Where The Rubber Meets The Road

Model year 1978 ushered in the use of the Goodyear P-Metric series tire for America's sports car, which continues through today with the production of aggressive units for the C6 Z06 Corvette. But the intent in 1978 was to offer customers a performance-handling option such as RPO FE7 heavy-duty suspension and match it up with a compatible RPO QBS 60 P-series tire in the wake of 1968-72 high-performance horsepower options.

Tire manufacturers never imagined those original tires would still be sought after some thirty years later; yet, the US Department of Transportation's (DOT) safety requirements documented in the Federal Motor Vehicle Safety Standard (FMVSS) help us distinguish PRODUCTION tires from SERVICE tires. In fact, tire manufacturers established a date code on the assumption that a tire would not see service beyond ten years. Thus, the use of the three-digit date code prior to the turn of the century. This article documents the distinctive characteristics of OEM tires, whether PRODUCTION or SERVICE, as originally specified for GM's Chevrolet Corvette. But first we describe the US Department of Transportation safety requirements.

DOT Safety Requirements

The National Highway Traffic Safety Administration was established as a separate organization within the Department of Transportation (DOT) in March 1970 with very broad powers, but essentially it was to administer the department's motor vehicle and highway safety programs. Its vision is to be a "Global leader in motor vehicle and highway safety" with authority over motor vehicles, motor vehicle equipment, drivers and highway safety. As a result, automotive manufacturers and their vendors became a regulated industry in regard to the safety of drivers and passengers. Not only were autos subjected to rigorous tests to ensure their safety, but tires were also, which aids restorers in the 21st century.

The NHTSA mission:

> *"Save lives, prevent injuries and reduce economic costs due to road traffic crashes, through education, research, safety standards and enforcement activity."*

Tire labels, embossed safety messages and manufacturer stampings can help differentiate an OEM production tire from an OEM service replacement tire or an OEM service replacement with typical configuration from an OEM service with non-typical configuration that show up on the judging field. Let us explore these labels and how manufacturers stamped tires with date codes.

Tire Identification Number

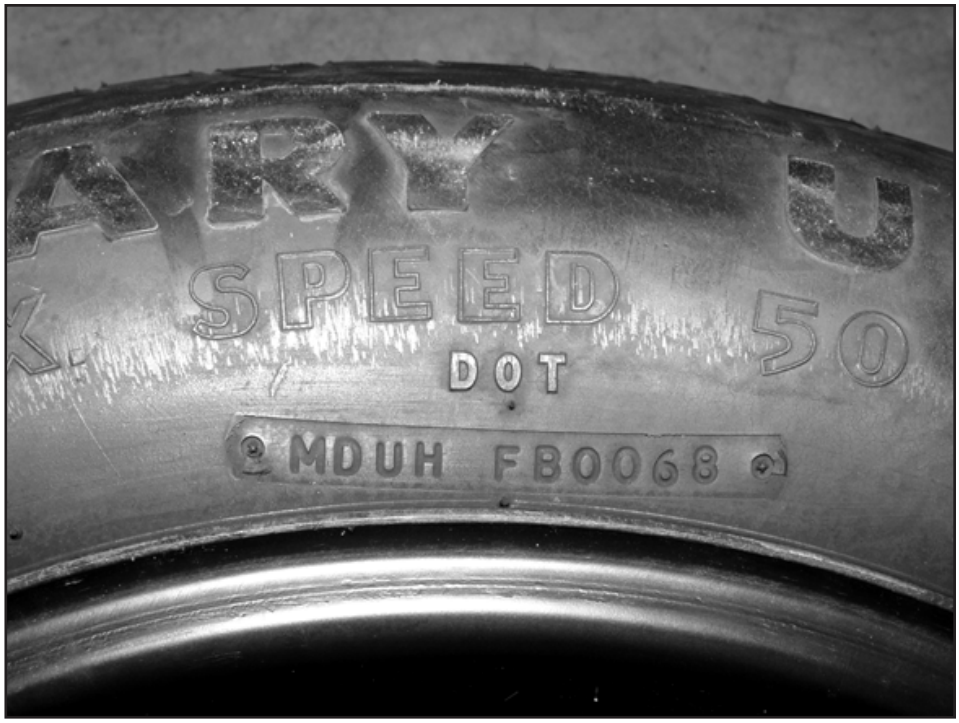
In 1971, Federal Regulations required tire manufacturers to stamp each tire with a Tire Identification Number (TIN), which permits tires to be traced and recalled in the event of a tire-related accident. The letters DOT accompany each TIN and indicate that the tire met all federal standards set by the US Department of Transportation at that time. Initially, the DOT label was centered above the TIN. Today the DOT label precedes each twelve alphanumeric TIN.

