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CONSUMER KNOWLEDGE AND USAGE OF TIRE-SIDEWALL MARKINGS

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16. Abstract

This study examined consumers' general knowledge and usage of the information displayed on automobile tire sidewalls. The data consisted of the responses of 618 adults in the U.S. to an online survey.

The examined topics were as follows:

- Experience maintaining and purchasing tires
- General knowledge and understanding of sidewall markings
- Experience using sidewall information
- Use of tire information not generally available on tire sidewalls
- Sources of information when researching or purchasing tires
- Ability to identify the important or frequently used tire-sidewall markings
- Knowledge of where to locate vehicle-specific tire requirements and recommendations

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Introduction

This survey was designed to gauge the general public's current levels of knowledge and usage of the information molded into tire sidewalls. The aim of the study was to better understand which tire markings are actually used by consumers, and how well they are able to locate and understand this information.

As discussed in the background section of the final rule establishing Federal Motor Vehicle Safety Standard (FMVSS) No. 139, *New Pneumatic Tires for Light Vehicles* (NHTSA, 2002), research has shown that consumers and mechanics alike have experienced difficulties when attempting to locate manufacturing or other identifying information for tires, such as the tire identification number (TIN) needed to determine the recall status of a tire.[1] That same discussion also references studies showing that consumers frequently underestimate the importance of inspecting tires for damage, proper loading of tires, and maintaining proper inflation pressure. Consumers were also often unaware of where to locate information regarding the specified maximum load and inflation pressures for their specific vehicle. (As required by FMVSS No. 139, the information for recommended loading and inflation pressures can be found on a vehicle's tire placard, located on or near the driver's side door, or B-pillar in vehicles manufactured after September 1, 2003.) New requirements were enacted for tire labeling and pressure-monitoring systems within the Transportation Recall Enhancement, Accountability, and Documentation (TREAD) Act (U.S. Congress, 2000).

To identify which elements of tire labeling (on sidewalls and placards) are understood and useful to consumers, this study was designed to obtain information about the following tire-related topics: (1) experience maintaining and purchasing tires, (2) general knowledge and understanding of sidewall markings, (3) experience using sidewall information, (4) use of tire information not generally available on tire sidewalls, (5) sources of information when researching or purchasing tires, (6) ability to identify the important or frequently used tire-sidewall markings (i.e., size, speed rating and load index, treadwear indicators, and winter tire symbol), and (7) knowledge of where to locate vehicle-specific tire requirements and recommendations.

[1] For detailed descriptions of the tire identification number and other required tire labels or markings, see U.S. DOT (2002).

Method

Survey instrument

An online survey was conducted using SurveyMonkey (www.surveymonkey.com). A questionnaire was developed to examine several topics related to consumer knowledge and usage of tire markings and information, with the primary interest being information contained on tire sidewalls. The text of the questionnaire is included in the appendix. The survey was performed in September 2017.

Respondents

SurveyMonkey's Audience tool was used to recruit respondents 18 years and older from SurveyMonkey's respondent database in the United States. Respondents were screened and those who do not own or drive an automobile were excluded. Fully completed surveys were received for 618 respondents. The margin of error at the 95% confidence level for the overall results is +/- 3.9%. Demographic breakdowns for the respondents are presented in Table 1. The age and gender breakdowns are similar to the latest U.S. Census demographics for age and gender. Figure 1 shows each U.S. Census region and the corresponding states.

Table 1
Demographic breakdowns for the 618 respondents.

Demographic aspect		Percent
Gender	Female	51.5
	Male	48.5
Age group	18 to 29	19.4
	30 to 44	26.4
	45 to 59	27.3
	60 or older	26.9
Income	$0 to $24,999	16.0
	$25,000 to $49,999	16.3
	$50,000 to $74,999	13.9
	$75,000 to $99,999	12.1
	$100,000 to $124,999	8.6
	$125,000 to $149,999	5.5
	$150,000 to $174,999	4.0
	$175,000 to $199,999	2.3
	$200,000 or more	6.5
	Prefer not to answer	14.7
U.S. region	New England	4.1
	Middle Atlantic	11.2
	East North Central	13.9
	West North Central	7.3
	South Atlantic	16.9
	East South Central	5.5
	West South Central	11.6
	Mountain	10.2
	Pacific	19.3

Figure 1. U.S. Census regions.

Tire maintenance frequency

In addition to the typical demographic breakdowns shown in Table 1, we also examined the data for trends related to frequency of tire maintenance, comparing groups of respondents who personally check and adjust their vehicle's tire pressure frequently (i.e., weekly or monthly), infrequently (less than monthly), or never. Table 2 shows a breakdown of respondents by frequency of tire maintenance.

Table 2
Breakdown of respondents by frequency of tire maintenance.[2]

Tire maintenance frequency	Response	N	Percent
Frequent	Q1 = 1, 2	189	30.6
Infrequent	Q1 = 3, 4, 5, 6, 11, 12, 13	363	58.7
Never	Q1 = 7, 8	66	10.7

[2] The specific text labels corresponding to each numeric response code for Q1 are located in the appendix.

Results

Experience maintaining and purchasing tires

Tire maintenance (Q1)

The most frequent response overall regarding the frequency with which respondents personally check and inflate (if needed) the tires on their automobile was that this was only performed when the tire-pressure monitoring system (TPMS) says one or more tires are low (31.2%). The second most frequent response was monthly (19.9%), followed by semiannually (19.4%). Figure 2 summarizes the results for all respondents, while Table 3 presents complete summaries of responses by gender and age.

Females expressed a greater likelihood than males for relying on TPMS to inform them of low tire pressure before checking (35.8% vs. 26.3%). Also, female respondents reported twice as often as males that they never check their vehicle's tire pressure because someone else maintains their vehicle (10.4% vs. 5.0%).

As respondent age increased, reliance upon TPMS increased (from 14.2% for 18-29 year olds to 40.4% for those 60 and older), but the most common response for the youngest age group was that they check their vehicle's tire pressure semiannually (28.3%). Respondents in the youngest and oldest age groups were much more likely to never check their vehicle's tire pressure because someone else maintains their vehicle (13.3% and 15.1%, respectively) than the two middle age groups (1.8% and 2.4%, respectively).

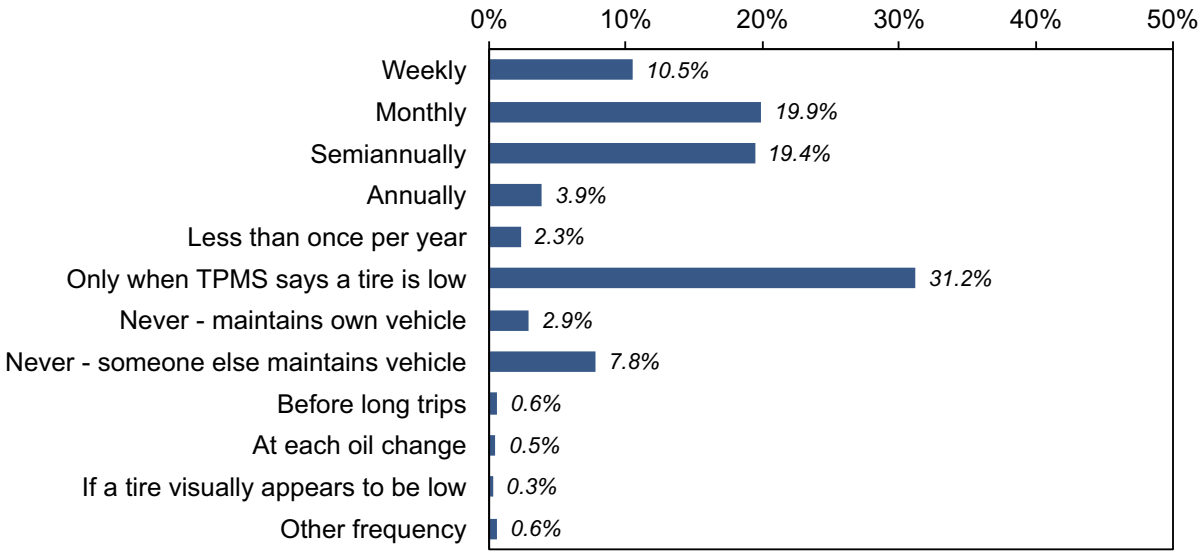

Figure 2. Summary of responses to Q1: "*In general, how often do you personally check and inflate (if needed) the tires on your automobile?*"

Table 3
Percentage of responses, by gender, age, and tire-maintenance frequency, to Q1: "*In general, how often do you personally check and inflate (if needed) the tires on your automobile?*" The most frequent response for each group is shown in **bold**.

Response	Gender		Age				*Total*
	Female	Male	18-29	30-44	45-59	60+	
Weekly	8.2	13.0	18.3	11.7	10.1	4.2	*10.5*
Monthly	14.5	25.7	17.5	22.7	19.5	19.3	*19.9*
Semiannually	17.9	21.0	**28.3**	20.9	18.9	12.0	*19.4*
Annually	4.4	3.3	1.7	6.1	4.1	3.0	*3.9*
Less than once per year	2.8	1.7	1.7	1.8	3.0	2.4	*2.3*
Only when TPMS says a tire is low	**35.8**	**26.3**	14.2	**28.8**	**36.7**	**40.4**	***31.2***
Never – even though they maintain their own vehicle	3.5	2.3	4.2	3.1	3.0	1.8	*2.9*
Never – because someone else maintains their vehicle	10.4	5.0	13.3	1.8	2.4	15.1	*7.8*
Before long trips	0.6	0.7	0.0	1.2	0.6	0.6	*0.6*
At each oil change	0.9	0.0	0.0	0.6	0.6	0.6	*0.5*
If a tire visually appears to be low	0.6	0.0	0.8	0.6	0.0	0.0	*0.3*
Other frequency	0.3	1.0	0.0	0.6	1.2	0.6	*0.6*

Tire purchasing (Q2)

While a substantial majority (75.7%) of respondents have purchased new tires for passenger cars, a large percentage of respondents have also purchased new tires for light trucks (42.1%). Figure 3 summarizes the results for all respondents, while Table 4 presents complete summaries of responses by gender, age, and frequency of tire maintenance (groupings based on responses to Q1).

