

WHAT WEIGHT CAN I TOW?

New formula makes it easier for beginners

IN future THE CARAVAN will express its advice on maximum towed weight for a given car in a slightly different form. Hitherto we have said that if a single simple check is needed it is best to follow a rule that the total weight of the caravan including all contents should never exceed the total weight of the car including driver and passengers, and that for a good performance or particularly hilly country it should not exceed 75 per cent of the total car weight. We now put this advice in the following terms:

The delivered weight of the caravan should not exceed 75 per cent of the kerbside weight, where the delivered weight of the caravan is that stated in the caravan manufacturers' catalogue, and the kerbside weight of the car is that stated in the car manufacturers' catalogue.

In arriving at this formula it is assumed that personal effects and baggage, together with gas cylinders and any other equipment not included in the caravan as standard, will not exceed

2½cwt in caravans up to 10cwt delivered weight,

3cwt in caravans over 10 but not over 20cwt delivered weight,

4cwt in caravans over 20 but not over 30cwt delivered weight,

5cwt in caravans over 30cwt delivered weight.

The idea of using the ratio caravan weight to car weight, instead of the older ratio caravan weight to car power, was introduced by THE CARAVAN soon after the war, when it was apparent that developments in cars towards higher power output and lower car weight, softer springs and higher gear ratios were making safety (the ability of the car to control the caravan downhill or at speed) more important than hill climbing. Our formula as stated in the first paragraph above was quickly adopted as sensible by other caravan journals, the clubs, motoring bodies, motoring Press and the dealers.

In recent years however the growing interest in caravan touring has led many newspapers and freelance writers without specialised knowledge to quote the formula without a proper understanding of it. Frequently novices are given the formula with merely references to car weight and caravan weight, these not being defined. THE CARAVAN therefore responded sympathetically when the National Caravan Council recently urged that all bodies giving this kind of advice should give the same advice, to avoid confusing the public.

We are well satisfied that our original formula is the most logical and reliable, but in discussions with the other bodies we have agreed that the new formula is easier to work, because the two weights required can be found in catalogues, whereas the two weights of the original formula have to be found by weighing the vehicles, and will vary somewhat from journey to journey.

Check calculations for sample outfits show that the results from the revised formula generally come out very close to those from the original.

Some cautions must however be given. The new formula assumes that all manufacturers are complying with the NCC standard terminology and quoting the delivered weight in their catalogues. In fact it is not yet safe to assume that every catalogue weight is the delivered weight as defined by the NCC. A check with the manufacturers may be necessary.

Further we stress, as we have always stressed, that there is no such thing as a foolproof, cast iron formula. The formula can only be a guide for the initial sifting of possible combinations. Cars of a given weight differ in such things as maximum power, maximum torque or pulling power, wheelbase, length of tail, gear ratios, clutch and other characteristics, and there are differences in the stability of caravans of the same weight, though the worst are much

nearer the best than they used to be.

Accordingly the formula must be used with common sense. If a car manufacturer quotes a maximum towed weight lower than the formula gives, his weight should normally be preferred, and if the chosen car or caravan leads to a ratio very close to the border line it is desirable to obtain an opinion on the particular vehicles selected from THE CARAVAN Advice Bureau or from other experienced caravanners.

A number of caravanners are towing caravan weights considerably in excess of the formula limit, and this can often be done with a suitable outfit by an experienced driver, especially if he does not wish to climb mountains, but the beginner is advised to follow the guidance given here.

EXAMPLES

YES—EASY

1963 Standard Vanguard
kerbside weight—22.75cwt
$$\frac{3 \times 22.75}{4} = 17\text{cwt.}$$

Proposed van

15ft Thomson Glenalmond—15cwt

YES—POSSIBLE

1959 Ford Anglia
kerbside weight—14.5cwt
$$\frac{3 \times 14.5}{4} = 10.8\text{cwt.}$$

Proposed van Sprite Alpine—11.25cwt

NO

1957 Ford Zephyr Mk 2
kerbside weight—23cwt
$$\frac{3 \times 23}{4} = 17.25\text{cwt.}$$

Proposed van Stirling 15—19cwt

TOWING DATA FOR 1966 CARS

The table of data on towing cars, with suggested maximum weights to be towed, which we published in December 1964, proved to be so popular that we are repeating it for 1966 models. More makes of car are included and the table is itself improved, particularly with regard to suggested weights. The significance of each column of information is explained later on, but readers should also study the explanation of the new weight-to-weight formula on the preceding page.

