

WNT's expertise in titanium machining creates high-speed bolts

With just one race of the season gone the Team WNT F2 powerboat team remains focused on improving the performance of its boat, with help from team sponsor WNT (UK). As in all forms of motorsport the power to weight ratio is crucial to maximising performance and even the smallest gains can be the difference between the top step of the podium and coming second.

As part of its sponsorship of the team WNT (UK) is making availability of its technical centre in Sheffield to produce a range of components that will help to reduce weight and improve overall performance, with WNT's Project Sales Engineer, Tony Gale, providing in-house expertise to develop parts and introduce new materials and tooling technology to the process. The most recent example was to replace the transom bolts with new versions made from Grade 5 (Ti6Al4V) titanium. Often found in aerospace airframe, marine, offshore, power generation and engine component applications the advantages of this material are its lightweight and increased strength compared to steel. Important factors in this application as the transom bolts hold the 230 ps V6 two stroke engine, capable of propelling the boat through the water at 200 kph, to the hull.



In total there are six transom bolts and by a combination of re-design and use of titanium the team has removed an additional 600 grams of weight from the boat, this is in addition to other significant weight reductions that Team WNT achieved before the season started. "Weight reduction is one of several things that we can control in the boat and having the ability to call on WNT (UK) for assistance in this area was a great help in winning the championship last year and will continue to play an important role as we challenge for honours again this season. The fact that they can put their latest cutting tools to the test to produce items such as the titanium transom bolts that are specific to our needs is also an advantage," says Team WNT F2 driver, Steve Hoult.

The replacement transom bolts were machined by Tony Gale at the WNT technical centre using a selection of standard tools from the WNT catalogue that are aimed at titanium machining. "There are two styles of bolts, one 90 mm long and one 110 mm long and both feature a mix of threading, drilling and milling, which allowed us to make use of a variety of tools, and apply cutting data directly from the information in our catalogue," says Tony Gale.

The mix of tools included a 6 mm Ti solid carbide drill running at 35 m/min and a feed rate of 0.08 mm/rev. The hexagon flats were machined using an 8 mm Ti endmill with 1mm radius from WNT's Mastertool range running at 80 m/min and 0.04 mm/tooth feed. The main turning was completed using a WNT DNMG 150608 M34 HCN 5110 for Titanium insert at 80 m/min and 0.25 mm/rev feed, with the thread generated using a 1.5 mm pitch threading insert taking seven passes (plus one relief pass) at 40 m/min surface speed. The final operations of boring the relief in the head of the bolt and drilling the holes for the retaining wire were achieved using WNT's solid carbide Eco-Cut Mini boring bar and a 1 mm diameter HSS Uni Drill.

"This work that we are doing to assist Team WNT F2 is an ideal way for highlighting the broad range of tooling available from WNT for a diverse set of applications. It also emphasises the level of technical applications support that we can offer through the WNT Technical Centre in Sheffield, where we are happy to work with customers to develop optimum machining solutions," says Tony Pennington, Managing Director, WNT (UK).

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