Male respondents were more likely than females to have purchased new tires for light trucks (48.0% vs. 36.5%, respectively).

As respondent age increased, the percentage of respondents reporting having purchased new tires for passenger cars increased (from 57.5% for 18-29 year olds to 83.1% for those 60 and older). Respondents reporting having purchased new tires for light trucks also generally increased as age increased, but peaked with the 45-59 age group (51.5%). A relatively high percentage of the youngest age group reported never having purchased new tires for a vehicle (23.3%).

In general, the number of respondents having purchased new light-truck tires decreased as frequency of tire maintenance decreased (from 48.1% for those who frequently maintain their tires down to 31.8% for those who never maintain their tires). (There was not a similar effect of tire-maintenance frequency among respondents who have purchased new passenger-car tires.)

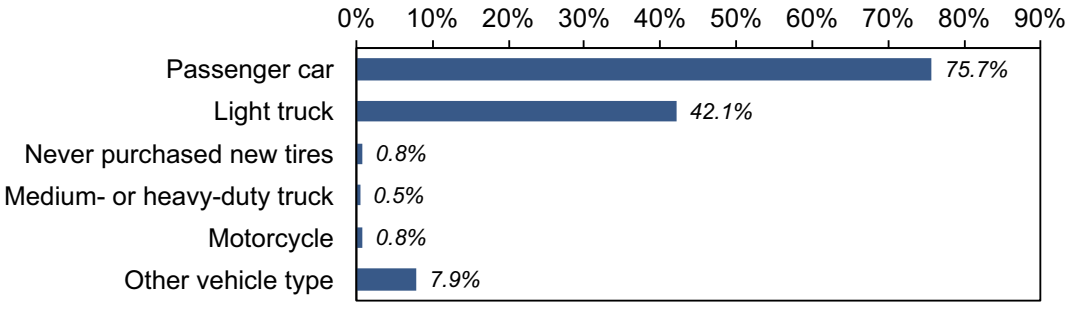

Figure 3. Summary of responses to Q2: "*For which vehicle types have you ever purchased new tires?*" (The percentages add up to more than 100% because respondents could select more than one vehicle type.)

Table 4
Percentage of responses, by gender, age, and tire-maintenance frequency, to Q2: "*For which vehicle types have you ever purchased new tires?*" The most frequent response for each group is shown in **bold**. (The percentages add up to more than 100% because respondents could select more than one vehicle type.)

Response	Gender		Age				Tire maintenance			*Total*
	Female	Male	18-29	30-44	45-59	60+	Frequent	Infrequent	Never	
Passenger car	**73.9**	**77.7**	**57.5**	**78.5**	**78.7**	**83.1**	**74.6**	**77.4**	**69.7**	***75.7***
Light truck	36.5	48.0	25.0	44.8	51.5	42.2	48.1	40.8	31.8	*42.1*
Medium/heavy duty truck	1.3	0.3	0.0	0.6	1.8	0.6	1.1	0.8	0.0	*0.8*
Motorcycle	0.6	0.3	1.7	0.6	0.0	0.0	1.1	0.3	0.0	*0.5*
Other vehicle types	0.3	1.3	1.7	0.0	1.8	0.0	1.1	0.8	0.0	*0.8*
Never purchased new tires	9.4	6.3	23.3	6.7	2.4	3.6	7.9	7.4	10.6	*7.9*

General knowledge and understanding of tire-sidewall markings

General knowledge (Q3)

Respondents most frequently said that they were somewhat knowledgeable (49.4%) about the information molded into tire sidewalls. Figure 4 summarizes the results for all respondents, while Table 5 presents complete summaries of responses by gender, age, and frequency of tire maintenance.

Female respondents reported more than twice as often as males that they were not at all knowledgeable about tire-sidewall information (44.0% vs. 19.3%). At the other extreme, 30.0% of males reported being either extremely knowledgeable or very knowledgeable, compared with only 7.9% of females.

The youngest and oldest age groups were more likely to report being not at all knowledgeable about tire-sidewall information (40.8% and 36.7%, respectively) than the two middle age groups (25.8% and 27.2%, respectively).

A respondent's reported knowledge level of sidewall information was directly related to tire-maintenance frequency. While most respondents reported being somewhat knowledgeable about tire-sidewall information, those who never maintain their vehicle tires most frequently (65.2%) said that they are not at all knowledgeable. Respondents who reported being not at all knowledgeable decreased as tire-maintenance frequency increased. Furthermore, those who frequently maintain their vehicle tires were much more likely than other respondents to say they were extremely knowledgeable (10.6% vs. 4.9%, respectively) or very knowledgeable (25.9% vs. 13.8%, respectively).

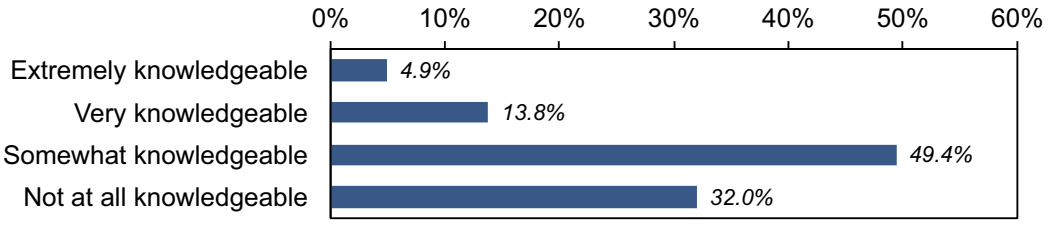

Figure 4. Summary of responses to Q3: "*In general, how knowledgeable are you about the information molded into an automobile tire's sidewall (the outside edge of the tire showing the brand name, etc.)?*"

Table 5

Percentage of responses, by gender, age, and tire-maintenance frequency, to Q3: "*In general, how knowledgeable are you about the information molded into an automobile tire's sidewall (the outside edge of the tire showing the brand name, etc.)?*" The most frequent response for each group is shown in **bold**.

Response	Gender		Age				Tire maintenance			*Total*
	Female	Male	18-29	30-44	45-59	60+	Frequent	Infrequent	Never	
Extremely knowledgeable	1.6	8.3	1.7	7.4	5.9	3.6	10.6	2.8	0.0	*4.9*
Very knowledgeable	6.3	21.7	11.7	17.2	13.0	12.7	25.9	9.6	1.5	*13.8*
Somewhat knowledgeable	**48.1**	**50.7**	**45.8**	**49.7**	**53.8**	**47.0**	**47.6**	**53.2**	33.3	***49.4***
Not at all knowledgeable	44.0	19.3	40.8	25.8	27.2	36.7	15.9	34.4	**65.2**	*32.0*

Understanding of tire-sidewall markings (Q4)

Respondents were most likely to say that they find the information molded into tire sidewalls to be somewhat easy to understand (43.2%). However, nearly 1 in 5 respondents (18.3%) has never looked at the information on tire sidewalls. Figure 5 summarizes the results for all respondents, while Table 6 presents complete summaries of responses by gender, age, and frequency of tire maintenance.

Female respondents reported more than twice as often as males that they have never looked at the information on tire sidewalls (25.8% vs. 10.0%).

The youngest and oldest age groups were more likely to say that they have never looked at the information on tire sidewalls (27.5% and 23.5%, respectively) than the two middle-age groups (14.1% and 10.1%, respectively). Additionally, as age increased, so did the likelihood of saying that the information on tire sidewalls was not at all easy to understand (from 14.2% for 18-29 year olds to 21.7% for those 60 and older).

While most respondents reported that tire-sidewall information was somewhat easy to understand, those who never maintain their vehicle tires most frequently said that they have never looked at the information on a tire sidewall (34.8%). Respondents who reported never having looked at tire-sidewall information increased markedly as tire-maintenance frequency decreased. Those who frequently maintain their vehicle tires were much more likely than other respondents to say that tire-sidewall information was extremely easy (9.0% vs. 4.0%, respectively) or very easy (24.9% vs. 16.3%, respectively) to understand.

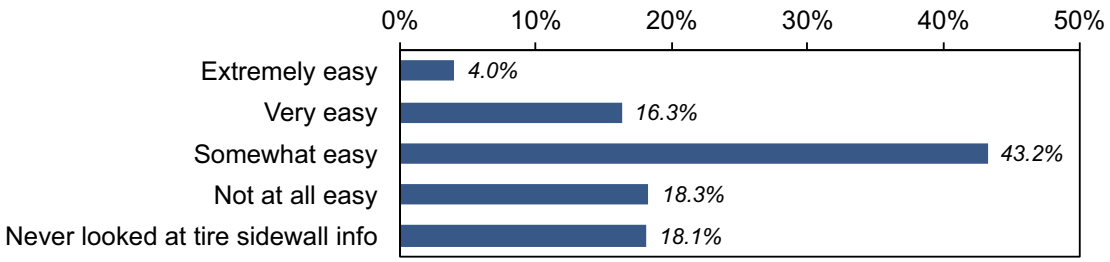

Figure 5. Summary of responses to Q4: "*In general, how easy is it to understand the information molded into the sidewall of tires?*"

Table 6
Percentage of responses, by gender, age, and tire-maintenance frequency, to Q4: "*In general, how easy is it to understand the information molded into the sidewall of tires?*" The most frequent response for each group is shown in **bold**.

