PRESS RELEASE

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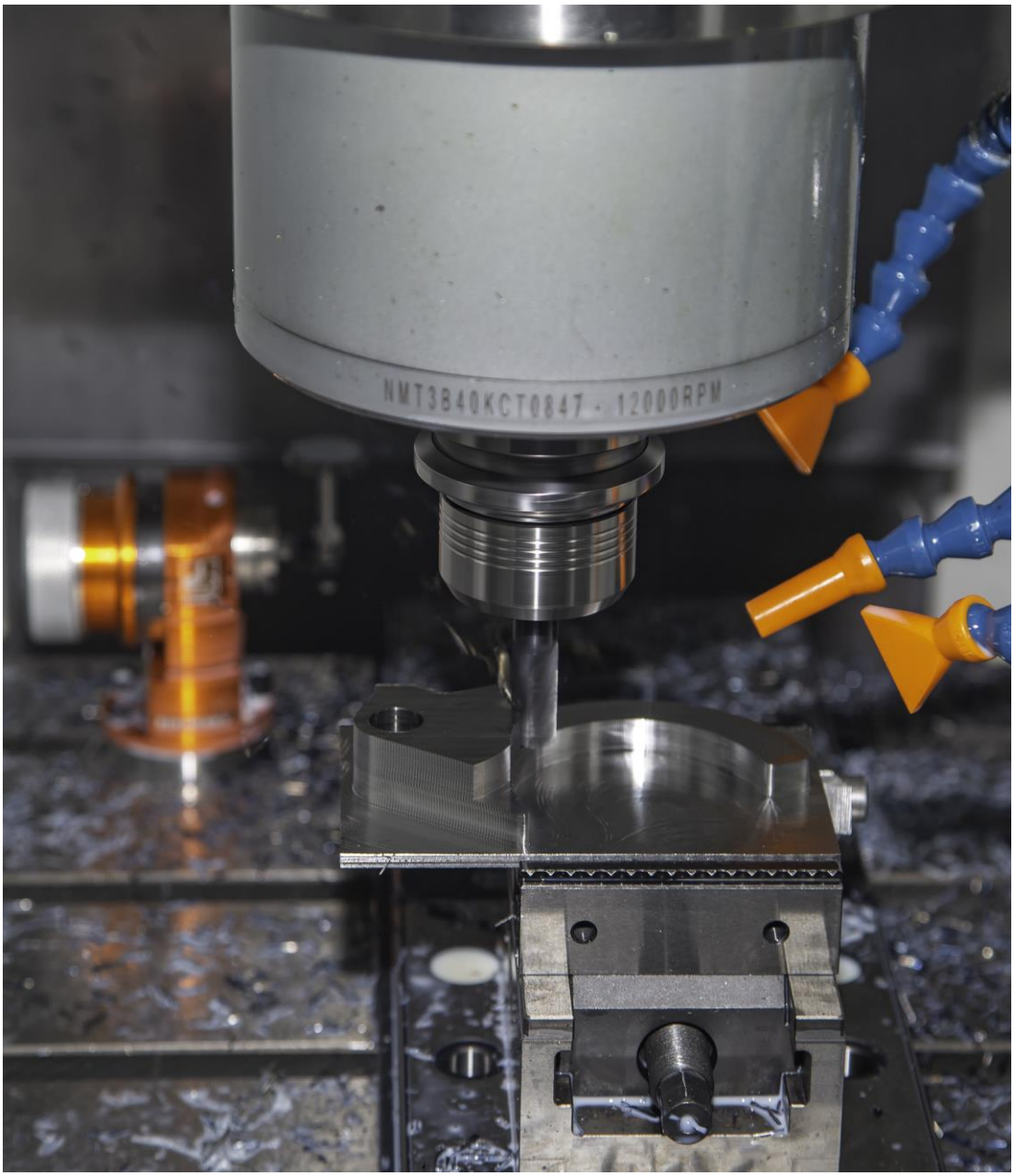
Nova steps up a gear with help of WNT workholding

Working in the high-speed, high-pressure, environment of motorsport, West Sussex-based Nova Racing Transmissions is constantly working to tight deadlines. With customers ranging from teams in the World and British Superbike championships down to club-level racers producing parts on-time is vital, which is why it has turned to its tooling partner CERATIZIT UK & IRELAND and its WNT brand to deliver improved performance across its machining activities, particularly in the manufacture of gear selector forks.

