

# Never say



**MIKE NORMAN** recounts a story from 15 years ago when he set out to be the all-conquering team of the day. It was an epic journey where many would have given up, but not Mike. However, it did leave some things unfinished, as he recounts.

“I wanted a win in that class and I was going to stop at nothing – short of cheating – to get it”

# Never

Coming off the 1994 racing season with the Willow Springs Motorcycle Club, Robbie Dowie and I had just wrapped up the 600cc Superstock Championship, setting a new lap record in the process. It was Robbie's first championship as a rider and we were hungry for another in 1995. Honda had just updated its CBR600 to the F-3 with the inclusion of a ram airbox and some other minor performance upgrades. We still had the older CBR600F-2 variant, but it was well tuned. We were set to chase the 650cc Superbike Class Championship with that bike. That was until Lance Holst and Kaz Yoshima showed up with the *Sport Rider* magazine CBR600F-3.

Being a lead journalist for *Sport Rider* magazine, Lance was able to pool together a very nice machine and teamed up with the infamous Mr Yoshima to build, tune and offer trackside support for him. Kaz had been building Superbike engines since a time I was still in diapers. His legacy goes back to CB550s and CB750s and many other bikes of that era. However, he had no problems building an outstanding machine with the latest equipment at hand. The *Sport Rider* team was amazing together. If memory recalls, Lance took the Kaz Yoshima-prepared CBR600F-3 to every victory, with Robbie usually close in trail. It seemed as though there was no stopping them. Or, if there was, we had a huge task in front of us.

Frustrated, I put our CBR600F-2 on the lift at the shop and stared at every component on that bike. I read the rule book cover to cover multiple times trying to interpret the rules in every favourable way possible. I wanted a win in that class and I was going to stop at nothing – short of cheating – to get it. I set out to build the ultimate 650cc Superbike from the tyres up. The bike was stripped to the bare frame and I scrutinised every single part on the bike. If it didn't need to be there, it was gone. If it was too heavy, it was replaced with something lighter. If it was too weak, I replaced it with something stronger. The bike was to be reborn into a prominent racing machine that had nothing held back. I dug out and spent my life savings on that machine.

I found cracks in the frame. So, I had them welded and the frame strengthened in those areas. I chopped off the massive steel sub-frame and replaced it with an aluminium one, saving nearly 5 lb. I removed the front fairing stay and gage bracket and had a custom unit made completely from carbon fibre. The entire assembly weighed less than 2lb, saving another 3 lb. The 12 lb steel fuel tank was replaced with a 2.6 lb carbon fibre copy. The bodywork was replaced with even lighter fairings in the body shape of the newer Honda. It was more aerodynamic and it had provisions to add the ram airbox that was on the newer CBR600F-3. The heavy stock wheels were replaced with Dymag magnesium wheels saving another 8 lb. The bike weighed less than 320 lb wet and was amazing just to roll through the pits it was so light. The majority of that removed weight was from high up and far forward and rearward on the bike. This made a tremendous improvement to the way the bike transitioned from corner to corner. It also accelerated and stopped much easier.



## Pulling out all the stops

Although the chassis received much attention, the heart of the labour was in the engine. After all, I am considered an 'engine builder' so that is where I really poured it on. At the time, the top 600cc based Superbikes were running with 102hp to 105hp at the rear wheel. This was with higher compression over-bored pistons, porting, camshafts and improved valve train. Up until 1995, that was the type of engine that was winning in the Superbike class. That was what we were running as well. However, the Holst/Yoshima combination now made that engine formula inadequate to win at the superfast Willow Springs International Raceway. It was time to pull out all the stops so apart that engine came.

The cases were left alone for the most part. They were heavy but the compromise in weight reduction for stability was not a trade-off I was willing to accept. I removed any sound deadening dampers that were installed to keep the mechanical noise down for the average street rider. I removed the starter that added extra dead-weight as well as resistance through the starter clutch assembly. I removed the alternator, which added resistance to acceleration, and ran a total-loss electrical system. With sprint racing, we only needed a battery to last 30 minutes maximum anyway, so we swapped the battery every session. Even the battery was reduced in size as it no longer had to run lights or crank a starter. However, these items do not really make horsepower, they just reduce losses. The real magic came from the basic architecture of the engine.