Response	Gender		Age				Tire maintenance			*Total*
	Female	Male	18-29	30-44	45-59	60+	Frequent	Infrequent	Never	
Extremely easy	2.5	5.7	1.7	6.7	4.1	3.0	9.0	1.9	1.5	*4.0*
Very easy	12.3	20.7	14.2	19.6	18.3	12.7	24.9	14.3	3.0	*16.3*
Somewhat easy	**42.1**	**44.3**	**42.5**	**43.6**	**47.3**	**39.2**	**45.5**	**44.1**	31.8	***43.2***
Not at all easy	17.3	19.3	14.2	16.0	20.1	21.7	13.2	19.0	28.8	*18.3*
Never looked at tire-sidewall information	25.8	10.0	27.5	14.1	10.1	23.5	7.4	20.7	**34.8**	*18.1*

Experience using tire-sidewall information

Sidewall information needed (Q5)

The most common piece of information respondents reported ever needing to know was tire size (63.1%), followed by maximum inflation pressure (58.1%) and maximum load rating (20.1%). (The percentages add up to more than 100% because respondents could select more than one response.) About 1 in 5 respondents (21.0%) reported never needing to know or use any tire-sidewall information. Figure 6 summarizes the results for all respondents, while Table 7 presents complete summaries of responses by gender, age, and frequency of tire maintenance.

Males more frequently reported needing to know each sidewall-information element asked about in Q5 compared with females. Females were about two-and-a-half times as likely as males to say that they never needed to know or use any tire-sidewall information (29.9% vs. 11.7%, respectively).

The youngest and oldest age groups were much more likely to report never needing to know or use any tire-sidewall information (32.5% and 26.5%, respectively) than the two middle age groups (12.3% and 16.0%, respectively).

For every information element asked about in Q5, the likelihood of ever needing to know or use sidewall information increased as tire-maintenance frequency increased. While overall a majority of respondents (63.1%) were likely to report needing to know tire size, those who never maintain their vehicle tires most frequently said that they have never needed to know or use tire-sidewall information (45.5%). Respondents who reported never having needed to know or use tire-sidewall information increased substantially as tire-maintenance frequency decreased, ranging from 8.5% for those who frequently maintain their vehicle tires to 45.5% for those who never maintain their tires.

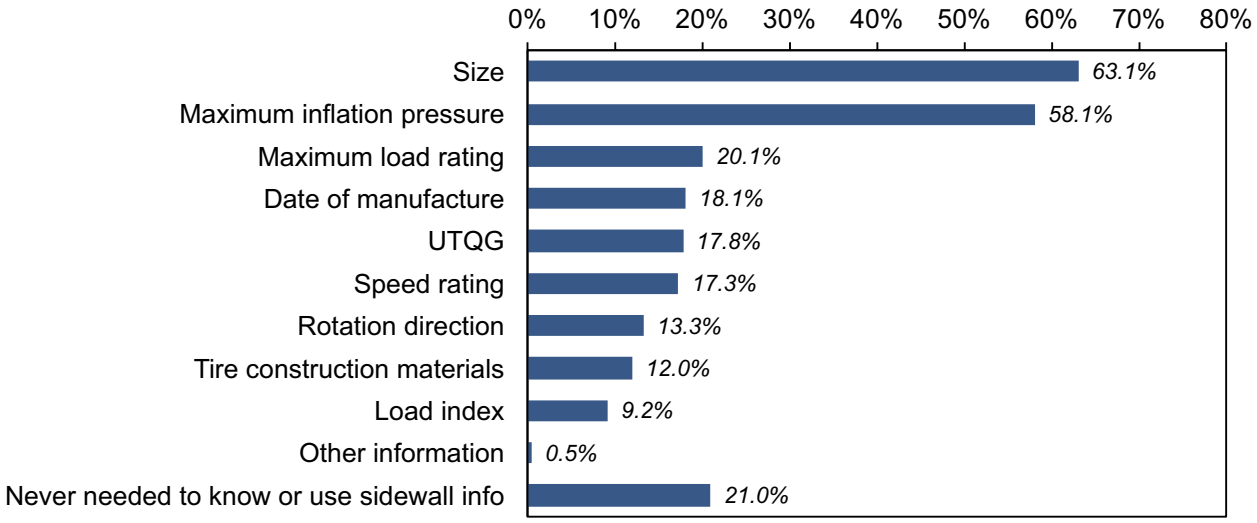

Figure 6. Summary of responses to Q5: "*Which of the following information elements that are molded into the sidewall of your tires have you ever needed to know or use?*" (The percentages add up to more than 100% because respondents could select more than one response.)

Table 7

Percentage of responses, by gender, age, and tire-maintenance frequency, to Q5: "*Which of the following information elements that are molded into the sidewall of your tires have you ever needed to know or use?*" The most frequent response for each group is shown in **bold**. (The percentages add up to more than 100% because respondents could select more than one response.)

Response	Gender		Age				Tire maintenance			*Total*
	Female	Male	18-29	30-44	45-59	60+	Frequent	Infrequent	Never	
Size	**53.1**	**73.7**	**50.8**	**69.3**	**67.5**	**61.4**	**77.8**	**60.1**	37.9	***63.1***
Maximum inflation pressure	49.7	67.0	46.7	65.0	60.9	56.6	68.8	55.9	39.4	*58.1*
Maximum load rating	10.1	30.7	19.2	21.5	20.1	19.3	28.6	18.7	3.0	*20.1*
Date of manufacture	13.2	23.3	18.3	17.2	20.1	16.9	25.9	16.3	6.1	*18.1*
UTQG	11.9	24.0	18.3	20.2	16.6	16.3	29.6	13.5	7.6	*17.8*
Speed rating	6.9	28.3	14.2	18.4	18.9	16.9	26.5	15.2	3.0	*17.3*
Rotation direction	8.2	18.7	16.7	17.8	7.7	12.0	20.6	11.6	1.5	*13.3*
Tire construction materials	6.0	18.3	11.7	8.6	12.4	15.1	21.2	9.1	1.5	*12.0*
Load index	4.1	14.7	6.7	9.2	10.7	9.6	15.3	7.7	0.0	*9.2*
Other information	0.0	1.0	0.0	0.0	1.2	0.6	0.5	0.3	1.5	*0.5*
Never needed to know or use tire-sidewall information	29.9	11.7	32.5	12.3	16.0	26.5	8.5	23.1	**45.5**	*21.0*

Reasons sidewall information was needed (Q6)

The top reason respondents said they needed to know the sidewall information for tires was to make sure they were inflating them properly (60.6%), followed by the need to select or purchase new tires (58.1%), and the need to tell someone else the sidewall information (27.8%). (The percentages add up to more than 100% because respondents could select more than one response.) Figure 7 summarizes the results for all respondents, while Table 8 presents complete summaries of responses by gender, age, and frequency of tire maintenance.

No notable gender differences were observed for the responses to this question.

The top response differed by respondent age, with the two youngest age groups (18-29 and 30-44) most frequently saying that they needed to know or use tire-sidewall information to make sure they were inflating them properly (66.3% and 56.6%, respectively); the oldest two age groups (45-59 and 60+) most frequently said they needed tire-sidewall information to select or purchase new tires (66.7% and 63.0%, respectively).

The top response also differed for respondents who never maintain their vehicle tires, as they most frequently said that they needed tire-sidewall information to select or purchase new tires (39.5%).

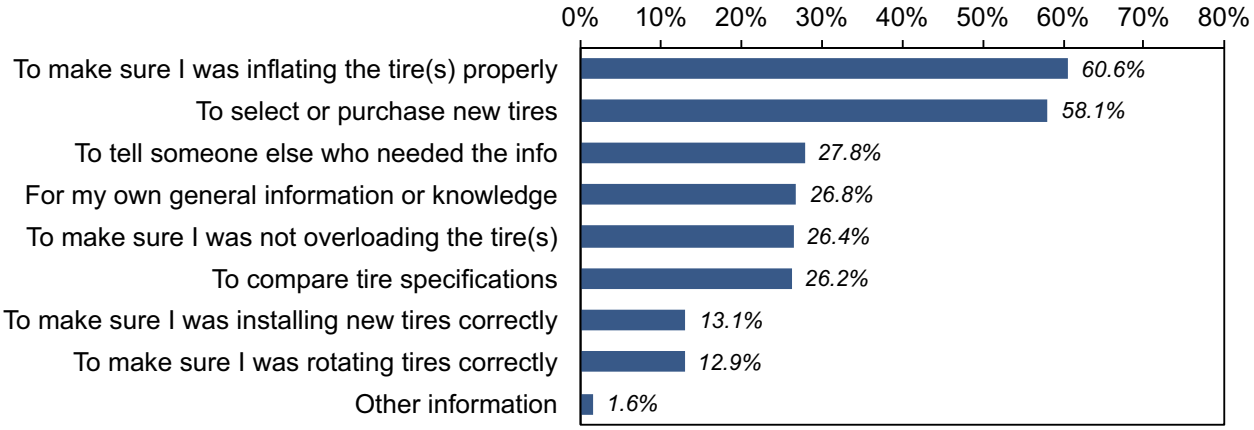

Figure 7. Summary of responses to Q6: "*When you used the information molded into the sidewall of your tire, what was the purpose or reason?*" (The percentages add up to more than 100% because respondents could select more than one response.)