The most recent development was the introduction of WNT's ZSG4 centric vices along with its MNG Zero Point location system which is used on the machine bed of its new XYZ 710 VMC HD and on the 4th axis unit on the machine. The result is an on-machine flowline that delivers one complete selector fork every cycle from a raw billet. This new process delivers both time savings, with set-up times halved, as well as improved quality and consistency. "Prior to the adoption of the WNT MNG Zero Point and ZSG vices we used conventional

vices to hold cumbersome fixtures, now we can grip on just 3 mm of a raw billet, machine one face completely, transfer the part to the 4th axis to machine a location pin, prior to finish machining the second face, gripped in aluminium jaws that match the shape of the selector fork," says Daniel Vaughan, Manager, Nova Racing Transmission. "In addition, we are seeing improved surface finish and consistency of parts, with repeatability of between 2-3 micron from fork to fork."



Gripping for the 1st operation, which involves relatively high volumes of material to be removed is done using the 80 mm wide ZSG4 vice with serrated jaws, the gripping force for this operation is 65 Nm, the machining of the reverse face of the fork is undertaken in a 125 mm wide ZSG vice, with aluminium jaws, which are

machined to match the profile of the selector fork. In doing this the gripping force can be reduced to 40 Nm, which is a major advantage in maintaining flatness and consistency of the finished part. “By being able to use a much lower gripping force we maintain the integrity of the part, without any deformation. This is only possible due to the quality of the WNT ZSG4 vices.” Combining the vices with the MNG Zero Point base plates also guarantees datum points when setting up and gives Nova greater flexibility, especially on lower volumes, which occasionally involve one-off production to help customers. “The speed at which we can set up now for any part is a significant advantage, we can swap vices over quickly in the knowledge that the datum is a known dimension meaning we can quickly get back to machining.”

As part of the process Nova Racing Transmissions called on the expertise of CERATIZIT UK & IRELAND’s Applications Sales Engineer Michael May, who looked at the entire manufacturing method for the selector forks. Originally these parts were produced from round bar, which required an initial turning operation, by switching to square section material this operation was eliminated, saving cycle time and freeing up capacity on the turning section. “Typically, we could process 65 selector forks using the lathe for the 1st operation, eliminating this work has freed up capacity to turn enough gears to produce the equivalent of 10 gearboxes a day, all of which reduces pressure on deliveries to customers,” says Daniel Vaughan. With all the machining of selector forks now undertaken on the XYZ VMC, attention turned to the tooling in order to reduce cycle times.

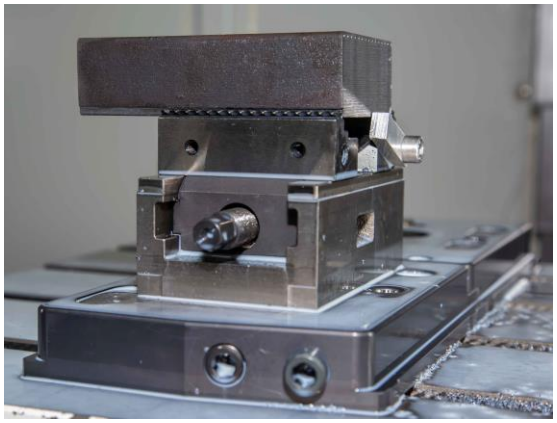
The key to cycle time reduction was the milling in operation one where the bulk of the material is removed. Here the decision was to use WNT’s CCR-UNI, these solid carbide end mills are ideal for use with Trochoidal milling strategies, allowing much higher surface speeds, reduced cycle times and improved tool life. The CCR-UNI cutters benefit from a unique chipbreaker ground into the flute, five or six cutting edges, dependant on diameter and feature WNT’s Dragonskin multi-layer coating technology. Initially a 16 mm diameter cutter was chosen, but after cutting trials this was reduced to 12 mm, but with trochoidal milling depths of cut of 2xDiameter are still achievable, running at 260 m/min with an infeed (ae) of 1.2 mm and federate of 6.6 m/min. “The changes instigated by Michael with the CCR-UNI cutters made a major difference to cycle times, with a complete selector form now being fully machined in 10 minutes, compared to the previous 30 minutes. Tooling costs have also been reduced due to extended tool life and the fact we can use smaller diameter cutters to achieve these results.,” says Daniel Vaughan.