The first series represents the plant code where the tire was manufactured, while the last three digits are the date code. In addition to the week and year data, tires are labeled with production line, press mold, tire construction and other marketing information. Beginning in 1997, tire manufacturers began to use a four-digit date code. For example, the numbers 3197 means the 31st week of 1997. Other numbers are also used and are marketing codes used at the manufacturer's discretion. But it's the last digits of the TIN, which convey the tire date code located on the backside of the tire.

Part II (published in a future issue of *The Corvette Restorer*) will describe in detail how regulatory updates got phased into production but the question arises how did the worker update the date code each week? The technique used by the tire assembly plant for continuous tire manufacturing was to simply unscrew a stencil plate which held a gang of digits, update the date code, install the stencil plate and restart for the week's production. However, Goodyear changed the TIN format during the production of 1978-1982 tires for Corvette, and by recognizing these formats, it assists with the confirmation of tire originality.

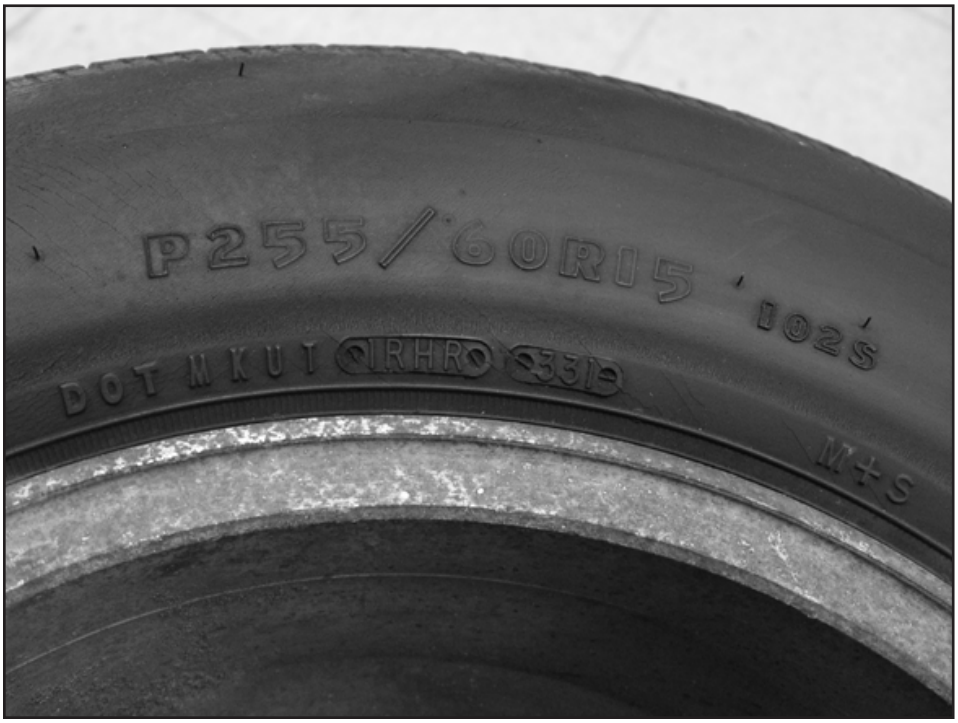
Tire date codes are not judged, but we know that Goodyear continued to produce tires with the TPC label, which eventually made it into the market as original tire equipment. When presented for judging, these tires could be accepted as original tires as delivered from the factory, but a study of date codes would reveal that all tires with a TPC code are not original to the Corvette under study, especially if the safety warning label appears on the tire. Too often as low-mileage Corvettes change hands, buyers are told the tires are original when later study reveals the appearance and configuration is original, but the tire date code confirms production beyond a Corvette's build date.

