



The 330xi on Bridgestone Blizzak RFT LM-22s exhibited perfect road manners during the Blizzard Of 2006.

Run Silent, Run Flat

Like it or not, run-flat tire technology is the wave of the future—and the future is here.

STORY AND PHOTOGRAPHS BY JONATHAN SPIRA

Where would the automobile be without the wheel and tire? The pneumatic tire, in its current incarnation, allowed the automobile to become our primary means of transportation during the past 100 years—but with the advent of the pneumatic tire came the problem of the flat tire. It certainly wasn't a problem with the earliest of wheels in the late Neolithic age, as these were simple wooden disks with a

hole for the axle. In fact, the wheel was one of the technological advances that gave rise to the Bronze Age.

Wooden wheels were eventually rimmed with a band of iron, as many a Western can attest. Wagon wheels gave way to wheels first cushioned by leather and then solid rubber to soften the ride. But adding rubber was not as simple as it sounds; until Charles Goodyear invented

vulcanized rubber in 1844, rubber was unsuitable, as it would melt in warmer weather and become brittle in cold.

In 1888, John Dunlop invented the air-filled, or pneumatic, tire to make his son's bicycle ride less harsh. Soon carriage makers and the nascent automobile industry were using Dunlop's inflatable tires. In ten years, inflatable tires had all but replaced solid tires; by then, the problem of broken wagon



The 330xi equipped with eighteen-inch Bridgestone Potenza RE050A RFT summer performance tires and xDrive drove as if it were on rails, whether on the A10 Autobahn near Gmünd in Austria...



...or the B100 Bundesstraße near Simmerlach.

wheels had been replaced by the problem of flat tires and blowouts. In fact, early tire advertisements touted a brand's resistance to punctures; the Michelin Man appeared drinking a cocktail made from nails and broken glass. His name, Bibendum, or "Mr. Bib," is from the Latin "Nunc est bibendum" ("Now is the time for a drink"), and the company's motto was "Le pneu Michelin boit l'obstacle!" ("The Michelin tire drinks obstacles!")

However, no tire can drink them all—and flat tires usually occur at the worst possible moment and cause great inconvenience at the very least. Whether you change the tire yourself or wait for BMW's Roadside Assistance crew, a flat tire can leave a BMW owner on the side of the road. Under some conditions, it might be dangerous to change the tire (e.g., no shoulder, foul weather, poor lighting conditions). Blowouts can be far more dangerous; at speed, a blowout can cause significant loss of control, possibly resulting in a serious accident.

Until recently, the most a motorist could do for flat tires was carry a fully-inflated spare tire, a jack, and a tire iron, and the phone number for BMW Roadside Assistance or some other roadside-assistance company like Triple A. But one key emerging automotive technology isn't actually in the car: the run-flat tire—which, when totally deflated, with zero air pressure, will support the car long enough to drive it to a secure area. The primary advantage of run-flat tires is their ability to continue driving once the tire has lost air pressure, through either a slow leak or a puncture. Since no spare is required, the car weighs less, which positively impacts performance and fuel economy.

But If I Take My Run-Flats Off The Rims, Won't They Grow Warts?

The issue of repairing run-flats—or even remounting them—is tricky. Vehicle manufacturers do not recommend the use of repaired tires—run-flat or not—on their vehicles because it is difficult for anyone, including a technician at a certified run-flat shop, to know what occurred between deflation and the shop. Was it driven only within limits? Was it driven "normally," or in a more spirited manner? According to Robert Saul, product planning manager for UHP and RFT at Bridgestone Firestone North American Tire, "In limited circumstances, and after determining that the tire was not

driven flat, a run-flat tire can sometimes be repaired. A certified RFT dealer can make the determination on whether a repair is prudent or not." And even then, because we live in a litigious society, some tire shops may not repair run-flat tires, as they don't want to be held responsible if there is non-apparent damage.