Table 8
Percentage of responses, by gender, age, and tire-maintenance frequency, to Q6: "*When you used the information molded into the sidewall of your tire, what was the purpose or reason?*" The most frequent response for each group is shown in **bold**. (The percentages add up to more than 100% because respondents could select more than one response.)

Response	Gender		Age				Tire maintenance			*Total*
	Female	Male	18-29	30-44	45-59	60+	Frequent	Infrequent	Never	
To make sure I was inflating the tire(s) properly	**58.0**	**62.7**	**66.3**	**56.6**	61.8	59.8	**68.4**	**58.9**	36.8	***60.6***
To select or purchase new tires	55.8	60.1	44.6	53.1	**66.7**	**63.0**	61.6	58.5	**39.5**	*58.1*
To tell someone else who needed the information	28.3	27.3	38.6	38.5	24.3	12.6	31.1	24.5	36.8	*27.8*
For my own general information or knowledge	18.6	33.6	33.7	27.3	21.5	27.6	36.7	21.3	21.1	*26.8*
To make sure I was not overloading the tire(s)	23.9	28.4	38.6	30.1	22.9	18.1	30.5	26.6	5..3	*26.4*
To compare tire specifications	20.4	31.0	34.9	30.8	20.8	21.3	32.2	25.5	2.6	*26.2*
To make sure I was installing new tires correctly	10.2	15.5	24.1	16.8	8.3	7.1	18.6	11.3	0.0	*13.1*
To make sure I was rotating tires correctly	8.8	16.2	15.7	14.0	11.8	11.0	20.9	9.2	2.6	*12.9*
Other information	0.4	2.6	2.4	0.0	0.7	3.9	0.6	1.4	7.9	*1.6*

Use of information not generally available on tire sidewalls

Additional tire information needed or sought (Q7)

Nearly half (49.2%) of all respondents reported never searching for any additional information not molded into tire sidewalls. When respondents did search for additional information, fuel efficiency (26.9%) was the most common piece of information sought, followed by road noise (25.2%) and snow traction (23.0%). (The percentages add up to more than 100% because respondents could select more than one response.) Figure 8 summarizes the results for all respondents, while Table 9 presents complete summaries of responses by gender, age, and frequency of tire maintenance.

For every sidewall-information element asked about in Q7, males more frequently reported searching for such information than did females. Also, females were more likely than males to say that they have never searched for any additional tire information (58.8% vs. 39.0%, respectively).

The oldest two age groups (45-59 and 60+) most frequently reported searching for information about road noise (30.8% and 23.5%, respectively).

While most respondents were most likely to report never having searched for additional information, those who maintain their vehicle tires frequently most often said that they sought information about fuel efficiency (41.8%) and road noise (38.6%), with the frequency of those saying they have never searched for additional information (33.3%) ranking third. Respondents who reported never having searched for additional tire information increased greatly as tire-maintenance frequency decreased, ranging from 33.3% for those who frequently maintain their vehicle tires to 77.3% for those who never maintain their tires.

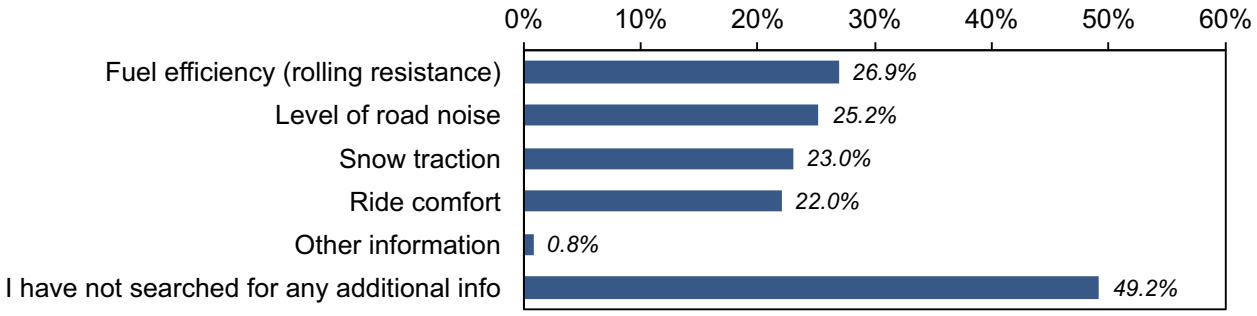

Figure 8. Summary of responses to Q7: "*Which of the following information that is not molded into the tire have you ever searched for or wanted to know?*" (The percentages add up to more than 100% because respondents could select more than one response.)

Table 9

Percentage of responses, by gender, age, and tire-maintenance frequency, to Q7: "*Which of the following information that is not molded into the tire have you ever searched for or wanted to know?*" The most frequent response for each group is shown in **bold**. (The percentages add up to more than 100% because respondents could select more than one response.)

Response	Gender		Age				Tire maintenance			*Total*
	Female	Male	18-29	30-44	45-59	60+	Frequent	Infrequent	Never	
Fuel efficiency (rolling resistance)	18.6	35.7	30.0	30.1	25.4	22.9	**41.8**	20.7	18.2	*26.9*
Level of road noise	17.6	33.3	24.2	22.1	30.8	23.5	38.6	21.2	9.1	*25.2*
Snow traction	17.3	29.0	22.5	22.1	26.6	20.5	28.0	22.3	12.1	*23.0*
Ride comfort	17.0	27.3	23.3	23.9	20.1	21.1	33.3	19.3	4.5	*22.0*
Other information	0.9	0.7	0.0	1.2	1.2	0.6	1.1	0.8	0.0	*0.8*
I have not searched for or wanted to know any additional information	**58.8**	**39.0**	**52.5**	**47.9**	**43.8**	**53.6**	33.3	**52.3**	**77.3**	***49.2***

Sources of additional tire information (Q8)

Respondents most frequently said that they obtain additional information for tires from local retail tire stores (42.1%), followed by tire manufacturer websites (26.2%), and automotive repair shops (25.4%). (The percentages add up to more than 100% because respondents could select more than one response.) Figure 9 summarizes the results for all respondents, while Table 10 presents complete summaries of responses by gender, age, and frequency of tire maintenance.

Although females and males share the same top choice for additional tire information (local retail tire stores; 41.8% and 42.3%, respectively), females prefer local stores as their second and third choices for sources of tire information (automotive repair shops: 28.3%; vehicle dealerships: 22.0%), while males prefer internet-based sources of information (tire manufacturer website: 36.7%; online tire retailer: 32.0%).

Several age-related trends were observed. Differing from the average top choice of local tire retailer, the youngest age group (18-29) prefers automotive repair shops (37.5%) as their top choice for additional tire information. Although automotive repair shops ranked third overall, it was not in the top three for the middle two age groups (30-44 and 45-59), replaced instead by online tire retailers; this choice ranked third for the 30-44 age group (33.7%) and second for the 45-59 age group (26.6%).

The top response for respondents who never maintain their vehicle tires was that they have not needed any additional tire information (34.8%). The top choice for that same group when they do seek additional information was automotive repair shops (33.3%), though this choice ranked third overall for all respondents. Furthermore, the frequency of those saying they have not needed any additional tire information steadily dropped as tire maintenance frequency increased, with only 4.8% of those who frequently maintain their tires selecting this option.

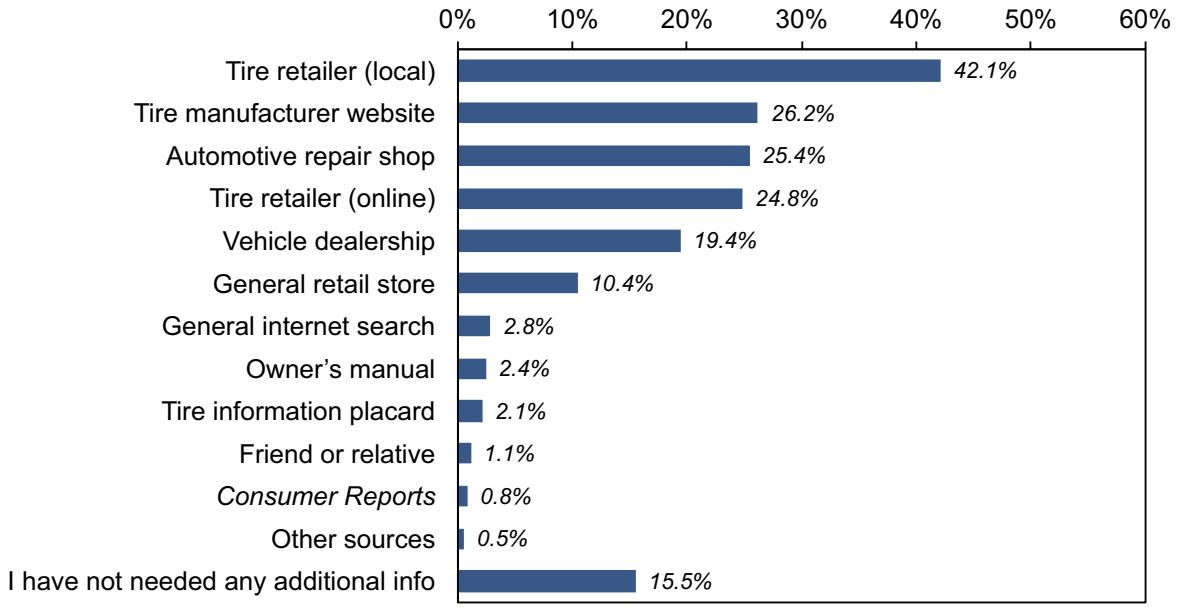

Figure 9. Summary of responses to Q8: "*Other than the sidewall of your tires, where do you usually get additional information about tires?*" (The percentages add up to more than 100% because respondents could select more than one response.)