As the reader studies the figures, he should note the location of the embossed DOT label. Early tire production reveals that the DOT was located above the TIN, while later production shows the TIN is preceded by DOT on the same line. Both certify that this tire conforms to the federal regulations documented in the federal motor vehicle safety standards.



Here is a typical 1978 date code and shows that tire assembly used a single gang (stencil plate) to mold the TIN into the tire with "DOT" stamped above it.

1978 Polyspare DOT TIN – single stencil plate with date code 068 (6th week of 1978).



However, this photo shows that by 1981, the front portion of the TIN was a premolded label, followed by the week's date code (331) and other related TIN information. The "DOT" precedes the TIN.

1981 P255/60R15 DOT TIN – multiple plates with date code 33rd week of 1981 (331). Note speed rating of 102S or don't go over 112 mph!

TPC Specification Label

GM's TPC (Tire Performance Criteria Specification) label has its origins in the study of tires and rolling resistance in the mid-1970's to mid-1980. In response to rising fuel prices and the push to improve mileage and fuel economy, the industry geared up for corporate average fuel economy (CAFÉ) regulations.

These regulations required tire manufacturers to differentiate a PRODUCTION tire from a SERVICE tire and GM adopted the use of the TPC specification for original tire equipment and used the TPC label. The TPC spec defined the rolling resistance characteristics an engineered tire should have to meet the requirements of the automobile it was intended to service. So if we were to trace the TPC Spec 1033 or 1032, we would find that this was intended for a 3,500-pound third-generation Corvette that required such and such. The TPC label indicates that this tire is an automobile manufacturer's original equipment passenger tire, engineered per the automobile manufacturer's specification for tires. Other automobile manufacturers refer to their specification by a different name, while General Motors refer to theirs as the TPC.

1978 Polysteel RPO QGR P225/70R15 with TPC 1033.
This label is on a 1978 Corvette tire for RPO QBS (P225/70R15).

The intent was to encourage owners to replace original equipment tires with compatible service replacements and to notify purchasers of new vehicles in the event tires were found to be defective or that did not comply with applicable Federal motor vehicle safety standards. When you get new tires, get ones consistent with the TPC Spec number. That way your vehicle will continue to have tires that are designed to give proper endurance, handling, speed rating, traction, ride and performance during normal service on your vehicle.

Safety Message

Numerous surveys and studies conducted over the decades underscore the significance of under-inflated tires and their relationship to accidents. This fact drove NHTSA to require auto and tire manufacturers to add safety message labels to both tires and vehicles that would inform buyers to maintain proper tire inflation as well as provide what the proper inflation number is for the tire installed on that particular vehicle.

> *"It was a problem in the 1960's and it continues today… Many vehicles have significantly under-inflated tires, primarily because drivers infrequently check their vehicles' tire pressure. Other contributing factors are the difficulty of visually detecting when a tire is significantly under-inflated and the loss of tire pressure due to natural leakage and seasonal climatic changes."*
>
> *National Highway Traffic Safety Administration, 2000 TREAD Act*

SAFETY WARNING

* SERIOUS INJURY MAY RESULT FROM:
TIRE FAILURE DUE TO UNDERINFLATION/OVERLOADING
FOLLOW OWNER'S MANUAL OR TIRE PLACARD IN VEHICLE

* EXPLOSION OF TIRE/RIM ASSEMBLY DUE TO IMPROPER MOUNTING
ONLY SPECIALLY TRAINED PERSONS SHOULD MOUNT TIRES

The author estimates that in 1981, tires began to appear with the safety-warning label above, encouraging drivers to not over-inflate a tire and to not drive an under-inflated tire. As a tire mold broke or was changed out, the new mold incorporated the safety message. Eventually, old molds were replaced with new molds and the label was added to all new tires.

