

# A Study of Cycle Rickshaws of Bangladesh— A Technical Report

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## ABSTRACT :

*A study has been made of cycle rickshaws of Bangladesh that are plying in different parts of the country. The different dimensions and the weight of the rickshaws were measured and recorded and the positions of the Center of Gravity of the empty rickshaws were located. The height of the C. G. was found to fall between 26 and 29 inches above the ground level which is quite high. The distance of the C. G. from the rear axle falls between 12 and 15 inches and is safe during braking. The weight of empty rickshaws was found to fall between 180 and 200 lbs.*

## INTRODUCTION :

Cycle Rickshaw is one of the major types of manually driven vehicle used in both rural and urban areas of Bangladesh for carrying passengers and commodities.

The design of the chassis and the body is mainly based on tradition, having a fixed gear transmission ratio of the order of 1 : 2.2 from the paddle shaft to the rear wheel shaft.

In this report Cycle Rickshaws of different regions of Bangladesh are studied and the weight

and C. G. of the empty Rickshaws are determined and tabulated. Different linear dimensions are also recorded.

## STUDY OF DIFFERENT TYPES OF RICKSHAWS :

In Bangladesh the design of the Cycle Rickshaw can be grouped into four major styles viz ; Comilla, Khulna, Sylhet and Dacca styles. Rickshaws in Chittagong area fall between Dacca and Comilla styles. With insignificant fraction of other styles, the particular style is mostly

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concentrated in the region that goes with the name of the style.

Extensive study of the above varieties of Rickshaws have been done; different dimensions were measured; the weights of the empty Rickshaws were determined.

The schematic diagrams with different dimensions of the Rickshaws are presented in Tables 1, 2 and 3 along with Figs. 1, 2 and 3.

The weight of the Rickshaw was determined by placing the three wheels on three different weighing scales; and using similar set up and placing the front wheel over a wooden block the position of the C. G. was determined. For different regions the weight, the height of C. G. from the ground level (H) and the distance of C. G. from the rear axle (C), all for empty Rickshaws are presented in Table 4.

#### DISCUSSION :

From the above study, it is evident that the length of the Rickshaw from the rear axle to the front wheel hub does not vary much and is of the order of 67.5 inches and the distance between the rear wheels is around 46 inches.

Main differences in the styles are found in the seating arrangement for passengers. Rickshaws from Dacca region being the least comfortable and does not have enough leg space. Rickshaws from Sylhet region have the maximum leg space (around 20 to 23 inch.). Rickshaws from Sylhet, Comilla and Khulna regions are quite comfortable.

Other minor differences are in the height of chasis attachment point from the ground, rear tie bar etc.

From Table 4 it is evident that the weight of the empty Rickshaws varies from 180 to 200 lbs. Height of the C. G. of empty Rickshaws falls between 26 to 29 inches from the ground (wheel diameter is 28 inches). With passengers this height will increase making the Rickshaw more unstable if tilting occurs while plying over uneven roads. The distance of C. G. from rear axle is around

12 to 16 inches and is safe in braking and riding a mild slope.

Rickshaws from Dacca, Khulna and Comilla regions have only front wheel brakes. In Sylhet, in addition to front wheel brakes Rickshaws are provided with emergency rear wheel brakes and it works simultaneously on both the rear wheels as shown in Fig. 4. This system though works alright is not very economical as it wears out the tyres of the rear wheels very quickly.

In Khulna areas some Rickshaws have 64 spokes in each of the rear wheels. It is claimed by the Rickshaw drivers that this improves the strength and stability of the wheels. In all other areas there are 40 spokes in each of the rear wheels and 32 spokes in the front wheel. Some Rickshaws in Khulna region have spokes of larger diameter (0.155 in.), fitted on a specially designed hub.

