



®

NASA Time Trial (NASA TT)

Official 2009 National Rules

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1 Definitions and Claims

NASA Time Trial (NASA TT) is an automobile road course competition series focused on time trial style competition, and shall function as an advertising and marketing tool for the series sponsors, the independent sponsors of each team, as well as the official sanctioning body of the series. The trade name, "NASA Time Trial (NASA TT)" and these rules are the property of the National Auto Sport Association, Incorporated ®; located at P.O. Box 21555, Richmond, CA 94820; 510-232-NASA (6272).

2 Sanctioning Body

The NASA TT series is sanctioned by the National Auto Sport Association (NASA). All events are governed by these rules, applicable addendums, prima facie rules, as well as those found in the latest version of the NASA *Club Codes and Regulations* © (CCR). All decisions made by the NASA TT Administration are final, except under certain conditions, as specified under Section 12 Protests.

3 Intent

The intent of these rules is to provide mandates to ensure that all vehicles are modified within clearly established limits, to strive for an even platform, in which a contest of driving skill may provide the most talented drivers with great rewards. These rules provide the NASA TT Administration a guideline to use when making decisions regarding NASA TT. The intent of the rules and safety considerations will be the overriding factors in making such decisions, as opposed to a constrained interpretation of the rules based on phraseology or verbiage. The rules shall be applied in a logical manner that seeks to provide competitors a safe and fair venue for competition.

If a modification is not specifically allowed by the rules, it is prohibited. A permitted item cannot be modified to perform either a prohibited function, or the function of an item that would otherwise be assessed points under the modification rules. Vehicle legality is the sole responsibility of the driver. NASA TT Officials will attempt to use less invasive techniques for monitoring TT rules compliance than is expected in NASA race classes. As such, penalties for non-compliance with the rules will be harsh, and may include disqualification and expulsion from further NASA TT competition with a single infraction, regardless of the nature of the infraction. Competitors are encouraged to seek clarification of any rule and/or inspection of any modified or non-OEM part they are unsure about, before competition, from their Regional TT Director or the National TT Director.

4 Purpose

NASA TT provides a venue for spirited on-track competition with a high degree of both safety and convenience. NASA TT allows qualified individuals to compete in a "best lap time" format in a prepared car in advanced level open-passing sessions, and bridges the gap between HPDE 4 and wheel to wheel racing.

5 Driver Requirements/Licensing

The Regional TT Director must approve all drivers before they may compete. The minimum requirements for getting approval include:

- 1) Successfully completing a NASA HPDE 4 event, or current NASA Competition or Provisional Race License, or current Competition Race or TT license with various other organizations at the discretion of the TT Director, or an extensive verifiable driver history of open passing road course events or competitions with other reputable organizations (may include former racers without a current competition license, etc.) at the discretion of the TT Director and run group leader.
- 2) Exhibiting knowledge of the NASA TT rules, and understanding of the consequences of non-compliance.
- 3) Exhibiting understanding of the nature of NASA TT including the spirit of cooperation that is required between drivers on the track, and the high standard of driving performance and safety that is expected.
- 4) Exhibiting knowledge of the technical and safety inspection process.

After filling out the NASA TT license application and getting the signed approval of the Regional TT Director, a driver may begin TT competition. After the driver completes one event day of TT competition, the Regional TT Director may (at his discretion) approve the application for a National NASA TT license, require an additional event day for evaluation, or deny the application and counsel the driver on what is needed to become successful at the next attempt. The approved driver must then **e-mail or fax** in the approved, signed application and **credit card information for a** \$10 processing fee to NASA at least two weeks before the next event. The NASA TT license is valid for use in any NASA region, and at the NASA Championships. It is valid for up to one year, and will expire at the end of the calendar year of competition. Renewal (**on-line**) will only be an administrative formality provided that the driver competed in at least two event days during the season. Renewal for drivers not competing in at least two days **may** require repeating the initial application process as described above.

Drivers that possess a current NASA Competition or Provisional Race License will not be required to also get a NASA TT License. However, over-aggressive driving in a TT/HPDE4 run session may put their Competition Race License in jeopardy.

A NASA TT license can be revoked for a variety of reasons, some of which include: giving false information on the application, failure to comply with the rules, unsafe driving, high incident count (spins/off), car contact (with objects or other vehicles), and unsportsmanlike conduct on or off the track. Licensed racers participating in NASA TT that commit any of the above infractions may be subject to suspension or permanent ejection from NASA TT competition, as well as revocation of their NASA Competition license.

6 The Classes

6.1 General Car Classification

6.1.1 Base Classes and Modification Points

NASA TT includes eight combined production and racecar competition classes and one unlimited racecar class. In addition, there are two classes (G & H) that are listed for purposes of base classing only. There will be no competition in either of these classes in 2009. Stock (OEM) vehicles are defined as those equipped at their original year, make, model and equipment level specifications, without factory options. Unless otherwise specified in the base class listing, a vehicle's base trim package/model (U.S. Domestic Market), without factory upgrades or options, will be used for purposes of base classing and modification points assessment. The vehicles that are specifically listed and classed below that were never available for retail sale in the U.S.A. will use the base trim package of the vehicle in its primary domestic market. All other non-USDM models need to be assessed by the National TT Director for base classification. Stock (OEM) cars in Classes A to H, and "SUR" (Super, Unlimited, or Race Unlimited) are listed as follows below under their base classification in Section 6.3.2 (*** denotes a seven (7) point initial assessment, and ** denotes a fourteen (14) point initial assessment that gets added to the total number of modification points for the purposes of upclassing**).

Cars may be upclassed as defined below in Section 6.4 based on vehicle modifications. **All factory options and other modifications by the factory that are not included in the basic trim package of a model** (or in the non-basic trim package specifically listed below in 6.3.2 to assign a TT base class), **must be assessed modification points as in Section 6.4**. OEM special edition cars that are not listed under the base classifications need to be verified with both the Regional and National TT Directors to determine the correct base class, or whether they will simply be assessed modification points for all factory upgrades compared to their standard counterparts. New cars will be classified as they enter competition on a provisional basis. The National TT Director will determine the classifications, and they will be posted on the National NASA TT website <http://nasa-tt.com> in the Rules/Classification section. Any changes to base classifications, rules revisions or additions, approved motor swaps, and Technical Bulletins will also be released on the National TT website <http://nasa-tt.com> in the Rules/Classifications section, and will supercede these rules. Links to these sections will also be provided in the Time Trial forum at <http://www.nasaforums.com>.

Once a vehicle exceeds the limits of the TTA class (by initial base class, upclassing due to modification points, or "adjusted" weight/horsepower ratio), it will be classed in either TTS, TTU, or TTR based on the criteria set forth in 6.2. Instead of using base classing and modification points, the cars competing in TTS and TTU use a classing system based on actual measured weight and horsepower, with "modification factors" used to adjust the wt/hp ratio to equalize the classes. **The minimum "adjusted" weight/horsepower ratio (defined in 6.2.4 & 6.2.5) for any car in TTA is 8.70:1, regardless of how many points it has, or which base class it begins in.**

The TTR class is designated as a truly unlimited racecar class. It is intended for purpose built, tube frame, never street legal, and monocoque racecars, as well as very high-end modified streetcars with low weight/hp ratios. Modifications are completely unlimited (within NASA safety technical guidelines), although open-wheel formula cars are not legal. The TTS class is

the “Super” class for production vehicles originally built and approved by the DOT, TUV, and Japanese government for street use, that meet the listed “adjusted” power/weight ratio of 8.70:1 or higher, and that retain their original **OEM frame rails (or unibody), strut towers, floorpan, and subframe** (no tube frame conversions). TTU is the “Unlimited” class for production cars with the same requirements as TTS, but with a much lower “adjusted” power/weight ratio limit of 5.50:1. All sports racers, Radicals, tube-frame chassis, and prototypes will run in the TTR class unless otherwise specified in these rules, or granted a specific waiver by the National TT Director.

A participant seeking re-classification of the base class of a vehicle model or entire “model group” should make the request directly to the National TT Director (via e-mail greg@nasa-tt.com.) A participant can submit a written request for re-evaluation of the vehicle’s base class or a modification rule to the National TT Director by **June 1st** for consideration of a class/rule revision prior to the Championships that would apply to all participants.

Some NASA race classes and NASA guest classes for purpose-built racecars have been assigned a TT competition classification below (6.3.1). Provided that a vehicle complies with all of the rules for its race class, it is exempt from upclassing in Section 6.4. If the vehicle does not comply with all of the rules of its race class (including tires), then it will need to be re-classified by the National TT Director. Purpose built racecars and kit cars that are not given a base classification below (6.2.7 or 6.3.1) may run in the TTR class. However, they could possibly be classed into lower level classes to be determined by the National TT Director on an individual basis as they present for competition.

All cars with engine swaps, aftermarket forced induction, an upgraded or modified turbocharger/ supercharger, increased number of camshafts, non-OEM heads, or a ported rotary engine, need to be evaluated by the NASA National TT Director to determine the correct base class.

6.1.2 Minimum Adjusted Weight/Power Ratios for each Class

Each class has been assigned a minimum “Adjusted” weight/power ratio. Regardless of how many points a car has, or which base class it begins in, it may not exceed the minimum “Adjusted” weight/power ratio for its competition class. Any vehicle found competing with an “Adjusted” weight/power ratio less than the minimum level assigned below will be disqualified, and additional penalties may be assessed.

TTA	8.70:1
TTB	10.25:1
TTC	12.00:1
TTD	14.25:1
TTE	16.50:1
TTF	19.50:1

The “Adjusted” weight/power ratio is calculated using the actual chassis dynamometer maximum horsepower of the vehicle, the minimum competition weight (with driver), and other factors such as body type, transmission type, and tire type and size. The method used to calculate the “Adjusted” weight/power ratio is fully described in 6.2.4 and 6.2.5 (as well as in the Super Touring Rules). **These minimum “Adjusted” weight/power ratios are not a substitute**

for base classing followed by calculation of modification points to determine the final competition class. They are an additional limitation placed on vehicles to help achieve a level platform for competition in each class.

Dynamometer testing procedures are outlined in 6.4.2. However, it is noteworthy that dynamometer tests must be conducted on a Dynojet Model 248 or 224 for front and rear wheel drive vehicles, and on a Dynojet, Mustang, Dyno Dynamics, or Dynapack for AWD cars, in a commercial facility that offers dynamometer testing as part of their business and is open to the public. **It is not a requirement for all drivers to submit Dyno testing results, or for that matter, to have their vehicles Dyno tested before competition.** However, each driver/owner is responsible for ensuring that the vehicle is compliant with the above “Adjusted” weight/power restrictions. If the driver/owner is unsure of the chassis dynamometer maximum horsepower of the vehicle, or if the car is close to the limit for its class, NASA recommends that the driver/owner do appropriate testing of the vehicle before competition.

6.2 TTS, TTU, TTR Classing

6.2.1 TTR Eligibility

Any four wheel racecar or production vehicle that passes NASA safety technical inspection can be used to compete in TTR (note: open wheel formula cars are not permitted). There are no maximum power limits or minimum weight limits. Any type and size tires may be used. All types of transmissions, chassis frames, suspensions, aerodynamic modifications, and braking systems are legal. Roll cage modifications are unlimited, as long as they pass NASA safety technical inspection. Any type of performance modification is permitted.

Front driver and passenger side fixed/Lexan windows are specifically not permitted unless they are factory installed during the manufacturing of the vehicle. Both front side windows must otherwise be in the down position while on track.

6.2.2 TTU and TTS Eligibility

Any closed wheel/fendered production vehicle, approved for street use by the D.O.T., T.U.V., or Japanese government, that complies with all NASA safety requirements in the CCR, and all of the restrictions and limitations listed below (6.2.3) is eligible to compete based on the “adjusted” weight/power ratios below:

TTU = “adjusted” wt/hp ratio equal to, or greater than, 5.50:1

TTS = “adjusted” wt/hp ratio equal to, or greater than, 8.70:1

Performance enhancing modifications are otherwise unlimited. Some kit cars and purpose-built tube-frame or monocoque racecars may be permitted to compete in TTS and TTU with the approval of the National TT Director as they present for competition. The National TT Director will determine and publish the minimum weight/horsepower ratio for those vehicles, as well as any other specific limitations and restrictions placed on those vehicles.

6.2.3 TTU and TTS Vehicle Modification Restrictions/Limitations

Unless listed below, any other performance enhancing modifications are permitted, provided that the vehicle complies at all times with NASA safety rules and the minimum “adjusted” weight/power ratio for its class. Roll cages may be built to provide an unlimited amount of chassis stiffening. Any number of cage mounting points may be used above the six (6) minimum requirement, and, any number of additional tubes may be used above the minimum with additional attachment points to the body, including tubes that penetrate the firewall.

Front driver and passenger side fixed/Lexan windows are specifically not permitted unless they are factory installed during the manufacturing of the vehicle. Both front side windows must otherwise be in the down position while on track.

- 1) Every vehicle must retain its OEM **frame rails (or unibody), strut towers**, floorpan, and subframe. Tube-frame chassis conversion (partial or complete) is not permitted without a waiver from the National TT Director. Floorpan modifications to include items such as subframe connectors, roll cage bracing, and fuel cell placement may be approved on a case-by-case basis by the National TT Director. Such modifications will be subject to approval and possible modification factor assessments.
- 2) Aerodynamic modifications are unrestricted, except that a rear wing (or rear spoiler for wagon-style bodies), may not exceed a height of eight (8) inches above the roofline (or OEM windshield height for convertibles).
- 3) Nitrous Oxide use is prohibited. Pre-existing tanks must be removed.
- 4) Sequential, Tiptronic-like, paddle shift/semi-automatic, and dog-ring/straight-cut gears (i.e. non-synchromesh) transmissions are permitted, but will be assessed via the “adjusted” weight/power ratio formula regardless of whether they are OEM or not.
- 5) Tire and wheel size are unlimited, but non-DOT approved tires will be assessed via the “adjusted” weight/power ratio.
- 6) Up to two hundred and fifty (250) lbs. of added ballast is permitted—All ballast must be of solid material (no fluids or shot pellets) and safely secured in any location on the vehicle approved by NASA safety technical inspectors. The preferred method is to use at least one (1) 3/8-inch grade-5 bolt, two (2) “fender” washers and a locking nut system for every fifteen (15) pounds of weight.
- 7) From the start of competition through the end of post competition inspection, vehicles may not have any adjustments or modifications made to systems that could alter chassis dynamometer readings by changing horsepower levels (without the direct approval of the TT Director.)

6.2.4 “Adjusted” Weight/Power Ratio Calculation

The “adjusted” weight/power ratio for each vehicle will be calculated based on a simple competition weight to peak chassis dynamometer horsepower ratio (wt./hp), followed by the adjustment of the resulting ratio by adding to, or subtracting from it, based on the list of modification factors below. Competition weight is defined as the minimum weight of the vehicle, with driver, any time that it is competing in a TT session. Peak chassis dynamometer horsepower and dynamometer testing procedures are defined in Section 6.4.2

6.2.5 Modification Factors for “Adjusted” Weight/Power Ratio

The “modification factor” listed after each item below is added or subtracted from the actual measured wt/hp ratio to determine the “adjusted” wt./hp ratio that determines vehicle legality in each TT class.

Body Type: 4-door Sedan or 5-door Wagon = +0.4

Transmission: Dog-ring/Straight-cut gears (non-synchromesh) = -0.2
Sequential/Tiptronic-like/paddle shift/semi-automatic = -0.2

Drivetrain: AWD = -0.5
FWD = +1.0

Tires: Non-DOT approved tires = -0.75 (VRL & GAC Hoosiers see App. B)
Size 275 to 250 (or 10.5” to 9.6” for non-DOT approved) = +0.4
Size 245 or smaller (or less than 9.6” for non-DOT approved) = +0.8

Competition Weight:

Equal to **or Less** than:

3200-2800lbs	2750-2350lbs	2300-1900lbs	1850-1450lbs
3200 lbs -0.05	2750 lbs -0.5	2300 lbs -0.95	1850 lbs -1.4
3150 lbs -0.1	2700 lbs -0.55	2250 lbs -1.0	1800 lbs -1.45
3100 lbs -0.15	2650 lbs -0.6	2200 lbs -1.05	1750 lbs -1.5
3050 lbs -0.2	2600 lbs -0.65	2150 lbs -1.1	1700 lbs -1.55
3000 lbs -0.25	2550 lbs -0.7	2100 lbs -1.15	1650 lbs -1.6
2950 lbs -0.3	2500 lbs -0.75	2050 lbs -1.2	1600 lbs -1.65
2900 lbs -0.35	2450 lbs -0.8	2000 lbs -1.25	1550 lbs -1.7
2850 lbs -0.4	2400 lbs -0.85	1950 lbs -1.3	1500 lbs -1.75
2800 lbs -0.45	2350 lbs -0.9	1900 lbs -1.35	1450 lbs -1.8

Equal to **or Greater** than:

3300-3500lbs	3550-3750lbs	3800-4000lbs	4050-4250lbs
3300 lbs +0.05	3550 lbs +0.35	3800 lbs +0.65	4050 lbs +0.9
3350 lbs +0.1	3600 lbs +0.4	3850 lbs +0.7	4100 lbs +0.95
3400 lbs +0.15	3650 lbs +0.45	3900 lbs +0.75	4150 lbs +1.0
3450 lbs +0.2	3700 lbs +0.55	3950 lbs +0.8	4200 lbs +1.05
3500 lbs +0.3	3750 lbs +0.6	4000 lbs +0.85	4250 lbs +1.1

Note: If between 3201 lbs and 3299 lbs, there is no modification factor.