1978-82 Corvette Production Tires

All 1978-82 Corvettes were equipped with Goodyear P-Metric series radial tires, but options and service replacements varied throughout this period. The table below illustrates tire model by option and year.

Model year 1978 was the first year that Corvette buyers were offered the option to upgrade base radial tires to a performance radial tire, the QBS P255/60R15 series. Through 1977, all Corvette tire RPOs were cosmetic with options for white letters, white stripes or the red or gold lines from early shark years. But the introduction of P-Series radial tires ushered in a performance tire capable of matching Corvette's handling performance for the first time in its 25-year history. This matching of performance tire to handling performance persists through the sixth generation with no end in sight.

In 1978, Corvettes were equipped with one of three options: base, RPO QBS or RPO QGR. Base tires are the P225/70R15 blackwall tires. "Goodyear" and "Polysteel" can be read in raised letters. Production QGR has solid white letters that read "Goodyear" and "Polysteel Radial" and are the P225/70R15 series. RPO QBS are the wider P255/60R15 series with "Goodyear" and "GT Radial" in white outline letters. These were available for ordering with any model but required grinding of the inside fender to eliminate tire/fender rub.

The same RPOs for tire options were offered in 1979, but in 1980 the RPOs changed to QGB (P225/70R15) and QXH (P255/60R15). RPO QXH was still the 60 series RPO through 1982, but model year 1981 saw the return of RPO QGR for the 70 series tire, which remained the base equivalent but with white outline letters through 1982.

Tire Size		RPO by YEAR					Comments
Original	Service Replacement	78	79	80	81	82	
P225/70R15	P225/70R15	QGQ					Goodyear Polysteel Blackwall Radial Tires
P225/70R15	P225/70R15	QGR		QGB	QGR		White Letter SBR Tires Raised white block letter reads "Goodyear" and "Polysteel Radial"
P255/60R15	P255/60R15	QBS					White Letter SBR Tires Raised white letter outline reads "Goodyear" and "GT Radial"
P255/R6015	P255/R6015			QXH			White Letter SBR Tires Raised white letter outline reads "Goodyear" and "Eagle GT"

Polysteel Radials: Solid White Letters P225/70R15)

The Goodyear Polysteel Radials were Corvette OEM equipment delivered on new Corvettes from 1978 through 1982 as an option with RPO QGR or QGB. The number of configurations during that period is not known, but what we know is that tires were manufactured with the solid white letters in at least three configurations during the period.

1. The first design RPO QGR Polysteel Radial was produced through the 1978 model year and also on some 1979 models. The characteristics of the solid white letters is best described as similar to the size of white letters of tires from the early shark years (11/16" width x 12/16" height). These tires display TPC SPEC 1033 molded into the tire.
2. In 1979, Polysteel Radials begin to show up with a wider letter but virtually the same height. The name reaches further around the tire and resembles a stretch version of a 1978 QGR. The appearance is consistent with RPO QBS and its white outline letter style. These measure the same height (3/4") but width measures 19/16". These tires show TPC SPEC 1033 molded into the tire because the performance characteristics remain the same…only the cosmetics differs.
3. Also manufactured were SERVICE replacements such as a Polysteel Radial (first design) with solid white letters but without the TPC label and another Polysteel Radial with the safety message and whose letters were the stretch version of "Polysteel Radial."

The photo at left shows a Polysteel tire with 1st design solid white letter configuration. The "L" letter width measures 11/16"

The photo below shows a Polysteel tire with 2nd design solid white letter configuration. The "L" letter width measures 19/16" or a stretch version of the 1st design.