Where does the user start? The importance of towing in the annual use of the car is the first factor. If you tow only once a year you are unlikely to consider only the car's towing ability: it's what you expect from it in solo motoring which counts more. However, we must assume that you are looking for the best towing vehicle you can buy.

The price you are willing to pay at once narrows the field. Within this limit start by considering the heaviest cars because the ability of the car to stop the tail wagging the dog is a major factor. If the car is heavy enough for the van (see the formula on the preceding page) it will usually be powerful enough. It's not getting up the hill which is so critical as getting down the other side.

Few people come to car buying with a completely open mind. Most of us have decided preferences or dislikes and you will probably have your eye on just one or two models which already catch your fancy. Within your price limit, see how many others you can find of similar or better characteristics. Then look at these cars as well as those you already fancy. To find out how to compare one car with another study the following notes which deal with the information presented column by column.

Cars are grouped by parent manufacturers and where models differ by little more than name and trim they are put together (eg, BMC: A60/Oxford/16-60 covers Austin, Morris and Wolseley variants of the basic model). Figures in columns 1-11 are taken from manufacturers and recognised trade sources.

1: Engine capacity (cc)

The size of the engine is usually of no very great significance—except as an indication of where to start looking. Weight is more important. Compare the BMC A60 and the

Triumph Vitesse—their engines differ by only 26cc but one car is 4.8cwt lighter.

2: Lowest weight (cwt)

This is the weight of the car in the showroom, without passengers, luggage, or much petrol. De luxe versions or those with automatic transmission are usually a little heavier. The figures in this column determine those in column 12.

3: Max BHP at RPM

The maximum brake horsepower, at stated engine revolutions, governs, in simple terms, the car's top speed. In enthusiasts' terms, high BHP indicates a hairy beast. To the towing man, high BHP alone is unimportant—a sports car churns out plenty but at the lower speeds at which an outfit restarts on a gradient the engine will be producing poor torque (see below).

4: Max torque at RPM

Torque, or turning effort, governs, again in simple terms, acceleration and hill climbing. A car with plenty of torque at the right engine speeds has plenty of guts, slogging power. Starting on a hill with a caravan demands lots of torque at the lowest possible engine speed. If maximum torque is produced at something like 1800-2000rpm the engine characteristics are good for towing. But bear in mind also the actual amount of torque produced.

5: Number of forward gears (and overdrive if available)

Four gears are better than three for towing. With only three you feel the gaps between each ratio much more on tow. An asterisk after the number of gears indicates that synchromesh is provided on all forward speeds. Overdrive, often available as an extra, is useful especially if it operates on the gear below top when the driver has four closely spaced ratios to choose from for best performance. Some manufacturers, when fitting overdrive, provide a lower-ratio back axle, so that every gear is lower and better for towing; these makers include Hillman, Humber, Jaguar, Rover, Singer, Sunbeam and Vauxhall. In the table (T) means overdrive on top gear only, (T3) top and third, (T2) top and second on a three-speed box, and (all) overdrive on all forward speeds.

6: Automatic transmission if available

Most automatic transmissions incorporate a torque converter which has the advantage of being able to deliver full torque to the road wheels at zero miles per hour—ideal for getting away on a hill with a van. Key to the abbreviations is: DB—Daimler-Benz (fluid coupling with no torque converter), EMC—electro-magnetic clutch (no torque converter). The following all use a torque converter: AP—Automotive Products (four gears), BMW—BMW's own system, BW—Borg-Warner (models DG, 35 and 8), JA—Jaeger, PG—Powerglide.

7: MPH per 1,000 RPM in top gear

Comparison of overall gear ratios is misleading because the wheel and tyre size have an effect on the ratio. The road speed at a fixed engine speed in top gear provides a useful comparison. The higher the road speed (most family cars run between 15-20 mph) the higher-g geared is the car. High gearing leads to fuel economy and easy engine performance at high road speeds but the caravanner will find such a car calls for much changing of gears when towing. Low gearing is better but see below.