Note: All vehicle weights will be measured to the tenth of a pound (xxxx.x), then rounded off to the nearest pound for all calculations. Any weight ending in “.5” (xxxx.5x) will be rounded up or down to the benefit of the competitor.

6.2.6 Example Calculations of “Adjusted” Weight/Power Ratio

Example: 2003 Dodge Viper, with OEM transmission, on DOT approved 345 size tires, weighing 3701 lbs, with peak chassis dyno power of 450 hp:
 $3701/450 = 8.22$, plus 0.55 (weight 3700 lbs or greater) = 8.77 (TTS)

Example: 2004 Chevrolet Corvette Z06, with OEM transmission, on DOT approved 345 size tires, weighing 3265 lbs, with 375 peak hp:
 $3265/375 = 8.70$ (TTS)

Example: 2005 Ford Mustang, with dog-ring gearbox, non-DOT 11” slicks, weighing 3000 lbs, with peak chassis dyno power of 435 hp:
 $3000/435 = 6.89$, minus 0.2 (dog box) = 6.69, minus 0.75 (slicks) = 5.94, minus 0.25 (3000 lbs or less) = 5.69 (TTU)

Example: 2005 Subaru STI, with OEM transmission, on DOT approved 305 size tires, weighing 3201 lbs, with 550 peak awhp:
 $3201/550 = 5.82$, plus 0.4 (4-door sedan) = 6.22, minus 0.5 AWD = 5.72 (TTU)

Example: 2000 Dodge Viper with OEM transmission, on DOT approved 345 size tires, weighing 3451 lbs, with 645 peak rwhp:
 $3451/645 = 5.35$, plus 0.2 (3450 lbs or greater) = 5.55 (TTU)

Example: 2002 Ferrari 360, with OEM sequential transmission, on non-DOT approved 12” slicks, weighing 2851 lbs, with 410 rwhp:
 $2851/410 = 6.95$, minus 0.25 (sequential transmission) = 6.70, minus 0.75 (slicks) = 5.95, minus 0.35 (2900 lbs or less) = 5.60 (TTU)

Example: 2004 Dodge SRT4, with OEM transmission, on non-DOT approved 10.3” slicks, weighing 2501 lbs, with 500 fwHP:
 $2501/500 = 5.0$, plus 0.4 (4-door sedan) = 5.4, plus 1.0 (FWD) = 6.4, minus 0.75 (non-DOT approved tires) = 5.65, plus 0.4 (10.5” to 9.5” non-DOT tires) = 6.05, minus 0.7 (less than 2550 lbs) = 5.35 (TTR)

Example: 2001 Ford Mustang, with OEM transmission, on DOT approved 295 tires, weighing 3201 lbs, with 365 rwHP, and TT competition class TTA by base class and mod points:
 $3201/375 = 8.50$ (Car bumps from TTA to TTU)

Note: If one knows the competition weight of the vehicle, a simple reverse calculation will yield the maximum horsepower allowed for that vehicle. Begin by adding/subtracting all of the modification factors for the vehicle as listed above. Then use either the 5.50 or 8.70 ratio (depending on which class the car is being prepared for), and subtract that number from the ratio to get the vehicle’s actual target wt/hp ratio. Divide the competition weight by this number to obtain the horsepower target.

Using the Dodge SRT4 example above:

$$0.4 + 1.0 - 0.75 + 0.4 - 0.7 = 0.35$$

$$5.5 - 0.35 = 5.15$$

$$2501/5.15 = 485 \text{ max hp for TTU}$$

$$8.7 - 0.35 = 8.35$$

$$2501/8.35 = 299 \text{ max hp for TTS}$$

Using the Ferrari 360 example above:

$$-0.25 - 0.75 - 0.35 = -1.35$$

$$5.5 + 1.35 = 6.85 \text{ (note that subtraction of the negative number here results in addition)}$$

$$2851/6.85 = 416 \text{ max hp for TTU}$$

$$8.7 + 1.35 = 10.05$$

$$2851/10.05 = 283 \text{ max hp for TTS}$$

6.2.7 TTS/TTU Approved Non-Production & Tube-Frame Vehicles

The following vehicles have been approved for TTU/TTS, based on their “adjusted” wt/hp ratio, with the listed modification factors:

7's Only Mazda GT Spec RX7 (-0.2 modification factor)

Active Power GTR MKI, GTR 2D, GTR 70, M6 GTR (-0.75 modification factor)

Brunton Stalker (If aero mods, wing, or splitter, then -0.75 modification factor)

Brunton Stalker (If no aero mods, wing, or splitter, +0.75 modification factor)

Caterham & Lotus 7 (if aero mods, wing, or splitter, then -0.75 modification factor)

Caterham & Lotus 7 (if no aero mods, wing, or splitter, then +0.75 modification factor)

Dodge Viper Competition Coupe (-0.2 modification factor)

Ferrari 348, 355, and 360 Challenge Series (no modification factor)

Ferrari 430 Challenge (-0.2 modification factor)

Factory Five GTM Supercar (-0.75 modification factor)

Factory Five Roadster (if aero mods, wing, or splitter -0.4 modification factor. Note: no modification factor for FF Challenge “standard front air dam” or exact replica built with a different material)

Factory Five Type 65 Coupe (-0.4 modification factor)

Lotus 2-Eleven (no modification factor)

Panoz GTRA, GTWC (-0.2 modification factor)

Panoz GTS (-0.2 modification factor)

Porsche 997 & 996 GT3 Cup (-0.4 modification factor)

Pro Challenge Road Race Spec Car (See Appendix B)

Rossion Q1 (-0.2 modification factor)

Thunder Roadster ('08 released body/wing type -0.75 modification factor. Note: must keep chassis, body, wing to TR specs)

Note: Future approved vehicles will be posted on the Time Trial website <http://www.nasa-tt.com> in the Rules/Classification section.

6.3 Base Classifications (TTA-TTH, “SUR”)

6.3.1 Approved Racecar **Competition TT** Classifications

These NASA racecar and guest racecar classifications are valid provided that the car meets all of the requirements and restrictions of its own class rules, including tire size and brand if applicable. **As well, specific restrictions and specifications that must be adhered to are listed for some of the below models in Appendix B (see Appendix B for details).**

<u>Race Class</u>	<u>TT Class</u>
Allison Legacy	TTC (see Appendix B)
Baby Grand	TTA
Factory Five Challenge	TTA
Legends (all)	TTC
Panoz '97-'99 GTRA	TTB (see Appendix B)
Pro Challenge Road Race	TTA (see Appendix B)
RSR	TTB
Spec Racer Ford	TTB
Thunder Roadster	TTA (see Appendix B)

6.3.2 Base Classification Table and Listed Base Weights

Any tube-frame, never street legal, monocoque purpose-built racecar, vehicle not approved by the DOT, TUV or Japanese government for street use, or production vehicle that does not retain the original front clip, floorpan, and sub-frame, or is converted (partially or wholly) to a tube-frame design, that is not otherwise classed below or in section 6.2.7 or 6.3.1, will default to the TTR class until evaluated by the National TT Director for possible homologation into another class. **Individual cars may be approved for classing or re-classing by the National TT Director using the vehicle's actual dynamometer measured maximum chassis horsepower and torque, and the minimum competition weight of the vehicle (with driver).**

Make	Model	Class	Weight	Make	Model	Class	Weight
Acura	CL 2.2L	TTG	3064	Austin	Mini Cooper 1071S	TTF	1512
Acura	CL V6	TTF*	3470	Austin	Mini Cooper 1275S	TTF**	1433
Acura	CL-S	TTE	3510	BMW	135i Coupe ('08)	TTC*	3370
Acura	CL-S (6 spd)	TTE	3446	BMW	2002 ('68-'74)	TTG**	2282
Acura	Integra 1.6L ('86-'89)	TTF	2300	BMW	2002 ('75-'76) (2403 lb)	TTG*	2403
Acura	Integra 1.8L (non-VTEC)	TTF*	2529	BMW	2002tii	TTE	2225
Acura	Integra GS-R	TTE	2667	BMW	318 1.8L (E30)(pre-'92)	TTF*	2657
Acura	Integra Type-R	TTD	2600	BMW	318 (E36)('92-'98)(1.8L & 1.9L)	TTG**	2933
Acura	NSX 3.0L ('91-'96)	TTC**	3047	BMW	318 ti ('95-'99)	TTF*	2778
Acura	NSX	TTC**	3153	BMW	323 ('98-'00)(2.5L)	TTF*	3153
Acura	RL ('05-'07)	TTE	3984	BMW	325e (121 hp)	TTG**	2780
Acura	RL (pre'05)	TTG**	3920	BMW	325 (E30)('87-'91)(168hp)	TTF**	2855
Acura	RSX	TTF**	2734	BMW	325ic ('92)(168 hp)	TTF*	2990
Acura	RSX-S	TTD	2770	BMW	325 ('92-'95)(189 hp)	TTF**	3087
Acura	TL ('04-'05)	TTE*	3465	BMW	325 ('01-'06)(2.5L184 hp)	TTF**	3197
Acura	TL 3.2L ('06-'07)	TTE	3580	BMW	325i ('06)(3.0L 215hp)	TTE	3285
Acura	TL 3.5L ('07)	TTE**	3559	BMW	328 2.8L ('96-'00)	TTF**	3197
Acura	TL (pre '04)	TTF*	3487	BMW	328 ('07-'08) (3.0L 230 hp)	TTE	3351
Acura	TL-S	TTE	3558	BMW	330 ('01-'06)(225hp)	TTE	3285
Acura	TSX ('04-'07)	TTF**	3257	BMW	330 ('06)(255hp)	TTE**	3417
Alfa Romeo	1600 Spider	TTF	2250	BMW	335 3.0L ('07-'08)	TTD**	3571
Alfa Romeo	2000 Spider	TTE	2288	BMW	5 series (<226hp)(RWD)(inc '07)	TTF**	3494
Alfa Romeo	2600 Spider	TTF**	2683	BMW	5 series (RWD)('08)	TTE	3500
Alfa Romeo	Milano 2.5L ('87-'89)	TTF*	2907	BMW	540	TTE**	3803
Alfa Romeo	Milano 3.0L ('87-'89)	TTE	2907	BMW	M Coupe/Roadster (240hp)	TTD	3131
Audi	A3 2.0T (200 hp)('06-'07)	TTF**	3263	BMW	M Coupe (315 hp)	TTC**	3141
Audi	A3 3.2 AWD (250 hp)('06-'07)	TTE*	3660	BMW	M Roadster (315 hp)	TTC**	3141
Audi	A4 1.8T (150 hp)('97-'00)	TTF	2992	BMW	M3 (E30)(pre-'89)	TTE**	2733
Audi	A4 1.8T (150 hp)(AWD)('97-'99)	TTF	3241	BMW	M3 (E30)('89-'91)	TTE*	2865
Audi	A4 1.8T (170 hp)	TTF	3252	BMW	M3 (E36)('95-'99)	TTD*	3175
Audi	A4 2.0T (197 hp)('05-'07)	TTF*	3428	BMW	M3 (E46)('01-'06)	TTC**	3415
Audi	A4 2.0T AWD (200 hp)('05-'07)	TTF**	3549	BMW	M5 E28,E34('85-'93)	TTD*	3788
Audi	A4 2.8L (190 hp)	TTF**	3263	BMW	M5 E39 ('00-'03)	TTC**	3792
Audi	A4 3.0L (220 hp)	TTF**	3462	BMW	M5 E60 ('06-'08)	TTA	4012
Audi	A4 3.2L (255 hp)(AWD)('07)	TTE**	3671	BMW	M6	TTE*	3570
Audi	A6 2.7T (AWD)	TTE	3958	BMW	M6 ('06-'08)	TTA	3909
Audi	A6 4.2L ('00-'04)(AWD)	TTE*	4024	BMW	MINI Cooper ('01-'04)	TTF	2315
Audi	A6 4.2L ('05-'06)(AWD)	TTE**	4145	BMW	MINI Cooper ('05-'08)	TTG**	2546
Audi	A6 4.2L ('07)(AWD)	TTD	4222	BMW	MINI Cooper S ('02-'04)	TTC**	2513
Audi	A8 4.2L (AWD)('97-'03)	TTE**	4068	BMW	MINI Cooper S ('05-'08)	TTE**	2678
Audi	A8 4.2L (AWD)('03-'06)	TTE**	4288	BMW	MINI Cooper Works ('06-'07)	TTD*	2720
Audi	A8 4.2L (AWD)('07)	TTD	4288	BMW	Z3 4-cyl	TTF*	2701
Audi	A8 6.0L (AWD)('05-'07)	TTC	4729	BMW	Z3 6-cyl (2.5L)	TTE	2932
Audi	Coupe (110 hp)	TTG**	2507	BMW	Z3 6-cyl (2.8L)	TTE*	2943
Audi	Coupe (164 hp)	TTG**	3174	BMW	Z3 6-cyl (3.0L)	TTD	2943
Audi	RS 4 (4.2L) (AWD)('07)	TTB*	3957	BMW	Z4 2.5L	TTE	2932
Audi	S4 ('03-'07)(AWD)	TTC	3869	BMW	Z4 3.0L ('03-'05)	TTD	3000
Audi	S4 (pre '03)(AWD)	TTD	3593	BMW	Z4 3.0L (215 hp)('06-'08)	TTE*	3020
Audi	S8 ('01-'03)(AWD)	TTD**	4068	BMW	Z4 3.0L (255 hp)('06-'08)	TTD*	3108
Audi	TT (180 hp)('00-'06)	TTE	2822	BMW	Z4 M ('06-'08)	TTB	3197
Audi	TT (225 hp)('02-'06)(AWD)	TTD	3220	BMW	Z8	TTB*	3500
Audi	TT (250 hp)('04-'06)(AWD)	TTD	3351	Cadillac	Catera	TTG**	3762
Austin	Mini 1L (<40hp)	TTG	1358	Cadillac	CTS 2.8L ('05-'07)	TTF*	3509
Austin	Mini 1L, 1.1L (40 to 47hp)	TTG	1450	Cadillac	CTS 3.6L ('03-'07)	TTE*	3509
Austin	Mini Cooper (55hp)	TTG	1576	Cadillac	CTS-V ('04-'07)	TTC**	3847

