Rear axle and Front axle calculation

Legend – Weights with example		
Code	**Weight position**	**Weight**
BB	Front bumper	15
FW	Empty front axle	1,200
FS	Front seat	130
RS	Rear seat	50
FT	Fuel tank	58
RW	Empty rear axle	800
BT	Boot	200
TB	Tow ball	300

Legend – Distances with example		
Code	**Description**	**Distance**
BBd	Distance between Front axle and Front bumper	500
FSd	Distance between Front axle and Front seat	700
RSd	Distance between Front axle and Rear seat	1,400
FTd	Distance between Front axle and Fuel tank	2,000
BTd	Distance between Front axle and Boot	2,200
TBd	Distance between Rear axle and Tow ball	1,200
WBd	Wheelbase	2,100

Calculation to find rear axle weight before front axle weight

Convention	↺ +ve	↑ +ve
$M_{RW} = -R_{RW} * WBd$ (-ve)	$-R_{RW} * 2,100$	$-2,100R_{RW}$
$M_{BB} = BB * BBd$ (-ve)	$15 * -500$	$-7,500$
$M_{FS} = FS * FSd$ (+ve)	$130 * 700$	$91,000$
$M_{RS} = RS * RSd$ (+ve)	$50 * 1,400$	$70,000$
$M_{FT} = FT * FTd$ (+ve)	$58 * 2,000$	$116,000$
$M_{RW} = RW * RWd$ (+ve)	$800 * 2,100$	$1,680,000$
$M_{BT} = BT * BTd$ (+ve)	$200 * 2,200$	$440,000$
$M_{TB} = TB * (WBd + TBd)$ (+ve)	$300 * (1,200 + 2,100)$	$990,000$
$M_{RW} - M_{BB} + M_{FS} + M_{RS} + M_{FT} + M_{RW} + M_{BT} + M_{TB} = 0$	$-2,100R_{rw} -7,500 + 91,000 + 70,000 + 116,000 + 1,680,000 + 440,000 + 990,000 = 0$	$R_{RW} = 1,609.286$
$-R_{FW} - R_{RW} + M_{BB} + R_{FW} + M_{FS} + M_{RS} + M_{FT} + M_{RW} + M_{BT} + M_{TB} = 0$	$-R_{FW} - 1,609.286 + 15 + 1,200 + 130 + 50 + 58 + 800 + 200 + 300 = 0$	$R_{FW} = 1,143.714$