Table 10

Percentage of responses, by gender, age, and tire-maintenance frequency, to Q8: "*Other than the sidewall of your tires, where do you usually get additional information about tires?*" The most frequent response for each group is shown in **bold**. (The percentages add up to more than 100% because respondents could select more than one response.)

Response	Gender		Age				Tire maintenance			*Total*
	Female	Male	18-29	30-44	45-59	60+	Frequent	Infrequent	Never	
Tire retailer (local)	**41.8**	**42.3**	32.5	**42.9**	**46.7**	**43.4**	**50.3**	**39.7**	31.8	***42.1***
Tire manufacturer website	16.4	36.7	24.2	38.0	21.3	21.1	40.2	22.6	6.1	*26.2*
Automotive repair shop	28.3	22.3	**37.5**	28.8	17.8	21.1	28.0	22.6	33.3	*25.4*
Tire retailer (online)	17.9	32.0	20.0	33.8	26.6	17.5	34.4	22.0	12.1	*24.8*
Vehicle dealership	22.0	16.7	26.7	17.8	14.8	20.5	19.0	21.2	10.6	*19.4*
General retail store	6.9	14.0	14.2	12.3	11.2	4.8	17.5	7.7	4.5	*10.4*
General internet search	1.9	3.7	2.5	2.5	3.6	2.4	3.7	2.2	3.0	*2.8*
Owner's manual	2.2	2.7	0.0	1.2	3.0	4.8	2.6	2.8	0.0	*2.4*
Tire information placard (on door frame)	1.6	2.7	1.7	2.5	3.0	1.2	0.5	3.0	1.5	*2.1*
Friend or relative	2.2	0.0	0.0	1.8	1.2	1.2	0.5	1.7	0.0	*1.1*
Consumer Reports	0.9	0.7	0.0	0.6	0.6	1.8	0.5	1.1	0.0	*0.8*
Other sources	0.0	1.0	0.0	0.0	0.6	1.2	0.0	0.6	1.5	*0.5*
I have not needed any additional information	18.9	12.0	23.3	14.1	11.8	15.1	4.8	17.6	**34.8**	*15.5*

Ability to locate information when researching tires (Q9)

Respondents overwhelmingly (96.0%) said that they were able to find the information they need when researching new tires. Figure 10 summarizes the results for all respondents, while Table 11 presents complete summaries of responses by gender, age, and frequency of tire maintenance.

No notable age or gender differences were observed for this question.

Respondents who never maintain their vehicle tires were much more likely to report never searching for new tire information (9.3% vs. 1.3% overall).

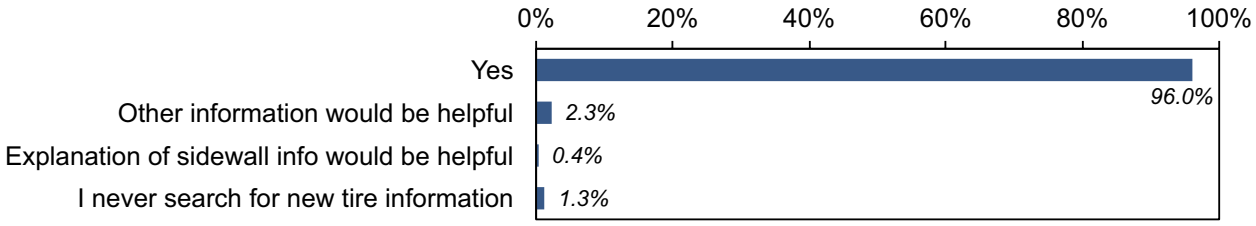

Figure 10. Summary of responses to Q9: "*Are you generally able to find the information you need when researching new tires?*"

Table 11
Percentage of responses, by gender, age, and tire-maintenance frequency, to Q9: "*Are you generally able to find the information you need when researching new tires?*" The most frequent response for each group is shown in **bold**.

Response	Gender		Age				Tire maintenance			*Total*
	Female	Male	18-29	30-44	45-59	60+	Frequent	Infrequent	Never	
Yes	**95.4**	**96.6**	**96.8**	**95.7**	**95.3**	**96.5**	**96.7**	**97.4**	**83.7**	***96.0***
No – other information would be helpful	1.9	2.6	1.1	2.8	4.0	0.7	2.8	2.0	2.3	*2.3*
No – information provided with tire purchase that explains sidewall information would be helpful	0.8	0.0	1.1	0.7	0.0	0.0	0.0	0.0	4.7	*0.4*
I never search for new tire information	1.9	0.8	1.1	0.7	0.7	2.8	0.6	0.7	9.3	*1.3*

Sidewall marking preferences and identification

Preference for sidewall markings versus removable stickers (Q10)

When asked about their preference for displaying tire information (i.e., specifications) that changes over the lifetime of the tire, respondents were evenly split regarding their preference for permanently molding the information into the sidewall (45.5%) versus including such information on a sticker to be removed after purchase (45.6%). Figure 11 summarizes the results for all respondents, while Table 12 presents complete summaries of responses by gender, age, and frequency of tire maintenance.

In general, no major differences were observed by gender, age, or tire maintenance frequency for this question. However, the preference for including information that changes over the lifetime of the tire on separate paperwork, brochure, etc. that is provided with the purchase of new tires was higher for females than for males (4.7% vs. 2.0%, respectively), steadily increased as age increased (from 0.8% for the youngest age group to 4.2% for the oldest age group), and steadily decreased as tire-maintenance frequency decreased (from 4.8% for those who frequently maintain their tires to 1.5% for those who never maintain their tires).

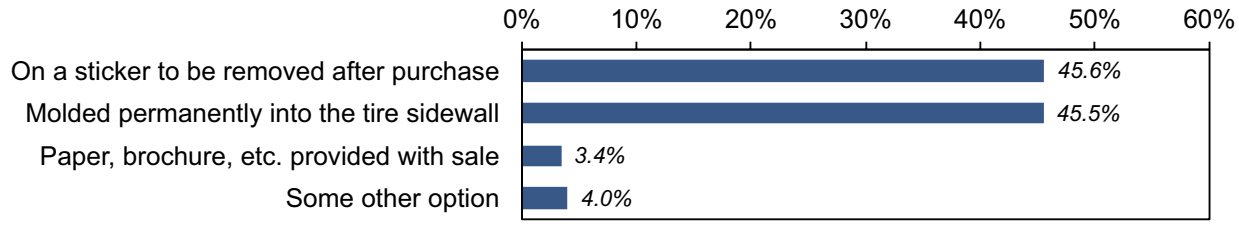

Figure 11. Summary of responses to Q10: "*Certain aspects of tire performance can change over the lifetime of the tire, for example, treadwear, traction, and fuel-efficiency. Would you prefer that this information be permanently molded into the sidewall, shown with a sticker that is removed after purchase, or some other option?*"

Table 12

Percentage of responses, by gender, age, and tire-maintenance frequency, to Q10: "*Certain aspects of tire performance can change over the lifetime of the tire, for example, treadwear, traction, and fuel-efficiency. Would you prefer that this information be permanently molded into the sidewall, shown with a sticker that is removed after purchase, or some other option?*" The most frequent response for each group is shown in **bold**.

Response	Gender		Age				Tire maintenance			*Total*
	Female	Male	18-29	30-44	45-59	60+	Frequent	Infrequent	Never	
On a sticker to be removed after purchase	**48.7**	42.3	44.2	45.4	**47.3**	**45.2**	44.4	**46.8**	42.4	***45.6***
Molded permanently into the tire sidewall	41.8	**49.3**	**50.8**	**46.6**	41.4	44.6	**45.0**	45.2	**48.5**	*45.5*
Paper, brochure, etc. that is provided with sales paperwork	4.7	2.0	0.8	3.7	4.1	4.2	4.8	3.0	1.5	*3.4*
Some other option	3.1	5.0	2.5	3.1	5.9	4.2	3.7	4.1	4.0	*4.0*

Familiarity with treadwear indicators (Q11)

A slight majority (53.2%) said that they are familiar with the treadwear indicators that are molded into a tire and know how to use them to tell when new tires are needed, but 46.8% were not. Figure 12 summarizes the results for all respondents, while Table 13 presents complete summaries of responses by gender, age, and frequency of tire maintenance.

Females were less likely than males to say that they are familiar with treadwear indicators and know how to use them to tell when new tires are needed (45.0% vs. 62.0%, respectively).

The youngest age group (18-29) differed from the average, with less than a majority (46.7%) reporting that they are familiar with treadwear indicators and know how to use them to tell when new tires are needed.

Familiarity with treadwear indicators and knowing how to use them to tell when new tires are needed was affected by a respondent's tire-maintenance frequency. Individuals who reported familiarity with treadwear indicators and know how to use them dropped sharply as tire-maintenance frequency decreased, with 70.4% of the frequent-tire-maintenance group saying they were knowledgeable, down to 28.8% of the never-maintenance group saying the same.

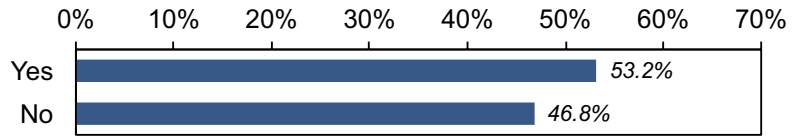

Figure 12. Summary of responses to Q11: "*Are you familiar with the treadwear indicators that are molded into a tire and how to use them to tell when you need new tires?*"

Table 13
Percentage of responses, by gender, age, and tire-maintenance frequency, to Q11: "*Are you familiar with the treadwear indicators that are molded into a tire and how to use them to tell when you need new tires?*" The most frequent response for each group is shown in **bold**.