Make	Model	Class	Weight	Make	Model	Class	Weight
Cadillac	STS (4.6 V8) AWD ('05)	TTD	4295	Chrysler	Conquest Tsi (turbo)	TTF**	3050
Cadillac	STS (V6)('05-'07)	TTF**	3858	Chrysler	Crossfire (215hp) ('04-'07)	TTE	3010
Cadillac	STS (V8)('05-'07)	TTE**	3940	Chrysler	Crossfire SRT6 ('05-'06)	TTC**	3240
Cadillac	STS-V ('06-'07)	TTC*	4233	Chrysler	PT Cruiser	TTG	3147
Cadillac	XLR ('04-'07)	TTD**	3647	Chrysler	PT Cruiser GT	TTF**	3364
Cadillac	XLR-V 4.4L V8 ('07)	TTB	3810	Datsun	510 (96 hp)	TTF*	2040
Caterham	Super 7 (240 hp)	SUR	1150	Datsun	510 (L20B swap)	TTF**	2150
Chevrolet	Aveo ('04-'07)	TTG*	2365	Datsun	1600 Roadster ('66-'70)(96hp)	TTF	2030
Chevrolet	Camaro 3.1L	TTG*	3105	DeTomaso	Pantera	TTC*	3300
Chevrolet	Camaro 3.4L	TTG*	3306	Diasio	D962R	TTR	1400
Chevrolet	Camaro 3.8L	TTF*	3307	Dodge	Caliber RT 2.4L AWD ('07-'08)	TTF	3308
Chevrolet	Camaro 5.0L carb (170 hp)('87)	TTF**	3250	Dodge	Caliber SRT4 2.4L Turbo ('07-'08)	TTD**	3200
Chevrolet	Camaro SS ('98-'02)	TTD**	3433	Dodge	Charger 3.5L ('06-'07)	TTF**	3800
Chevrolet	Camaro SS ('96-'97)	TTD*	3439	Dodge	Charger 5.7L ('06-'07)	TTD*	4031
Chevrolet	Camaro Z28 ('98-'02)	TTD*	3439	Dodge	Charger SRT8 ('06-'07)	TTC	4160
Chevrolet	Camaro Z28 (pre '98)	TTE**	3441	Dodge	Magnum RT	TTE*	4180
Chevrolet	Cavalier	TTF	2617	Dodge	Magnum RT AWD	TTE**	4393
Chevrolet	Cavalier Z24	TTF*	2611	Dodge	Magnum SRT8	TTC	4260
Chevrolet	Cobalt 2.2L ('05-'08)	TTG*	2991	Dodge	Neon DOHC Coupe	TTF	2625
Chevrolet	Cobalt 2.4L ('06-'08)	TTF	2991	Dodge	Neon DOHC Sedan	TTF	2625
Chevrolet	Cobalt SS 2.0L (S/C)('05-'07)	TTE*	2991	Dodge	Neon SOHC Coupe	TTF	2450
Chevrolet	Cobalt SS (turbo)('08)	TTC*	2975	Dodge	Neon SOHC Sedan (1st gen)	TTF	2450
Chevrolet	Corvair (140hp)	TTF**	2500	Dodge	Neon SOHC Sedan (2nd gen)	TTF	2525
Chevrolet	Corvair (95,100hp)	TTG	2500	Dodge	Neon SRT4 ('03-'05)	TTE*	2970
Chevrolet	Corvair Corsa Turbo	TTE*	2500	Dodge	Neon SRT4 ACR	TTE**	2900
Chevrolet	Corvair Monza GT Spyder	TTF**	2570	Dodge	Shelby Charger (110hp)	TTG**	2296
Chevrolet	Corvette '63-'82 (>200, <330 hp)	TTD	3200	Dodge	Shelby Charger (146hp)	TTF*	2500
Chevrolet	Corvette '63-'82 (>330,<425 hp)	TTC*	3200	Dodge	Shelby Charger GLHS (turbo)	TTE	2550
Chevrolet	Corvette '63-'82 (>425 hp)	TTB	3400	Dodge	Shelby Lancer	TTF	3000
Chevrolet	Corvette '63-'82 (200hp)	TTF**	3200	Dodge	Shelby Omni GLH (146 hp)	TTF*	2500
Chevrolet	Corvette C4 ('85-'91)	TTD**	3223	Dodge	Shelby Omni GLHS	TTE	2540
Chevrolet	Corvette C4 ('92-'96) (LT1)	TTC*	3203	Dodge	Stealth (DOHC)	TTE	3153
Chevrolet	Corvette C4 (LT4 option) (330 hp)	TTC**	3350	Dodge	Stealth (SOHC)	TTF	3086
Chevrolet	Corvette C5 (inc. FRC w/o Z51)	TTB*	3246	Dodge	Stealth Turbo ('91-'93)(AWD)	TTD	3803
Chevrolet	Corvette C5 (all w/ Z51)	TTA	3173	Dodge	Stealth Turbo ('94-'96)(AWD)	TTC	3671
Chevrolet	Corvette C6 ('05-'07)(Z51 ok)	TTA*	3179	Dodge	Stratus 4-cyl	TTG	3192
Chevrolet	Corvette C6 ('08)(LS3)	SUR	3217	Dodge	Stratus RT	TTF	3219
Chevrolet	Corvette GS	TTC**	3350	Dodge	Viper	SUR	3410
Chevrolet	Corvette Z06 ('01-'04)	TTA*	3118	Dodge	Viper ACR	SUR	3325
Chevrolet	Corvette Z06 ('06-'08)	SUR	3130	Dodge	Viper Comp. Coupe	SUR	2995
Chevrolet	Corvette ZR-1	TTB	3500	Eagle	Talon 2.0L (135-140hp)	TTG**	2739
Chevrolet	Impala SS ('04-'05)	TTF*	3606	Eagle	Talon Turbo ('90-'94)	TTE	2789
Chevrolet	Impala SS ('06-'08)	TTE*	3711	Eagle	Talon Turbo ('95-'98)	TTE*	2866
Chevrolet	Impala SS ('94-'96)	TTF*	4036	Eagle	Talon Turbo AWD ('90-'94)	TTE*	3108
Chevrolet	Monte Carlo 3.9L LTZ ('06)	TTF**	3501	Eagle	Talon Turbo AWD ('95-'98)	TTE*	3153
Chevrolet	Monte Carlo SS 3.8L ('04-'05)	TTE	3391	Ferrari	308	TTD	3159
Chevrolet	Monte Carlo SS 5.3L ('06-'07)	TTD	3490	Ferrari	328	TTC**	2803
Chevrolet	Monte Carlo SS (pre '04)	TTF	3333	Ferrari	355	TTA*	2975
Chevrolet	S10 Extreme (180hp)	TTF	3216	Ferrari	360	SUR	3064
Chrysler	300 (3.5L) ('05-'07)	TTF*	3650	Ferrari	430	SUR	3197
Chrysler	300C (5.7L)('05-'07)	TTE**	4066	Ferrari	550	SUR	3726
Chrysler	300C (5.7L) (AWD)('05-'07)	TTE**	4273	Ferrari	612	SUR	4056
Chrysler	300C SRT8 ('05-'07)	TTC	4160	Ferrari	348 (<305 hp)	TTC*	3233
Chrysler	Cirrus 4-cyl	TTG*	3141	Ferrari	348 (320 hp)	TTB	3071
Chrysler	Conquest (turbo)	TTF**	2900	Ferrari	360 Challenge	SUR	2822

Make	Model	Class	Weight	Make	Model	Class	Weight
Ferrari	456GT	TTA*	3726	Ford	Pinto 2.3L	TTG*	2250
Ferrari	575M	SUR	3815	Ford	Pinto 2.8L	TTG*	2570
Ferrari	Enzo	SUR	3009	Ford	Probe GT	TTF*	2815
Ferrari	F430	SUR	3197	Ford	Probe Turbo	TTF*	2730
Ferrari	Superamerica	SUR	3815	Ford	Sierra Cosworth 2.0L T (204 hp)	TTE**	2756
Ferrari	Testarossa	TTA	3660	Ford	Sierra Cosworth AWD (220 hp)	TTD*	2816
Fiat	124 Spider 1400	TTG**	2083	Ford	Shelby GT500 5.4L S/C ('07-'08)	TTA*	3920
Fiat	124 Spider 1600	TTF*	2116	Ford	Taurus GL	TTH**	3326
Fiat	124 Spider 1800	TTF**	2116	Ford	Taurus SHO	TTF**	3379
Fiat	124 Sport Spider 2000	TTG*	2359	Ford	Thunderbird Super Coupe/Turbo	TTF**	3536
Fiat	128 (55-60 hp)	TTG	1730	Ford	Thunderbird V6 (pre-'02)	TTH**	3536
Fiat	X1-9 1.3L	TTG*	1940	Ford	Thunderbird V8 ('02)	TTF**	3775
Fiat	X1-9 1.5L	TTG**	2030	Ford	Thunderbird V8 ('03+)	TTE	3775
Fiat	X1-9 2000	TTB*	1973	Ford	Thunderbird V8 ('90-'97)	TTF*	3536
Ford	Contour SVT	TTF**	3126	Geo	Metro 1.0L	TTH**	1804
Ford	Escort 1.9L	TTH*	2356	Geo	Metro 1.3L	TTH**	1940
Ford	Escort 2.0L	TTG*	2457	Geo	Prizm	TTF	2359
Ford	Escort GT (1.8L)	TTF	2375	Geo	Storm	TTG	2282
Ford	Escort ZX2	TTF	2400	Geo	Storm GSI	TTF*	2480
Ford	Escort ZX2 S/R	TTF	2450	Honda	Accord 2.0L (120hp)	TTG*	2670
Ford	EXP 1.6L ('82-'85)	TTG	2130	Honda	Accord 2.2L ('90-'97)(130hp)	TTG*	2800
Ford	F150 Lightning	TTE*	4670	Honda	Accord 2.3L	TTG**	2976
Ford	Festiva	TTH**	1797	Honda	Accord 2.4L ('03-'07)	TTF	3097
Ford	Focus (2.0L 16v) ('05-'08)	TTF	2580	Honda	Accord 2.7 V6 ('95-'97)	TTF	3219
Ford	Focus (2.0L 16v)('00-'04)	TTG**	2651	Honda	Accord 3.0 V6 ('03-'07)	TTE	3303
Ford	Focus (2.0L 8v)('00-'02)	TTG	2606	Honda	Accord 3.0 V6 ('98-'02)	TTF*	3197
Ford	Focus (2.3L 16v)('04)	TTF	2612	Honda	Civic 1.6L SOHC ('88-'91)	TTF	2291
Ford	Focus ST 2.3L 16v ('07)	TTF*	2636	Honda	Civic Base ('88-'91)	TTG	2127
Ford	Focus SVT (2.0L)('02-'04)	TTF**	2750	Honda	Civic Coupe 1.8L ('06-'08)	TTF*	2586
Ford	Focus ZX4 ST (2.3L)('05-'06)	TTF*	2636	Honda	Civic CX ('92-'95)	TTG	2094
Ford	GT	SUR	3485	Honda	Civic del Sol S (<107hp)	TTG**	2302
Ford	Mustang Cobra ('93-'95)	TTE*	3354	Honda	Civic del Sol Si (<128hp)	TTF*	2414
Ford	Mustang Cobra ('96-'98)	TTC	3393	Honda	Civic del Sol VTEC (DOHC 1.6L)	TTE	2522
Ford	Mustang Cobra ('99 & '01)	TTC*	3285	Honda	Civic DX 1.5L 16v ('88-'91)	TTG**	2165
Ford	Mustang Cobra R ('00)	TTB*	3590	Honda	Civic EX 1.6L ('96-'00)	TTF	2440
Ford	Mustang Cobra R ('93)	TTD*	3248	Honda	Civic EX 1.7L ('01-'05)	TTF	2597
Ford	Mustang Cobra R ('95)	TTC*	3325	Honda	Civic Non-VTEC (92hp)	TTF	1950
Ford	Mustang Cobra SVT ('02+)	TTB*	3665	Honda	Civic Si 1.6L ('92-'95)	TTF	2390
Ford	Mustang GT ('05-'06)	TTD**	3450	Honda	Civic Si 1.6L ('99-'00)	TTF**	2612
Ford	Mustang GT ('07-'08)	TTC	3356	Honda	Civic Si 2.0L ('01-'05)	TTF*	2782
Ford	Mustang I4	TTH**	2699	Honda	Civic Si 2.0L ('06-'08)	TTE*	2877
Ford	Mustang I4 turbo	TTG*	3065	Honda	Civic Type R ('07) (JDM)(225 hp)	TTC	2792
Ford	Mustang I6	TTG	2800	Honda	Civic VX	TTG**	2094
Ford	Mustang Mach 1	TTC	3420	Honda	CRX DX 1.5L 16v ('88-'91)	TTG**	2103
Ford	Mustang SVO ('84-'86)	TTE	3036	Honda	CRX DX 12v ('85-'87)	TTG**	1865
Ford	Mustang V6 ('99-'08)	TTF**	3351	Honda	CRX HF	TTG	1967
Ford	Mustang V6 (pre-'99)	TTG**	3065	Honda	CRX Si 1.5L ('85-'87)	TTF**	1978
Ford	Mustang V8 ('64-'68 <272 hp)	TTF*	2980	Honda	CRX Si ('88-'91)	TTF*	2174
Ford	Mustang V8 ('69-'70 <291 hp)	TTF*	3250	Honda	CRX 1.6L DOHC VTEC	TTE	2436
Ford	Mustang V8 ('71-'73 <286 hp)	TTF	3560	Honda	Fit ('07-'08)	TTG*	2432
Ford	Mustang V8 ('79-'93 <226 hp)	TTE	3075	Honda	Prelude S ('92-'96)	TTG**	2775
Ford	Mustang V8 ('94-'98 <226 hp)	TTE*	3075	Honda	Prelude Si ('92-'96)	TTF*	2866
Ford	Mustang V8 ('99-'04)	TTE**	3273	Honda	Prelude Si (pre-'92)	TTF	2639
Ford	Pinto 1.6L	TTG	2000	Honda	Prelude VTEC ('93-'01)	TTF**	2954
Ford	Pinto 2.0L ('71-'74)	TTG	2235	Honda	S2000 (2.0L)('00-'03)	TTD**	2850

Make	Model	Class	Weight	Make	Model	Class	Weight
Honda	S2000 (2.2L)('04-'08)	TTC	2850	Lexus	SC430 ('02-'08)	TTE*	3840
Honda	S2000 CR (2.2L)('08)	TTC**	2813	Lincoln	LS (V8) ('03-'06)	TTE	3772
Hyundai	Accent 1.5L (105hp)	TTF*	2149	Lotus	Elise ('05-'07)	TTC**	1975
Hyundai	Accent 1.6L ('01-'08)	TTG**	2366	Lotus	Esprit (V8) TT	TTA	2968
Hyundai	Elantra 1.6L	TTG**	2500	Lotus	Esprit 4 Turbo	TTB	2866
Hyundai	Elantra 1.8L	TTF	2453	Lotus	Exige ('06)	TTB*	2015
Hyundai	Elantra 2.0L ('00-'08)	TTF	2626	Lotus	Exige S ('07)	TTA*	2077
Hyundai	Genesis 3.8L ('09)	TTE*	3750	Lotus	Exige 240R	SUR	2050
Hyundai	Genesis 4.6L ('09)	TTD**	4000	Mazda	323 (pre'95--82hp)	TTG	2075
Hyundai	Tiburon 2.0L ('03-'07)	TTG	2940	Mazda	323 GTX (1.6L T)	TTF	2645
Hyundai	Tiburon 2.0L ('97-'01)	TTF	2633	Mazda	626 2.0L	TTG	2864
Hyundai	Tiburon V6 2.7L ('03-'07)	TTF*	2986	Mazda	626 2.5L V6	TTF	3023
Infiniti	G20 ('93-'02)	TTG	2877	Mazda	Mazda3 (2.0L)('04-'06)	TTF*	2696
Infiniti	G20 ('91-'92)	TTF	2535	Mazda	Mazda3 (2.0L)('07-'08)	TTF	2780
Infiniti	G35 (incl. 6MT) (pre-'05)	TTD	3435	Mazda	Mazda3 (2.3L)('04-'06)	TTF*	2762
Infiniti	G35 (incl. 6MT)('05-'06)	TTD	3524	Mazda	Mazda3 (2.3L)('07-'08)	TTF	2930
Infiniti	G35 Coupe 6MT ('07)	TTD	3524	Mazda	Mazda6 2.3L ('03-'06)	TTF	3042
Infiniti	G35 (306 hp)(incl. Sport)('07-'08)	TTD*	3532	Mazda	Mazda6 2.3L ('07-'08)	TTG**	3091
Infiniti	G35x (AWD)('07-'08)	TTD**	3650	Mazda	Mazda6 3.0L (V6) ('03-'05)	TTF**	3243
Infiniti	I30 ('00-'01)	TTF**	3342	Mazda	Mazda6 3.0L (V6) ('06-'08)	TTF*	3320
Infiniti	I30 ('96-'99)	TTF*	3090	Mazda	Mazdaspeed Protegé (Turbo)	TTF**	2843
Infiniti	I35	TTE*	3342	Mazda	Mazdaspeed3 (turbo)('07-'08)	TTD*	3153
Infiniti	Q45 ('02-'07)	TTE*	4153	Mazda	Mazdaspeed6 (AWD)('06-'07)	TTD*	3589
Infiniti	Q45 (pre-'02)	TTF**	3895	Mazda	Miata 1.6L	TTF**	2182
Jaguar	S-Type 3.0L (235 hp)	TTF**	3777	Mazda	Miata 1.8L ('94-'97)	TTE	2293
Jaguar	S-Type 4.0L, 4.2L	TTE**	3874	Mazda	Miata 1.8L ('99-'05)	TTE	2299
Jaguar	S-Type R 4.2L S/C ('03-'04)	TTD**	4046	Mazda	Miata MX-5 ('06-'08)	TTE*	2474
Jaguar	S-Type R 4.2L S/C ('05-'07)	TTC	4075	Mazda	Miata MX-5 turbo ('05)	TTE*	2529
Jaguar	XJ Vanden Plas (<301 hp)	TTE*	3819	Mazda	MX-3	TTG*	2443
Jaguar	XJ8 3.5L	TTE	3613	Mazda	MX-3 GS	TTF	2582
Jaguar	XJ8 4.2L	TTE**	3613	Mazda	MX-6 (2.2L)(110hp)	TTG*	2560
Jaguar	XJ8 S/C ('00-'07)	TTC	4001	Mazda	MX-6 GT (turbo)	TTF*	2729
Jaguar	XJR ('98-'07)	TTC	3958	Mazda	MX-6 V6 ('92-'97)	TTF*	2800
Jaguar	XKR-SC ('00-'06)	TTC*	3865	Mazda	Protegé 1.6L	TTG	2493
Jaguar	XKR-SC ('07)	TTC**	3781	Mazda	Protegé 1.8L	TTF	2385
Jaguar	XKE	TTD*	3100	Mazda	Protegé 2.0L	TTF	2634
Jaguar	X-Type ('02-'07) AWD	TTE	3538	Mazda	Protegé 5	TTG*	2716
Kia	Rio	TTG**	2365	Mazda	Protegé MP3	TTG**	2725
Kia	Sephia	TTF	2472	Mazda	RX-7 12A	TTG**	2345
Kia	Spectra	TTG*	2701	Mazda	RX-7 13B	TTE	2800
Lamborghini	Diablo VT	SUR	3582	Mazda	RX-7 13B GSL-SE (1st Gen)	TTF**	2512
Lexus	GS300 ('06)	TTE	3536	Mazda	RX-7 TT	TTC**	2826
Lexus	GS300 ('93-'05)	TTF*	3649	Mazda	RX-7 Turbo II	TTD	2775
Lexus	GS350 ('07-'08)	TTD	3704	Mazda	RX-8 ('04-'08)	TTD	3045
Lexus	GS400	TTE**	3693	Mazda	RX-8 ('09)	TTD*	3045
Lexus	GS430 ('01-'07)	TTE**	3745	Mazda	RX-8 (197 hp)(Auto)('04-'05)	TTE	3053
Lexus	GS460 ('08)	TTD	3945	Mazda	RX-8 (212 hp)(Auto)('06-'07)	TTE*	3075
Lexus	IS250 ('06-'08)(6sp man.)	TTF	3450	Mercedes	190E 2.3 (16v)	TTF**	3030
Lexus	IS250 (AWD)('06-'08)	TTF**	3650	Mercedes	190E 2.6L ('86-'93)	TTF**	2955
Lexus	IS300	TTF**	3255	Mercedes	C230 ('02-'05)	TTF**	3305
Lexus	LS400	TTE	3890	Mercedes	C230 ('06-'07)	TTF**	3405
Lexus	LS430	TTE	3990	Mercedes	C280 ('94-'00)	TTF**	3316
Lexus	LS460 ('07-'08)	TTD	4244	Mercedes	C280 ('06-'07)	TTE	3460
Lexus	SC300	TTF*	3560	Mercedes	C32 AMG ('02-'04)	TTC*	3540
Lexus	SC400	TTE*	3655	Mercedes	C320 ('01-'05)	TTE	3428