Service replacements are available today in the P225/70R15 series though the solid white letter configuration will vary from the original RPO QGR and the QGB options. The photo on the following page shows a correct P225/70R15 service replacement. For the purpose of judging, a P225/70R15 in a white letter outline would not be a correct configuration for a Corvette delivered with a P225/70R15 series tire. All P225/70R15 tires (RPO QGR or QGB) on Corvettes from 1978-82 were solid white letters whether the name is Polysteel Radial or Eagle GT.

Thus, the reader can use tire names (lettering) to date a tire and this knowledge can assist a restorer/judge with a quick method for differentiating original tires from service replacements.

GT Radials: White Outline Letters (P255/60R15)

In contrast to the Polysteel 225/70R15 P-Metric tire and the evolution of its signature raised solid white lettering, the GT Radial 255/60R15 raised white outline letter configuration remained consistent through the 1982 model year. We see the font style, letter size and spacing between letters consistent from 1978 through 1982 with only the word change from GT Radial to Eagle GT. The configuration and style of individual letters is consistent throughout this period and remains on tires manufactured as today's service replacements. As testimony to the success of the QBS/QXH design, the style has stuck for over thirty years.

The Goodyear GT Radials were Corvette OEM optional equipment delivered on new Corvettes from 1978 through early production of 1980, as RPO QBS. RPO QXH introduced for the 1980 model year transitioned the GT Radial to the Eagle GT; therefore, early 1980 models are known to have been equipped with the GT Radial as the supply was exhausted. The 1978 Pace Car was equipped with RPO QBS (GT Radial) as base equipment and the 1982 Collector's Edition included QXH (Eagle GT) as base equipment.

Goodyear Eagle P225/70R15 series SERVICE replacement. Note letter design, size and configuration approximates that of an original GT Radial but with bold white raised letters. Date code 1302 or 13th week of 2002.

1. The RPO QBS GT Radial was produced through the 1979 model year and installed on early 1980 Corvettes. The characteristics of the raised white outline letters are not unlike what we see purchased over the counter today at a local Goodyear dealer. OEM tires have the TPC SPEC 1032 molded into the tire and no safety label.

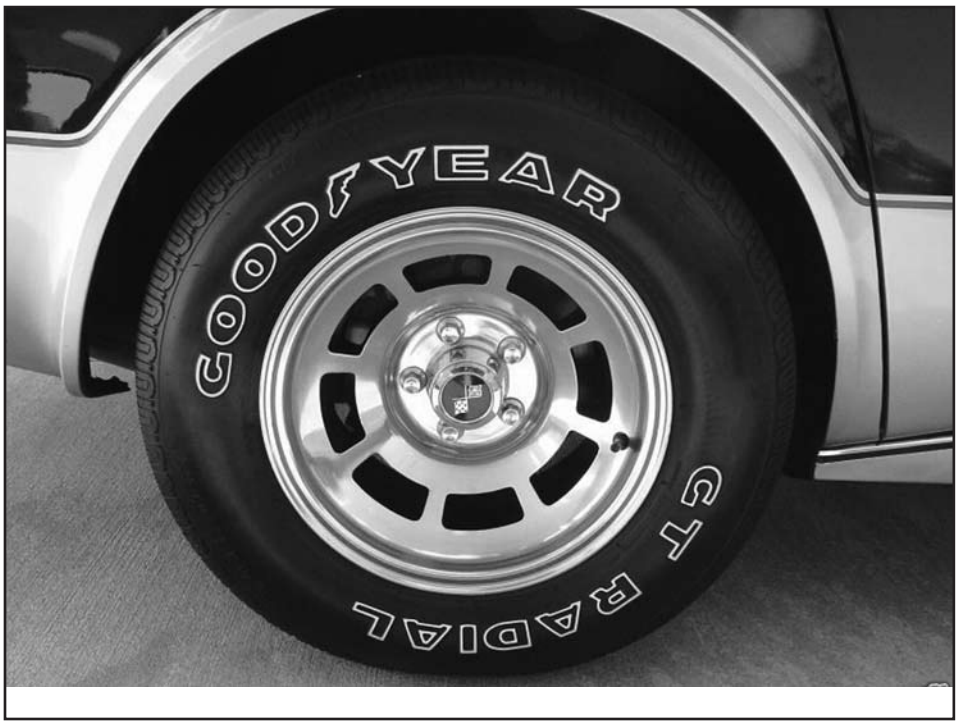
2. RPO QBS GT Radial tires were also manufactured as service replacements, many of which show up today on the judging field and in swap meets. These will not have the TPC label molded into the tire and none have been observed with the safety message.