It's a Catch-22 situation: A driver on run-flats can drive to his destination, but driving on a deflated run-flat generally renders it unrepairable. Because of this, BMW owners should give strong consideration to wheel-and-tire road hazard insurance, which will

pay for a replacement run-flat tire.

But the repair-or-replace question has never been limited to run-flat tires; no manufacturer recommends running on patched high-performance tires, either. Even with simple through-the-tread punctures, hidden damage within the radial plies may affect a tire's reliability. Sidewall damage, of course, has always been unrepairable, and any BMW driver who has experienced the thrill of tire failure at speed can attest that by the time you get the car stopped, the deflated tire is usually ruined anyway, if not in shreds and tatters.

Run-flat tires require the same maintenance as conventional tires. Even with the FTM, the driver needs to check the air pressure; monthly checks are recommended. And the stories of run-flats being destroyed if you take them off the wheels is urban-legend baloney: According to Bridgestone, their run-flat tires can be demounted and remounted by a certified run-flat dealer as many times as you like. But be sure to mark their location; BMW recommends against rotating tires, and this recommendation extends to run-flats, too.—Jonathan Spira

Since the unveiling of the Z8 in 2001, BMW has been fitting run-flat tires on some of its cars, to mixed reviews. The transition to the days when spare tires will be remembered with the nostalgia afforded starting cranks and carbide headlamps hasn't been entirely smooth. First-generation run-flats had a reputation for excessive ride harshness due to their reinforced sidewalls, and early owners of run-flats found them less-than-ideal for spirited performance. (Indeed, BMW engineers admit that run-flat technology will have fully come of age when the M cars come with run-flats; so far the gnomes at BMW M GmbH have opted for conventional ultra-high-performance rubber with tire-repair kits in the trunk.)

But manufacturers have not been idle. For the latest generation, tire makers have worked to overcome the comfort and performance tradeoffs, and automakers have designed their cars' suspensions around the run-flats. The new E90 3 Series is the

larger retaining hump which prevents the tire from slipping off the wheel when pressure is lost. Together, the self-supporting run-flat tires, specially developed extended-hump wheel rims, and a Flat Tire Monitor (FTM) comprise the BMW Run-Flat Combination (RFC) wheel-tire system, standard on the E90 3 Series worldwide.

To the naked eye, run-flat tires don't appear any different from conventional tires. But looks can be deceiving; thicker reinforcement rubber is built into the inside of the sidewall and a reinforced bead package helps keep the tire on the wheel and supports the weight of the vehicle even if the tire's air pressure is zero. While 80% of flat tire incidents involve a gradual loss of air pressure, with run-flat tires, the only indication a driver will have is a warning from the FTM.

Let's take a not-too-uncommon driving scenario: a tire puncture at speed where the driver has to perform a correcting maneu-



One summer tire off and secure in its Tire Tote; three new Blizzaks to go and we're set for winter.

first BMW with a suspension specifically designed for run-flats; only run-flat tires are available for it. The aluminum double-pivot type front suspension and the new five-link rear suspension have been optimized for run-flat tires to provide the firm, sporty ride BMW owners expect, while remaining comfortable over bumpy asphalt—a problem owners of first generation run-flat tires are well aware of. (This is reminiscent of the radial-tuned suspension that became commonplace on American cars in the 1970s as radial tires became more prevalent.)

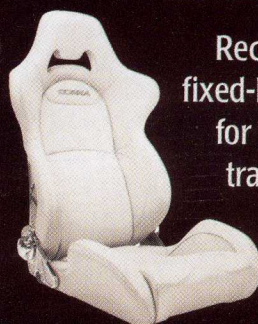
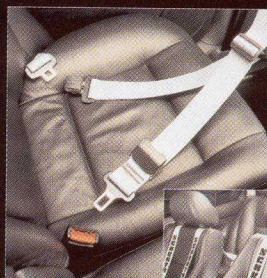
BMW supplies many of its cars with Bridgestone SSR (sidewall support run-flat) tires, which can be driven at least 80 kilometers at a maximum speed of 80 kph after loss of pressure. This means that a BMW driver can not only continue to a safe and convenient location after deflation, but there would be no need to miss an important appointment or event because of a flat tire. The EH2 (extended hump) wheels feature a