Make	Model	Class	Weight	Make	Model	Class	Weight
Mercedes	C55 AMG ('05-'06)	TTC**	3540	Mitsubishi	Lancer Evo X GSR ('08)(AWD)	TTB*	3500
Mercedes	CL65 AMG ('06)	TTA*	4654	Mitsubishi	Lancer Evo X MR ('08)(AWD)	TTB**	3500
Mercedes	CLK55 AMG ('04-'06)	TTC	3960	Mitsubishi	Mirage	TTG*	2183
Mercedes	CLK430 ('99-'01)	TTD*	3323	Mitsubishi	Mirage 1.8L	TTF	2293
Mercedes	CLK430 ('02-'03)	TTD	3485	Mitsubishi	Starion (turbo)	TTF**	2900
Mercedes	CLK500 ('03-'06)	TTD*	3585	Mitsubishi	Starion ESI-R (turbo)	TTF**	3050
Mercedes	CLK550 ('07)	TTC*	3965	Nissan	200SX 1.6L	TTF	2325
Mercedes	CLK63 AMG ('07)	TTA	3960	Nissan	200SX 2.0L ('80-'81)	TTG*	2500
Mercedes	E55 AMG ('03-'06)	TTB*	4087	Nissan	200SX 2.0L Turbo	TTE	2800
Mercedes	E55 AMG ('99-'02)	TTC*	3768	Nissan	200SX SE-R (2.0L)	TTF	2586
Mercedes	E63 AMG ('07)	TTA*	4035	Nissan	240SX	TTF**	2700
Mercedes	SL55 AMG ('03-'06)	TTB*	4280	Nissan	240SX (S14 220hp swap)	TTD*	2700
Mercedes	SL55 AMG ('07)	TTB*	4365	Nissan	240SX HICAS	TTE	2700
Mercedes	SL65 AMG ('07)	TTA*	4564	Nissan	240SX SOHC ('89-'90) (140hp)	TTF*	2684
Mercedes	SLK 320 ('01-'04)	TTE*	3120	Nissan	240Z	TTE	2425
Mercedes	SLK32 AMG ('02-'04)	TTB*	3220	Nissan	260Z	TTF**	2660
Mercedes	SLK55 AMG ('05-'07)	TTB	3420	Nissan	280Z	TTF**	2800
Mercury	Capri 1.6L (75hp)	TTG	2135	Nissan	280ZX	TTF**	2800
Mercury	Capri 2.0L ('71) (100hp)	TTF	2135	Nissan	280ZX Turbo	TTE	2800
Mercury	Capri 2.0L ('72-'74)	TTG*	2275	Nissan	300ZX all (Z31--'84-'88) NA	TTE	2668
Mercury	Capri 2.3L ('76-'77)	TTH**	2491	Nissan	300ZX Turbo (Z31--'84-'89)	TTE	3260
Mercury	Capri 2.6L, 2.8L ('72-'74)	TTF	2275	Nissan	300ZX NA (Z32) 2+2	TTE	3414
Mercury	Capri 2.8L ('76-'77)	TTH*	2800	Nissan	300ZX NA (Z32--'89-'96)	TTE*	3174
Mercury	Cougar 2.5L V6	TTF*	2892	Nissan	300ZX TT	TTD**	3480
Mercury	Marauder	TTE	4195	Nissan	350Z (287hp)('03-'05)(enth. ok)	TTC	3188
Merkur	XR4Ti	TTE	2920	Nissan	350Z (300hp)('06)(enth. ok)	TTC	3339
MG	Midget 1.1L, 1.3L, 1.5L	TTF	1515	Nissan	350Z (306hp)('07-'08)(enth. ok)	TTC*	3320
Mitsubishi	3000 VR-4 ('91-'93)(AWD)	TTD	3803	Nissan	350Z Nismo ('07-'08)	TTB	3350
Mitsubishi	3000 VR-4 ('94-'99)(AWD)	TTD**	3760	Nissan	350Z Roadster ('06)	TTD*	3602
Mitsubishi	3000GT (NA-DOHC)	TTE	3219	Nissan	350Z Track ('05-'06),35ann, GT	TTC*	3370
Mitsubishi	3000GT (NA-SOHC)	TTF	3131	Nissan	350Z Track Model ('03-'04)	TTC*	3225
Mitsubishi	Eclipse 2.4L (pre-'06)	TTG**	2965	Nissan	Altima 2.4L	TTF	2853
Mitsubishi	Eclipse 2.4L ('06-'08)	TTG*	3274	Nissan	Altima 2.5L ('02-'08)	TTF*	2992
Mitsubishi	Eclipse GT 3.8L ('06-'08)	TTE*	3472	Nissan	Altima 3.5L ('02-'06)	TTE*	3225
Mitsubishi	Eclipse GT 3.0L ('00-'05)	TTF**	3142	Nissan	Altima 3.5L ('07-'08)	TTE**	3268
Mitsubishi	Eclipse Turbo ('90-'94)	TTE	2778	Nissan	Altima 3.5L SE-R ('05-'06)	TTD	3279
Mitsubishi	Eclipse Turbo ('95-'98)	TTE*	2877	Nissan	GT-R ('09+)	SUR	?
Mitsubishi	Eclipse Turbo ('99)	TTE	2970	Nissan	Maxima 3.5L ('02-'03)	TTE*	3239
Mitsubishi	Eclipse Turbo AWD ('92-'94)	TTE*	3093	Nissan	Maxima 3.5L ('04-'06)	TTE*	3471
Mitsubishi	Eclipse Turbo AWD ('95-'98)	TTE*	3157	Nissan	Maxima 3.5L ('07-'08)	TTE	3591
Mitsubishi	Eclipse Turbo AWD ('99)	TTE*	3270	Nissan	NX2000	TTF	2461
Mitsubishi	Galant 2.4L ('94-'03)	TTG*	2835	Nissan	Pickup ('90-'97)(2WD)	TTG**	2800
Mitsubishi	Galant 2.4L ('04-'07)	TTG	3428	Nissan	Pulsar NX 1.8L	TTF	2566
Mitsubishi	Galant 3.0L V6 (195hp)	TTF	3252	Nissan	Sentra 1.6L	TTF	2299
Mitsubishi	Galant 3.8L (230 hp)('02-'07)	TTF*	3616	Nissan	Sentra 1.8L ('00-'06)	TTG*	2590
Mitsubishi	Galant 3.8L Ralliart ('07)	TTF*	3748	Nissan	Sentra 2.0L ('07-'08)	TTG**	2853
Mitsubishi	Galant VR4 (AWD) ('91-'92)	TTE	3275	Nissan	Sentra SE ('98-'01)	TTF	2617
Mitsubishi	Lancer 2.0L ('02-'07)	TTG	2745	Nissan	Sentra SE-R 2.0L ('91-'94)	TTF	2467
Mitsubishi	Lancer 2.0L DE, SE ('08)	TTG*	3000	Nissan	Sentra SE-R 2.5L ('02-'06)	TTF*	2730
Mitsubishi	Lancer 2.4L ('04-'07)	TTF*	2843	Nissan	Sentra SE-R 2.5L ('07-'08)	TTF	3102
Mitsubishi	Lancer Evo VIII ('03-'05)(AWD)	TTC**	3263	Nissan	Sentra Spec V ('02-'06)	TTF**	2710
Mitsubishi	Lancer Evo VIII MR ('05)(AWD)	TTB	3263	Nissan	Sentra Spec V ('07-'08)	TTF**	3078
Mitsubishi	Lancer Evo IX ('06)(AWD)	TTB	3263	Noble	M12 GTO-3R (352 hp 3.0L V6)	SUR	2380
Mitsubishi	Lancer Evo MR ('06)(AWD)	TTB*	3285	Noble	M400 (425 hp 3.0L V6)	SUR	2337
Mitsubishi	Lancer Evo RS ('06)(AWD)	TTB	3219	Oldsmobile	Cutlass Calais 2.3L Int. (150hp)	TTF	2700

Make	Model	Class	Weight	Make	Model	Class	Weight
Oldsmobile	Cutlass Calais 2.3L Int. (180hp)	TTF**	2730	Porsche	928 (78-'82)(4.5L)	TTD	3200
Oldsmobile	Cutlass Calais 2.3L Quad442	TTF**	2730	Porsche	944 ('83-'87)	TTF**	2779
Oldsmobile	Cutlass Calais Quad442 W41	TTE*	2625	Porsche	944 2.5L ('88)	TTF**	2844
Opel	GT 1100	TTG	1918	Porsche	944 2.7L ('89)(162 hp)	TTF**	2866
Opel	GT1900	TTG*	2138	Porsche	944 S	TTE*	2975
Opel	Manta	TTG	2230	Porsche	944 S2	TTD*	2892
Peugeot	505 Turbo 2.2L ('86-'88)(150hp)	TTF*	2850	Porsche	944 Turbo ('86-'88)	TTD	2899
Peugeot	505 Turbo 2.2L ('88-'89)(180hp)	TTF**	2950	Porsche	944 Turbo S ('88-'89)	TTD**	2998
Plymouth	Laser Turbo ('90-'94)	TTE	2756	Porsche	959	SUR	2970
Plymouth	Laser Turbo AWD ('92-'94)	TTE*	3073	Porsche	964 Carrera 2	TTD**	2970
Plymouth	Prowler	TTD*	2857	Porsche	964 Carrera 4 (AWD)	TTD**	3190
Pontiac	Fiero (4-cyl)	TTG	2590	Porsche	964 RS	TTC**	2706
Pontiac	Fiero (V6)	TTF*	2778	Porsche	964 RS America	TTC*	2820
Pontiac	Firebird 3.4L (V6)	TTG*	3306	Porsche	965 3.3L (Turbo II--'90-'92)	TTC**	3234
Pontiac	Firebird 3.8L	TTF*	3306	Porsche	965 3.6L (Turbo II--'93-'94)	TTB	3234
Pontiac	Firebird Firehawk	TTC	3481	Porsche	968	TTD*	2910
Pontiac	Firebird WS6	TTD**	3499	Porsche	968 Turbo S	TTB	2866
Pontiac	Formula ('98-'02)	TTD*	3452	Porsche	993 C2 ('94-'95)	TTC*	3064
Pontiac	Formula (pre-'98)	TTE**	3408	Porsche	993 C2 ('96-'99)	TTC**	3064
Pontiac	Formula '87 (5.0L, 215hp)	TTF**	3383	Porsche	993 C2S	TTC**	3064
Pontiac	Grand AM 2.3L (170,180hp)	TTF**	2852	Porsche	993 C4 (AWD)	TTC**	3175
Pontiac	Grand Am 3.4L (V6)	TTG**	3091	Porsche	993 C4S (AWD)	TTB	3197
Pontiac	Grand Prix GT 3.8L ('98-'04)	TTF	3484	Porsche	993 Cup	SUR	2464
Pontiac	Grand Prix GT 3.8L ('05-'06)	TTE	3484	Porsche	993 RS 3.8L	TTB*	2800
Pontiac	Grand Prix GTP ('99-'03)	TTF*	3464	Porsche	993 Turbo (AWD)	SUR	3300
Pontiac	Grand Prix GTP ('04-'06)	TTE	3583	Porsche	993 Turbo S (AWD)	SUR	3203
Pontiac	Grand Prix GXP ('05-'08)	TTE**	3600	Porsche	996 C2 (3.4L) ('99-'01)	TTB	2910
Pontiac	Grand Prix SE 3.1L	TTG*	3384	Porsche	996 C2 (3.6L)('02-'04)	TTB*	2959
Pontiac	GTO ('04)	TTD*	3725	Porsche	996 C4 (3.4L)	TTB	3034
Pontiac	GTO ('05-'06)	TTC*	3725	Porsche	996 C4 (3.6L)	TTB	3267
Pontiac	Solstice ('06-'08)	TTE	2860	Porsche	996 C4S (3.6L)	TTA	3240
Pontiac	Solstice GXP (turbo)('07-'08)	TTC	2988	Porsche	996 GT2	SUR	3130
Pontiac	Trans Am ('98-'02)	TTD*	3494	Porsche	996 GT3	SUR	2976
Pontiac	Trans Am (pre-'98)	TTE**	3477	Porsche	996 Cup	SUR	2550
Pontiac	Trans Am Turbo V6	TTD*	3346	Porsche	996 Turbo	TTA*	3388
Pontiac	Vibe 1.8L ('03-'07)	TTG*	2700	Porsche	996 Turbo S	SUR	3505
Pontiac	Vibe GT ('04-'06)	TTF	2780	Porsche	997 C4 ('06-'07)	TTA	3197
Pontiac	Vibe GT ('03)	TTF*	2780	Porsche	997 C4S ('06-'07)	TTA	3252
Porsche	911 ('63-'69)	TTE*	2248	Porsche	997 Carrera ('05-'07)	TTB*	3075
Porsche	911 ('70-'73)	TTE*	2375	Porsche	997 Club Coupe	TTA*	3053
Porsche	911 ('73-'77)	TTE*	2469	Porsche	997 CS ('05-'07)	TTA	3131
Porsche	911 ('78-'83)	TTE**	2552	Porsche	997 GT3 ('07)	SUR	3076
Porsche	911 ('84-'89)	TTD*	2756	Porsche	997 GT3 Cup	SUR	2536
Porsche	911 Carrera ('73-'77)	TTD*	2469	Porsche	997 Turbo AWD ('07)	SUR	3495
Porsche	911 Turbo 3.0L ('74-'77)	TTC**	2508	Porsche	Boxster ('97-'99)	TTE*	2822
Porsche	911 Turbo 3.3L ('77-'89)	TTC**	2937	Porsche	Boxster ('00-'02)	TTE**	2900
Porsche	911S ('67-'69)	TTD	2248	Porsche	Boxster ('02-'04)	TTD	2920
Porsche	911S ('70-'73)	TTD*	2374	Porsche	Boxster ('05-'06)	TTD*	2855
Porsche	912	TTF**	2095	Porsche	Boxster ('07)	TTD**	2855
Porsche	914-4	TTF**	2138	Porsche	Boxster S ('05-'06)	TTC*	2965
Porsche	914-6	TTE	2070	Porsche	Boxster S ('00-'02)	TTD**	2950
Porsche	924	TTF**	2344	Porsche	Boxster S ('03-'04)	TTC	2911
Porsche	924S ('87)	TTF**	2734	Porsche	Boxster S ('07)	TTC**	2965
Porsche	924S ('88)	TTE	2734	Porsche	Carrera GT	SUR	3043
Porsche	924 Turbo	TTE*	2601	Porsche	Cayenne S ('03-'06)(AWD)	TTF*	4950

