There are no Gallic shrugs and no promises made, but there is calm about the way Monté goes about trying to ensure that Hayashi's LMP1 makes the cut for qualifying.

Monté, familiar with Zhuhai because of his close association with the single-seater Formula Renault program in China, sighs. "The Japanese want to take so many risks in the wet... They come to ask if we have any wishbone arms, but ours are not the same. Our Courage-Oreca is in a different category. I know some people doing carbon, doing welding, they are local. I introduce them to the Japanese. No problem getting the car ready tomorrow. Sometimes at Le Mans, you have two or three constructors, sometimes eleven constructors. Who are the others? Only private teams. We are a private team..." The camaraderie here impresses us. I am unaccustomed to seeing such sportsmanship at any level of competitive motor racing outside of historic motor racing.



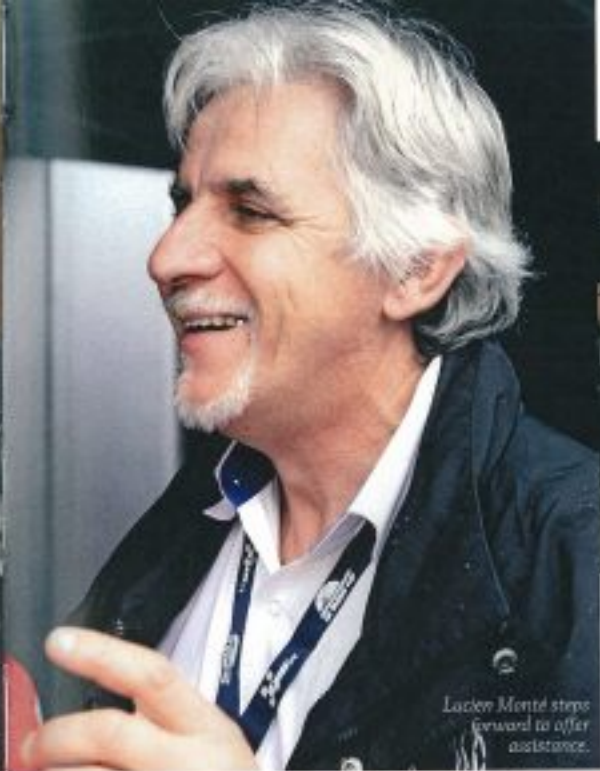
Professor Hayashi emphasizing the importance of teamwork.



YUKI Takahara was present to assist with engine work.



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Lucien Monté steps forward to offer assistance.



The rebuild begins.



There is no better learning environment for them than to be working in a race paddock.

LOFTY AMBITIONS

Under the stewardship of Professor Hayashi, a student team from Tokai University first fielded a car for the Le Mans 24 Hours race in 2008. It was the first time that a university team had attempted racing at this level. While most universities ran low-cost mechanical engineering departments catering for Formula SAE (where the university enters a self-built single-seater marginally larger than a kart and is judged on a series of tests), Tokai's Institute of Science and Technology was ahead of the game. The team entered a Courage-Oreca LC70-YGK in the Le Mans Prototype LMP1 class. They returned unclassified, retiring before the halfway stage due to a gearbox problem.

Hayashi's involvement with motor sports and endurance racing dates back even earlier. He was part of the Works Nissan Le Mans team that raced between 1988 and 1990, and again with Nissan at the IMSA Daytona races in the United States in 1992. Hayashi is credited as the architect of Nissan's late eighties and early nineties Group C engines, from which the present-day privately-produced YGK engine can trace its DNA.

Putting together a team of students for an international endurance race at this level is commendable, and expensive. We could not get to the bottom of the source of funding for their endeavour. There are indications of involvement from Nidec, the world's largest motor-drive maker, and a number of other Japanese concerns including engine supplier YGK. Their problems this weekend, though, were not about cheque books.



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ZEN AND THE ART OF REBUILDING A RACE CAR

Six lecturers monitor the activity in the pits providing little support to the students. Along with Hayashi, YGK has their engineer Yuji Takahara present to assist with data acquisition and other engine work. Takahara explained that their unrestricted turbocharged engine puts out between 940 bhp and 1000 bhp, but with mandatory restrictors, engine output is reduced to around 600 bhp. Hayashi reveals that the handsome camshaft covers were inspired by one of his earlier designs, the Nissan VRH35Z, one of the most powerful engines ever to run at Le Mans. The professor remains as chief technical advisor for YGK's engines.

