

Find Optimized pattern for arranging the tyres in a truck

Description of the Problem: -

1. Variation in loading pattern causing under utilization of vehicle capacity.
2. Lack of compatibility of load plan with Vehicle capacity causing changes in load.

What we want:-

1. Need to determine the compatibility of a load plan with a vehicle in optimized manner so as to accommodate maximum tyres with vehicle constraints (Weight & Volume). Results can advice under or over Utilization of available space.
2. Flexibility in planning to accommodate variation in vehicle dimensions / Chimney space etc.
3. Accommodate various loading patterns – Horizontal / vertical / cross loading.
4. Determine the optimal loading pattern with sequence.

Process

Planning team Issues confirmation to Warehouse through mail as per standard format



Warehouse team prepares check sheet as per confirmation received



As per check sheet WH team prepare tyre and put tyre in preparation area with tags of location & Qty



After vehicle arrival pre inspection are done and warehouse starts loading

		C & F		F'BAD	DELHI-N	B'LORE	H'BAD	MADURAI	Jabalpur
		MODE		CTL 7T	CTL 7T	MXL	MXL	MXL	CTL 7T
		From WH		M001	M001	M001	M001	M001	M001
		C&F Company No.		C060	C070	C350	C310	C480	C180
Sr. No.	BSID SIZE	PATT.	TYPE	PRODUCT CO	PC FOR TUBE				
A01	135 70 R 12	B290	TL	PSR0D539		4	10		
A02	145 70 R 12	FR500	TL	PSR0D45F					
A03	145 70 R 12	S322M	TT	PSR0D252	PSRCD143		40	35	100
A04	145 70 R 12	S322M	TO	PSR0D2523		6			
A05	145 80 R 12	AR2AZ	TL	PSR0D438					
A06	145 80 R 12	B290	TL	PSR0D526		300	50	250	70
A07	145 80 R 12	ER60BZ	TL	PSR0D357		20		20	
A08	145 80 R 12	FR500	TL	PSR0D37F			60		
A08	145 80 R 12	FS100	TL	PSR0D64F					
A09	145 80 R 12	S248E	TT	PSR0D358	PSRCD142	6	12	130	150
A10	145 80 R 12	S248E	TO	PSR0D3583					
A11	155 65 R 12	B290	TL	PSR0D541			4	15	20
A12	165 60 R 12	EG3KZ	TL	PSR0D359				15	
PSR TYRE TOTAL						332	130	480	275
TBR									350
Total Tonnage:									20
Road Permit									80
Size Count						4	5	7	4
								3	2
Order No.		4600012999	4600013000	4600013001	4600013002	4600013003	44000002256		
Order No.									

BRIDGESTONE TBR TRUCK TIRE - LOADSHEET										MXL	10.96	Rank
CUSTOMER NO. C290										TRUCK NO.		
E-WAY BILL										21-Feb-19		
TYRE CODE	TUBE CODE	SIZE	ROW	PATT.	TYRE	O.K.	TUBE	OK	FLAP	OK	OK	OK
1 PSR0D508		145 70 R 13	S322	10	X	X	X	X	X	X		
2 PSR0D510	PSRCD136	165 65 R 13	S322	12	12	X	X	X	X			
3 PSR0D549	TL	155 65 R 14	B290	20	X	X	X	X	X			
4 PSR0D62217	TL	165/65 R14	S322M	20	X	X	X	X	X			
5 PSR0D53817	TL	185/60 R15	B290	20	X	X	X	X	X			
6 PSR0D568	TL	205 65 R15	B390T2	60	X	X	X	X	X			
7 PSR0D482	TL	215 75 R 15	D689F2	50	X	X	X	X	X			
8 PSR0D570	TL	215/75 R15	693AC2	60	X	X	X	X	X			
9 PSR12389	TL	215 65 R 16 TL	D 684	10	X	X	X	X	X			
10												
11												
12 TBR0D059	TBRCD018	10.00 R20	M751Z	14	14	14						
13 TBR0D00517	TL	295/80 R22.5	R156	10	X	X	X	X	X			
14 TBR0D015	TBRCD018	10.00 R20	G611	16	16	16						
15 TBR0D011	TBRCD014	10.00 R20	M751Z	60	60	60						
16 TBR0D014	TBRCD014	10.00 R20	R153Z	20	20	20						
17												
18												
19												
20												
21												
22												
23												
24												
25												
TOTAL										72	62	50
TOTAL										310	60	60
Grand Total										382	122	110
LOADING PERSON										ROW DETAILS		
										TOTAL		

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Target – Use Weight / Volume to the fullest extent possible.

Process -

1. Input

- a) size wise Dispatch Plan (SKU – Qnty) for every location.
- b) Vehicle dimension for planning.

2. Output –

- a) Options for optimum loading plans within rules
- b) Sequence wise loading plan to ensure max utilization of available volume.
- c) Indicate spare capacity to enhance loading plan.