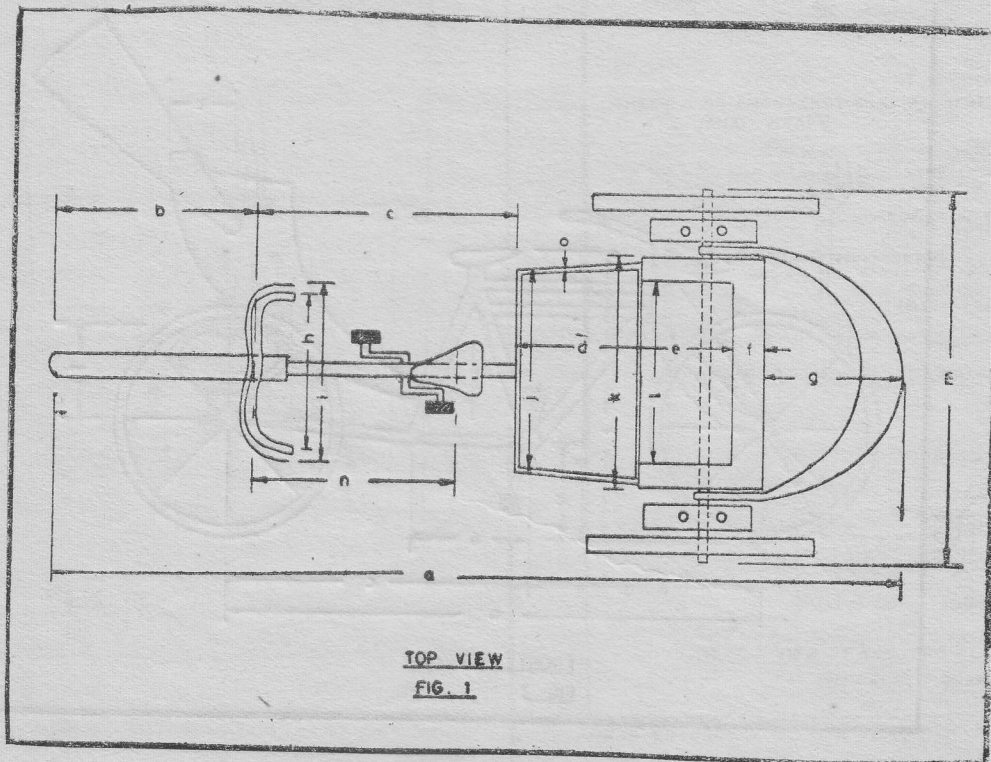


**Table—1**  
 Dimensions of Cycle Rickshaw  
 of different Regions  
 (to be used with Figure 1)

**TOP VIEW**

	Dacca	Khulna	Comilla	Sylhet (Sylhet style)	Sylhet (Comilla style)
a	106.50	—	—	—	—
b	28.00	—	—	—	—
c	30.00	—	55.50	58.00	58.00
d	15.50	19.00	18.75	23.00	20.50
e	11.50	11.50	11.50	10.25	11.00
f	4.00	33.50	3.00	3.00	3.00
g	17.50	—	17.50	—	—
h	18.00	18.00	17.50	—	—
i	21.00	19.50	—	—	—
j	25.00	26.00	26.00	24.50	24.50
k	29.00	29.75	28.50	27.25	26.50
l	22.50	24.75	23.25	23.50	23.50
m	46.00	45.50	46.00	43.25	44.50
n	—	—	23.25	—	—
o	—	—	0.75	—	—