ver to avoid an accident. With a conventional tire, the deflated tire quickly goes down on its wheel, and when the driver performs the accident-avoidance maneuver, it could lead to significant tire and wheel damage. With a run-flat tire, the sidewall supports ensure stable handling through the maneuver. "It's kind of weird," says editor Carlson, who spent some time driving fully deflated run-flats through an autocross course in Spain. "You don't notice a significant difference in the feel of the car—so drivers are going to need some kind of signal that tells them when the tire is flat. If you're outside the car, it's pretty obvious; a deflated run-flat on an autocross course wails like a newly-indicted congressman."

My first run-flat road test took me 2,400 kilometers in five days across a variety of roads and conditions in Austria, Germany, Hungary, and Italy—everything ranging from the Autobahn to two-lane *Land-*

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straßen—in a BMW 330xi equipped with eighteen-inch Bridgestone Potenza RE050A RFT tires and xDrive. I couldn't sense any difference in the Three's handling compared to tens of thousands of miles of driving in sport-package-equipped *Fünfers* (E39) and E46s, which come with non-run-flat summer performance tires. The 330xi drove as if it were on rails, and any harshness was appropriate for low-profile tires. In fact, thanks in part to the characteristics of xDrive, I would have to say this is the best-handling BMW I've ever driven.

The second round of testing came on the parkways, expressways, and streets of the New York metropolitan area. After about 600 miles, I still couldn't sense any difference; the car's road manners were impec-

cable and the tires remained responsive. What felt harsh in other BMWs felt harsh in the 330xi, such as poorly patched pavement—but I also detected more road feel.

The third round of testing, still in the 330xi, was on run-flat winter tires, Bridgestone Blizzak RFT LM-22s fitted on seventeen-inch BMW wheels. As temperatures started to fall in December, the summer tires noticeably lost adhesion; it was time to fit winter tires. The first thing I noticed about the Blizzaks was how sticky they were in cold weather. The Blizzaks had a slightly softer ride, and, as I expected, the handling was less precise. But I knew they would do the trick once winter hit.

However, one thing was missing: snow. I had to wait until February, when a Nor'easter brought a record snowfall to

the region. The 330xi cut through the snow-covered streets with abandon; I was able to drive up steep inclines with confidence (leaving many front-wheel-drive cars and SUVs behind). The combination of xDrive and Blizzaks was truly unbeatable.

And in January, television viewers around the country were treated to another kind of road test: a man driving a 2006 BMW 330i led police on a high-speed chase for over 90 minutes in Houston. The police attempted to use spikes to flatten the car's tires, but those attempts were ineffectual due to the run-flat technology. Television reports noted that the driver continued at speeds of up to 130 mph, tires smoking.

But I don't think BMW or the tire manufacturer will be using this particular incident as a testimony to the new technology! ♦

Ask The Guy Who Drives On 'Em

Based on an online survey of BMW drivers, the vast majority of responding E90 3 Series owners—two thirds, in fact—like their run-flats and how they ride and handle. Owners with summer performance tires overwhelmingly like the handling characteristics and ride comfort; in fact, only 7% of owners surveyed said they did not like their run-flat tires and had replaced them with non-run-flats, a figure not unusual for any factory wheel-and-tire setup.