Our class was the 650cc Superbike class. This meant that all engines could begin life as a 650cc engine. The reasoning for this rule was to allow a bigger variety of machines into the class. I don't recall many bikes that began life as 650cc machines though. As an addition to that initial displacement, we were allowed to run up to an additional 1.0mm of bore over the 650cc starting point. There were no limitations of how we could achieve the original 650cc starting point. Since displacement is bore x stroke x number of cylinders, I looked at our current configuration of standard stroke and a 1.0mm overbore from stock, which came to 618cc. I had 33cc to go just to get to the starting displacement. I increased the bore to +2.0mm over stock, which brought me to 637cc. I still had 13cc to go, just to get to the starting point. So, I opted to increase the stroke to make up the rest.

On the automotive side, "stroking" is not uncommon. In fact, if you open any hot-rod magazine for any American muscle car, there are "stroker kits" listed on almost every page. However, at that time in the motorcycle industry, stroking was rarely done in the roadracing scene. Without spending wads of money on a custom billet crankshaft, there were few avenues to do this. I was lucky enough to have been privy to one of them. I had the crankpins welded up and re-ground to an increased stroke that brought the final engine displacement to 658cc. Although over the base capacity of the class, we still were far

within the 650cc +1.0mm envelope of the rules.

Now, adding stroke to a crankshaft opens up the doors to many more things that could cause serious problems. The pistons were now sticking up proud above the cylinders by approximately 1mm. So, I needed to space the cylinder head up. This now put extra tension on the cam chain, which caused a few of them to snap during the development period. It also increases the loads on the connecting rods, which caused us to replace the stock rods with Carrillo ones. These had been 100% fail proof in all my years of experience, so they were the best insurance money could buy for the lower end of the engine. Cam timing now needed to be monitored carefully, particularly the piston-to-valve clearance on the exhaust stroke. With the pistons covering more ground than before, they were chasing the closing exhaust valves with increased destructive potential.

## Breathing like an Olympiad athlete

Up in the top end, we wanted to run more aggressive cams, but needed to be very careful with the tighter clearances being run with the big Cosworth pistons being flung around by the stroker crankshaft. Crane Cams worked very closely with Erion Racing – one of the Factory Honda Racing teams – to develop a set of cams that delivered more aggressive performance



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without putting tremendous strain on the valve train. So, we ran these cams with great confidence and amazing results. Now that the engine capacity was increased and the cams were allowing the engine to inhale bigger breaths, it was time to focus on increasing the breathing. I increased the intake valve size and spent hours on the flow bench with test heads finding the perfect balance of flow vs velocity. The heads were now breathing like an Olympiad athlete and ready to feed this new engine life.

Once finally tuned and the bugs worked out, the engine produced an impressive 115hp at the rear wheel. This coupled with the impressive weight savings made the bike leap from corner to corner. Robbie said it was like no other bike he had ever ridden. The bike's monster power and fierce snarl led us to name the bike "Ivan the Terrible", able to conquer anything in his path.

Ivan was ready to take on The *Sport Rider* team with anger. Unfortunately, Robbie was not. Earlier that year on his Superstock bike, he had a nasty off that ended up breaking a very small bone in his wrist but it never healed. Shortly before the end of the season, we decided together it would be best for his health to end the season early and get the needed surgery sooner, rather than later.



Our chances for the 650cc Superbike Championship had long vanished with Lance Holst winning every race thus far. However, Robbie's early retirement seemed to be the end of our chances to beat Lance and Kaz. Obviously as a rider, Robbie wanted to beat Lance. As a tuner, I wanted my creation to destroy Kaz's one. After all the time money and passion I had invested, I thought this the end of our chances. The year was almost over and my rider had just retired early – but then the phone rang. A good friend of ours, Steve Teschke, had called me. He said he had heard Robbie had retired and wanted to know what the chances were to borrow Ivan. I didn't think borrowing the bike was such a good idea with all that was invested, but I replied, "how about using just the engine"? Steve was quick to respond, "Yes, please".

At that time, the specs of the engine were very secret. Very few people knew what was inside, and I intended on keeping it that way as long as we were racing. I made Steve sign a contract that stated he would use my tuning specs, would follow my every word and could not open the engine up. Without hesitation he agreed since he knew what the engine was capable of and really thought he might have a chance to use it to its full potential. My shop was over 450 miles from Steve, so we each drove approximately 225 miles each way and met at some café along the side of the road to make the transfer. He bought me lunch for my generosity and we were on our way back to our homes. For Steve, it was off to drop his tired engine and install Ivan's Heart for

passion and intensity I put into building that engine, I felt like I had just lost my child. Steve explained that the anti-back-lash gear that Honda was commonly using on the clutch primary-drive gear had grenaded. The gear sent fragments through the crankcase top and bottom halves inevitably spewing a trail of smoke and oil down the track. The anti-back-lash gear had also destroyed the primary gear on the crankshaft..... the unobtainium stroker crankshaft. The engine was done. Ivan's Heart had just stopped beating and I was certain mine was about to as well.