N. B. : All dimensions are in inches.

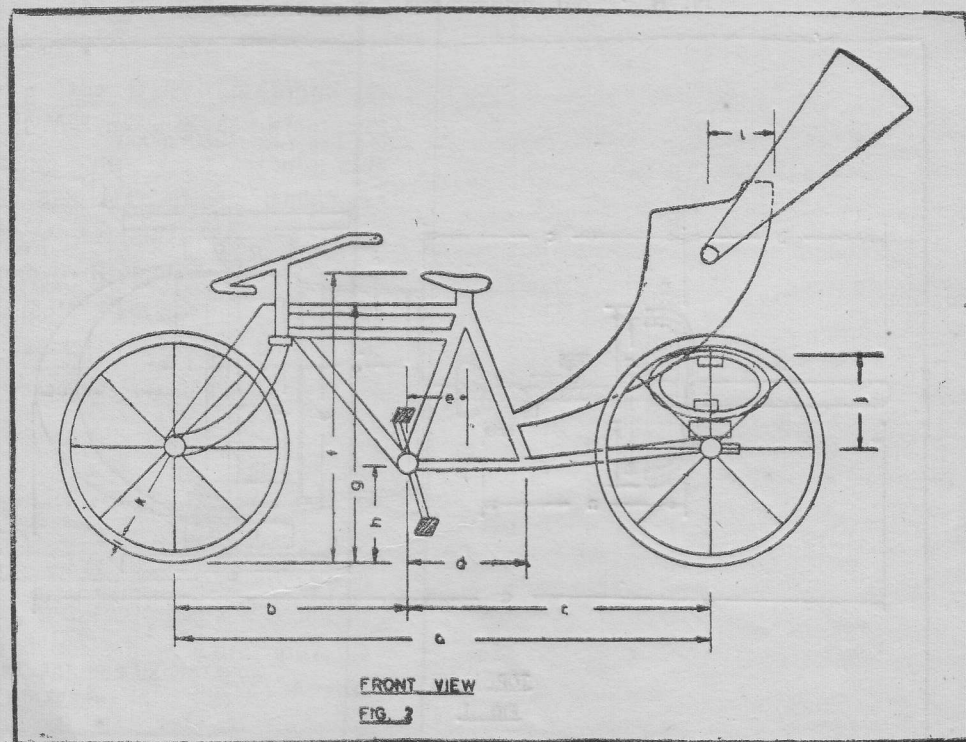


Table—2  
 Dimensions of Cycle Rickshaw  
 of different Regions  
 (to be used with Figure 2)

FRONT VIEW

	Dacca	Khulna	Comilla	Sylhet (Sylhet style)	Sylhet (Comilla style)
a	67.00	67.50	67.50	69.50	66.50
b	27.75	27.75	—	—	26.00
c	38.25	—	40.50	41.50	40.50
d	13.50	18.00	15.75	17.00	17.00
e	7.00	—	8.00	6.50	9.00
f	36.00	40.00	36.00	38.25	37.00
g	32.00	32.50	32.25	34.50	32.50
h	12.00	13.50	12.00	14.50	12.50
i	4.50	8.00	16.50	9.50	9.50
j	16.00	18.00	16.50	17.00	18.50
k	13.00	13.00	12.75	12.75	12.75
l	1.25	1.24	1.25	1.50	1.50

