



Chassis Considerations

Weight ratings are important when matching motorhomes with dinghies



WORKHORSE W24

Dinghy towing has become so popular among motorhome enthusiasts that it's quite uncommon to see a coach of any size on the open road without one. Thus, the ability to tow a reasonable amount of weight figures heavily in chassis design — and is critical to coach builders' desire to satisfy customers.

Chassis choices that might affect dinghy towing are quite limited, because only in gasoline-powered units has an option been offered, with

many companies offering buyers either Workhorse or Ford platforms. In contrast, builders of diesel-pusher motorhomes usually specify a particular chassis for each coach — and there is no option.

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Fortunately, the outcome is that all chassis have good-to-excellent towing capability if weight limits are observed.

Great strides have been made by all motorhome chassis builders during the past several years, enhancing performance, handling and ride quality — and maintaining or improving towing capability. While Workhorse and Ford both have increased gross vehicle weight ratings (GVWR), allowing coach builders to greatly increase comfort and convenience through the use of slideouts and expanded amenities, towing allowances have been maintained or even increased. The two companies rely on proven engines — the 8.1-L GM Vortec engine used by Workhorse, and the 6.8-L V-10 by Ford — with horsepower ratings in the 300-350 range and torque output of 425-455 lb ft.

Use of larger and more efficient diesel engines has dramatically boosted mountain performance of pusher motorhomes, as well, with ratings in the 300-370 HP range for mid-range motorhomes, and more than 500 HP for the largest road warriors.

Chassis evolution has occurred at all levels, but arguably the most dramatic change has occurred in gasoline-powered motorhomes during the past few years as Workhorse and Ford have raised load

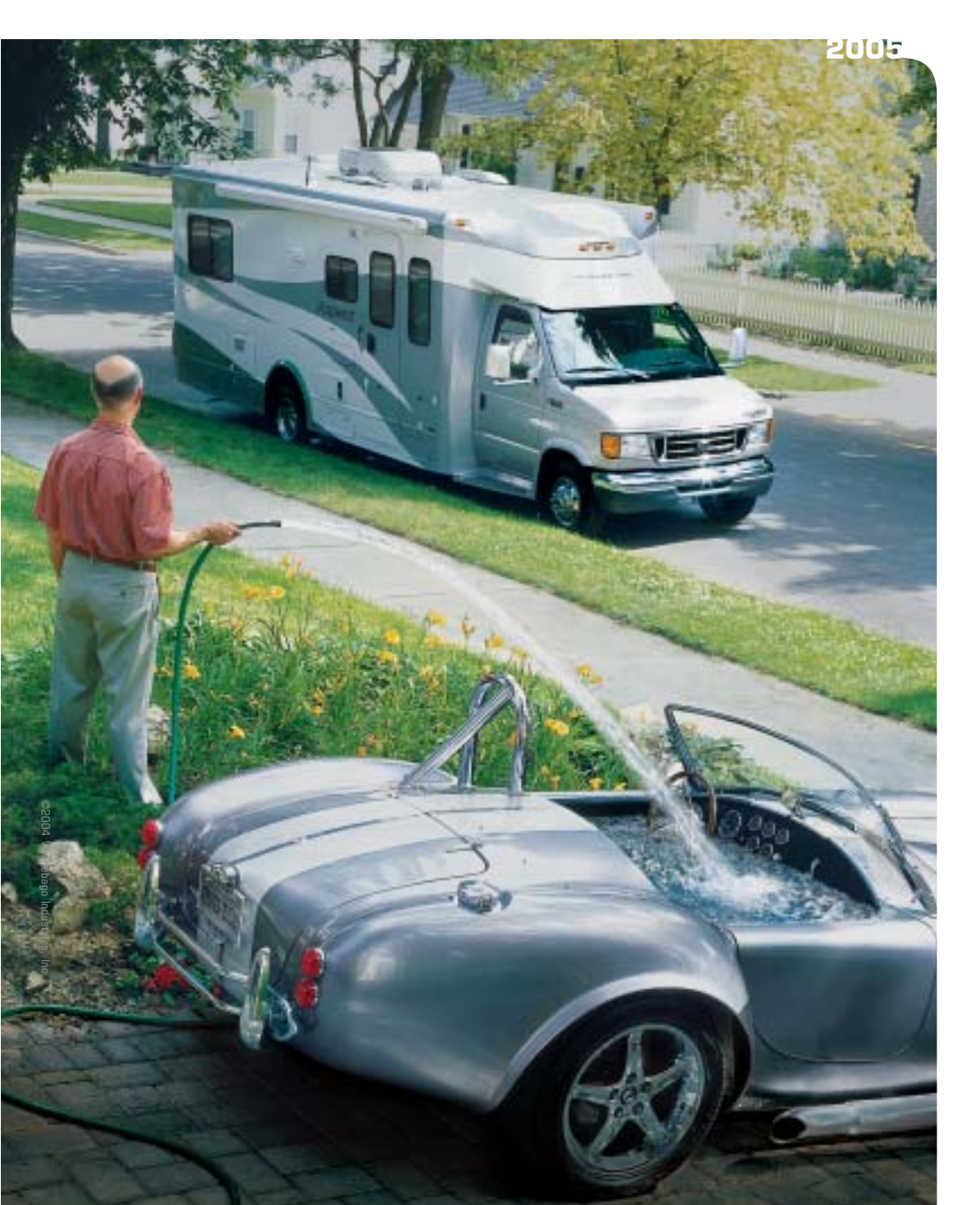
ratings, allowing coach builders to greatly expand floor space and amenities. Workhorse recently raised the bar to 24,000 pounds GVWR and up to 30,000 pounds gross combination weight rating (GCWR) for the new W24 gasoline-powered chassis, giving it a 6,000-pound allowance for towing (see accompanying chassis ratings). All W-series chassis have 50-degree steering angles and are powered by the 8.1-L V-8, rated at 340 HP @ 4200 RPM and 455 lb-ft torque @ 3200 RPM. Manufacturers commonly build 38-foot motorhomes with multiple slideouts on this chassis, and the W22 is not far behind in load capability.