I was 450 miles away from the engine and they were not allowed to open it up as per our agreement. I also still had five more motorcycles to prepare for other racers that would be at the track by 6:00am Saturday waiting for me. I surrendered to the fact that my chances of putting my talent against that of the legendary Kaz Yoshima had just gone away in a puff of oil-spewed smoke. Or so I was thinking.

### On the point of giving up

At that moment, it would have been easy to just give up. In fact, I was completely ready to. I figured it was completely incapable of having a happy ending. Then Steve chimed in. He reminded me that he was an aerospace welder, and that his mechanic Larry was an aerospace machinist, and that they had 24 hour access to their facilities. They just needed my permission to open up the engine and start assessing the damage. I found some new drive in me and said, "Go for it!"

I still had work to be done at my shop. I had been working past midnight every night that week getting everybody's bikes ready, and was in at 6:00am that day to get an early start with the hopes of leaving for the long drive to the track at a reasonable hour. That never happens, no matter how hard you prepare though. I finally rolled out of the shop after midnight, now making it Saturday morning with more than six hours of driving ahead of me. I was already tired from the long week of preparation and the drive didn't help me any. I rolled into Willow Springs shortly after 7:00am with my riders anxious and panicking – this was a time before everyone had mobile phones. I unloaded the truck, lined up the race bikes and told everyone they were on their own this weekend. They didn't look happy, but seemed to understand and support me as I drove away. Another hour and thirty minutes of driving and I was in Orange County, just south of Los Angeles, where my work was just about to begin.

Not having spoken to Steve or Larry since late Friday night they ran down what they had found. The crankcases had two holes about the size of golf balls, one in the top and one in the bottom. The clutch basket gear was completely torn up and in turn it destroyed a 6mm band of primary drive gear on the crankshaft. The rest of the engine, though, was left unscathed. The primary power items were completely untouched and working great. However, the items

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Friday practice just a couple of days later. For me, it was back to my race shop to complete the preparation of five other motorcycles for the rest of my team.

I was working frantically to get the rest of the bikes done. The 450 mile trip had cost me a day of wrenching and I didn't want to let anyone down. I was working 16 to 20 hour days all week and was feeling drained. Thursday night I received a call from Steve letting me know the bike was running, sounded great, and that he was so excited to ride the following day.

I didn't hear from him throughout Friday, so I was hoping that no news was great news. Then, at just around 5pm, I received his call. "Hey Mike, it's Steve. Wow! That thing was the fastest 600 I have ever ridden. Dan Kyle even had his radar gun on it asking if that was a 900cc engine in a 600cc frame". I had to jump in and ask, "Was? What do you mean WAS?"

My stomach grew tight. My mouth was as dry as cotton. My heart was racing. With the amount of

damaged were still critical to get repaired as replacement wasn't an option the day before the race. It was even hard to find a replacement for something as simple as the clutch basket.

We huddled together and made a plan. Steve was to weld the cases back together. Larry was to turn the damaged portion of the primary gear away, reducing the thickness of the gear to just that which rode against the main primary gear, letting the anti-backlash portion of the clutch basket gear run in empty space. I was to call around and locate a clutch basket and clean and prepare the rest of the parts for a smooth reassembly.