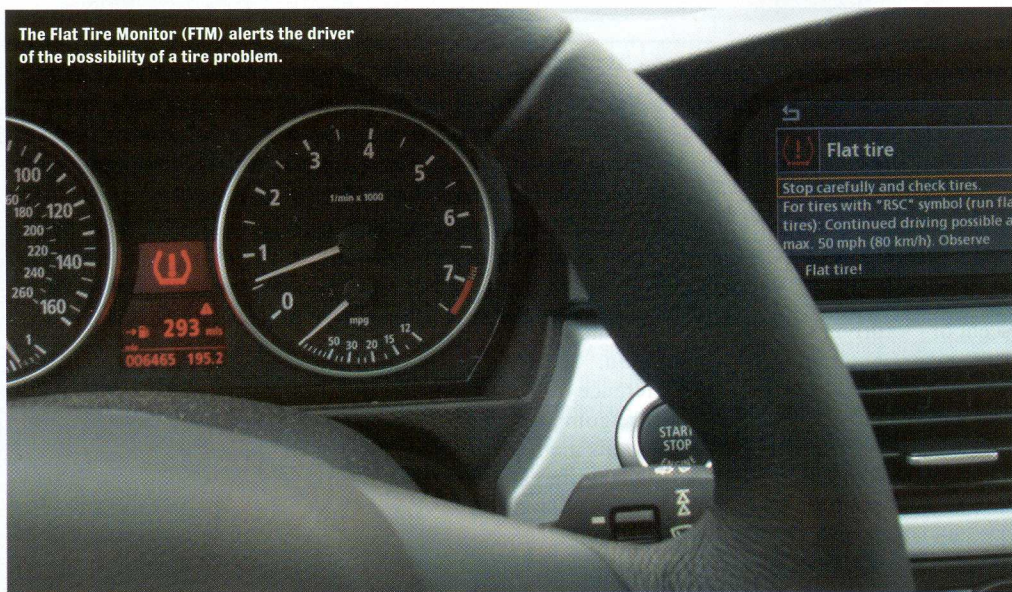
Chuck Kelly has had three flat tires in the course of owning several BMWs—and each time, the incident ruined a sport tire. “All three flats were at a most inconvenient time,” says Kelly. “They never occurred when my car was parked in the garage.” The small premium per tire for a run-flat is well worth it, he says: “Changing tires on the side of the road can be quite dangerous, especially as more and more freeways have lost their shoulders” Kelly takes comfort knowing that a family

rough over bumps compared to non-run-flats,” says Kelly, “but they are far more quiet and handle cornering much better.”

Tony Ivancic recently discovered the safety aspects of run-flat technology while at speed on a highway. As he was driving home, the flat-tire warning symbol appeared in his cluster display and his iDrive gave detailed instructions. He exited the highway and checked the tires: all four looked normal and were equally hard; there was no visual

wobbly. He checked the air pressure: 0 psi. Upon closer examination, he found a slice between the tread blocks. Ivancic is a fan now of run-flats. “Driving at 80 mph, something really bad could have happened,” he says. “I had the ability not only to exit the highway so I didn't risk getting hit, but I was able to drive normally on the tire for three days.”

Jason Adrian was a passenger in a friend's new 325xi. At 60 mph, the car ran over a section of wood the width of an entire lane, and they heard a popping sound at the point of impact. But the car's handling didn't change at all; the driver was able to safely pull over to the side of the road, where a four-inch screw was found in the rear passenger tire. Instead of having to change the tire on the side of the road in ten-degree weather, they drove to the nearest dealer and had the tire replaced—and the replacement was covered by a tire warranty the owner had purchased at the time of delivery. Adrian is convinced: “I do all of my own tire changes, summer to winter and back, so changing tires is second nature,” he says, “yet I see incredible value in run-flats. They don't blow out and leave you riding on the rim for your trip to the side of the road. Plus, if there's no place to stop, you can pull over where you please.”—*Jonathan Spira*



TONY IVANCIC

The Flat Tire Monitor (FTM) alerts the driver of the possibility of a tire problem.

I also spoke with several BMW CCA members who own E90 3 Series vehicles about their driving impressions of run-flats.

member won't be stranded on the side of the road in the event of a flat tire. For day-to-day driving, the run-flats were “a bit

sign that one of them was flat. So he continued driving. Three days later, he felt a thumping from the rear and the car seemed a bit