Also recently added to the Workhorse line is the all-new R-series diesel-pusher chassis, with GVWR up to 32,000 pounds and GCWR up to 44,000 pounds. The chassis is powered by a Cummins ISC 8.3-L 330-HP engine coupled to a six-speed Allison 3000MH automatic transmission, and all models are rated to tow more than 10,000 pounds. Towing ratings vary from 4,000 to 12,000 pounds in the Workhorse gasoline and diesel lines.

Ford offers Class A as well as Class C chassis. For 2005, the company has raised engine output for the Triton 6.8-L engine, boosting horsepower to 355 @ 4,750 RPM and torque to 455 lb-ft @

TABLE 1

GVW (gross vehicle weight)	=	ACTUAL WEIGHED TOTAL OF: Motorhome + full fuel, fluid tanks (holding and water) and LP-gas + cargo weight + passenger weight.
GVWR (gross vehicle weight rating)	=	Coach manufacturers' maximum allowable weight of the fully loaded motorhome (including passengers, fuel, LP-gas, fluids and cargo). <i>The gvw must never exceed the gvwr.</i>
GCW (gross combined weight)	=	ACTUAL WEIGHED TOTAL OF: Motorhome + full fuel, fluid tanks, LP-gas + cargo weight + passenger weight + the loaded weight of anything being towed (dolly, trailer or dinghy).
GCWR (gross combined weight rating)	=	Coach manufacturers' maximum allowable weight of the fully loaded motorhome (including passengers, fuel and fluid tanks, LP-gas and cargo) + the loaded weight of anything being towed (dolly, trailer or dinghy). <i>The gcw must never exceed the gcwr.</i>



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CHASSIS COMPARISON

Chassis manufacturers provide chassis to the coachbuilders, which often modify or extend chassis to suit their floorplans. This can affect the vehicle's towing capacities; always check weight to make sure the towing allowance is not reduced by chassis overloading.

Manufacturer	Model	GVWR (lbs.)	GCWR (lbs.)	Towing Allowance
Workhorse	W20	20,700	26,000	5,300
Workhorse	W22	22,000	26,000	4,000
Workhorse	W24	24,000	30,000	6,000
Workhorse	P-series	15,000	19,000	4,000
Workhorse	P-series	17,000	22,000	5,000
Workhorse	P-series	18,000	22,000	4,000
Workhorse	R-series Diesel	28,000	40,000	12,000
Workhorse	R-series Diesel	29,500	41,500	12,000
Workhorse	R-series Diesel	32,000	44,000	12,000
Spartan	NVS	25,500	28,000	2,500
Spartan	NVS GT	24,000-28,000	34,000-38,000	10,000
Spartan	MM	29,600-32,700	41,600-44,700	12,000
Spartan	MM GT	32,700-34,600	47,700-49,600	15,000
Spartan	K2	33,700-36,600	48,700-51,600	15,000
Freightliner	XC	26,850-34,600	36,850-44,600	10,000
Chevrolet/GMC	C5500	16,000-19,500	26,000	6,500-10,000
Roadmaster (Monaco)	R4R	47,600	57,600	10,000
Roadmaster (Monaco)	RR4R	33,000	43,000	10,000
Roadmaster (Monaco)	RR8R	33,000	43,000	10,000
Roadmaster (Monaco)	RR8S	34,600	44,600	10,000
Roadmaster (Monaco)	S-Series	47,600	57,600	10,000
Country Coach	Prevost	52,000	62,000	10,000
Country Coach	Affinity	52,000	62,000	10,000
Country Coach DynoMax	Allure	45,200	55,200	10,000
Country Coach DynoMax	Intrigue	45,200	55,200	10,000
Country Coach DynoMax	Magna	52,000	62,000	10,000
Ford (Class A)	178" wheelbase	15,700	26,000	10,300
Ford (Class A)	190" wheelbase	18,000	26,000	8,000
Ford (Class A)	208" wheelbase	20,500	26,000	5,500
Ford (Class A)	228" wheelbase	22,000	26,000	4,000
Ford (Class C)	138-176" wheelbase	14,050	20,000	5,950
Peak	217-278" wheelbase	33,000	43,000	10,000
Liberty/Freightliner	266" wheelbase	34,600	46,600	12,000
Liberty/Spartan	266" wheelbase	34,600	49,600	15,000
Liberty/Spartan	290" wheelbase	44,600	59,600	15,000
Foretravel	270 & 290 Series	35,320	45,300	10,000
Foretravel	320 Series	42,000	52,000	10,000