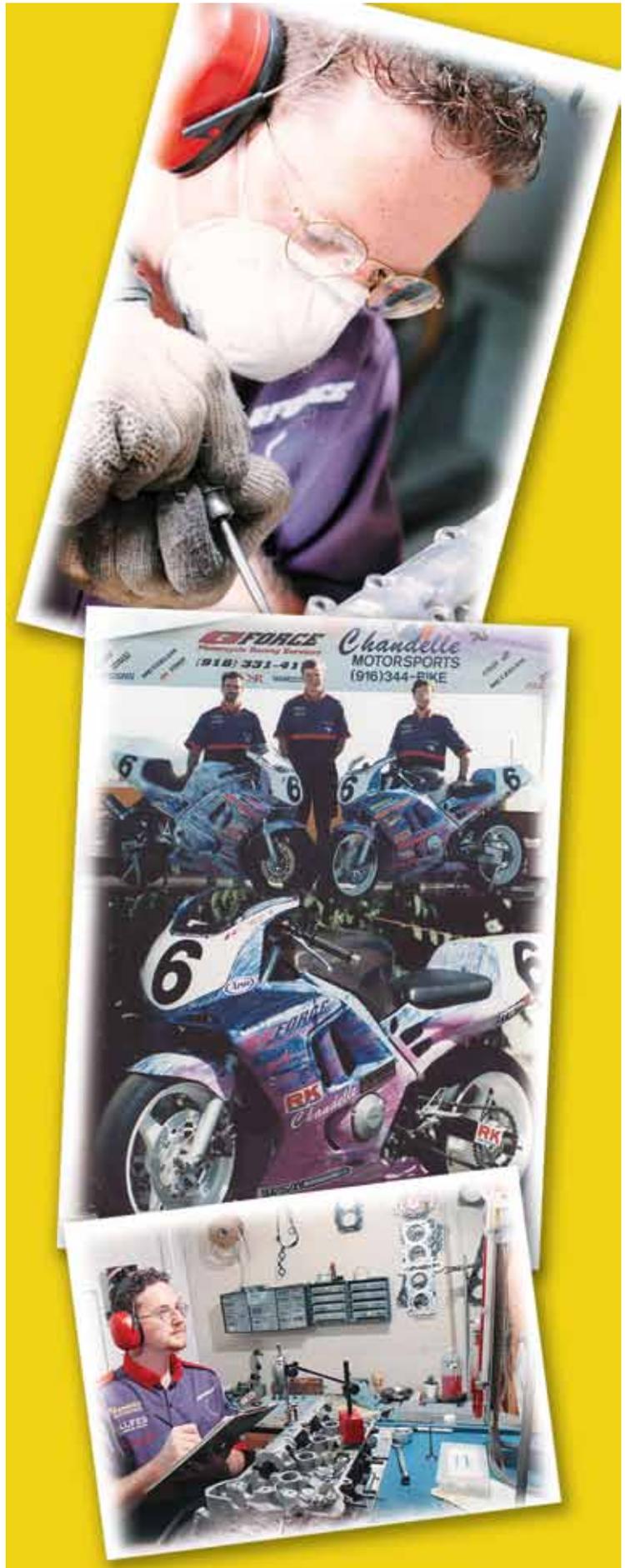
Steve and Larry were amazing. You could hardly tell the cases had anything wrong with them. The patch was shaped to match the curve of the castings and the weld bead was more like art than a "repair". If I hadn't known the gear was supposed to have been wider, I would have thought that it was intended to look like it did.

The last item was the clutch basket. Steve and I drove to a salvage yard ('breaker') and were able to sort through what they had until we found what we needed. Steve and Larry recommended that it would be better to modify the anti-backlash gear by removing the teeth and welding the spring-loaded gear into place. This was a great idea, but took yet more time.

We finally arrived back at Larry's house Saturday evening, and it was time to begin the assembly. Having not slept since Thursday night, and not much the whole week prior to begin with, I was really struggling to keep awake. Having to perform very intricate work that could go wrong by forgetting just one thing was not easy in this state of mind. Luckily, I knew this engine inside out and could practically build it in my sleep – because that was essentially what I was doing by then. I had all the coffee and sugar I could consume, but none of it was working. I just had Larry and Steve taking turns talking with me to keep me awake, while the other slept. Somehow that worked, and by 3am Sunday morning I had the engine complete and ready to put in the chassis. All I remember about the moment after I announced I was done was looking at Steve and Larry and asking if I could go pass out.

#### The resurrection

About 4:30am they woke me up to ask if I wanted to hear it fire up. I walked outside, feeling completely dazed and confused and watched Larry push Steve down the street to bump-start the bike to life. It only took one or two shots to get fuel running through the carburetors and he fired up with a healthy snarl. Somehow, with a miracle on our side, we were able to revive Ivan's Heart back into the angry screamer of an engine that he was meant to be. I was immediately awake again, hearing the sounds and smelling the race fuel. It was like life was pumped back into me as well – but the journey wasn't over yet. We still had plenty of work to do. We immediately loaded up the trucks and tried to get going to make Sunday morning practice except all of us were too tired. We decided 



it might be wiser if we all rested to have some energy left for the actual race. So, with everything loaded up, we set an alarm and all collapsed.