Response	Gender		Age				Tire maintenance			*Total*
	Female	Male	18-29	30-44	45-59	60+	Frequent	Infrequent	Never	
Yes	45.0	**62.0**	46.7	**57.7**	**52.7**	**54.2**	**70.4**	48.8	28.8	***53.2***
No	**55.0**	38.0	**53.3**	42.3	47.3	45.8	29.6	**51.2**	**71.2**	*46.8*

Identification of tire size on the sidewall (Q12)

A majority (59.7%) of respondents could identify an example of a standard size designation found on tire sidewalls; 35.1% stated that they did not know and 5.2% selected an incorrect response. Figure 13 summarizes the results for all respondents, while Table 14 presents complete summaries of responses by gender, age, and frequency of tire maintenance.

Females, the youngest age group (18-29), and those who never maintain their tires all most often said that they did not know which set of numbers and letters showed an example tire size (48.1%, 50.8%, and 63.6% respectively).

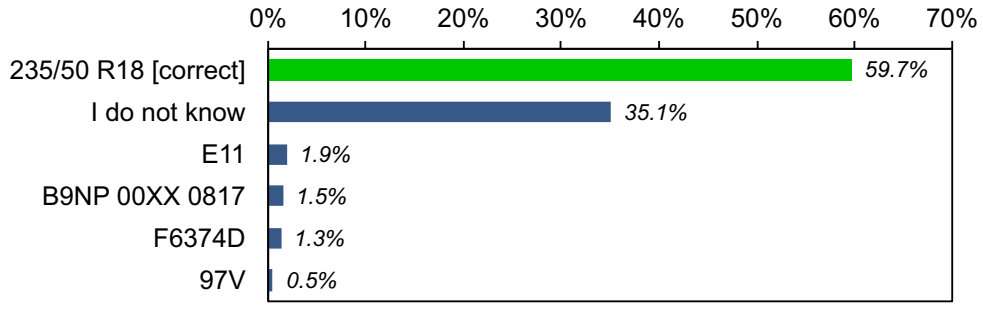

Figure 13. Summary of responses to Q12: "*Which of the following sets of numbers and letters shows an example of a tire size?*"

Table 14
Percentage of responses, by gender, age, and tire-maintenance frequency, to Q12: "*Which of the following sets of numbers and letters shows an example of a tire size?*" The most frequent response for each group is shown in **bold**.

Response	Gender		Age				Tire maintenance			*Total*
	Female	Male	18-29	30-44	45-59	60+	Frequent	Infrequent	Never	
235/50 R18 [correct]	47.2	**73.0**	40.8	**64.4**	**71.0**	**57.2**	**73.5**	**57.0**	34.8	***59.7***
I do not know	**48.1**	21.3	**50.8**	30.1	23.7	40.4	18.5	38.6	**63.6**	*35.1*
E11 [ECE type approval mark]	2.2	1.7	3.3	2.5	1.8	0.6	3.2	1.7	0.0	*1.9*
B9NP 00XX 0817 [DOT tire identification number]	16.6	1.3	2.5	1.2	1.8	0.6	1.6	1.4	1.5	*1.5*
F6374D [model number]	0.9	1.7	1.7	0.6	1.8	1.2	2.1	1.1	0.0	*1.3*
97V [speed index and load rating]	0.0	1.0	0.8	1.2	0.0	0.0	1.1	0.3	0.0	*0.5*

Identification of combined load index and speed rating (Q13)

A large majority (90.8%) of respondents could *not* identify an example of a combined load index and speed rating found on tire sidewalls; 72.8% stated that they did not know and 18.0% selected an incorrect response. Overall, respondents were equally likely to select the correct load index and speed rating as they were to select the example of a tire size (both 9.2%). Figure 14 summarizes the results for all respondents, while Table 15 presents complete summaries of responses by gender, age, and frequency of tire maintenance.

Males and those who maintain their tires frequently were the most likely to select the correct option (16.7% and 15.9%, respectively), but they were also most likely to select an incorrect option (versus saying that they do not know). Conversely, females and those who never maintain their tires were most likely to say that they do not know (84.3% and 90.9%, respectively).

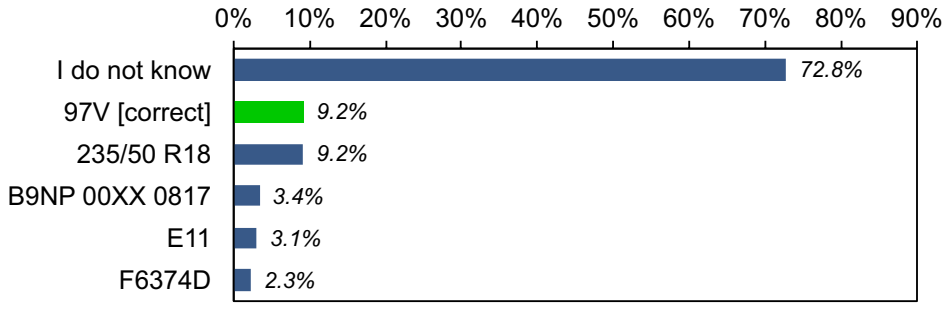

Figure 14. Summary of responses to Q13: "*Which of the following sets of numbers and letters shows an example of the combined load index and speed rating of a tire?*"

Table 15

Percentage of responses, by gender, age, and tire-maintenance frequency, to Q13: "*Which of the following sets of numbers and letters shows an example of the combined load index and speed rating of a tire?*" The most frequent response for each group is shown in **bold**.

Response	Gender		Age				Tire maintenance			*Total*
	Female	Male	18-29	30-44	45-59	60+	Frequent	Infrequent	Never	
I do not know	**84.3**	**60.7**	**73.3**	**60.7**	**74.6**	**82.5**	**56.6**	**78.0**	**90.9**	***72.8***
97V [correct]	2.2	16.7	8.3	13.5	7.7	7.2	15.9	7.2	1.5	*9.2*
235/50 R18 [size]	8.5	10.0	9.2	15.3	7.1	5.4	12.7	8.0	6.1	*9.2*
B9NP 00XX 0817 [DOT tire identification number]	2.5	4.3	1.7	4.3	5.9	.2	5.3	3.0	0.0	*3.4*
E11 [ECE type approval]	1.6	4.7	3.3	4.3	3.0	1.8	4.8	2.5	1.5	*3.1*
F6374D [model number]	0.9	3.7	4.2	1.8	1.8	1.8	4.8	1.4	0.0	*2.3*

Winter tire symbol identification (Q14)

Respondents most frequently said that they did not know what symbol formally identifies a winter tire (i.e., the three-peak mountain with snowflake, or 3PMSF, also called the Alpine symbol; see Figure 15) (49.7%), followed by those who selected *mud and snow* (27.8%), and *all season* (22.2%). The correct response of mountain with snowflake was only the fourth most frequently selected (19.6%). (The percentages add up to more than 100% because respondents could select more than one response.) Figure 16 summarizes the results for all respondents, while Table 16 presents complete summaries of responses by gender, age, and frequency of tire maintenance.

Females were more likely than males to report not knowing what symbol formally identifies a winter tire (57.5% vs. 41.3%, respectively). The demographic group most often selecting the correct response was the frequent-tire-maintenance group (24.9%), although their most frequent response was mud and snow (36.5%).

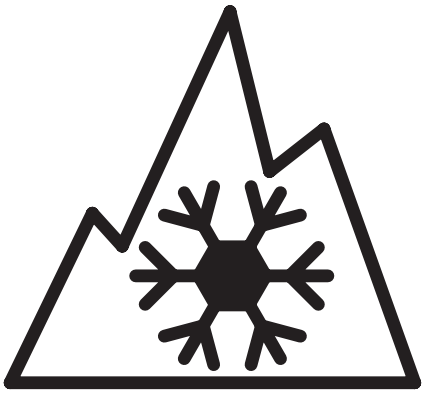

Figure 15. Example of the three-peak mountain with snowflake symbol, or 3PMSF (also called the Alpine symbol), that formally identifies a winter tire.

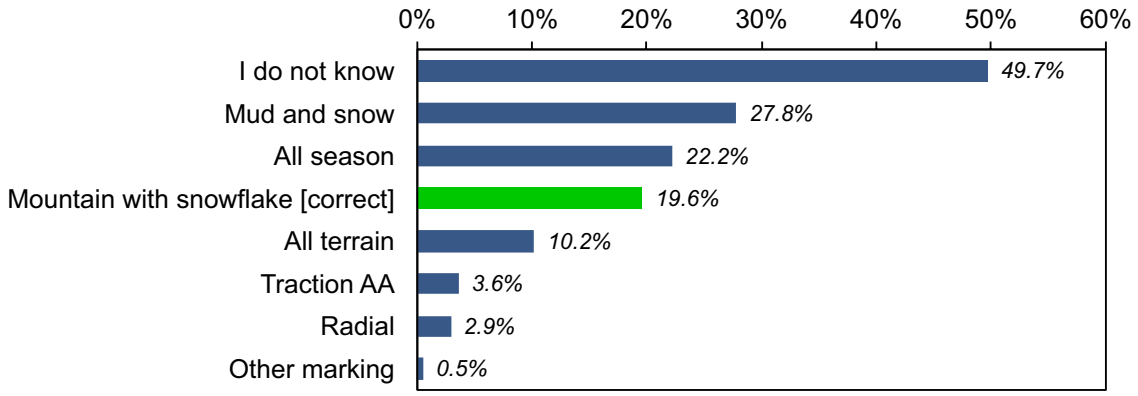

Figure 16. Summary of responses to Q14: "*Which of the following sidewall markings formally identifies a tire as a winter tire?*" (The percentages add up to more than 100% because respondents could select more than one response.)