Make	Model	Class	Weight	Make	Model	Class	Weight
Porsche	Cayenne Turbo ('08)(AWD)	TTC	5191	Suzuki	Swift ('94-'01)	TTG*	1930
Porsche	Cayman 2.7L ('07-'08)	TTD**	2866	Suzuki	Swift 1.3L GT ('89-'94)	TTF*	1900
Porsche	Cayman S 3.4L ('06-'08)	TTB	3075	Toyota	Camry 2.4L ('02-'06)	TTG*	3086
Renault	Alliance 1.4L (60hp)	TTG	2030	Toyota	Camry 2.4L ('07-'08)	TTG	3263
Renault	Alliance 1.7L (85hp)	TTG*	2030	Toyota	Camry 3.0L (V6)('97-'01)	TTF	3240
Renault	Alliance 2.0L GTA (95hp)	TUR**	2161	Toyota	Camry 3.0L (V6)('03-'05)	TTF*	3296
Rosion	Q1	SUR		Toyota	Camry 3.3L (V6)('04-'05)	TTF*	3351
Saab	900 Turbo SPG ('85-'89)	TTF**	2875	Toyota	Camry 3.3L (V6)('06)	TTF	3450
Saab	900 Turbo SPG ('90-'91)	TTF**	2900	Toyota	Camry 3.5L (V6)('07-'08)	TTE*	3461
Saab	9000 Aero 2.3L Turbo ('93-'97)	TTE	3265	Toyota	Celica AllTrac ('88-'89)	TTE	3270
Saab	9-2X Aero ('05)(AWD)	TTD	3179	Toyota	Celica AllTrac ('90-'93)	TTE	3272
Saab	9-2X Aero ('06)(AWD)	TTD*	3208	Toyota	Celica GT ('00-'05)	TTF**	2425
Saab	9-3 Aero 2.0T & 2.0T ('04-'07)	TTF**	3175	Toyota	Celica GT ('77-'82)	TTG**	2460
Saab	9-3 Aero 2.8L ('06-'07)	TTE**	3285	Toyota	Celica GT ('83-'86)	TTG*	2500
Saab	9-3 Viggen ('99-'02)	TTE*	3170	Toyota	Celica GT ('87-'89)	TTG**	2455
Saab	9-5 2.3T	TTE*	3470	Toyota	Celica GT ('90-'99)	TTF	2600
Saab	9-5 Aero 2.3T & 2.3T ('02-'06)	TTE	3470	Toyota	Celica GT-S ('00-'05)	TTE*	2500
Saab	99 EMS ('72-'76)(2.0L)	TTG*	2560	Toyota	Celica GT-S ('83-'85)	TTG	2566
Saturn	Ion ('03-'04)	TTF	2653	Toyota	Celica GT-S ('86-'93)	TTF	2679
Saturn	Ion ('05-'07)	TTG**	2766	Toyota	Celica Supra (1st gen)	TTF**	2789
Saturn	Ion Redline ('04-'07)	TTE*	2945	Toyota	Corolla 1.8L ('03-'07)	TTF	2530
Saturn	Sky ('07-'08)	TTF**	2933	Toyota	Corolla FX-16 GT-S	TTF	2390
Saturn	Sky Redline ('07-'08)	TTC	2990	Toyota	Corolla GT-S 1.6L 16v ('84-'87)	TTF**	2200
Saturn	S-Series (DOHC) ('91-'02)	TTF	2437	Toyota	Corolla GT-S 1.6L 16v ('88-'89)	TTF	2390
Saturn	S-Series (SOHC) ('91-'02)	TTG*	2345	Toyota	Corolla SR5 ('79-'83)(3TC)	TTG	2185
Scion	tC ('05-'08)	TTF	2905	Toyota	Corolla XRS	TTF**	2670
Scion	xA ('04-'06)	TTG*	2340	Toyota	Echo	TTF**	2035
Scion	xB ('04-'06)	TTG	2415	Toyota	Matrix ('03-'07)	TTG*	2673
Subaru	Forester XT ('04-'05) (AWD)	TTF**	3225	Toyota	Matrix XRS (180 hp)('03-'04)	TTF*	2800
Subaru	Forester XT ('06-'07) (AWD)	TTE	3270	Toyota	Matrix XRS ('05-'06)	TTF	2800
Subaru	Impreza 1.8L (AWD)	TTG**	2605	Toyota	MR Spyder	TTE*	2195
Subaru	Impreza 1.8L (FWD)	TTG**	2325	Toyota	MR2 (1st Gen NA)	TTF*	2380
Subaru	Impreza 2.2L (AWD)	TTF**	2730	Toyota	MR2 2.2L DOHC	TTF*	2657
Subaru	Impreza 2.5L ('98-'01)(AWD)	TTE	2840	Toyota	MR2 SC	TTF**	2605
Subaru	Impreza 2.5L ('02-'05)(AWD)	TTF**	2972	Toyota	MR2 Turbo	TTE**	2825
Subaru	Impreza 2.5L ('06-'08)(AWD)	TTE	3016	Toyota	Paseo	TTG**	2025
Subaru	Legacy 2.2L ('90-'94)(AWD)	TTF	2830	Toyota	Prius	TTH	2932
Subaru	Legacy 2.2L ('95-'99)(AWD)	TTF*	2885	Toyota	Solara 3.3L ('04-'06)	TTF*	3419
Subaru	Legacy 2.2L T AWD ('91-'94)	TTF*	3100	Toyota	Solara 3.3L ('07-'08)	TTF	3440
Subaru	Legacy 2.5L ('00-'08)(AWD)	TTF**	3200	Toyota	Supra NA ('88-'92)	TTF**	3430
Subaru	Legacy GT ('05-'08)(AWD)(Turb)	TTD*	3300	Toyota	Supra NA ('94-'98)	TTE*	3265
Subaru	Legacy 3.0 AWD ('08)	TTE	3545	Toyota	Supra T	TTE	3534
Subaru	Outback 3.0 ('01-'04)(AWD)	TTF*	3630	Toyota	Supra TT	TTC**	3450
Subaru	Outback 3.0 ('05-'07)(AWD)	TTE	3610	Toyota	Tercel ('88-'90) (78hp)	TTG	2020
Subaru	Outback XT ('05-'06)(AWD)	TTE*	3415	Toyota	Yaris ('07)	TTG**	2293
Subaru	Outback XT ('07)(AWD)	TTE	3535	Triumph	GT6 MK I	TTF**	1905
Subaru	SVX (AWD)	TTE	3375	Triumph	GT6 MK III	TTE	1904
Subaru	WRX 2.0L ('02-'05) (AWD)	TTD	3085	Triumph	Spitfire MK 2 (75hp, 1147cc)	TTF*	1564
Subaru	WRX 2.5L ('06-'08)(AWD)	TTD*	3140	Triumph	TR4 ('61-'64)	TTF*	2240
Subaru	WRX 2.5L ('09)(AWD)	TTC*	3175	Triumph	TR6 ('69-'76)(2.5L S6 US Carb)	TTF*	2360
Subaru	WRX STi ('04-'07)(AWD)	TTB	3260	Triumph	TR6 ('69-'76)(2.5L S6 Fuel Inj)	TTD	2360
Subaru	WRX STi ('08-'09)(AWD)	TTB**	3395	Volvo	242 GLT ('81-'85)(turbo)	TTF	3072
Subaru	XT	TTG*	2455	Volvo	850 2.4L n.a. ('93-'97)	TTF	3180
Subaru	XT6 (AWD)	TTF*	2885	Volvo	C30 T5 2.5L turbo ('08)	TTE**	2970
Sunbeam	Tiger	TTE*	2575	Volvo	C70 T5 2.3 T Coupe ('01-'02)	TTE*	3200

Make	Model	Class	Weight	Make	Model	Class	Weight
Volvo	C70 T5 2.3 T Conv. ('99-'04)	TTF**	3450	VW	GTI 1.8L 8v ('85-'92)	TTG*	2267
Volvo	C70 T5 ('06-'07)	TTF	3772	VW	GTI 1.8L DOHC	TTF*	2267
Volvo	P1800 ('61-'62)	TTF	2215	VW	GTI 1.8L turbo (150 hp)	TTF	2762
Volvo	S40 1.9 L ('00-'04)	TTF**	2767	VW	GTI 1.8L turbo (180hp)	TTF*	2934
Volvo	S40 2.4L ('04-'06)	TTF	3084	VW	GTI 2.0L 8v ('95-'98)	TTG*	2557
Volvo	S40 2.4L ('07)	TTG**	3234	VW	GTI 2.0L 8v ('99-'00)	TTH**	2765
Volvo	S40 T5 ('05)	TTE	3126	VW	GTI 2.0L DOHC (134 hp)	TTF*	2445
Volvo	S40 T5 ('06-'07)	TTF**	3278	VW	GTI 2.0L Turbo ('06-'08)(200hp)	TTF**	3100
Volvo	S40 T5 ('05-'07)(AWD)	TTE*	3447	VW	GTI 2.8L V6 (174hp)	TTF	3011
Volvo	S60 2.4L	TTF	3230	VW	GTI 2.8L V6 (200hp)	TTF**	3036
Volvo	S60 2.5L Turbo ('04-'06)(AWD)	TTE	3603	VW	GTI 337 (turbo)	TTF**	2857
Volvo	S60 2.5L Turbo ('07)(AWD)	TTF**	3651	VW	Jetta 1.6L	TTH**	2040
Volvo	S60 2.5L Turbo ('04-'06)(FWD)	TTF**	3393	VW	Jetta 1.8L DOHC	TTF*	2305
Volvo	S60 2.5L Turbo ('07)(FWD)	TTF*	3501	VW	Jetta 1.8L SOHC	TTG	2450
Volvo	S60 R ('04-'05)(AWD)	TTD*	3715	VW	Jetta 1.8L turbo GLI	TTF	3106
Volvo	S60 R ('06-'07)(AWD)	TTD*	3715	VW	Jetta 2.0L GLI DOHC	TTF*	2438
Volvo	S60 2.4L T5 ('05-'07)	TTE**	3393	VW	Jetta 2.0L SOHC	TTH	2934
Volvo	S60 2.3L T5 ('01-'04)	TTE*	3406	VW	Jetta 2.0L turbo ('06-'08)	TTF*	3259
VW	Beetle 1.8L T (150hp)('99-'05)	TTF	2820	VW	Jetta 2.5L I5 ('05-'07)	TTG	3230
VW	Beetle 1.9L TDI ('98-'03)	TTH**	2750	VW	Jetta 2.5L I5 ('08)	TTG**	3230
VW	Beetle 1.9L TDI ('04-'06)	TTH**	2850	VW	Jetta 2.8L VR6 12v ('94-'98)	TTF	2927
VW	Beetle 2.0L ('98-'05)	TTH**	2743	VW	Jetta 2.8L VR6 12v ('99-'02)	TTG**	3113
VW	Beetle 2.5L ('06-'08)	TTG**	2884	VW	Jetta 2.8L VR6 24v	TTF*	3179
VW	Beetle Turbo S ('02-'04)	TTF*	3005	VW	Passat 2.0L turbo ('06-'08)	TTF*	3305
VW	Corrado 1.8L DOHC, 2.0L DOHC	TTF**	2403	VW	Passat 2.8L	TTF*	3151
VW	Corrado 2.0L SOHC	TTG**	2418	VW	Passat 3.6L ('06-'08)	TTE*	3576
VW	Corrado G60 1.8L S/C	TTE*	2558	VW	Passat 3.6L ('06-'08)(AWD)	TTE*	3700
VW	Corrado VR6	TTF**	2733	VW	Passat W8 (AWD)	TTE	3918
VW	Golf 1.6L, 1.8L	TTG*	2120	VW	Rabbit 1.6L	TTH**	2000
VW	Golf 1.8L DOHC, 2.0L DOHC	TTF	2672	VW	Rabbit 1.6L Diesel (<'92)	TTH*	2270
VW	Golf 1.9L TDI ('99-'03)	TTH**	2750	VW	Rabbit 1.6L Turbo-Diesel (<'93)	TTH*	2300
VW	Golf 1.9L TDI ('04-'06)	TTH**	2850	VW	Rabbit 1.7L (74hp)	TTH**	2046
VW	Golf 2.0L, 1.4L & 1.6L DOHC	TTG*	2533	VW	Rabbit 2.5L ('06-'07)	TTG**	2975
VW	Golf 2.0L ('99-'06)	TTH**	2771	VW	Rabbit 2.5L ('08)	TTF	2975
VW	Golf 2.5L V5	TTF*	2732	VW	Rabbit GTI 1.8L (90hp)	TTG*	2120
VW	Golf 2.8L V6	TTF*	3102	VW	Scirocco 1.6L (75-78hp)	TTH**	2015
VW	Golf 2.8L VR6	TTE	2546	VW	Scirocco 1.7L (74hp)	TTH**	2040
VW	Golf R32 (AWD)('04)	TTD	3350	VW	Scirocco 1.8L DOHC	TTF*	2287
VW	Golf R32 (AWD)('08)	TTE*	3600	VW	Scirocco 1.8L SOHC	TTG*	2120

6.4 Up-Classing System

6.4.1 Modifications and Point Assessments:

If your car accrues 20 or more points you will be bumped up in Class. There is no limit - a car with a high level of modifications might move up several Classes.

20 thru 39 points - Up ONE Class

40 thru 59 points - Up TWO Classes

60 thru 79 points - Up THREE Classes

80 thru 99 points - Up FOUR Classes

100 thru 119 points - Up FIVE Classes

120 thru 139 points - Up SIX Classes

140 thru 159 points - Up SEVEN Classes

160 thru 179 points - Up EIGHT Classes

One (1) * on a base class assignment denotes a 7 point initial assessment, and two (2) ** denotes a 14 point initial assessment that is added to the total number of modification points to determine the final competition class.

FORCED INDUCTION VEHICLES will add an additional five (+5) points to the total number of modification points to determine the final competition class. (Forced induction vehicles that have been classed or re-classed based on Dyno testing are exempt from this additional five (+5) point assessment.)

TIRES:

- 1) DOT-approved R-compound tires with a UTQG treadwear rating of 40 or less (ex. BFG R1, Hankook Z214, Hoosier R6/A6, Kumho V710, etc.--note: G.A.C. & VRL Hoosiers OK) +10
- 2) DOT-approved R-compound tires with a UTQG treadwear rating of 50 to 130 (ex. Kumho V700, Michelin Pilot Sport Cup, Nitto NT01, Pirelli PZero Corsa, Toyo R888, Yokohama A048, etc.—note: see exception below in 3)) +7
- 3) Toyo RA-1 and Nitto NT555R11 +5
- 4) Non-DOT-approved racing slicks +30 (of any origin--re-caps and re-treads are not permitted)
- 5) The following tire sizes will be used as the base tire size for each **Base Class** for all vehicles regardless of their OEM tire size(s). All vehicles in a given base class may use this tire size (or smaller) without a points assessment:

TTA: 295 mm, TTB: 265mm, TTC: 255mm, TTD: 245mm, TTE: 235mm,
TTF: 215mm, TTG: 195mm, TTH: 175mm

Tire width points assessed or points credited are determined by the difference between the width of the **largest tire on the vehicle and the assigned base tire size as follows:**

Equal to or greater than: 10mm +1, 20mm +4, 30mm +7, 40mm +10, 50mm +13, 60mm +16, 70mm +19, 80mm +22, 90mm +25, 100mm +28, 110mm +31, 120mm +34, etc.

Equal to or less than: -10mm -1, -20mm -4, -30mm -7, -40mm -10, -50mm -13, -60mm -16, -70mm -19, -80mm -22, -90mm -25, -100mm -28, -110mm -31, 120mm -34, etc.

Tire width is determined by the number printed on the tire sidewall by the manufacturer. If a tire does not have a manufacturer's printed number on the sidewall, then actual tread width

measurement will be used. UTQG treadwear ratings are as of the date of the current version of the TT rules. Any new tire or tire with a changed UTQG treadwear rating must be evaluated by the National TT Director before the rating will be legal for use in NASA TT classing. All DOT-approved tires must be available for purchase by the general public through Federal or state licensed tire dealers.

WEIGHT REDUCTION:

Weight reduction points are based on the actual vehicle minimum competition weight (with driver). Removal and lightening of non-essential parts is permitted unless stated otherwise in these rules. Modification of the OEM frame, sub-frame, and floor pan are not permitted (see 6.3.2). Removal or lightening of engine parts is permitted only as listed elsewhere in these rules:

If the base weight used for base classing purposes (above in 6.3.2) minus minimum competition weight (with driver*) is greater than: 5 lbs +1, 20 lbs +2, 35 lbs +3, 50 lbs +4, 65 lbs +5, 80 lbs +6, 95 lbs +7, 110 lbs +8, 125 lbs +9, 140 lbs +10, 155 lbs +11, 170 lbs +12, 185 lbs +13, 200 lbs +14, 215 lbs +15, 230 lbs +16, 245 lbs +17, 260 lbs +18, 275 lbs +19, 290 lbs +20, 305 lbs +21, 320 lbs +22, 335 lbs +23, 350 lbs +24, 365 lbs +25, 380 lbs +26, 395 lbs +27, 410 lbs +28, 425 lbs +29, 440 lbs +30, 455 lbs +31, 460 lbs +32, 475 lbs +33, 490 lbs +34, 505 lbs +35, etc...

*Minimum competition weight is the vehicle's lightest weight with the driver and safety gear, during any competition session. Any driver/team who's vehicle at impound does not meet the minimum weight that they have declared on their car classification sheet **will** be disqualified and **may** lose all accrued points for the season if the number of modification points based on the lighter actual weight puts the car in a higher competition class.

ENGINE/DRIVETRAIN:

- 1) Engine swap: All engine swaps must be evaluated for new base classification by the National TT Director on an individual basis, unless a base class for the particular swap is listed above in 6.3 Base Classifications or in Appendix A. The following factors will be taken into account in classing the car: wt./hp ratio, total weight, high torque in the usable rpm range, body style, engine location, drivetrain type, advanced technology/engineering in OEM suspension, brakes, drivetrain, and aerodynamics, and dry sumps (if engine is lowered). Competitors should submit all of the above data to the National TT Director with the request for re-classification of the vehicle. Many engine swaps will require chassis dynamometer testing of the competition-ready vehicle and submittal of the minimum competition weight chosen by the competitor. (see section 6.4.2)
- 2) Increased number of camshafts or non-OEM (non-stock) head(s)/hybrids: engine swap rules with Dyno testing apply—must be evaluated by the National TT Director for re-classification. (see section 6.4.2 Dyno Testing Procedures)
- 3) Non-OEM turbo or supercharger, or upgraded or modified turbo/supercharger: engine swap rules apply—all OEM naturally aspirated vehicles that have been upgraded to forced induction and forced induction vehicles with an upgraded or modified turbo or supercharger must be evaluated by the National TT Director on an individual basis for new base classification based on chassis dynamometer testing and minimum competition weight as in 1) above and in Section 6.4.2 Dyno Testing Procedures. After re-classification, modification points will not be assessed for weight reduction or engine. However, if the power output of the vehicle is later increased, the participant will have to get the vehicle re-classified again.

