

LIFTING THE LEVEL

New techniques are speeding up NASCAR pit stops but are they also increasing the risk of mistakes? **Andrew Charman** investigates

WHEN veteran NASCAR Cup driver Denny Hamlin took a second successive victory of the season at Darlington in April, one of his pit crew found himself being interviewed by as many media as his driver.

A new technique being employed by Joël-Alexandre Bouagnon and some of his fellow jack men on pit road this season is shaving vital tenths of seconds from tyre changes in the Cup Series – in Hamlin's case the Darlington stop with three laps to go vaulted him from second place to the race lead. But the increased focus on reducing pit stop time is also being pointed to by some as a possible contributor to a renewed spate of loose wheels in the series.

One of the few direct comparisons between NASCAR and Formula 1 is that both series use external jacks, operated by a pit crew member, to lift a car and change tyres. Back in 2017 onboard jacking was reportedly under consideration by NASCAR during the development phase of the current Gen-7 car that was introduced in 2022. Yet at a time when the pit stops were undergoing a major change with the Gen-7 car employing 18-inch wheels secured by a single nut rather than the 15-inch wheels with five nuts previously employed, NASCAR opted not to go the extra step with the jack. The reasoning was perhaps as much about the mechanics of lifting a 3.4-tonne race car as retaining a part of the sport's heritage.

“A new technique is shaving vital tenths of seconds from NASCAR tyre changes”

With such weight to lift, the jacks employed in NASCAR are effectively a trolley jack, albeit a specialist race version. A single pump when the jack is put under the car's side lifts it far enough to remove and replace the tyres, after which it is dropped and the jack carried round to the other side of the car to repeat the technique.

Unlike the guns now used by teams to undo the single wheelnuts, the jacks are not specified by NASCAR; the leading teams build their own while others buy them off the shelf from ▶

RIGHT Sprint race: Jack man Joël-Alexandre Bouagnon runs around Denny Hamlin's car, overtaking the tyre changer, before victory at Martinsville in March



John K. Harrison/Toyota

specialists. They average around 30lb, a weight the jack man has to carry as he runs round the front of the car. As such it's no surprise that all pit crew members are regarded as athletes and NASCAR teams routinely recruit American football players reaching the end of their career.

It was the technique used by Bouagnon, himself a former Chicago Bears running back, that excited observers at Darlington. Straight after dropping the left side of the car, he grabbed the jack in his left hand then, as he ran around the front of the car, he swung it behind his back, crossing his arms to catch the jack in his right hand. This process rotated the handle to set for lifting rather than dropping... then Bouagnon slid it under the right side of the car just as the tyre changers arrived in front of their respective wheels.

Traditionally in NASCAR pit stops the front tyre changer arrives at the left-side



Rusty Jarrett/Toyota

wheel first; he has to hold back to allow the jack man to pass in front of him before dropping to change the wheel. But the new technique allows the jack man to arrive on the left side before the tyre changer, who can drop straight into place to attack the wheelnut.

Boagnon told TV broadcaster Fox Sports that the technique had taken most of the off-season to learn. Speaking on Denny Hamlin's Actions Detrimental ▶

ABOVE Winning habit: Bouagnon's technique helped secure a second successive win for the Joe Gibbs Toyota at Darlington in April

BELOW Catch it: Jack man Joël-Alexandre Bouagnon already has the jack in his right hand as he runs around the front of Denny Hamlin's car

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podcast, motorsport writer and IMSA pit crew member Bozi Tatarevic pointed out that a similar technique had been tried by Hendrick Motorsports in the 2024 season – but not as effectively as what was being used this year, primarily by the teams of Joe Gibbs Racing that Hamlin drives for and the 23XI squad he part owns. Hamlin's no 11 Gibbs Toyota team rates second in pitstop time in the 2025 season, beaten only by the 23XI crew of Bubba Wallace.

Fast and loose

Some observers have suggested, however, that cutting pit stop times could be a contributing factor to rising incidences of loose wheels being seen this year. When the Gen-7 car was first introduced there were several such occurrences, as teams became accustomed to the manner in which the single wheelnut aligns with the pin that pops out of the axle to secure it. According to former championship winning crew chief Todd Gordon, speaking on NASCAR's post-race broadcast following the Martinsville

“Cutting pit stop times could be contributing to rising incidences of loose wheels”

event, the pin only pops into place with the nut around 1/16th of an inch (1.6mm) from being tight, leaving very little margin for error. Gordon believes this is an area that could be addressed by the governing body to cut loose wheel incidents.

Concerned at the prospect of cars losing wheels at speed, NASCAR mandated major penalties for such occurrences. Initially these saw a car's crew chief and two pit crew suspended for four races but from 2023 this was eased back. Now a car that loses a wheel on the track is held on the pit road for two laps, effectively ruining its race, while two crew members earn a two-race suspension. Which members are not specified but typically they

are the tyre changer and jack man.

In successive years the incidences of loose wheels have been generally declining but there has been a spate in 2025 and the pit crew are increasingly in the spotlight. Part of NASCAR's focus on both safety and costs has been a reduction in the number of crew who go 'over the wall' during a pit stop. It is now down to five – and as a result they each now have multiple responsibilities.

When there were six crew over the wall the jack man's only role was lifting and dropping the car so they could watch the tyre changes and spot any issues. Now, however, they have an extra role. On the right side, immediately after

RIGHT Jacked up: The influence of the jack man, here on Tyler Reddick's 23XI Racing Toyota, has increased in recent races



Rusty Jarrett/Toyota

raising the car, they hang the new front wheel that has been carried over by another crew member then drop the jack. On the left side they do the same for the rear tyre before dropping the car – long regarded as the signal to the driver to leave.

Tatarevic, a tyre changer in IMSA, told the Actions Detrimental podcast that the jack man now acts on sound rather than vision as a signal to drop the car. Looking at the wheels would take around three tenths of a second which, with the levels that are now routine in today's Cup pit stops, could cost the team five or more places leaving pit road.

Former Cup championship-winning crew chief Steve Letarte agrees. "If you take 11 seconds on a pit stop the wheel won't fall off," he stated on NASCAR's post Martinsville coverage. He added that such incidences would not happen with more crew members over the wall, a view he accepted is unpopular with

both NASCAR and the teams.

"(With six crew) the stops would not get a whole lot faster and people would be watching their job, not jack to tyre, tyre to jack," said Letarte. "The current orchestration doesn't allow a pit crew member to focus on one thing."

Such a scenario is not likely to happen any time soon, and unless NASCAR intervenes with further regulation, the jack man technique will no doubt be more widely adopted as just one of the ways teams use to try to shave essential time from their pit stops.

Another innovation tried this season has been in fuel-only stops where a crew member holds an iPad in front of the windscreen, displaying a panel which shrinks and then turns the entire screen green, the signal for the driver to accelerate away. Again the onus is on the pit crew to complete everything they need to do by the time the countdown ends – the pressure is on... 

LEFT Whole nut: The new single-nut 18-inch Cup wheels have brought their own challenges to pit crews



Lesley Ann Miller/Toyota