



USST National Series Performance Factors (2010)

The USST National Championship Series combines trucks from many different origins and blends them into a racing class that includes their different features. With the high expense of racing, fuel cost, and the economy in general, a USST goal is for its racers to be able to use and depreciate the existing equipment they have invested in while moving toward a common truck. There is first goal of this rule set is to create a cornerstone on which to build equal competition between the following truck series; USST multiple divisions, I-70, Nashville, and ex-ARTS trucks.

90% of the trucks in these groups share three identical factors and one common factors:

- Perimeter frame
- Big Spring
- Steering Box (OEM style)
- Symmetrical Chassis

The most common styles of truck racing in all the USST races is the baseline. These four characteristics are the common denominators on which the USST National rule set is based. The fundamental concept is that performance enhancing features are weighted depending on track size and banking. A table of equalization factors for different features on trucks is used to add or remove weight. This is a weight based rule set that is easily adjustable. Lead is the cheapest and most measurable equalizer. Each truck team will be given an assessment sheet to list these factors before events and their required weight will be calculated. This procedure is described in the separate document “USST National Series Procedures”.

National Series Performance Factors

USST defines a Performance Factor as the following: “Characteristics that are deemed to affect performance shall be assigned weight breaks or penalties depending on the track size and banking.” The base weight for these calculations shall be geared towards the most common trucks which are USST South, Nashville, I-70, and Midam. These trucks have reasonable percentages at base weight of 3000 to 3100 pounds. For the National Series, a baseline weight and maximum left side percentage will be selected that is attainable by a majority of the trucks. Performance factors will then adjust the truck weight up or down. USST has identified the following characteristics that it deems to affect performance. A brief description is included.

- 1 **604 Crate Engine:** Given large breaks on big track and no break on short tracks when compared to Mid-am and USST “built” motors.
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- 4 **Coilovers:** Often overrated as performance gain. Pays big penalty on short flat tracks but diminishes to zero penalty on big tracks. The Coil over weight penalty is based on USST analysis that began in 2002. Research and analysis shows that the



- reactiveness advantage from coil over shocks diminishes as track size increases and banking increases. No spring stabilizer / ICP devices will be allowed on coilovers.
- 5 **Unequal A Lower Frames:** If USST measures any difference greater than 1/4 in the triangle created by the lower control arm, penalty applies. Offsets Camber Gain control.
 - 6 **Wide 5 Spindles:** Penalty offsets gain from rotating weight, geometry, and unsprung spindle weight.
 - 7 **Rack Steering:** Penalty applied in front of crossmember for unsprung weight and steering advantages.
 - 8 **Track width:** 50 pounds per inch with penalty starting with anything over USST North, South, Mid-am and Nashville Rule of 65.0. Measured with driver in seat.
 - 9 **4 Piston Front Brake:** No penalty on non-braking tracks. Weight Penalty high on short flat tracks due to documented corner entry advantages.
 - 10 **Locker:** Provides great turning ability in center of corner for trucks that typically push.
 - 11 **Extended Cab:** Pays slight penalty on short tracks for rear percentage.
 - 12 **Unequal Rear Trailing Arms:** Slight Penalty for being non symmetrical and providing late model roll steer tuning ability.
 - 13 **Stock Spindles:** Trucks with stock spindles may not be able to get the front end geometry, bump steer and camber gains that aftermarket spindles provide.
 - 14 **Clutch:** 7 ¼ baseline. Deduct 35lbs for 8.5” Coleman clutch, add 35lbs for 5.5 clutch. Minimum Clutch allowed is 5.5.
 - 15 **Drive shafts:** The future is steel driveshafts. For 2009 only, add 20lbs for Aluminum to give teams a year to change. Illegal in 2010.
 - 16 **Underslung:** Underslung trucks can drastically lower center of gravity. Possible rule option is to allow with the understanding that no weight may be mounted to the rear clip in a way that no weight is lower than the plane of the horizontal axle centerline.
 - 17 **Right Side Door Bars:** Trucks will be constructed with 4 right side door bars (including the crossbar). Starting in 2011, trucks with less than 4 door bars will carry 50 lbs of their lead on the right side existing X-ing or door bars. Weight must be mounted above the plane of the right side spindle height.
 - 18 **Engine Setback:** Trucks must meet one of the following requirements. 1. Measurement of 91 inches back of block to centerline of rear axle. 2. Center of forward most spark plug hole to center of upper ball joint centerline maximum two inches.
 - 19 **Crankshaft Height:** Iron Head engines 11 inches. 12 inches for aluminum head engines. Measured without driver.

Sample performance factor tables are listed on the next page. These tables would be applied to any trucks with features



outside the baseline rules. The tables below are for example only. Tables will be published and maintained by USST.



Tables: The performance factors in the tables below are separated from each other to allow each one to carry its own adjustment for track size and banking. This allows infinite adjustment and fine-tuning.

Track Size	603 crate	604 Crate	Coil Over	4 Piston Front Brk	Wide 5	Unequal A Frames
3/8 flat	-200	0	100	100	50	100
3/8 bank*	-200	0	50	100	50	100
1/2 flat	-200	-100	50	100	50	100
1/2 banked*	-200	-100	0	0	50	100
3/4 all	-250	-200	0	0	50	50
7/8 banked*	-250	-200	0	0	25	50
1 mile or more	-300	-200	0	0	25	50

Track Size	Rack Steering	Stock Spindles	Track width	Extended Cab	Locker	Unequal Rear Trail Arms
3/8 flat	50	-50	50	50	100	50
3/8 bank*	50	-50	50	0	100	50
1/2 flat	50	-50	50	0	100	50
1/2 banked*	50	-50	50	0	100	50
3/4 all	50	-50	50	0	100	50
7/8 banked*	25	-50	50	0	100	50
1 mile or more	25	-50	50	0	100	50

Table 2: The SAMPLE table below shows the calculations that result from applying the weight tables to a sample truck from each series. The base weight for these calculations is 3000 pounds. Trucks in each class may vary based on the extra features.

Track Size	ARTS	Coil Truck offset 604	Nash 603	I-70 Symmetrical	Midam	USST	USST with 604
1/2 banked	2850	3150	2950	2950	3050	3050	2850
3/4 all	2750	3050	2850	2900	3050	3050	2800
7/8 banked	2750	2900	2825	2850	3050	3050	2800
1 mile or more	2650	2850	2725	2850	3050	3050	2750

The following show a sample tech sheet that shows how the performance factors will be used to determine weight for a truck at a race.

United States Super Trucks



Sample Tech Sheet