- 4) Increased displacement by: <1.5% +0, 1.5% to <5.5% +4, 5.5% to <7% +6, 7% to <10% +8, 10% to <15% + 10, 15% to <20% +15, > 20% +20.
Formula to calculate % = current disp. divided by OEM disp., minus 1, x 100 = %
Example: 407ci/351ci =1.16, minus 1= .16, x 100 = 16% (+15 pts)
Example: 1852cc/1799cc = 1.029 minus 1 = .029 x 100 = 2.9% (+4 pts)
- 5) Modified or non-OEM camshaft(s) or cam timing gears +6 (for one or more)
- 6) Valve size change, modified, ported or polished OEM head (other than simple shaving of the head only) +6
- 7) Any modifications that result in increased engine compression ratio (including shaving the head or decking the block to factory specs):
0.50 or less +0, >0.50 +3, >1.0 +6, >2.0 +10, >3.0 +15
- 8) De-stroked engine +4
- 9) Replacement pulleys (other than for supercharger) +1
- 10) Port modification for rotary engine: **Dyno testing rules apply—must be evaluated by the National TT Director for re-classification. (see section 6.4.2 Dyno Testing Procedures)**
- 11) Added dry sump oil system +7 (+14 if motor is lowered from OEM location)
- 12) Aftermarket computer system (any non-OEM “stand-alone” or “piggyback”):
+3 naturally aspirated, **+10** forced induction
- 13) Modification of the OEM air intake/box, air filter location, air piping to the turbo/supercharger/intercooler/throttle body/carburetor, or hood/fascia/fender air inlet(s) +1 (air filter upgrade alone—0 pts.)
- 14) Replacement pulley for OEM supercharger +4
- 15) Aftermarket boost controller or modification/alteration of OEM vacuum lines that serve to function as a boost controller +4
- 16) Aftermarket or modified wastegate actuator, wastegate, or vacuum line(s) that serve to control the wastegate actuator function or increase peak boost +3
- 17) Add aftermarket intercooler +7
- 18) Non-OEM or modified intercooler +4
- 19) Non-OEM or modified/ported throttle body +2; **independent throttle bodies +4**
- 20) Non-OEM, modified/ported, **or deleted** intake manifold: 4 cyl. +1, 6cyl. +2, 8 cyl. +3, 12A &13B rotary +2, all other rotary +3
- 21) Non-OEM or modified carburetor, fuel rail, fuel injectors, fuel pump, and/or fuel pressure regulator +2 (no points for fuel pump alone if using OEM fuel and timing maps, sensor inputs and ignition timing)
- 22) Water injection system +6 (An alcohol-water mixture is permitted, but the driver must notify Race Control and Safety that it is being used.)
- 23) Nitrous oxide injection is illegal.
- 24) Modification or porting of the exhaust manifold +2
- 25) Aftermarket or modified header +2
- 26) Non-OEM or modified exhaust system downstream from the header, exhaust manifold, or turbo. (does not include catalytic converter removal/upgrade) +2
(Note: Replacement of a failing OEM exhaust system may be permitted without a points **assessment if the OEM definition in 6.5 OEM Definition is strictly adhered to.**)
- 27) Non-OEM or modified exhaust piping, resonators, or mufflers downstream from the OEM catalytic converter(s) locations(s) +1 (for basic “catback” exhaust or performance mufflers only—otherwise, must use **26**) +2 if the vehicle has an aftermarket, modified, or deleted header/secondary/downpipe/pre-cat section/catalytic converter)
- 28) Removal, upgrade, or modification of catalytic converter(s). +1

- 29) Non-OEM sequential (semi-automatic) or dog-ring (non-synchromesh) transmission (includes altered gear ratios) +7
- 30) Upgrade number of forward gears in transmission or altered gear ratios +3
- 31) Added paddle/electronic shift +3
- 32) Added limited slip differential or welded/locked differential +3
- 33) Changed or modified limited slip differential (or welded/locked OEM LSD) +1
- 34) Added traction control +3 (no points if proven disabled during competition)
- 35) Relocation of engine/transmission between 1 and 10 inches of the OEM location +7
(note: Relocation of less than 1 inch is not assessed points, and more than 10 inches is not permitted without the approval of the National TT Director.)
- 36) Modification/upgrade from a fixed to a floating rear axle +3

SUSPENSION/BRAKES/CHASSIS:

- 1) Non-OEM shocks/struts/dampers with an external reservoir or more than two ranges of adjustment—must still take points for springs below +10 (example: compression (bump) and both high & low rebound adjustments).
- 2) Non-OEM shocks/struts/dampers with a retail price of greater than \$600 (\$2400 total) or \$750 each if sold only as a coilover with spring included (\$3000 total). Also “Piggyback” external reservoir shocks/coilovers/dampers with a retail price of less than \$1050 per unit (\$4200 total)—must still take additional points for the springs below +7
- 3) Non-OEM or modified/re-valved shocks/struts/dampers +3 (all others)(springs not included)
- 4) Non-OEM or modified coil springs, leaf springs/spacers/brackets, or torsion bars +2
- 5) Conversion of torsion bar/leaf spring suspension to coil spring and strut/shock suspension +2
- 6) Add, replace, remove, or modify anti-roll bars (“sway” bars—front, rear, or both—may have spherical joints on the end links without additional points assessment) +2
- 7) Replace or modify control arms (other than plates, shims, slots, or eccentric bolts/bushings for simple camber/caster adjustment only)(may have spherical/metallic joint(s) for the connection to the spindle/knuckle) +4
- 8) Relocation of front suspension mounting points +6
- 9) Relocation of rear suspension mounting points +6
- 10) Changing the mounting orientation/design of the OEM shock and/or spring perch to invert them +1
- 11) Using the alternate control arm mounting location on cars equipped OEM with multiple choices (example: to increase track width) +6
- 12) Changing the orientation or design of an OEM mounting point or pick-up point of a control arm for a panhard bar or trailing arms +1
- 13) Replaced or modified K-members that change the location of the lower control arms +8
- 14) Tubular K(cross)-members that do not change the location of the lower control arms +2
- 15) Bump steer kits or shimming of the steering rack +2
- 16) Alteration of ball joints/dive angles +2
- 17) Add panhard rod or Watt’s link (regardless of whether the Watt’s link replaces an OEM panhard rod or not) +4
- 18) Replace or modify an OEM panhard rod or Watt’s link +2
- 19) Add torque arm +4
- 20) Replace or modify an OEM torque arm

- 21) Increase in track width greater than 3 inches due to non-OEM axles, control arms, brake rotors/hats, wheel spacers, hubs, wheel offset, and/or camber adjustment +6 (measured from the inside of one tire to the outside of the opposite tire at ground level—averaging the measurements in front of and behind the contact patch to negate the effect of toe)
- 22) Non-OEM rear trailing arms (for stiffness only, no change in suspension mount or pick-up points from stock) +1
- 23) Non-OEM rear control arms on FWD vehicles (for stiffness and wheel alignment only, no change in suspension mount or pick-up points from stock) +1
- 24) Non-OEM brake calipers +2
- 25) Metallic replacement suspension bushings (Heim joints/spherical joints) +3 (except for pillow ball camber plate joints, sway bar end links already assessed points in 6) above, and control arm spindle/knuckle joints already assessed points in 7) above)
- 26) Add front lower stress/arm brace (two attachment points maximum) +1
- 27) Add a third attachment point to front or rear strut tower bar (or replace existing 3 point) +1
- 28) Add or modify other chassis stiffening devices or fabricated parts (such as lower strut braces or lower arm braces (with greater than two attachment points), subframe connectors, subframe braces, subframe mounts/bushings, etc) +3
- 29) Non-OEM driver/cockpit adjustable sway bar or suspension settings +4

AERODYNAMICS:

- 1) Add, replace, or modify front fascia or air dam +3 (except as provided for in 13), 25), 57) of the No-Points Modification list) (note: Additional points must be assessed below for any component of the added/replaced/modified fascia or air dam that performs the functions listed in 2) and 4) below)
- 2) Add, replace or modify a single front splitter/spoiler/wing/foil +3 (note: This part may extend horizontally past the side of the vehicle no greater than five inches. If any portion of this part that protrudes from the side of vehicle is not parallel to the ground, then additional points must be assessed for canards in 4) below.) (note: No material or part may extend the vertical reach of the OEM front fascia without taking fascia modification points above.)
- 3) Add, replace, or modify rear wing or spoiler +4 (a rear wing or spoiler may not exceed a height of eight (8) inches above the roofline (or OEM windshield height for convertibles), or a width greater than the width of the car body.
- 4) Add or modify canards/winglets (includes portions of an added/modified/replaced fascia that provide a downward force other than that listed in 2) above) +2
- 5) Add or fabricate flat bottom/belly tray (rearward of the centerline of the front axle) +5
- 6) Add rear diffuser (note: additional points must be assessed for any vertical panels incorporated into a rear diffuser that are greater than five inches in height) +2
- 7) Replace or modify OEM rear diffuser, rear bumper cover, or rear “fascia” (note: additional points must be assessed for any vertical panels incorporated into a rear diffuser that are greater than five inches in height) +1
- 8) Add rear vertical panels in any location (note: see 6) and 7) and 10)) +2
- 9) Add or modify side skirts +2
- 10) Add vortex generator to roof, rear window, or rear deck lid (note: additional points must be assessed for any vertical panels incorporated into a rear diffuser that are greater than five inches in height) +1
- 11) Removal of the front windshield/windshield frame +7
- 12) Front side window frame air dams/diverters (driver and/or passenger side) +2

ROLL BARS/CAGES:

4- point roll bar and 6 or 8-point roll cage designs constructed per the NASA CCR may be utilized without a TT modification point assessment. Additional bars and/or attachment points within the driver's compartment that exceed the allowances in the CCR are also permitted. The following roll cage designs are permitted but will be assessed points as follows:

- 1) One or more bars that penetrate the front bulkhead/firewall +2
- 2) One or more bars that are welded to the chassis (directly or with a plate) anywhere farther than 6" from the end of a tube where it terminates at a plate +2

NO-POINTS MODIFICATIONS:

- 1) Rolled fender lips
- 2) Flared fenders
- 3) Sun/moonroof removal and cover roof hole.
- 4) Battery replacement/lightweight battery/dry cell
- 5) Air bag removal (must be removed or disabled for Performance Touring)
- 6) Jack and spare tire removal (required if not bolted down securely—must remove for PT)
- 7) Floor mat removal (required)
- 8) Wheels, wheel studs, wheel bearings replacement/upgrade, **hub modification/replacement**
- 9) Final drive ratio modification
- 10) Simple camber, caster, and toe adjustment by any method that does not alter suspension mounting points (unless the modification used is otherwise assessed points above). Bolt on camber/**caster** plates are not assessed points.
- 11) Ride height adjustment (must still take points for springs and torsion bars above)
- 12) Air filter upgrade (**without modification of the air filter housing or air intake system**)
- 13) Radiator upgrade/shrouding/fascia modification (**drilled or cut holes/slots**) that only provides increased airflow to the radiator or oil/transmission coolers (without aerodynamic or engine air intake improvement)
- 14) Starter motor replacement
- 15) Alternator replacement (must be able to sustain vehicle operation without a battery)
- 16) Oil systems and coolers other than added dry sump
- 17) Motor mounts and inserts replacement/upgrade or modification (with up to 1 inch of relocation of the motor/transmission)
- 18) Engine rebuild with head shave, block decking and 0.020" overbore—provided that compression ratio is not increased by more than 0.5 and displacement is not increased by greater than 1.49%. Forged pistons and internals are legal; however, points must be assessed for de-stroking, and/or increased displacement and compression ratio if greater than the limits listed above. (Note: 0.020" overbore with OEM rods and overbore pistons will yield an increase in displacement of approximately 1.1% for most engines.)
- 19) Engine balancing and blueprinting
- 20) Spark plug wires, plugs, coil, ignition replacement/upgrade
- 21) Turbo blow-off valve upgrade, modification, or addition
- 22) Removal of the engine balance shaft and/or balance shaft drive mechanism
- 23) Lightweight flywheel and/or clutch assembly
- 24) Fuel: Any grade of commercially available unmodified gasoline or diesel--all octane levels of retail available race gas are permitted. No "home brewed" methanol/ethanol/alcohol mixtures are permitted. Methanol injection systems are illegal. Fuel additives are prohibited. **Retail available E-85 is permitted.**

- 25) Brake duct addition or modification, including electric fans (water sprayers are illegal).
Two holes may be cut or drilled out of the front fascia for brake air ducts. Any hole providing improved intake air to the engine will be assessed one (1) point under Engine 13).
- 26) Non OEM brake pads and rotors
- 27) Brake lines, brake boosters, and master cylinder modification or replacement.
- 28) Emergency brake removal
- 29) Non-metallic replacement suspension bushings
- 30) Steering wheel replacement
- 31) Mirror addition or replacement
- 32) Gear shifters and shift knob replacement/upgrade
- 33) Seat harnesses (must be compliant with NASA CCR)
- 34) Maximum of two hundred and fifty (250) lbs. of added ballast—All ballast must be of solid material (no fluids or shot pellets) and safely secured in any location on the vehicle approved by NASA safety technical inspectors. The preferred method is to use at least one (1) 3/8-inch grade-5 bolt, two (2) “fender” washers and a locking nut system for every fifteen (15) pounds of weight.
- 35) Data acquisition systems—telemetry is not permitted (NASA CCR section 18.7)
- 36) Non-OEM driver’s seat
- 37) Non-OEM front passenger seat
- 38) Relocated Battery
- 39) Undertray/ belly pan forward of the centerline of the front axle
- 40) No aero points for adding a hardtop to a convertible or removal of convertible soft top/frame
- 41) Seam welding of the body/chassis
- 42) Shock tower reinforcement plate (to strengthen tower shock mount location only--no bars)
- 43) Shock mount replacement/modification (only if already taking points for both shocks and springs)(may raise or lower mount location up to two (2) inches if no horizontal movement.)
- 44) Accelerator, brake, and clutch pedal modification or replacement.
- 45) Drive by wire to cable throttle conversion (throttle body must remain identical to OEM in both size and shape to avoid a +2 throttle body assessment).
- 46) Add front strut tower bar (two attachment points—bolted in or as component of the cage)
- 47) Add rear strut tower bar (two attachment points—bolted in or as a component of the cage)
- 48) Lexan windshield, rear window, and rear passenger side windows (windshield must be 3/16” minimum thickness). (See section 10 Safety regarding front side windows)
- 49) OEM ECU/PCM reprogramming or chip (must use OEM ECU/PCM box/housing/hardware)
- 50) Programmable fuel systems without control of engine timing (such as SAFC, VAFC)
- 51) Non- OEM sensors or alteration of sensor inputs (such as non-programmable MAF or MAP voltage “clamps”)
- 52) Steering rack replacement or modification without geometry change (ratio changes)
- 53) Non-OEM valve springs and retainers
- 54) Ignition timing adjustments
- 55) NACA ducts, air ducts, or air hoses placed in a side window frame solely for purposes of driver cooling.
- 56) Front wing window removal and replacement with Lexan
- 57) Headlamps, headlight covers, and fog lights may all be removed, and the holes may be covered with material that replicates the shape of the OEM light/cover, leaving the shape of the OEM fascia intact. Uncovered holes may be used for brake ducts. Any hole providing improved intake air to the engine will be assessed one (1) point under Engine 13).

**For NASA racecars/guest classes that are given a base classification in 6.3.1, these modifications must also be legal under the racecar's class rules. The race class rules take precedence over this list.

Note: Many of the modifications listed above can/will alter the overall weight of the vehicle. While these modifications are not assessed points individually, and additional weight reduction methods are permitted without individual points assessment (as stated under Weight Reduction), the overall weight of the vehicle and driver (minimum competition weight) will be used to assess points and/or penalties for all vehicles.

6.4.2 Dyno Testing Procedures—TTS/TTU, Motor Swaps, Forced Induction, Hybrids

The following rules apply to:

Cars competing in TTS and TTU

Cars that have an added, modified, or upgraded turbocharger or supercharger

Cars that have a non-OEM head(s) or increased number of camshafts (hybrid engines)

Engine swap vehicles that have been designated as requiring dynamometer testing by the National TT Director.

Cars with Rotary Engines that have been ported.

Other vehicles that have been designated by the National TT Director to be classed based on dynamometer testing.

(The Dyno testing procedures also apply whenever dynamometer testing is used as a non-invasive tool to help determine technical compliance with the classification rules for any car.)

The owner/driver must submit the maximum dynamometer horsepower and torque numbers, and the minimum competition weight of the vehicle (with driver) to the National TT Director prior to the car's first competition in order to be assigned a new A-H base class (for those cars requiring re-classification). Any competitor wishing to drive without a certified Dyno report will compete in the TTR class. All competitors will be required to include the latest certified Dyno report and minimum weight in their vehicle logbook at all times. Any subsequent modifications or adjustments done to the car that could alter power output will require repeat Dyno testing, and a new certified Dyno report. NASA Officials may request repeat Dyno testing at any other time. A certified Dyno report consists of three separate, reproducible Dyno tests with SAE correction. The highest peak horsepower number of the three tests will be used as the official certified horsepower for weight to horsepower calculations. A smoothing factor up to five (5) is permitted. The owner/driver may elect to submit a higher horsepower number for the purposes of reassigning a base class to ensure that any Dyno testing done at another location or at the track by the TT Officials will show hp ratings equal to or less than those provided by the owner/driver. Dynamometer tests must be conducted on a Dynojet Model 248 or 224 for front and rear wheel drive vehicles, and on a Dynojet, Mustang, Dyno Dynamics, or Dynapack for AWD cars, in a commercial facility that offers dynamometer testing as part of their business and is open to the public. Each Regional TT Director may retain the option to specify which business locations will be the approved centers for that particular region. Please check with the TT Director in your area for instructions. All sites approved by the NASA American Iron series are approved for TT.

Certified Dyno reports are potentially valid for up to a maximum of three years (provided that no changes have been made to the vehicle that would alter Dyno readings). However, at his

discretion, a NASA TT Director may require an updated certified Dyno report (at the driver's/owner's expense) after one year from the date of the previous report.

Dynamometer tests are official and certified when performed by series Officials. It is the responsibility of the competitor to be within power levels on any Dyno that NASA officials choose to use for testing. The Dynojet will be the preferred Dyno for all vehicles, and will be used exclusively when available.

As AWD Dyno availability is limited, NASA Officials may use any of the four AWD Dynos listed above. AWD drivers need to be especially careful that their cars will be compliant on any official Dyno that is available.

Vehicles may not have any adjustments during the competition day to systems that allow adjustment of horsepower levels that would serve to alter Dyno readings. Examples of such systems are driver-adjustable electronic tuning and engine timing advance devices, fuel pump output modification devices, boost controllers, adjustable MAP and MAF voltage clamps, and any other system that could alter the Dyno readings when measured for compliance purposes. Any restriction device placed in the air intake system must be clearly identified as such and marked to indicate its dimensions.

For compliance testing, the dynamometer operator and the Time Trial Director or NASA Official will determine the dynamometer testing procedures and how many test runs will be performed for any given car being tested in order to obtain accurate test data. Prior to the dynamometer inspection the competitor may top off any fluids needed to ensure the engine and drivetrain are not damaged during testing. The fluids must be added with a NASA Official present. No other modifications or adjustments may be made to the car. To ensure fairness, a NASA Official, or an individual appointed by a NASA Official, will operate any cars being inspected on the dynamometer. SAE correction with a smoothing factor of five (5) will be used. Any run that results in an erratic or non-reproducible result may be dismissed by Time Trial officials.