Table 16
Percentage of responses, by gender, age, and tire-maintenance frequency, to Q14: "*Which of the following sidewall markings formally identifies a tire as a winter tire?*" The most frequent response for each group is shown in **bold**. (The percentages add up to more than 100% because respondents could select more than one response.)

Response	Gender		Age				Tire maintenance			*Total*
	Female	Male	18-29	30-44	45-59	60+	Frequent	Infrequent	Never	
I do not know	**57.5**	**41.3**	**53.3**	**50.3**	**47.9**	**48.2**	36.0	**54.3**	**63.6**	***49.7***
Mud and snow	22.0	34.0	25.0	23.3	24.9	37.3	**36.5**	24.0	24.2	*27.8*
All season	17.3	27.3	16.7	19.0	25.4	25.9	24.3	22.0	16.7	*22.2*
Mountain with snowflake [correct]	16.4	23.0	19.2	22.1	20.7	16.3	24.9	18.2	12.1	*19.6*
All terrain	7.5	13.0	13.3	14.1	8.9	5.4	13.2	9.4	6.1	*10.2*
Traction AA	2.5	4.7	7.5	2.5	4.1	1.2	6.9	2.2	1.5	*3.6*
Radial	1.6	4.3	2.5	3.1	3.0	3.0	3.7	2.8	1.5	*2.9*
Other marking	0.0	1.0	0.8	0.6	0.6	0.0	0.5	0.6	0.0	*0.5*

Locating vehicle-specific tire requirements and recommendations (Q15)

When respondents were asked where they should look to find important information describing the requirements or recommendations, including the correct inflation pressure, for tires installed on their specific vehicle, most correctly responded that the owner's manual (59.4%) was one place to find this information, yet less than half (45.3%) also knew that the tire information placard installed in the vehicle was another correct location to find this information. (The percentages add up to more than 100% because respondents could select more than one response.) Figure 17 summarizes the results for all respondents, while Table 17 presents complete summaries of responses by gender, age, and frequency of tire maintenance.

Females were less likely than males to mention the tire placard in a vehicle as a place to find important vehicle-specific information describing the requirements or recommendations for tires (38.1% vs. 53.0%, respectively). Females were also twice as likely as males to say that they do not know where to find this information (16.7% vs. 8.3%, respectively).

While approximately half (45.3%) of all respondents correctly identified the tire placard as a place to find important vehicle-specific information describing the requirements or recommendations for tires, only one-third (33.3%) of those in the 18-29 age group mentioned this location. The frequency of reporting not knowing where to locate such information dropped steadily as age increased (from 27.5% for the 18-29 age group to 5.4% for the 60+ age group). Conversely, correct responses identifying the owner's manual increased as age increased (from 49.2% for the 18-29 age group to 73.5% for the 60+ age group).

While the frequency of correct responses mentioning the owner's manual as a place to find important vehicle-specific information describing the requirements or recommendations for tires dropped as tire-maintenance frequency decreased (from 61.9% for the frequent-tire-maintenance group to 53.0% for those who never maintain their tires), a majority of the group that never maintains their tires still correctly identified the owner's manual as a place to find such information. Correct identification of the tire placard also dropped as tire-maintenance frequency dropped, with twice as many respondents in the frequent-tire-maintenance group identifying this location compared with those in the never-maintenance group (from 49.7% for the frequent-tire-maintenance group to 22.7% for those who never maintain their tires). Additionally, the frequency of reporting not knowing where to locate such information increased substantially as tire maintenance frequency decreased (from 8.5% for the frequent-tire-

maintenance group to 31.8% for those who never maintain their tires). (While those who said that they would ask a dealership or repair shop, or find this information online, are neither correct nor incorrect, it is unclear how frequently the correct information is obtained using these sources.)

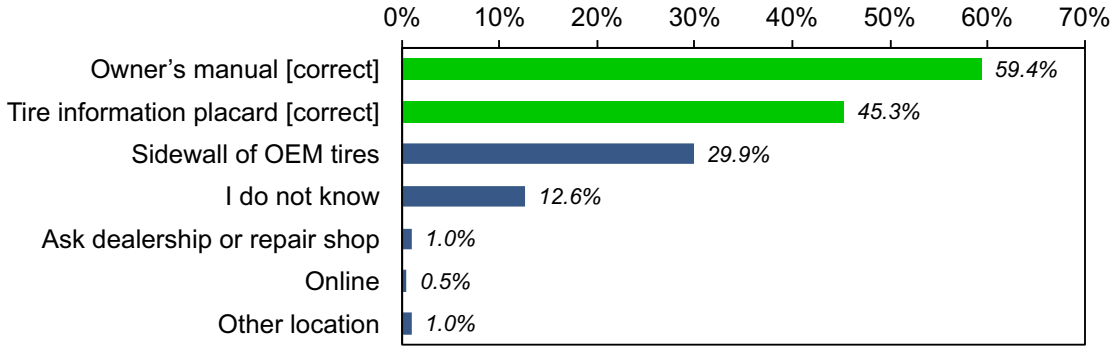

Figure 17. Summary of responses to Q15: "*Where should you look to find important information describing the requirements or recommendations, including the correct inflation pressure, for tires installed on your specific vehicle?*" (The percentages add up to more than 100% because respondents could select more than one response.)

Table 17

Percentage of responses, by gender, age, and tire-maintenance frequency, to Q15: "*Where should you look to find important information describing the requirements or recommendations, including the correct inflation pressure, for tires installed on your specific vehicle?*" The most frequent response for each group is shown in **bold**. (The percentages add up to more than 100% because respondents could select more than one response.)

Response	Gender		Age				Tire maintenance			*Total*
	Female	Male	18-29	30-44	45-59	60+	Frequent	Infrequent	Never	
Owner's manual [correct]	**58.8**	**60.0**	**49.2**	**54.0**	**58.0**	**73.5**	**61.9**	**59.2**	**53.0**	***59.4***
Tire information placard [correct]	38.1	53.0	33.3	47.9	46.7	50.0	49.7	47.1	22.7	*45.3*
Sidewall of OEM tires	25.5	34.7	30.8	36.8	26.0	26.5	34.4	29.5	19.7	*29.9*
I do not know	16.7	8.3	27.5	11.7	10..1	5.4	8.5	11.3	31.8	*12.6*
Ask dealership or repair shop	0.9	1.0	0.8	0.0	0.6	2.4	0.5	0.8	3.0	*1.0*
Online	0.9	0.0	0.0	0.0	1.8	0.0	0.0	0.8	0.0	*0.5*
Other location	0.3	1.7	0.0	0.0	3.0	0.6	1.1	1.1	0.0	*1.0*

Key Findings

Experience maintaining and purchasing tires

- Less than one-third (30.6%) of drivers claim to check their tire pressure frequently (monthly or more often), while nearly two thirds (58.7%) do so infrequently (less than monthly), and 1 out of 10 drivers (10.7%) never check their vehicle's tire pressure.
- Drivers most often said that they rely upon their TPMS warning that a tire is low before checking their vehicle's tire pressure (31.2% overall).
- Most drivers (75.7%) have purchased new tire for a passenger car, though slightly less than half (42.1%) have ever done so for a light truck.

General knowledge and understanding of tire-sidewall markings

- Respondents were fairly consistent across demographic divisions that they felt somewhat knowledgeable (49.4%) regarding tire-sidewall information.
- Overall, respondents find the information on tire sidewalls somewhat easy to understand (43.2%).
- However, never checking and maintaining tires negatively impacted knowledge and understanding of sidewall markings, with most respondents in that group saying they were not at all knowledgeable (65.2%) about sidewall markings, and most frequently saying that they never looked at a tire sidewall (34.8%) when asked about understanding such information.

Experience using tire-sidewall information

- A majority of respondents have needed to know the size (63.1%) and maximum inflation pressure (58.1%) found on tire sidewalls, although the most frequent response from those who never maintain their tires was that they never needed to know or use any of the tire-sidewall information (45.5%).
- A majority of respondents needed to know tire-sidewall information to make sure they were inflating their tires properly (60.6%) and to select or purchase new tires (58.1%).

Use of information not generally available on tire sidewalls

- Respondents were most likely to say that they have not searched for or wanted to know any additional information about tires (49.2%), though those who frequently maintain their tires were most likely (41.8%) to say they searched for information about fuel economy (rolling resistance).
- When searching for additional tire information, respondents most often get this information from local tire retailers (42.1%), although respondents who never maintain their tires most often report not searching for any additional information (34.8%).
- The vast majority of respondents (96.0%) said that they were able to find the information they need when researching new tires.

Sidewall-marking preferences and identification

- For tire information that can change over the lifetime of a tire (treadwear, traction, etc.), respondents were generally evenly split in their preferences for obtaining this information from a removable sticker or from the tire sidewall itself, where it is permanently molded.
- A slight majority (53.2%) of respondents said that they were familiar with treadwear indicators and how to use them to tell when they need new tires. However, this trend reversed for females, those 18-29 years old, and for those who either infrequently or never maintain their tires.
- When quizzed about knowledge of sidewall markings, a majority of respondents (59.7%) were able to identify the size designation; females, those 18-29 years old, and those who never maintain their tires were more likely to say they did not know.
- Most respondents (72.8%) said that they did not know when asked to identify an example of a combined load index and speed rating appearing on tire sidewalls; only 9.2% were able to properly identify this set of sidewall markings.
- About half (49.7%) of respondents said they did not know when asked to identify the sidewall markings that formally identify a winter tire (i.e., a three-peaked mountain with snowflake [3PMSF]). Only 19.6% were able to properly identify the 3PMSF winter tire-sidewall marking, and markings for *mud and snow* and *all season* were selected more often (27.8% and 22.2%, respectively).