8: MPH at max torque in 1st gear

A combination of the information which produces columns 4 and 7 shows what speed the car will be moving at in bottom gear when the engine is producing its greatest effort. As the caravanner moves off in bottom gear from a standstill he wants to know how soon the car will produce maximum torque.

9: Rear suspension

The rear springs of a car can greatly affect the stability of the whole outfit. The abbreviations mean: HE—half-elliptic leaf springs, CA—cantilever leaf springs, I—Independent, C—coil springs, Tor—torsion bars, Tr—transverse leaf spring, dD—de Dion layout, HP—hydro pneumatic, HI—hydrolastic. There is nothing wrong with independent rear suspension systems in themselves for towing but unfortunately the tendency is for some independent and coil systems to be softer than conventional leaf springing. Soft systems should be

While caravanners may feel inclined to exceed makers' recommendations if these are lower than the formula weights, for safety and stability the formula suggestions should be exceeded only by very experienced caravanners.

Before using these columns, read again

Column 12 deals in 'delivered weights', that is, how the caravan should come from the factory, to the nearest $\frac{1}{4}$ cwt. The figures shown are worked out strictly according to the weight-to-weight ratio formula, taking account of no other considerations, even the makers' own suggestions. Remember that allowance is

ALFA ROMEO : The makers do not recommend their cars for towing.