Penalties---If a car is tested by Officials, and found to have a higher hp rating than was submitted for base classification purposes on the Car Classification Form, the following formula will be used to determine possible penalty assessment for cars in classes TTF to TTA. One (1) "penalty" point will be assessed for any deviation above the submitted peak hp number. Then, one (1) additional penalty point will be assessed for every two (2) horsepower above the submitted number. The total number of penalty points will be added to the car's current number of modification points to determine if the car has illegally competed in a class that is too low. If a vehicle that has been reclassified based on its actual competition weight and Dyno power output is found to weigh less than the minimum weight listed on its Car Classification Form, it will be assessed two (2) penalty points for any deviation below the listed weight, followed by one (1) additional penalty point for each 10 pounds below the listed minimum competition weight. Following the NASA CCR 17.8, there will be a five (5.0) pound leeway allowed during the first time the vehicle is weighed for that event (weekend). There will be no leeway at subsequent weighings for the remainder of the event. Appropriate penalties will then be assessed per the TT rules (Section 11).

For cars competing in either the TTS or TTU classes, a newly calculated "adjusted" weight/hp ratio based on Dyno testing and weighing will determine if a car has competed illegally. Appropriate penalties will then be assessed per the TT rules (Section 11).

6.5 OEM Definition, Updating and Backdating Rules

For the purposes of NASA TT points assessments, the term OEM will be defined as follows: Any part that is identical in size, shape, and functional characteristics compared to the part that originally came on the vehicle, from the manufacturer, as a standard feature of the base model as it is listed in section 6.3.2 Base Classifications (factory options and specialty model parts are considered non-OEM) or is listed as a standard replacement part by the OEM manufacturer. Some parts that are produced by aftermarket manufacturers as generic replacement parts may not require a points assessment provided that: they are the same size and shape, and have the same functional characteristics as the OEM part, and that they provide no significant improvement in performance, longevity, or reliability. If it is determined in impound that such a part does not meet the above description, the driver may be disqualified. Consultation with the Regional TT Director prior to competition is advised for any driver using a vehicle with replacement parts that fall under this exception.

All factory optional parts, upgrades, and vehicle specifications must be assessed points, unless they legally fall under the update/backdate rule or are on the list of No-Points Modifications. **Base classifications are for the standard base model (base trim package) of a vehicle, without factory options or upgrades,** unless there is a specific TT base classification listing in 6.3.2 for a non-base trim model.

Updating and backdating of parts between different model years of the same vehicle model is legal provided that the competing vehicle is in the same or higher base class than the donor vehicle, and that the entire assembly is replaced. No interchange of parts between assemblies is permitted in order to create a new assembly. Updating or backdating (without a point's assessment) with specialty models or between two cars that have model names with different numbers or letters in them is prohibited, unless specifically approved by the National TT Director. The purpose of this rule is to equalize similar cars in the same (or lower) class, not to allow the creation of vehicles that were never manufactured or homologated. Motors and engine parts cannot be swapped under the update/backdate rule without the approval of the National TT Director. Any update or backdate involving parts that could provide a total weight reduction of greater than 15 pounds needs to be evaluated by the National TT Director for possible weight reduction points assessment.

6.6 Special Circumstances

In the event that a "large part swap" has occurred between the competing vehicle and a donor vehicle of the same model type in a higher base class, and the swap has resulted in a very large points assessment that would place the competing vehicle at a higher classification level than the donor vehicle, the competing vehicle may jump base classifications up to the donor car's base class, and not take the points' assessment for any parts identical to the donor car. However, if there are any parts on the competing vehicle that are not on the donor car that could be considered a performance advantage, and they do not meet the requirements of the updating/backdating rule, then those parts must either be assessed points or replaced with the part from the donor vehicle. Additionally, the National TT Director must individually evaluate this type of base class jump for any other potential differences (besides parts) between the two cars, such as horsepower, weight, suspension, and aerodynamics to ensure that no additional points' assessments are necessary.

In the event that a specialty or upgraded version of a vehicle, that is individually listed in 6.3.2 Base Classifications, has had so many of its “specialty” parts replaced or modified that a points assessment results in a situation where a hypothetical lower base classed “standard” model can be upgraded to be identical to it, but end up in a lower competition class, the specialty or upgraded version vehicle may be granted a waiver to “jump down” to the standard model’s base class. Then, it must be assessed points for all of its features that differ from the standard model. This will also require a specific evaluation and approval by the National TT Director. For example, a ’96 Mustang Cobra has a TTC base class. The owner replaces every part on the car that distinguishes it from the Mustang GT, except for the wing and sway bars (valued at +5 total). After adding up all of the modification points, the car is now in TTA for competition. However, a theoretical ’96 Mustang GT (TTE*) has the exact same modifications as our ’96 Cobra, making the two vehicles identical except for the wing and swaybars, but it ends up in TTB with 8 points to spare before it would jump up to TTA. To ensure fairness for the Cobra owner (who was essentially getting assessed twice for many of its specialty parts), we allow the Cobra to jump down to the GT’s base class, and after adding up all of its modification points, it ends up in TTB with 3 points to spare before it would jump up to TTA—i.e. parity between the two cars.

7 Timing & Scoring

7.1 TT Classification Forms

In order to accrue points or compete, NASA TT competitors must submit a completed NASA TT Classification Form (and certified Dyno report if re-classed under 6.4.2) to the Regional TT Director prior to having lap times count toward competition. This document will serve as a vehicle modification log for that competitor/vehicle for the season. If any changes are made to the vehicle the competitor must submit a new form (or amend the previous form), whether or not it will affect the vehicle’s classification, in order for the Regional TT Director to have a current list of the vehicle’s modifications. NASA TT Classification Forms are available online on the National TT website at <http://nasa-tt.com/Rules> or <http://www.nasaproring.com> at the “Rules” download page. A driver attending a multi-region “crossover” event will need to submit a copy of his/her TT Classification form to the hosting region’s TT Director for his/her records. Likewise, any driver choosing to compete in more than one region will need to submit a TT Classification form to each Regional TT Director. Competitors choosing to drive in the TTS, TTU, or TTR classes need to fill out a NASA TTS/TTU/TTR Classification Form (also available for download at the two sites listed above). However, they do not have to list their modifications. TTS and TTU drivers need to submit updated Dyno sheets and amend their “adjusted” wt/hp ratio on the Car Classification Form if modifications have been done to the car that increase power levels. TTR cars do not need to submit a new form mid-season if they make changes to the vehicle, unless they are changing classes.

7.2 Timing Format

NASA TT competitors will be scored on a basis of their fastest lap time for an event. An “event” is hereby defined as a single day of competition for regional events. Therefore, a NASA weekend would generally count as two separate events. NASA TT competitors will be timed continuously in each designated TT run session that they participate in (which could be a combined HPDE 4/TT run session or a TT only run session). The sessions are typically between

20 and 30 minutes long. The fastest lap time from all of the sessions will be used as the basis for his/her score for the event. Generally, the first run session of the day will not count for TT competition, and will function as a warm-up practice session at the discretion of the region's TT administration. The TT Director will announce at the driver's meeting held before the first session of the day whether the first session will be counted for competition or not. When the event schedule and situation permits, the last TT run session of the event day will be a TT only run group with a pre-grid based on fastest times during the previous sessions (also known as a "TT Shootout"). As often as possible, all TT competition run sessions will be pre-gridded based on previous lap times to help increase the number of "open track" laps for all competitors.

All competing vehicles must be equipped with an AMB TranX260 transponder in order to obtain lap times. Many NASA regions offer weekend rentals of these transponders for those drivers that do not own one. It is also legal for a vehicle to be equipped with an AMB Display IT lap time display, but it is not required. It is the responsibility of the driver to check the posted TT results after each session to ensure that the correct name, car number, and TT class is listed. Failure to notify the TT Director and Timing and Scoring officials of errors prior to the next session may result in disqualification of the previous and subsequent session's lap times. Teams must be especially careful to notify T&S of their team status/name at the beginning of the weekend, as most of the on-line registrations are input by an individual member or owner of a team, and that individual's name is often transferred automatically to the T&S computer before the event, instead of the team name.

7.3 Regional Championships

NASA TT competitors will accrue points only in their declared NASA TT class and only within the region sanctioning the NASA TT event they are competing in. Certain multi-region events will be designated as "crossover events", and the points earned by a visiting driver at such an event will be applied to both regions' championship series so the driver can choose to compete in either or both regions for the rest of the year. A driver competing in a crossover event in his/her home region that also desires to have the points applied to both regions' series needs to give the visiting TT Director a copy of his/her TT Classification form.

NASA TT competitors will be allowed to drop their two lowest event scores to arrive at their total score for year-end awards. The total amount of events scored for year-end award purposes will be the total amount of point's events held in the region plus designated crossover events minus two. The Regional TT Director must declare which events, if any, will not accrue points. Also, a Regional TT Director may choose to increase or decrease the number of dropped scores, especially if there are multiple crossover events. This information will be provided prior to any crossover events. Please consult your Regional TT Director for more information on which events in your region will qualify for NASA TT points. A driver must participate in a minimum of six (6) points event days (per class) to be eligible for championship series trophies, awards, or prizes at the end of the year (unless your Regional TT Director has announced otherwise).

Points will be distributed for each event as follows:

1st- 100, 2nd- 90, 3rd- 85, 4th- 80, 5th- 75, 6th- 70, 7th- 69, 8th- 68, 9th- 67, 10th- 66...and so on, subtracting one (1) point for each position after 10th. In the extremely unlikely event that two competitors end an event day with the same exact fast lap time, a tie will be declared, and both competitors will get the same number of points for the day. The next closest competitor will get points for the position two places down from the tied pair. Last place points may be

given to competitors who drove on track (during a TT practice or competition session), but never received an official lap time due to a mechanical failure of the vehicle. Drivers disqualified for rules violations that do not have an official “legal” lap time, will not be given last place points for the event.

In the event of a tie for season points, the winner will be decided using the following criteria in the order listed, until the tie is broken:

1. Most 1st places
2. Most 2nd places
3. Most 3rd places
4. Most 4th places, etc.
5. Average points per event
6. Head to head battles (number of times driver “A” finished ahead of driver “B” when competing at the same events.

7.4 Declaring a Class

A driver/team can choose to compete or accrue points in any class that is equal to or higher than the vehicle’s classification. For all classes, the appropriate TT Classification form must be filled out completely, scored, and show the appropriate final vehicle classification. The competitor can then declare on the form if the car will be competing in a higher class. Points will accrue only in the class declared by the competitor prior to competition. The competitor can switch classes, using the same vehicle on another event day, provided the above rule is followed and a new declaration is made to the Regional TT Director prior to competition. Points will then begin accruing in the new class. There will be no retroactive declarations or “points swapping” after-the-fact. A competitor can switch back and forth between classes multiple times on different days, provided that appropriate class letters are designated on the vehicle, NASA Timing and Scoring is notified of the change in class to update the computer, and a legal declaration is made to the Regional TT Director. (Note: This rule is advantageous to the competitor that is planning on making mid-season modifications to the vehicle that will cause the vehicle to jump up in class. The competitor can predict the class that the vehicle will eventually be modified to, and begin accruing points in that class from the start of the season, even though the vehicle may not be as competitive early in the season.)

7.5 Vehicle Substitutions

NASA TT is a contest between drivers or teams (see 7.7 Teams) competing in a particular class, and as such, a driver/team may change or substitute vehicles and continue to compete and accrue points for the season, provided that a NASA TT Classification Form is submitted to the Regional TT Director and approved for the substitute vehicle prior to competition. The vehicle must be classified in the same, or in a lower class, than that in which the driver/team desires to accrue points. The substitution can be for a single session or day (as in a substitution due to a mechanical malfunction of the primary vehicle), or it can be for any number of events remaining in the season. In the case of a temporary substitution where a car is entering competition midday, the driver/team must provide the Regional TT Director a completed Car Classification Form, and have the vehicle available for compliance inspection, at least one hour prior to the car competing. Only one vehicle substitution can occur for a driver/team per event day. Once a substitution has occurred, the driver/team is not permitted to bring the original vehicle back into

competition that day. There is no limit to the number of substitutions that can occur during the season, as long as the correct procedure is followed:

1. Provide the Regional TT Director with a new NASA TT Car Classification Form, and have the vehicle available for compliance tech inspection at least one hour prior to the first competition session for the vehicle. If the TT Director already has a completed Car Classification form for the vehicle (i.e., switching back to the primary vehicle on another day), then the driver must simply give notification of the substitution to the TT Director at least one hour prior to the first competition session for the vehicle.
2. Transfer the AMB transponder, assigned car number, and class letters to the substitute vehicle, and remove any other transponder from the vehicle. If it is not possible to swap the transponder(s) because it is hard wired to the vehicle(s), then NASA Timing and Scoring (and the Regional TT Director) must be notified of the driver/team change and transponder issue before the lap times will count. As well, in that situation, consult your Regional TT Director and T & S to determine whether or not you should change the car numbers.
3. Do not attempt to run the original vehicle from earlier in the day after the substitution has been completed. The TT Director and T&S must always be aware of which vehicle, transponder, car number, and class that a car and driver will be competing in prior to that run session.

Since it is likely that a temporary substitute vehicle will belong to another TT competitor or racer, any error in switching transponders or notifying NASA Timing and Scoring and the TT Director may result in both competitors losing their prior lap times for the day if the correct (verified) driver/team is not listed on the timing and scoring computer. Also, multiple competitors cannot share the same vehicle during a run session, even if they are able to switch transponders. Only one driver may drive a TT vehicle per session.

7.6 Competing in Multiple Classes

A driver/team can choose to compete in multiple TT classes simultaneously on the same event day using one or more cars each with its own transponder; however, the driver/team must register and pay registration fees for the additional vehicle(s) even though there are only a limited number of TT and/or HPDE 4/TT run sessions. The driver will not be given extra track time in another run group (i.e. HPDE 3) to make up the difference. The driver/team must register all vehicles, make the declaration of running in multiple classes at a single event, and submit all TT Car Classification forms to the TT Director at the beginning of the day, before the first practice session. Late entries for additional classes will not be accepted or valid. In the case of a driver entering a single car in multiple classes, the driver must use a different transponder for each class, and pay registration fees for each class. This rule may be advantageous for teams that choose to run more than one vehicle, while it will be costly for a single driver. A team may not run more than one vehicle in the same class during a run session. Only one driver may drive a car during a run session—as above in 7.5, no sharing of vehicles during a given run session. Also, a driver may drive only one car during a run session. He/she cannot drive for part of a session in one vehicle, then switch to another vehicle for the remainder of the run session.

7.7 Teams

While NASA TT is primarily a competition between individual drivers in a given class, there are legitimate reasons for drivers to choose to compete as a team, instead of as individuals. Some of these reasons include: lack of funding to compete solo, inability to attend an entire season's events, pooled resources for doing repairs/maintenance/vehicle storage/travel, team sponsorships, expectation of a driver moving up to TT mid-season, and others. Teams are legal in NASA TT, provided that specific guidelines are followed. While individual competitors will get recognition for their achievements using their full names, teams will be recognized only by their team names. Track records made by a member of a team will be recorded with the team name, not the individual's. Championship trophies, if engraved, will have the team name on them, and website results will list the team name.

A team is composed of two drivers. A driver may only be on one (1) team per TT class. All drivers must be approved for a NASA TT license before they can compete (see 5 above), but unlicensed potential drivers can be listed on the team roster that must be turned in to the Regional TT Director before beginning competition as a team. The primary car owner will be the designated team captain. A team will be designated by the word "Team" followed by the team captain's last name, or the team captain's chosen name. The Regional TT Director must approve all chosen names. **The team must declare their driver list on the initial TT Classification form before either competitor enters TT competition in that class for the season.** Once the team is declared, the two drivers shall have their points tallied together. Either driver may drive the car in practice or competition TT sessions at an event; however, both drivers must be registered for that event. A driver may collect points for himself/herself, independent of his/her declared team, as long as he/she notifies the Regional TT Director before the first competition session. A team may not run more than one vehicle in the same class during a run session.

If a team splits up mid-season, the team captain will retain rights to the team name and the team's points, and may use either of the drivers on the original roster to continue to compete; however, all recognition for wins, track records, championship placing, etc. will still go to the team, not any individual.

A driver can be a member of more than one active team; however, he/she can only compete with one TT team on any given day. A driver may compete for one team and as an individual on the same day (in different classes), provided that appropriate registration fees are paid.

8 On-Course Conduct

NASA TT competition will take place during advanced level, open-passing combined NASA HPDE/TT sessions or in a separate NASA TT run group at the discretion of the Event Director. All regulations applicable to NASA HPDE as set out in the NASA CCR will apply to NASA TT competitors. All NASA TT competitors are expected to drive in a safe and controlled manner in compliance with the NASA CCR's, namely Sections 6 and 7. Any NASA TT competitor that places four wheels off course or spins in a session (without an undisputed mechanical failure or track debris without a debris flag waving as the obvious cause of the incident) will lose any timed result for that session. NASA TT drivers are held to a high standard in regard to track etiquette, driver cooperation, and sportsmanship. Any driver found by NASA TT administration to be "blocking" another car in order to slow the following driver's lap time will be subject to harsh penalties, which may include expulsion from further TT competition. Drivers are

cautioned not to deliberately draft with another vehicle, except prior to making a pass. Prolonged drafting or “team” drafting may result in penalties for both drivers. In-car video is encouraged by NASA for a variety of reasons, and would be helpful to determine if a car is purposefully blocking or drafting. Any driver displaying unsportsmanlike conduct either on or off the track, driving in an over-aggressive manner, or failing to cooperate with other drivers on the track will be subject to harsh penalties, which may include expulsion from further TT competition. Any driver with a passenger in the car that gets a D/Q for a session due to a spin or 4-off incident will lose passenger privileges for the rest of the day.