N. B. : All dimensions are in inches.

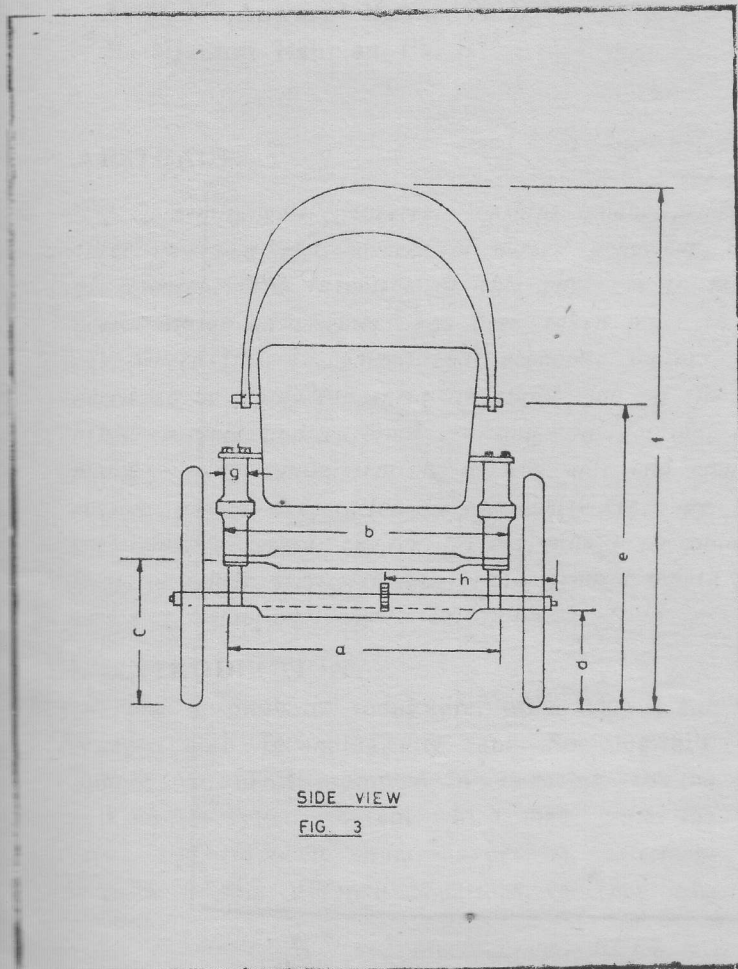




**Table—3**  
 Dimensions of Cycle Rickshaw  
 of different Regions  
 (to be used with Figure 3)  
**SIDE VIEW**

	Dacca	Khulna	Comilla	Sylhet (Sylhet style)	Sylhet (Comilla style)
a	33.00	34.25	31.50	30.25	32.50
b	33.50	—	32.75	29.75	30.75
c	—	19.00	18.00	18.25	18.50
d	13.00	14.50	13.50	—	—
e	36.00	35.50	33.50	34.25	34.00
f	70.00	—	70.00	70.00	70.00
g	—	—	—	1.75	—
h	—	—	—	21.00	—

N. B. : All dimensions are in inches.



**Table—4**  
 Comparative Study of the Weight and the  
 C. G. of Rickshaw of Different Region.

Sl.No.	Region	Total weight of Rickshaw lb	Centre of gravity, C inch.	H inch.
1.	Dacca	204.3	12.3	28.1
2.	Khulna	185.9	12.5	29.0
3.	Comilla	188.7	14.9	25.7
4.	Sylhet	172.8	15.1	25.8
5.	Sylhet (Comilla style)	180.1	13.3	26.9

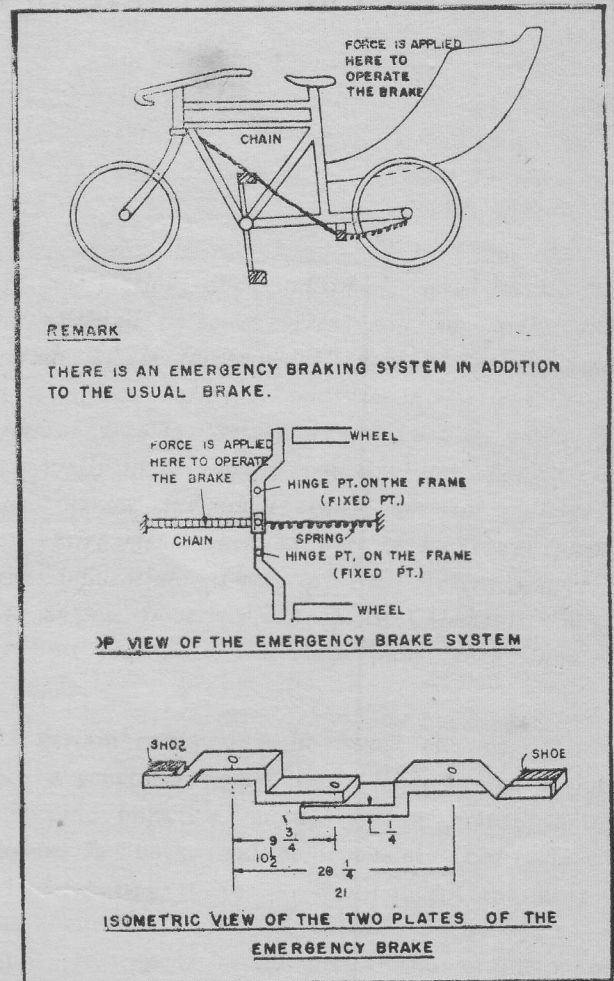


FIG. 4 EMERGENCY BRAKING SYSTEM OF RICKSHAW  
 SYLHET REGION