I swear the alarm went off two minutes after we set it but, in reality it was several hours. I can't describe the daze we were all in, but somehow we made it to the trucks and drove the hour and a half journey to the track. We were extremely late and missed all the practice sessions before the racing began. As Steve unloaded the bike he looked at his tyres and realised he needed new ones.

Not having been at the track, he was unable to get them sorted earlier, so he pulled the wheels off and raced over to the Dunlop tent. Unfortunately, we were so late that there were no more rear tyres left. Steve got the front mounted, but he was more concerned about the condition of the rear. So, he went around the pits to see who might have a rear – even a decent condition take-off would be better than the shredded tyre that he had on there.

Just about to give up, Steve pulled his last card. He went to Lance's pit and told him the situation. Lance had not lost a race yet that season, so he had nothing to be concerned about. He offered a used rear Michelin saying that was all he had. As he was giving the tyre a closer inspection Steve accepted it, and as he left Lance's pit he turned back and said with his usual confidence and charm, "Don't worry, I'll let you look at it much more during the race".

I was laughing when I heard that because I figured there was no way Steve could function well today after what we had all just been through, let alone win the race. I was hopeful, but at that point I would just be happy with Steve bringing everything home in one piece.

As they lined up on the grid, my heart was pounding so hard I could feel it through my shirt. I was probably more anxious than the guys on the grid. I stood at the pit wall as the engines revved high and then left the line like a squadron of fighter planes off to battle.

Steve was on the front row, but it looked like Lance got off the line clean and was bound for yet another holeshot. To my surprise, as they tipped into turn one I could see the bright yellow *Sport Rider* magazine bike was not in the lead. It was, in fact, Steve Teschke that pulled the holeshot. I've seen far too many riders take the holeshot only to lose out soon after, so I still didn't get too excited – but something was different this time. Steve was commanding the race and Lance could not make ground. We were in the "dance" and we just needed to stay in.

At only 10 laps, sprint races are very short compared to the 20-30 lap races of professional racing. After what we went through to get to this race, 10 laps seemed an eternity. For me standing at the pit wall watching Steve hold the lead, I sometimes had to remember to breathe. I know from being a racer the same can happen when on the bike but Steve didn't seem worried – at least from the pits. This race was amazing to watch because it looked as though he was just toying with Lance. There was one

moment when he was able to catch Steve and made an attempt for the pass. I figured that was it, Steve was tired and had nothing left. To my surprise, Steve twisted the throttle and closed the door on Lance. From that moment on, Steve opened up a solid gap and held it for the rest of the race. When he crossed the finish line with a solid win, I just about collapsed in a state of euphoria. Although that was not at all my first win as a tuner, it was by far the hardest. With a little help from the right team, we were finally able to beat Lance and Kaz.

After all the cheering and celebration in our pits, Steve went to find Lance and I wanted to shake Kaz's hand. However, they were nowhere to be found. The folks pitted next to them said they had packed and left right after the race. I was pretty disappointed to hear this. After every race they had beaten us, they came by to congratulate us on a fine race. When it was finally our turn, they didn't stick around for the return of congratulations. It was a bitter-sweet feeling. I felt somewhat robbed. I finally beat the legendary

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Kaz Yoshima, my nemesis of engine builders, and I never got to shake his hand and thank him for the amazing inspiration and competition. To this day, I can't explain the feeling it left me with.

Regardless, that was definitely one of the hardest weeks I have ever experienced in my entire racing career, but it was the best lesson I have ever learned in my life. That week taught me that no matter how bad it looks, no matter how dire the situation may seem, you keep on pushing and working and trying until you have no more to give. I ran out of steam, hope and even belief several times in that week but I had a team that worked hard to keep each other going and carrying one another through the tough moments to come out on top. Since that week, I always keep trying to find the light in any dark situation. I know that there is always light and to never, ever say "never". I think all of us learned this lesson that weekend.

The following year, Steve had me build him an engine as close to Ivan's Heart as he could afford and he went on to win the 650cc Superbike Championship with that engine while setting a new lap record in the process. Shortly after that, he was recruited by Two Brother's Racing to join its AMA Superbike team. Unfortunately, I have never seen Kaz or Lance since that weekend. I also haven't seen Steve or Larry since 1996. However, I will never forget any of them for one of the most enlightening experiences of my life. 