Q.2.

Consider a car with the following specifications that is parked on a level road. Find the load on the front

and rear axles. m = 1765 kg, l = 2.84m, a1 = 1.22m, a2 = 1.62m.

TWT February Monday 019 2019 Assignment 2 QNO: 2 Consider a car with the following specifications that is parked on a level road, Find the local on the front QNO: 2 reor axels, m = 1765 kg, 1= 2.83m. and al - 1.22m, az = 1.62m 2 az a CE ma 2 F21 $l = d_1 + d_2$ Fzi = 1 mg an you'll need them on your way do

6 February Wednesday February Wk M T W T F 06 1 06 4 5 6 7 8 07 11 12 13 14 15 08 18 19 20 21 22 09 25 26 27 28 2019 WK-6 • Day (037-328) m = 1765 kg l = 2.84m $a_1 = 1.22m$ a2 = 1.62m force under each front wheel is. $F_{21} = \frac{1}{2} mg \frac{d_2}{d}$ $=\frac{1}{2} \times 1765 \times 9.81 \times \frac{1.62}{2.89}$ = 1 x 1785 1765 xg.81 x 0.570 F21 = 4934.675N -free under each rear -wheel. Happiness has one advantage over wealth; no one

Tuesday 05 WK-6 + Day (036-329 2019 05 F22 = 2 mg di appling the edullibinum eqn. ZE=0 E My=0 $2F_{2}$, $+2F_{2}$ = mg = 0-2 Fz, ai + 2 Fz2dz = 0 provide the searching forecorr under the front- and lear tires, Fz1 = 2 mg az = 1 mg az Fz1 = 2 mg a1+az = 2 mg a $F_{22} = \frac{1}{2} mg \frac{a_1}{a_1 + a_2} = \frac{1}{2} mg \frac{a_1}{l}$ not the rear-view mirror

February Thursday 6 • Day (038-327) 2019 $F_{22} = \frac{1}{2} \operatorname{mg} \frac{a_1}{4}$ $= \frac{1}{2} \times 1785 \times 9.81 \times \frac{1.22}{2.89}$ $= \frac{1}{2} \times 1765 \times 9.81 \times 0.429$ $F_{22} = 3718.99N$ -*

Q: 3 : - What are the different parts of tires? Differentiate between types of tires on the basis of their

construction.

TIRE PARTS DIAGRAMparts of a tire diagram



BEADS

We'll start from the inside out! Tire beads hold the tire to the rim, or the outer edge of the wheel. They're made of copper, brass, or bronze-plated high tensile steel wires wound into a rubber band. Tire beads prevent the tire from sliding out of place when the wheel rolls.

BEAD FILLER

Bead filler is a rubber compound inside the tire's beads. It provides stability to the lower sidewall and bead area. The density and stiffness of a tire's bead filler help to determine a tire's performance characteristics.

RADIAL CORD BODY

The cord body gives the tire strength and transmits cornering forces from the tread to the wheel. Rubber coated fabric cord, called body plies, make up the cord body. Body plies can be made of polyester, rayon, or nylon. Polyester is most commonly used.

INNER LINER

The inner liner (in the center of the tire diagram) is a rubber compound bonded to the inside of the cord body that retains air under pressure. It has no cord reinforcement, and it functions like an inner tube. Note, however, that modern car tires no longer have inner tubes inside them. A tire's beads, bead filler, and inner liner work together to hold air within the tire walls.

BELT PLIES

Belt plies are two or more strong layers of cord just under the tread area of the tire. The

primary function of belt plies is to provide strength and stability to the tire tread. They play a role in improving tire mileage, impact resistance, and traction. Steel is the most common cord material used in belt plies.

SIDEWALL

The area of a tire from the bead to the tread—the side of the tire—is called the sidewall. It forms a protective covering for the cord body. Information about the tire is printed on the sidewall. This information includes the tire size, load index, and speed rating. Sidewall rubber compounds are designed to resist damage from ozone, cuts, and snags.

TREAD

The tread is the portion of the tire that comes in contact with the road surface. The tread's compound and its design have to balance wear, traction, handling, fuel economy, resistance, and other characteristics of the tire. Tread designs vary greatly!

Tires and Sidewall Information

Pneumatic tires are the only means to transfer forces between the road andthe vehicle. Tires are required to produce the forces necessary to control the vehicle, and hence, they are an important component of a vehicle.



Figure 1.1 illustrates a cross section view of a tire on a rim to show the

dimension parameters that are used to standard tires

The section height, tire height, or simply height, hT, is a number that must be added to the rim radius to make the wheel radius. The section width, or tire width, wT, is the widest dimension of a tire when the tire is not loaded. Tires are required to have certain information printed on

the tire sidewall.

2 1. Tire and Rim Fundamentals



Figure 1.2 illustrates a side view of a sample tire to show the important

information printed on a tire sidewall.

FIGURE 1.2. Side view of a tire and the most important information printed on

a tire sidewall.

The codes in Figure 1.2 are:

1 Size number.2 Maximum allowed inflation pressure.3 Type of tire construction.

4 M&S denotes a tire for mud and snow.5 E-Mark is the Europe type approval mark and number. 6 US Department of Transport (DOT) identification numbers. 7 Country of manufacture.8 Manufacturers, brand name, or commercial name.The most important information on the sidewall of a tire is the sizenumber, indicated by 1 . To see the format of the size number, an exampleis shown in Figure 1.3 and their definitions are explained as follows.P Tire type. The first letter indicates the proper type of car that thetire is made for. P stands for passenger car. The first letter can also beST for special trailer, T for temporary, and LT for light truck.215 Tire width. This three-number code is the width of the unloadedtire from sidewall to sidewall measured in [mm].

1. Tire and Rim Fundamentals 3

Passenger car

Tire width [mm]

Aspect ratio [%] Radial Rim diameter [in] Load rating Speed rating Ρ 215 60 R 15 96 Н P 215 / 60 R 15 96 H FIGURE 1.3. A sample of a tire size number and its meaning. 60 Aspect ratio. This two-number code is the ratio of the tire section height to tire width, expressed as a percentage. Aspect ratio is shown by sT. sT = hT wΤ

× 100 (1.1)

Generally speaking, tire aspect ratios range from 35, for race car tires, to

75 for tires used on utility vehicles.

R Tire construction type. The letter R indicates that the tire has

a radial construction. It may also be B for bias belt or bias ply, and

D for diagonal.

15 Rim diameter. This is a number in [in] to indicate diameter of the

rim that the tire is designed to fit on.

96 Load rate or load index. Many tires come with a service description

at the end of the tire size. The service description is made of a two-digit

number (load index) and a letter (speed rating). The load index is a rep resentation of the maximum load each tire is designed to support.

Table 1.1 shows some of the most common load indices and their load carrying capacities. The load index is generally valid for speeds under

210 km/ h (\approx 130 mi/ h).

H Speed rate. Speed rate indicates the maximum speed that the tire

can sustain for a ten minute endurance without breaking down.

Table 1.2 shows the most common speed rate indices and their meanings.

Types of Tyre

Winter Tyres. Winter tyres have been designed with a large number of grooves and sipes to offer greater traction and grip on snowy, icy and wet surfaces.

Summer Tyres. Also known as standard tyres, summer tyres are designed to offer high levels of performance and are optimised to cope in temperatures above 7°c.

All Season Tyres. All season tyres are constructed using a combination of summer and winter tyre technology. ...

Part Worn Tyres. Considering purchasing part worn tyres for your vehicle? ...

Budget Tyres. Debating buying budget or premium manufacturer tyres for your vehicle? Make sure you take all factors into consideration before you make your purchase.