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3,250 RPM — an additional 45 horsepower and 30 lb-ft of torque. Previously, peak horsepower was rated at 4,250 RPM, so the engine's powerband was broadened to acquire the additional output. Towing allowances range from 4,000 to more than 10,000 pounds.

As gross ratings increase, the proportional weight gap between motorhomes and dinghies widens — and the phrase, “I hardly even know it's back there,” is repeated more often. Even heavier dinghy vehicles — weighing as much as 6,000 pounds — won't significantly affect the highway performance of coaches with engines rated at 450 HP and higher. The effect of dinghy weight on hill-climbing performance and acceleration of motorhomes with lower-rated engines is more noticeable, but this added weight does not create a substantial negative effect in coaches with a minimum of 300 HP and 850 lb-ft torque, which is typical of what you find in mid-priced diesel motorhomes.

At the low end of the diesel lineup, with GVWR as low as 24,000 pounds, coaches with engine torque output in the 600 lb-ft range are more noticeably affected by dinghy weight in mountainous terrain and while accelerating to enter an expressway.

Most diesel-powered chassis are equipped with air suspensions, anti-lock brakes, air or air/hydraulic disc or disc/drum brakes and compression exhaust brakes, which are important accessories even when the dinghy is equipped with a braking device. Automatic traction control is used in some chassis. Six-speed Allison transmissions are the usual fare. Beam front axles are used in many chassis, but independent front suspensions may also be offered. Air bags are used in suspensions, sometimes with two at the front and four in the rear, while turning angles are in excess 50 degrees for excellent maneuverability relative to wheelbase length.

In all cases, manufacturers have become very good at creating engine/axle ratio combinations that produce the best possible performance-versus-economy results, if owners stay within the gross combination weight ratings of their chassis.

Although dinghy-towing weight ratings vary from a low of about 4,000 to more than 10,000 pounds, it's necessary when buying a coach to make sure the towing allowance — the difference

between the GVWR and the GCWR — is adequate for the dinghy that has been selected. With one exception, tow ratings of even the lowest-rated coaches (as seen in the accompanying chart) provide a towing allowance of at least 4,000 pounds, covering virtually all of the popular dinghy choices. However, owners who choose to tow Hummers, full-sized SUVs or heavy car-hauling trailers will need to hitch them to diesel-pusher coaches of more substantial capability.

As the accompanying weight data suggests, the important criteria for dinghy towing suitability are GVWR, GCWR and the difference between the two, which is the weight allowed for towing. It's important to note that the numbers are for gross weight — with supplies and passengers aboard the motorhome and all supplies aboard the dinghy. The towing allowance suggested in the accompanying data is viable only if the chassis is not overloaded. A trip to the scales will tell the tale; weigh front and rear axles individually to ensure that one or the other is not overloaded, even if the GVWR is not violated.

In selecting a new motorhome, cargo carrying capacity (CCC), an industry weight designation — that is posted in every new coach, is also an important consideration. It informs the owner of the cargo weight that can be added to the coach. For example, if the chassis is overloaded by 1,000 pounds, that amount of weight should be subtracted from the dinghy weight allowance in order to avoid violating the GCWR. Of course, overloading, whether it be GVWR, gross axle weight rating (GAWR) or GCWR, should be avoided.

Chassis builders vary in their approach to recommending auxiliary braking for a dinghy, with brakes recommended by some for towed loads exceeding 1,500 pounds. Compression- or exhaust-braking systems are highly recommended for diesel-powered chassis in any dinghy towing situation — especially one in which the owner has opted not to use a dinghy brake actuation system.

The bottom line? It's difficult to buy a motorhome that does not have the capability to tow a vehicle of significant size and passenger capability and to handle it well, because there is such a broad range of dinghies weighing less than 4,000 pounds — an ideal situation for the motorhomer who wants maximum mobility. ■