	1	2	3	4	5	6	7	8	9	10	11	12
SEE EXPLANATORY NOTES FIRST	Engine capacity (cc)	Lowest weight (cwt)	Max BHP at RPM	Max torque (lb/ft) at RPM	No of fwd gears (o/drive if available)	Automatic trans if available	MPH per 1,000 RPM in top gear	MPH at max torque in 1st gear	Rear suspension	Tail overhang (in)	Caravan weights	
											Maker's gross limit	Formula (delivered weight)
FIAT												
1100D	1221	17.6	55/5200	56/2500	4*	—	15.9	12.6	HE	37	10.75	13.25
1300	1295	18.8	70/5400	75/3200	4*	—	16.5	14.1	HE	39	11.75	14.0
1500	1481	19.3	83/5400	88/3200	4*	—	16.5	14.1	HE	39	11.75	14.5
1800B	1795	24.9	97/5300	101/3000	4*	—	17.4	16.2	HE	44	14.75	18.75
2300	2279	25.3	117/5300	136/3000	4* (T)	BW35	17.3	16.2	HE	44	14.75	19.25
FORD												
Anglia	997	14.4	39/5000	53/2700	4	—	14.8	9.7	HE	35	75% of car plus passengers	10.75
Anglia 1200	1198	14.6	48/4800	63/2700	4*	—	16.0	12.1	HE	35		11.0
Cortina	1198	15.7	48/4800	63/2700	4*	—	16.0	12.1	HE	43		11.75
Cortina 1500	1500	16.2	59/4600	81/2300	4*	BW35	17.4	11.3	HE	43		12.0
Cortina GT	1500	16.8	78/5200	91/3600	4*	—	17.4	17.6	HE	43		12.5
Corsair	1664	19.3	81/4750	99/3000	4*	BW35	18.0	15.3	HE	45		14.5
Corsair GT	1996	19.6	93/4750	123/2750	4*	BW35	18.0	16.7	HE	45		14.75
Zephyr 4	1703	22.2	68/4800	93/3000	4* (all)	BW35	18.5	12.3	HE	47		16.5
Zephyr 6	2555	23.4	98/4750	134/2000	4* (all)	BW35	20.3	12.8	HE	47		17.5
Zodiac	2555	24.3	109/4800	137/2400	4* (all)	BW35	20.3	15.4	HE	48	18.25	
JAGUAR												
2.4	2483	27.6	120/5750	144/2000	4* (T)	BWDG	17.4	10.0	CA HE	41	24.0	20.75
3.4	3442	28.3	210/5500	215/3000	4* (T)	BWDG	21.4	21.0	CA HE	41	25.0	21.25
S type 3.4	3442	30.0	210/5500	215/3000	4* (T)	BWDG	21.4	21.0	I C	47	25.0	22.5
3.8	3781	28.3	220/5500	240/3000	4* (T)	BWDG	21.4	21.0	CA HE	41	25.0	21.25
S type 3.8	3781	30.0	220/5500	240/3000	4* (T)	BWDG	21.4	21.0	I C	47	25.0	22.5
Mk. 10	4235	35.0	265/5400	283/4000	4* (T)	BW8	21.6	28.0	I C	51	30.0	26.25
LANCIA												
Fulvia 2C	1091	20.25	71/6000	not quoted	4*	—	15.0	16.0	HE	22	10.0	15.25
Flavia	1800	23.5	92/5200	108/3000	4*	—	19.8	16.0	HE	28	11.5	17.5
Flaminia	2775	31.0	129/5000	169/2500	4*	—	20.0	15.0	HE	32	15.0	23.25
MERCEDES-BENZ												
200	1988	23.6	105/5400	123/3800	4*	DB	17.9	15.8	I C	51	23.6	18.75
230	2306	24.3	118/5400	137/3800	4*	DB	17.9	15.8	I C	51	23.6	19.75
250S	2496	27.0	146/5600	157/4200	4*	DB	18.8	21.0	I C	52	23.6	21.25
250SE	2496	27.4	170/5600	174/4500	4*	DB	18.8	22.5	I C	52	23.6	21.75
300SE	2996	29.1	195/5500	203/4100	4*	DB	18.8	19.1	I C	52	23.6	23.0
PEUGEOT												
204	1130	15.7	58/5800	79/3000	4*	—	15.3	12.5	I C	30	17.0	12.5
403	1468	20.0	65/4900	74/2500	4*	—	17.3	10.8	C	42	17.0	15.0
404U6	1468	22.75	66/5000	83/2500	4*	—	16.5	10.2	C	40	20.0	17.0
404A	1618	20.5	76/5500	96/2500	4*	—	17.7	10.8	C	40	17.0	15.25
404KF2	1618	20.5	96/5500	101/2800	4*	—	17.7	11.5	C	40	17.0	15.25
RENAULT												
4 Estate	845	11.7	32/4700	49/2300	3*	—	14.6	9.2	I Tor	27	5.5	8.75
Gordini-Dauphine	845	13.2	40/5000	50/3300	4*	—	15.3	14.5	I C	32	6.0	10.0
8	956	14.9	48/5200	55/2500	4*	EMC	15.4	11.3	I C	37	6.3	11.25
1100	1108	15.6	50/4600	65/2800	4*	JA	16.3	12.9	I C	39	12.75	11.75
8 Gordini	1108	15.7	95/6000	72/4000	4*	—	16.3	18.4	I C	37	12.75	11.75
16	1470	19.3	63/5000	78/2800	4*	—	17.2	13.7	I Tor	31	16.5	14.5

MERCEDES: The 200 saloon is also available with a diesel engine. A more powerful version of the 230, known as the 230S, is available with twin carburettors.