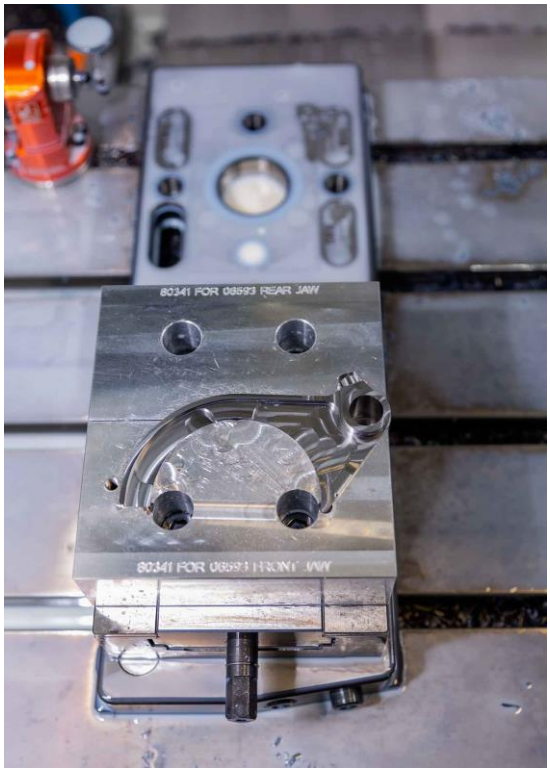
Nova Racing Transmissions partnership with CERATIZIT UK & IRELAND is a two-way street, with Nova supplying gearboxes and gear ratios to Sam Burman and her WNT Burman Racing MOTO 3 GP team, which Sam races in the British Motostar Championship, a support series to the British Superbike Championship. For 2019 Sam has a new KTM motorcycle and the OEM gearbox will be replaced by a Nova Racing unit. This new gearbox is an evolution of the 2014 unit that Sam previously used and brings several advantages, as Nova Racing Transmissions’ designer Michael Payne explains: “Our gearbox has improved lubrication that

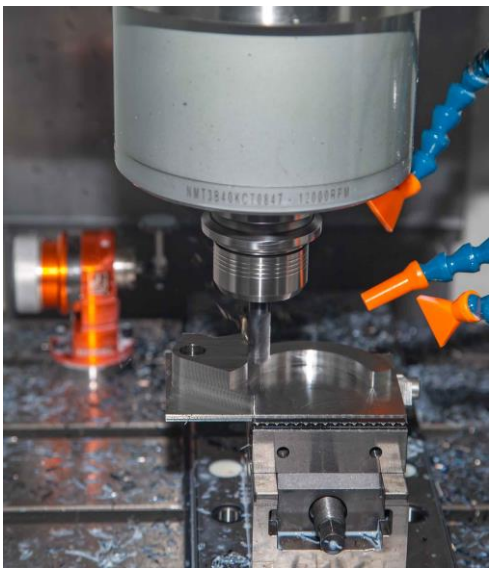
gives better oil flow to the gears, which in conjunction with improved tooth strength on the gears themselves gives improved reliability. Performance is also enhanced by the fact that all of the moving parts in the Nova gearbox are around 8 per cent lighter than the OEM giving better shift times and feel for the rider, especially at corner entry." The support for WNT Burman Racing will continue throughout the 2019 season, with Nova Racing Transmissions working with Sam to produce new gear ratios when needed.

"The world we inhabit means that we have to react quickly to the demands of race teams and individual customers. With the partnership we have with CERATIZIT UK & IRELAND with its WNT products and the technical applications support, we can make things more efficiently. The applications engineering that Michael provides is invaluable and is a fantastic asset and to us is just as important as the tooling we use," says Michael Payne.

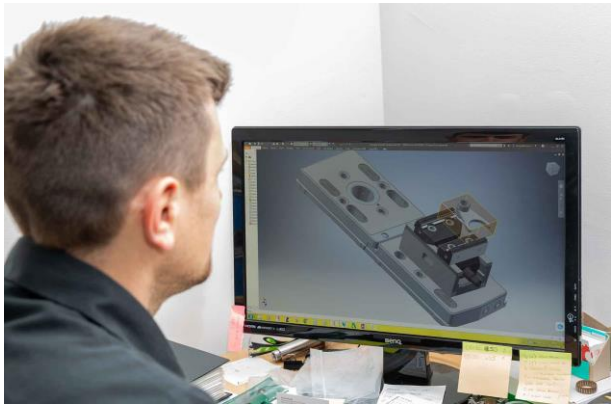
Attachments:







A finish machined selector fork can be produced every cycle thanks to the WNT ZSG vices and MNG Zero Point base plates, while Trochoidal milling techniques using WNT's CCR-UNI milling cutters is reducing that cycle time.



Programming of the selector forks is also simplified by the detailed CAD files available from CERATIZIT UK & IRELAND

Issued on behalf of

CERATIZIT UK & IRELAND Ltd.

Sheffield Business Park
Europa Link \ Sheffield \ S9 1XU
T. 0800 073 2073
F. 0800 073 2074

With compliments

Agitate PR Ltd

6 Sinclair Close
Gillingham
Kent ME8 9JQ
T. 01634 261288

E. tony.pennington@ceratizit.com
www.ceratizit.com

Contact:
Mr Tony Pennington
Managing Director

E. nigel@agitatepr.co.uk
www.agitatepr.co.uk

Contact:
Nigel Jones

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