Locating vehicle-specific tire requirements and recommendations

- Most respondents (59.4%) know that the owner's manual contains vehicle-specific tire requirements and recommendations, but less than half (45.3%) knew that this information was also provided on the tire information placard (usually mounted on or near the driver's side B-pillar).
- Approximately one-third of respondents (29.9%) would rely on the non-vehicle-specific maximums (listed for inflation pressure and loading) molded into a tire sidewall.

Discussion and Conclusion

As discussed in the Introduction to this report, poor or infrequent tire maintenance has been recognized as an ongoing problem for vehicles in the U.S. As indicated by the results of this survey, less than one-third of drivers say that they frequently (monthly or more often) check and inflate (if needed) the tires on their vehicle. Furthermore, approximately 1 out of 10 drivers claims to never perform such checks. Most often, drivers said that they rely solely upon the tire-pressure monitoring system (TPMS) installed on their vehicle to indicate the need to check their tires, and the frequency of this reliance increases as driver age increases. Both results reveal that (1) tire maintenance continues to be a problem (or at least overlooked by drivers) in spite of attempts to educate and increase awareness of the issue, and (2) effective, reliable, TPMS performance is critical as the market share of vehicles with such systems increases, likely resulting in more drivers expecting such systems to tell them when to maintain their vehicle's tire pressure. Furthermore, if drivers continue to rely solely on TPMS rather than frequent, manual checking of their vehicle's tires, additional consideration should be given to reducing the threshold for pressure loss before activation of TPMS warnings and/or the additional safety value in displaying the actual pressures in each tire to the driver (this last feature is often currently found in higher-end TPMS installations).

While the most frequent answer regarding where drivers get additional information about tires was from local tire retailers (42.1%), more than half of all responses (51.0%) mentioned an internet source as the place they get their tire information (26.2% said a tire manufacturer website and 24.8% said from an online tire retailer). Traditional methods of communicating important information to consumers at local tire retailers, dealerships, and repair shops may not reach many consumers who now prefer to get tire information online versus a physical store with trained tire professionals. Regardless of the source, nearly all respondents (96.0%) said that they were able to find the information they need when researching new tires.

Misconceptions and general lack of knowledge were found when drivers were quizzed about identification of winter tire markings. About half of all drivers surveyed said they did not know how to identify a winter tire. (This may be due, in part, to many respondents living in warmer states, and rarely if ever need to use or know about winter tires.) Furthermore, large percentages of drivers erroneously identified mud and snow tires (27.8%) or all-season tires (22.2%) as being winter tires. While tires with the mud and snow designation likely offer an

advantage over all-season tires for winter driving, they both lack the specific tread pattern designs and rubber compounds required to perform as an actual winter tire.

Most drivers were aware that the owner's manual was an appropriate location to find vehicle-specific tire requirements and recommendations, yet slightly less than half knew to look for the tire information on the placard mounted on their vehicle to find the same information. Furthermore, around one-third of drivers said that they would look to the OEM tire sidewall for vehicle-specific tire information, though tire sidewalls only contain *maximum* loading and inflation specifications, not vehicle-specific information.

Most respondents assessed their own knowledge level for tire-sidewall information as being relatively low (49.4% said somewhat knowledgeable, the second lowest category), and a similar percentage (43.2%) found the information on tire sidewalls only somewhat easy to understand. However, knowledge of tire-sidewall information varied considerably depending on the type of information. For example, most respondents said they knew how use identify and use treadwear indicators (53.2%), and slightly more were able to correctly identify an example of a standard tire size (59.7%). Conversely, nearly three-quarters stated that they did not know how to identify a combined load index and speed rating, and around half stated that they could not identify a winter tire; only 9.2% and 19.6%, respectively, were able to correctly identify these markings.

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Appendix: Questionnaire

Tire information survey

INTRODUCTION

We are conducting a survey about automobile tires—a topic about which some people know a lot and some people know very little. Regardless of how much you know (or don't know) about tires, we are interested in your views.

When answering each survey question, please consider only new tires for automobiles. Do not consider motorcycle or bicycle tires.

Q1. In general, how often do you personally check and inflate (if needed) the tires on your automobile?

1) Weekly
2) Monthly
3) Semiannually
4) Annually
5) Less than once per year
6) Only when the tire-pressure monitoring system (TPMS) tells me tire pressure is low
7) Other frequency (please describe): _____
8) Never – even though I maintain my own vehicle
9) Never – because someone else maintains my vehicle
10) I do not own or drive an automobile → ***Disqualify***

Q2. For which vehicle types have you ever purchased ***new tires***?

Please do not include tires that were included on a new vehicle unless you specifically selected the tires for that new vehicle. Please select all vehicle types that you have ever purchased new tires for:

1) Passenger car
2) Light truck (SUV, pickup, minivan, van)
3) Other (please describe): _____
4) I have never purchased new tires for a vehicle

Q3. In general, how knowledgeable are you about the information molded into an automobile tire's sidewall (the outside edge of the tire showing the brand name, etc.)?

1) Extremely knowledgeable
2) Very knowledgeable
3) Somewhat knowledgeable
4) Not at all knowledgeable

Q4. In general, how easy is it to understand the information molded into the sidewall of tires?

1) Extremely easy to understand
2) Very easy to understand
3) Somewhat easy to understand
4) Not at all easy to understand
5) I have never looked at the information on a tire sidewall

Q5. Which of the following information elements that are molded into the sidewall of your tires have you ever needed to know or use?

Please select all that apply: [the order of options 1-9 below were randomized]

1) Size
2) Speed rating
3) Load index
4) Maximum load rating
5) Maximum inflation pressure
6) Date of manufacture
7) Rotation direction
8) Uniform Tire Quality Grades (treadwear, traction, and temperature ratings)
9) Tire construction materials (layers of nylon, steel, polyester, etc.)
10) Other (please describe): _____
11) I have never needed to know or use any of this information

IF Q5 = NEVER [option 11], SKIP Q6

Q6. When you used the information molded into the sidewall of your tire, what was the purpose or reason?

Please select all that apply: [the order of options 1-8 below were randomized]

1) To select or purchase new tires
2) To make sure I was installing new tires correctly
3) To make sure I was rotating tires correctly
4) To make sure I was inflating the tire(s) properly
5) To make sure I was not overloading the tire(s)
6) To tell someone else who needed the information
7) For my own general information or knowledge
8) To compare tire specifications
9) Other (please describe): _____

Q7. Which of the following information that is not molded into the tire have you ever searched for or wanted to know?

Please select all that apply: [the order of options 1-4 below were randomized]

1) Fuel efficiency (rolling resistance)
2) Level of road noise
3) Snow traction
4) Ride comfort
5) Other (please describe): _____
6) I have not searched for or wanted to know any additional information

Q8. Other than the sidewall of your tires, where do you usually get additional information about tires?

Please select all that apply: [the order of options 1-6 below were randomized]

1) Tire manufacturer website
2) Tire retail store (online)
3) Tire retail store (local)
4) Vehicle dealership
5) Automotive repair shop
6) General retail store
7) Other (please describe): _____
8) I have not needed any additional information

IF Q8 = I HAVE NOT NEEDED ANY ADDITIONAL INFORMATION [option 8], SKIP Q9

Q9. Are you generally able to find the information you need when researching new tires?

1) Yes
2) No → Follow up:
   "How can finding the information you need be improved or made easier?"
   _____
   _____
   _____
   _____

Q10. Certain aspects of tire performance can change over the lifetime of the tire, for example, treadwear, traction, and fuel-efficiency. Would you prefer that this information be permanently molded into the sidewall, shown with a sticker that is removed after purchase, or some other option?

1) Molded permanently into the tire sidewall
2) On a sticker to be removed after purchase
3) Other (please specify): _____

Q11. Are you familiar with the treadwear indicators that are molded into a tire and how to use them to tell when you need new tires? Tread wear indicators are also known as wear bars or tread bars.

1) Yes
2) No

Q12. For the final four questions, we would like to ask about your familiarity with the information on automobile tires.

Which of the following sets of numbers and letters shows an example of a ***tire size***?

[the order of options 1-5 below were randomized]

1) B9NP 00XX 0817
2) 235/50 R18
3) 97V
4) E11
5) F6374D
6) I do not know

Q13. Which of the following sets of numbers and letters shows an example of the combined ***load index and speed rating*** of a tire?

[the order of options 1-5 below were randomized]

1) B9NP 00XX 0817
2) 235/50 R18
3) 97V
4) E11
5) F6374D
6) I do not know

Q14. Which of the following sidewall markings formally identifies a tire as a **winter tire**?

Please select all that apply: [the order of options 1-6 below were randomized]

1) Mountain with snowflake symbol
2) Mud and snow (M+S, M/S, M&S, etc.)
3) Traction AA
4) Radial
5) All terrain
6) All season
7) I do not know
8) Other (please describe): _____

Q15. Where should you look to find important information describing the requirements or recommendations, including the correct inflation pressure, for tires installed <u>on your specific vehicle</u>?

Please select all that apply: [the order of options 1-3 below were randomized]

1) Owner's manual
2) Tire information placard (usually on the edge of the driver's side door frame or door)
3) The sidewall of your vehicle's original equipment tires
4) I do not know
5) Other (please describe): _____

CONCLUSION

Thank you for completing this survey!