Vehicle Type:

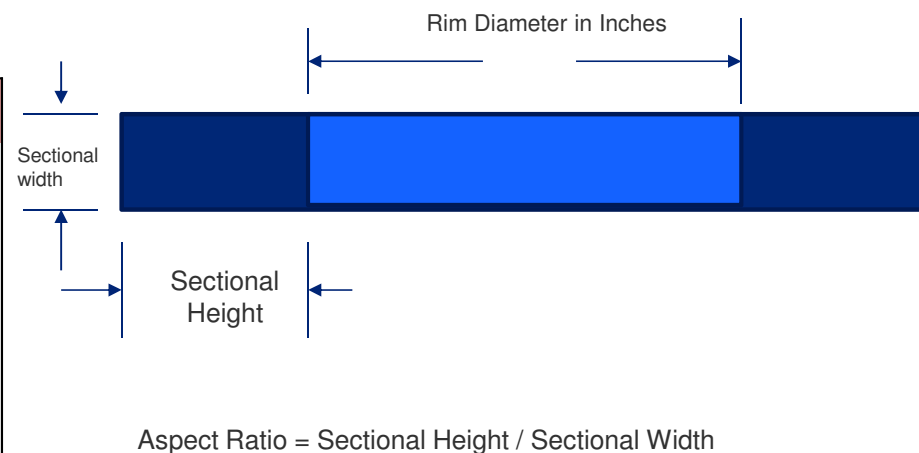
Type	Weight	Dimension (l x w x h)
MXL 270	14 MT	32 x 10.3 x 8.5 Ft
MXL 250	14 MT	32 x 8.5 x 9.5 Ft
MXL 220	14 MT	32 x 8.5 x 8.5 Ft
MXL 200	14 MT	32 x 8 x 8 Ft
FTL	7 MT	17 x 7.5 x 7.5 Ft
FTL 24FT	7 MT	24 x 7.5 x 7.5 Ft
CTL	7 MT	32 x 8.5 x 8.5 Ft

*From Autopandit

| Volume

Tyre Volume

EC Code	Description	Volume m ³	Unit Wt Kg	Loading Pattern
LVR0D082	LVR 155 R13 L607 TT	0.03	7.81	Cross
LVR0D079	LVR 215 R15 D689 TT	0.05	14.16	Cross
PSR0D696	PSR 215/60 R16 T01ABZ TL	0.04	9.60	Normal
PSR0D480	PSR 165/65 R14 S322 TT	0.03	8.16	Cross
PSR0D509	PSR 155/70 R13 S322 TT	0.03	6.92	Cross
PSR0D259	PSR 155/65 R13 S322 TT	0.02	6.10	Cross
PSR0D520	PSR 175/65 R14 B29Z TL	0.03	7.57	Cross
PSR0D433	PSR 165/80 R14 S248TL	0.04	7.84	Cross
PSR0D552	PSR 195/60 R15 B29Z TL	0.04	8.67	Cross
PSR0LC23	PSR 265/60 R18 684AGZ TL	0.08	16.04	Normal
PSR0D607	PSR 235 60 R18 850Z TL	0.06	13.56	Normal
PSR0D529	PSR 175 70 14 B290 TL	0.03	7.82	Cross
PSR0D669	PSR 195/65 R15 1501Z TL	0.03	8.52	Cross
PSR0D543	PSR 185/65 R15 B29Z TL	0.04	8.14	Cross
PSR0D538	PSR 185/60 R15 B29Z TL	0.03	7.98	Cross
PSR14227	PSR 245/40 R17 ES1Z TL	0.04	11.73	Normal
PSR15003	PSR 225/50 R17 ES1Z TL	0.04	13.76	Normal
PSR0D657	PSR 185/65 R14 B290 TL	0.03	8.53	Cross
PSR0D283	PSR 175 70 13 B250 TL	0.03	7.86	Cross
PSR0D590	PSR 175/60 R13 MY02AZ TL	0.02	7.09	Cross
PSR14651	PSR 245/45 R19 ES1Z TL	0.04	14.55	Normal
PSR12375	PSR 275/45 R20 DHPAMZ TL	0.05	17.38	Normal
PSR0D252	PSR 145/70 R12 S322 TT	0.02	6.16	Cross
PSR0D526	PSR 145/80 R12 B29Z TL	0.03	5.69	Cross
PSR0D539	PSR 135/70 R12 B29Z TL	0.02	4.92	Cross
PSR0D359	PSR 165/60 R12 EG3KZ TL	0.02	6.33	Cross
PSR0D673	PSR 195/60 R16 EP15KZ TL	0.04	9.11	Normal
PSR0D694	PSR 205/50 R17 EP15CZ TL	0.03	9.44	Normal



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Constraints –

1. Horizontal tyres loading on floor 3 layers.
2. No cross loading in 16~18 inch segment.
3. No cross loading for Firestone tyres & TBR Tyres
4. Bigger tyres below (Rim , Sectional width).
5. Gaps to be filled properly.
6. Heavy tyres must be placed near to cabin.

Truck Loading Pattern



a) Loading Sequence

[illegible]

c) Multiple layouts for volume utilization scenarios

d) Suggestion of remaining volume & Estimate the tyres can be added (inch wise).