3. The Goodyear Eagle GT was introduced in the 1980 model year and installed on Corvettes when RPO QXH was checked on the option list. The font used is consistent with the style ushered in with the GT Radial. The appearance of the raised white outline letters is consistent with RPO QBS and their white outline letter style.

4. Eagle GTs supersede the GT Radial as SERVICE REPLACEMENT for both the 225/70R15 and 255/60R15 P-Metric series tires.

Summary

Prior to the turn of the century engineers and NHSTA would have scratched their heads if it was known that tires produced in the late seventies are not only much sought after but used on America's roads today given the volume of safety information imprinted on each tire. Products made for the consumer markets are engineered for obsolesce within a few years. Anyone whose livelihood depends on technology understands this too well. Known factors that accelerate tire aging include sunlight, coastal climates, poor storage, handling and infrequent use. So why are Corvette owners driving around on thirty-year-old tires?



1978 Goodyear GT Radial equipped on a Pace Car. Original tire with 2,675 miles and TPC label.

Predictably, we can find reasons that owners shouldn't be using those thirty-year-old tires by reviewing the Firestone/Ford debacle of 2000 and the studies of tire failure that followed as a result of belt separation from the tire tread. From that research, we learn that failure of aged tires was a contributing factor. Spare tires that had sat in their trays were pulled and put into service years following their production. The irony is that all these tires were manufactured to federal safety specifications put into place back in the 1970's, precisely what this article has explored over the previous pages. It found that "as of December 2006 SRS has documented 108 incidents in which tires older than six years experienced tread/belt separations—most resulting in loss-of-control crashes. These incidents have caused 85 fatalities and 115 injuries." The tires described in these studies were spares, pulled from their perch and pressed into service.

As a result, Ford Motor Company now recommends six-year tire replacement regardless of tread wear. This information is included in Ford owners' manuals and added to its website. Other automobile manufacturers have followed suit and have begun to adopt the six-year replacement recommendation, regardless of tread wear. In contrast British and German tire manufacturers have recommended this practice for tire replacement since the mid-'90's.

Corvette originality is valued whether it's a 1969 L88 or the 1978 Limited Edition Pace Car. The latter comes with the expectation that tires are original as well. But what is the life expectancy of a tire? What was that life expectancy in 1978? What is that life expectancy in 2006? We learn that owners flirt with catastrophic results when old tires are pressed into driving service, and those new to the hobby must recognize the limitations of OEM NOS P255/60R15 low-mileage tires whether on their Corvette or picked up at a swap meet as original NOS tires (new old stock). Buyers take heed check date codes as well as that safety message to ensure your buying what you think you're buying.

Four conclusions are drawn from the technical details outlined above.

- Goodyear raised white outline letters on a P225/70R15 tire is not an original configuration and judged per the general tire deduction guidelines
- A Goodyear GT Radial claimed and judged to be original to the car will exhibit the TPC label and will not include a safety message.
- All 1978 Limited Edition Pace Cars were delivered with the GT Radial. Service replacement is a raised white outline tire and will specify the current version of the Eagle GT.
- A driver should not trust tires older than six years for road service.

This article references a Part 2 to be published in a future issue of *The Corvette Restorer*. Part 2 offers an in depth discussion of tire manufacturing to assist the reader with an understanding of how tire labels and federal safety regulations are incorporated into the production line. It describes how a tire series with same date code could be produced both with and without tire labels described here.

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