	1	2	3	4	5	6	7	8	9	10	11	12
SEE EXPLANATORY NOTES FIRST	Engine capacity (cc)	Lowest weight (cwt)	Max BHP at RPM	Max torque (lb/ft) at RPM	No of fwd gears (o/drive if available)	Automatic trans if available	MPH per 1,000 RPM in top gear	MPH at max torque in 1st gear	Rear suspension	Tail overhang (in)	Caravan weights	
											Maker's gross limit	Formula (delivered weight)
ROOTES												
Imp/Chamois	875	13.6	39/4800	56/2800	4*	—	15.1	10.6	I C	33	8.5	10.25
Husky	1390	18.4	41/4200	72/1800	4*	—	17.2	8.3	HE	35	15.0	13.75
Minx/Gazelle	1725	19.5	65/4800	98/2400	4*	BW35	17.45	12.5	HE	39	17.0	14.5
Super Minx	1725	20.8	65/4800	98/2400	4* (T3)	BW35	17.45	18.2	HE	38	17.0	15.5
Vogue	1725	21.0	85/5500	106/3500	4* (T3)	BW35	17.45	18.2	HE	38	17.0	15.75
Sceptre	1725	21.6	85/5500	106/3500	4* (T3)	BW35	16.4	17.1	HE	38	17.0	16.25
Rapier	1725	20.6	85/5500	106/3500	4* (T3)	—	17.8	18.6	HE	38	17.0	15.5
Hawk	2267	29.0	73/4400	128/2300	4* (T3)	BW35	18.1	12.6	HE	40	25.0	21.75
Super Snipe	2965	31.6	129/5000	179/2600	3* (T)	BW35	18.3	17.4	HE	40	30.0	23.75
ROVER												
2000	1978	24.2	90/5000	113/2750	4*	—	19.5	14.8	dD C	45	15.0	18.25
3 Litre Mk I and IA	2995	32.1	115/4500	164/1500	4 (T)	BWDG	18.7	8.8	HE	42	28.25	24.0
3 Litre Mk II	2995	32.1	134/5000	169/1750	4 (T)	BWDG	18.7	8.8	HE	42	28.25	24.0
3 Litre Mk III	2995	32.1	129/4750	161/3000	—	BW35	18.7	—	HE	42	28.25	24.0
SAAB												
96	841	15.9	44/4250	63/3250	4*	—	15.6	11.0	C	34	12.0	12.0
SIMCA												
1000	944	13.7	52/5400	55/3400	4*	—	15.0	13.8	I C	31	14.0	10.25
1300	1290	18.9	62/5200	74/2600	4*	—	15.4	11.0	C	40	18.0	14.25
1500	1475	19.6	81/5400	90/3000	4*	—	15.5	12.7	C	40	18.25	14.75
SKODA												
1000MB	988	15.75	45/4650	54/3000	4*	—	15.9	12.0	I C	36	—	11.75
Octavia	1221	17.25	47/4500	63/3000	4*	—	15.6	10.9	I Tr	39	10.0	13.0
TRIUMPH												
Herald	1147	15.2	48/5200	63/2600	4	—	15.7	10.9	I Tr	38	15.0	11.5
12/50	1147	16.0	51/5200	63/2600	4	—	15.7	10.9	I Tr	38	15.0	12.0
1300	1296	17.0	61/5200	73/3000	4*	—	15.4	14.4	I C	34	15.0	12.75
Vitesse	1596	17.2	70/5000	92/2800	4 (T3)	—	16.4	15.6	I Tr	38	16.5	13.0
2000	1998	21.7	90/5000	117/2900	4* (T3)	BW35	16.9	14.9	I C	38	20.0	16.25
VAUXHALL												
Viva	1057	14.0	44/5000	59/2800	4*	—	15.0	11.1	HE	41	15.0	10.5
Viva 90	1057	14.0	54/5600	60/3200	4*	—	15.0	12.7	HE	41	15.0	10.5
Victor	1595	19.4	70/4800	94/2800	3-4*	PG	16.5	12.4	HE	47	20.0	14.5
VX 4/90	1595	20.0	85/5200	99/3200	3-4*	PG	17.4	14.8	HE	47	20.0	15.0
Cresta	3293	24.4	123/4600	176/2400	3-4* (T2)	PG	20.9	19.3	HE	51	25.0	18.25
VOLKSWAGEN												
1300	1285	15.0	40/4000	64/2000	4*	—	18.8	8.3	I Tor	38	9.75	11.5
1600	1584	18.0	54/4000	81/2200	4*	—	21.1	9.0	I Tor	41	16.75	13.5
VOLVO												
121	1778	21.75	75/4500	101/2800	4*	—	18.0	16.1	C	42	19.5	16.25
122	1778	21.4	95/5000	107/3500	4*	—	18.0	20.1	C	42	19.75	16.0
WARTBURG												
1000	991	18.5	50/4200	71/2200	4	—	16.7	10.0	I C	45	10.0	14.0

ROOTES: Overdrive is also available on the Singer Gazelle. **SKODA:** The makers do not give a maximum towing weight for the 1000MB. **VAUXHALL:** Cresta entry in col 5 shows overdrive is available only with 3-speed gearbox.