What is important to the team now is completing the rebuild for the grueling six-hour race on Sunday when the forecast is for dry weather. With pragmatic Japanese meticulousness, each member of the student crew buckled down to his specific task with frenzied urgency as the team pieced back the front splitters and bodywork, painted bits, checked for damage to the tub, and ensured that the wishbones were properly welded and ground to look respectable. Reliability is not the issue for this conventional power-plant, nor is the chassis design from the Courage-

purchased tub; both have the reputation of being fundamentally sound.

THE WINNING FORMULA

This is top level motor sports with the professionals. Most of the students here have had exposure in the Formula SAE program. There is no better learning environment for them than to be working in a race paddock. These lads may not all end up working in motor sports, but the valuable experience gained will stand them in good stead when they find their respective roles in the automobile industry, be it in Toyota or Nissan.

Why Le Mans? "Three reasons," Hayashi replies, "The first is that Le Mans has the highest technical requirement in motor sport. I chose Le Mans as it is the biggest ideal of making a car and going racing. The third is the motor sport culture it infuses." Putting a team of third and fourth-year university students together into a project such as this is an admirable effort of empowering students with real world responsibilities. And, with tenacity and some help, they pulled through with flying colours. The team made the cut in qualifying in the wet and completed the race on Sunday in a respectable position. Mission accomplished. ■



YOSHIMASA HAYASHI, DR. ENG.

AND THE LURE OF ENDURANCE RACING

The Tokai University Le Mans project is the brainchild of University Professor Yoshimasa Hayashi, a former automotive engineer with Nissan Motor and author of the Japanese book *To Make the World's Best Race Car*. After a long career with Nissan, he returned to academia at Tokai University, a college focused particularly on the sciences and engineering. Hayashi's unusual approach to teaching saw him revamp Tokai University's engineering curriculum in 2001, integrating the objective of building an endurance race car with a real-world project.

An engine-development engineer at heart, Hayashi has been a part of Japanese motor sport for decades. He began his 32-year career with Nissan in 1962, and went on to become Director of the Sporting Vehicle Development Centre where he worked mainly on the company's concept cars. Later, overseeing Nissan's prototype racing program, his team won the domestic All Japan Sports Prototype Car Endurance Championship for three consecutive years between 1990 and 1992, overhauling Porsche dominance.

While the language barrier was an impediment when *Rewind* caught up with the professor at the track, it was no obstacle to the language of enthusiasm demonstrated by him, and his students, during the race weekend. That the Japanese had a translator helped.

RW: WHAT IS YOUR INTEREST IN MOTOR SPORT?

YH: I attended Le Mans in 1988, 1989,



1990...with Nissan. I was the General Manager for Nissan motor sports department for sports car racing. I have experience with the Daytona entry with Nismo in 1992. We finished on the podium.

RW: WHERE DOES THE TOKAI UNIVERSITY RACE PROGRAM DERIVE SUPPORT FROM?

YH: The Tokai University LMP1 entry...there was no technical support from Courage [builder of the monocoque tub for the team's race car]. We bought the chassis from them and developed it. The students designed the Le Mans car themselves. [The question on financial support were politely left unanswered]

RW: HOW DID THE IDEA OF FIELDING A STUDENT TEAM IN ENDURANCE RACING EVOLVE?

YH: Starting in 2001, my laboratory has been involved in the Le Mans Project, developing racing engines and a working race car...Over 150 students have participated in the project so far - all of them passionate about the ultimate goal of entering a car in the Le Mans endurance race. In 2008, the dream finally came true. We entered a team but did not finish the 24 hours due to a technical problem with the car.

RW: WHAT ARE THE OBSTACLES AND CHALLENGES?

YH: There are many people of the opinion that our project should be for education and research purposes only... I believe, however, that learning to design a racing engine and a race car in the classroom, and learning by actually building, are as different as night and day.

Unlike corporations, students come and go every year. In an ordinary research lab environment, a student completes a year in the lab, gaining one year of experience. The next year, they are replaced by another student, resetting the experience meter back to zero. Our challenge was to maintain the high level of our research even when team members came and went. We solved this problem by ensuring each student made a full record of his activities in the project so that the next batch of students has something to refer to.

RW: WHY IS IT IMPORTANT FOR YOUR STUDENTS TO BE INVOLVED IN ENDURANCE RACING?

YH: I chose Le Mans because it is a 24-hour endurance race [his 2008 Le Mans attempt]...teamwork is of the utmost importance. Everyone has to work together and remain disciplined. The technological aspect is also important...There are 86,400 seconds in 24 hours. Students can't break their concentration for even one of those seconds. I want them to fully appreciate the value of each and every second. The Intercontinental Le Mans race is run to six hours and is good preparation for us. ■

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