9 Car Appearance

9.1 Numbers and Class Designation

All NASA TT cars must display a three-digit number on both sides and the rear of the car unless a one or two digit number has been permanently assigned to that vehicle by NASA TT administration. Numbers must be of a contrasting color to the car or otherwise clearly visible, at least 10-inches tall with a 1.5-inch stroke for the sides, and four inches high for the rear. NASA TT cars must also display a class designation on both sides and the rear of the car in a four-inch height in contrasting color to the car. Class Designations shall be TT followed by the group number. For example, an A Group competitor would display “TTA” as a class designation.

9.2 General Car Appearance

All vehicles must be in good condition and appearance. Vehicles with excessive body damage, primered body panels, etc., are not permitted. The vehicle must meet the “50/50” rule, which means it must look undamaged and straight at fifty (50) mph from fifty (50) feet away.

10 Safety

10.1 Car Preparation, Technical Inspection, and Logbooks

All cars must meet the safety and car preparation standards specified at Section 11 of the NASA CCR. All convertibles must meet the roll bar specifications contained in the CCR for HPDE participation. In addition to the HPDE safety rules, it is highly recommended that all TT vehicles carry a NASA CCR compliant fire extinguisher with a metal mounting bracket (not on the “A pillars”). As well, we encourage all participants to obtain and use as much CCR compliant personal and vehicle safety equipment as possible.

Front driver and passenger side fixed/Lexan windows are specifically not permitted unless they are factory installed during the manufacturing of the vehicle. Both front side windows must otherwise be in the down position while on track.

As an added benefit for those that compete on a regular basis (especially those who’s cars require a trailer tow to get to an authorized tech station): In lieu of the usual HPDE vehicle technical inspection as outlined in the NASA CCR Section 11, a driver/owner that possesses a National NASA TT License may opt to follow a tech inspection process similar to that used by NASA racers in CCR Section 16, where the vehicle is issued a NASA TT inspection log book.

However, the driver must also be the owner of the vehicle used, and must be competent to perform a vehicle technical inspection. As well, in doing so, the driver/owner takes on the same responsibilities that apply to racers. As such, any driver failing to properly prepare his/her car as required by the tech sheet may be subject to license revocation, monetary fines, disqualification, or other penalties. All vehicles will be subject to random safety inspections while at the track facility. If at any time, illegal, non-conforming, or outdated safety equipment is found in or on the car, that equipment (in its entirety) will become the property of NASA. Additionally, the driver will be fined \$50 for each separate offense, and will lose the privilege to forego the CCR Section 11 HPDE technical inspection process, and the logbook will be revoked. The same penalties shall apply if the driver/owner is found to have inaccurately performed the vehicle inspection, or falsified entries on the inspection sheet.

After a TT licensed driver/owner has accepted the above responsibility, he/she may be issued a NASA TT inspection logbook by his/her home NASA Region for a \$10 processing fee. The vehicle must then be thoroughly inspected by a NASA authorized inspector using the CCR Section 11 criteria. Subsequent inspection by a NASA authorized inspector is required on an annual basis each calendar year before the vehicle's first event, and if the vehicle has been in a crash, had new safety equipment installed, or if the logbook notes indicate that re-inspection is necessary. At each event, the driver must fill out and sign an HPDE tech form. Assuming there are no outstanding issues, the driver will take the signed form and the vehicle's logbook to the tech area, where the tech steward will write, "OK for TT", sign the logbook, and give the driver the appropriate tech window sticker. Drivers that have a NASA Competition Vehicle Logbook for racing, and are compliant with Section 16 of the CCR, can follow those procedures in lieu of the above procedures.

10.2 Download Sessions

NASA TT drivers are expected to attend every "download session" after a run session (as are HPDE 4 drivers and instructors that choose to drive in a combined HPDE 4/TT run group). Failure to attend a download meeting without being excused by the Regional TT Director or his designee may result in loss of the previous session's lap times, and loss of track time for the next session. Serial unexcused absences will result in TT license revocation. These post-run session meetings are a vital component to our TT safety program.

11 Penalties

Various penalties are listed and underlined in the following sections of the TT Rules: (3, 5, 6.4.2, 7.2, 8, 10.1, 10.2, 13).

The overriding rule regarding car classification will be, as written in Section 3, "...penalties for non-compliance with the rules will be harsh, and may include disqualification and expulsion from further NASA TT competition with a single infraction, regardless of the nature of the infraction." Blatant lying and cheating will not be tolerated, and will result in expulsion from further NASA TT competition or suspension followed by classification in an unlimited class for any future events.

However, the **minimum** penalty for a driver found to be competing in a class that is too low (for whatever reason) will be disqualification of all lap times up to that point for the event (weekend). Since 7.4 does not allow a competitor to switch classes until a different day, the competitor may

continue to drive in the remaining sessions for practice, but all times will be disqualified. It will be at the TT Director's discretion whether to award last place points in the class that the car should have been competing in. If the infraction is found on the first day of a competition weekend, the TT Director may allow (at his discretion) the driver to compete on the second day in the correct class (whether by upclassing, or de-modification of the vehicle). As well, if there have been no changes to the Car Classification Form that show evidence that a change was made to the vehicle that led to it becoming non-compliant at a certain point in time, or other evidence that the vehicle was compliant in previous events, or if the driver admits that, in retrospect, the car was not compliant at previous events, the TT Director may revoke all previous points in that class, with or without assigning last place points for the driver in the higher class for those events.

Drivers are encouraged to seek the advice of their Regional TT Directors (or National TT Director) for any questions about the classification and modification points rules pertaining to their vehicles, prior to competition. If a question still remains, the driver should request an inspection of the car or the parts in question by the TT Director for clarification, and assistance with appropriate vehicle classification.

12 Protests

A competitor may protest the on-track behavior of another driver, or a suspected violation of the TT rules by another competitor. These protests should be made directly to the Regional TT Director. In the event of a conflict of interest, where the Regional TT Director is also a TT competitor and will be directly affected by the results of the protest, the TT Director shall appoint a substitute referee to handle the protest. Potential substitutes include the National TT Director, NASA Regional Director, Event Director, Race Director, or other National NASA Officials, depending on the nature of the protest. A driver may appeal the ruling of the Regional TT Director or "substitute referee", in writing by e-mail, to the National TT Director greg@nasa-tt.com, within 2 business days of the ruling. The National TT Director will then make the final decision as to how the issue will be resolved. In the event that a substitute referee was used to handle the initial protest, the Regional TT Director may also appeal the ruling to the National TT Director for final adjudication.

Drivers may appeal any decisions made by a Regional TT Director regarding car classification or modification points assessment to the National TT Director for final adjudication.

At the NASA Championships, the National TT Director will make final determinations on all TT protests and classing issues. In the event of a conflict of interest, where the National TT Director is also a TT competitor and will be directly affected by the results of the protest, there will already be an appointed "TT Race Director" for that specific TT class that will rule on the protest. The National TT Director may appeal any decision by the aforementioned TT Race Director to the NASA Executive Director or Executive Committee at the event for final adjudication.

TT license revocations can be made by: the Regional TT Director with NASA Regional Director approval, NASA Regional Director, National TT Director, Chief Divisional Director, and NASA Executive Director. These decisions are final, with no appeal per the CCR mechanism available. The competitor with a revoked TT license may reapply when authorized by the National TT Director, provided that he/she has not been permanently expelled from NASA. A

new license may be granted at the discretion of TT administration at that time. As well, the competitor may be restricted to competing in one of the unlimited classes if the revocation was due to non-compliance with car classification rules.

The above rules will supercede NASA CCR sections 17.5.1, 17.5.2, and 17.5.3.; however, the National appeals process listed in 17.5.4 will remain valid, with the exceptions that the words “National TT Director” will be substituted in place of the words “Race Director”, and “Executive Director” will be substituted with “Executive Director or Executive Committee”. Section 17.5.6 Bad Faith Protests shall also be valid.

13 Vehicle Inspection/Impound

NASA TT series administration reserves the right to perform random vehicle inspections and/or impounds at any time that the vehicle is at the track facility. These inspections may be done for the purpose of rules compliance verification or for safety inspection. Inspections may be a simple visual verification or car weight measurement, or may be complex, involving internal inspection of part’s assemblies using bore scopes, diagnostic computers, compression testing/whistlers, dyno testing, and/or disassembly and removal of parts for analysis. Although a rare occurrence, any requested disassembly will be the responsibility of the driver/owner to perform or to arrange for another mechanic to perform under the observation of a NASA TT inspector. The driver/owner will bear all financial responsibility for such disassembly and reassembly, regardless of whether or not the vehicle is found to be in compliance.

Should a driver/owner elect not to participate in any requested inspection for rules compliance verification, he/she will be disqualified from the event, all season points will be forfeited, and he/she may only continue to compete in one of the unlimited classes.

14 Website Posting

A variety of useful information pertaining to both our regional and National TT programs will be posted on the National NASA TT website <http://nasa-tt.com> as well as multiple regional NASA websites, <http://www.nasaforums.com>, and <http://www.nasachampionships.com>. This information includes the names, car numbers, and vehicle years, makes, and models of our competitors. It also includes event results, championship standings, narratives describing recent events, driver profiles (only when submitted by the driver), and photographs and video footage of our events and competitors.

15 NASA TT National Championships (NASA Championships)

The NASA Championships will be held yearly, in September, at the Mid-Ohio Sports Car Course **or at Miller Motorsports Park**. TT competition will be included in the event. The winners of each TT class at this event will be declared the NASA TT National Champion for that year. In order to be eligible to compete in the NASA Championships a TT competitor must score points in five regional TT events, in any region, in any TT class, on at least four (4) different event days, prior to the registration deadline for the Championships. Drivers planning on competing in the higher level classes (TTA, TTS, TTU, and TTR) must have regional experience driving in those classes, in vehicles of similar performance characteristics to the

vehicle they plan to compete with at the Championships. For example, a driver that usually drives a TTD car will not be permitted to drive a TTR sports racer without showing evidence of prior experience in such a vehicle.

Drivers are permitted to participate as a team under the following circumstances. The team must have been legally declared (7.7), and score points in five regional TT events (as above for individuals). However, each of the drivers must have personally driven in at least one session in each of the five events used for eligibility. Either driver may drive in any or all of the competition sessions at the Championships under the team name.

Drivers desiring to obtain eligibility to compete individually at the Championships and use point scoring events where they drove as part of a team in regional TT events will need to obtain a waiver from the National TT Director.

Each driver may compete in a maximum of two TT classes (whether individually or as part of a team). If using a single vehicle, the classes must run in separate run groups. This may only be possible for a few vehicles to accomplish depending on the final published schedule of class and run group separation. If using multiple vehicles, each one must have its own transponder.

Car numbers will be assigned based on a first registered, first served basis for number choice.

The competition will be based on the single best lap time obtained by a competitor during any of the declared competition sessions for the entire event (Note: “event” in this case does not mean a single day of competition as in regional TT events).

Drivers must attend all scheduled download sessions and meetings (usually a morning meeting and two download sessions), regardless of whether they drove in a session or not. If the TT Director (also called “Race Director” at this event) determines that a driver has an unexcused absence from a download session, that driver’s lap times from the previous competition session will be disqualified. As well, the driver will be penalized and not allowed to drive in the next run session if the driver had an incident (DQ) in the prior session, and may be similarly penalized if his/her name or car number are brought up for discussion for other reasons. Drivers that are both competing in TT and racing in other run groups (or are officials/event staff), that have unavoidable time conflicts that prevent their presence at a download session or meeting, should notify the TT Director and have a proxy (can be another competitor) attend the meeting for him/her. If that driver was involved in an incident of any type during the previous run session, he/she should report to the TT Director as soon as possible.

Any driver failing to attend the initial mandatory TT meeting on the morning of the first day of competition without an excused absence by the TT Director will not compete on the first day. If the TT Director has the time to go over all of the information presented during the meeting with the driver, he may allow the driver to drive for practice (with DQ’d lap times) for the remainder of the day. In either case, once the driver arrives, he/she must still attend all of the download sessions, regardless of whether or not he/she drives. Similarly, for any driver that arrives on the second or final day of competition, the first morning meeting of that day will be considered to be his/her “initial mandatory TT meeting”. Therefore, a driver that doesn’t arrive until the final day of competition, and has an unexcused absence from the morning meeting, will not compete in the event.

Passengers are **not** permitted. Any driver taking a passenger will be D/Q'd for that session and the following session (Note: Passengers are permitted in regional event competition sessions.)

All NASA TT Championships Car Classification Forms must be submitted to the TT Director at or before the initial mandatory morning TT meeting. Any changes made to the vehicle during the event that would change anything written on the Form, must be reported immediately to the TT Director.

Vehicle substitutions may only be made at the morning meetings, and at no other times. Vehicles submitted for approval for substitution on the final day of competition must be available for technical compliance inspection, dyno testing, GPS monitoring, etc. during the entire day, beginning immediately after the morning meeting. The first session that a substituted vehicle is driven in will serve as a practice session for the driver, regardless of whether or not it is a designated practice session for the rest of the run group.

Additional details on the format, schedule, and rules specific to the NASA TT Championships will be published at a later date on the <http://www.nasachampionships.com> website, <http://www.nasaforums.com> in the TT forum, and/or on the NASA National TT website <http://nasa-tt.com>. As well, Regional TT Directors will also disseminate this information.

Appendix A—Pre-Approved Engine Swaps

Acura Integra B18C1 (GSR 170 hp) swapped into a Honda Civic (2300#). The swap will result in the Civic moving up to the TTD base class with a base weight listing of 2300 lbs.

Acura Integra B18C5 (ITR 195 hp) swapped into a Honda Civic (2300 lb). The swap will result in the Civic moving up to the TTC base class with a base weight listing of 2300 lbs.

Acura Integra Type R (JDM 220hp) swapped into an Acura Integra RSX Type S (US). The swap will result in the RSX Type S moving up to the TTD* base class with a base weight listing of 2770 lbs.

Audi 80 2.0L (108/113hp) swapped into an '81 VW Scirocco 1.7L (74hp) body. The swap will result in the Scirocco moving up to the TTF** class, with a base weight of 2040 lbs.

BMW E36 325i 2.5L (189hp) swapped into a BMW E30 325i (2855#). The swap will result in the E30 moving up to the TTE* base class with a base weight listing of 2855 lbs.

BMW E36 328 2.8L (190 hp) swapped into BMW E36 318ti (2778 lbs). The swap will result in the E36 318ti moving up to the TTE* base class with a base weight listing of 2865 lbs.

Eagle Talon turbo 2.0L 16v (210 hp) swapped into an Eagle Talon non-turbo 2.0L (4g63) chassis/body of equal weight. The swap will result in the car moving to the Eagle Talon Turbo's base class of TTE with a base weight listing of 2889 lbs.

Ford Escort LX SPI 2.0L SOHC (110 hp) swapped into '91-'96 Ford Escort LX. The swap will result in the Escort LX Hatchback moving to the TTG** base class with a base weight listing of 2391 lbs. and the Escort LX Wagon moving to the TTG* base class with a base weight listing of 2484 lbs.

Ford Escort ZX2 Zetec 2.0i VVT (130hp) swapped into '91-'96 Ford Escort LX. The swap will result in the Escort LX (hatchback and wagon) moving to the TTF* base class with a base weight listing of 2391 lbs

Ford Mustang '69 351W (290 bhp, 232 net hp)(TTF*) swapped into a '66 Ford Mustang 289W (271 bhp, 217 net hp)(TTF*). The swap will result in an increase in the '66 Mustang's listed base weight by 210 lbs to 3190 lbs if the alternate method of weight reduction mod points is used. If not, a +11 point assessment will be made.

Mazda 323 GTX ('90-'94) BP-T 1.8L (176 hp) swapped into '91-'96 Ford Escort LX. The swap will result in the Escort LX (hatchback and wagon) moving to the TTD base class with a base weight listing of 2391 lbs.

Mazda 626 KLZE 2.5L (JDM 200hp) swapped into '91-'96 Ford Escort LX. The swap will result in the Escort LX Hatchback moving to the TTC base class with a base weight listing of 2391 lbs. and the Escort LX Wagon moving to the TTD** base class with a base weight listing of 2484 lbs.

Mazda Miata '94-'97 1.8L (128 hp), using the 1.6L ECU, swapped into '90-'93 Mazda Miata 1.6L (116hp) body. The swap will result in the '90-'93 Miata moving to the TTE base class, with a base weight listing of 2275 lbs. As well, the '90-'93 Miata may update other non-ECU parts from the '94-'97 Miata.

Nissan CA18DET (175hp) swapped into an '89-'94 Nissan 240SX (140hp). The swap will result in the Nissan 240SX moving to the TTE base class, with a base weight listing of 2700 lbs.

Nissan (JDM or USA) VG30DETT (300ZXTT) (300hp) engine swapped into a Nissan 300ZX Z-32 2+2 (n.a)(3414 lb) (222hp) body. The swap will result in the Nissan 300ZX Z-32 2+2 (n.a) moving up to the TTD** base class, with a listed base weight of 3480 lbs. This swap does not apply to the 300ZX Coupe (3219 lbs).

Pontiac Firebird 3.4L V6 (160hp) swapped into an '88 Fiero 2.8L (140hp). The swap will result in the Fiero moving from TTF* to TTE with a listed base weight of 2778 lbs.

Pontiac Grand Am '99 3.4L V6 (175hp) swapped into an '88 Pontiac Fiero (4 cylinder). The swap will result in the Fiero moving to the TTE* base class (from TTG), with a base weight listing of 2590 lbs.

VW Jetta 2.0L 16V (134hp) ('90) swapped into a '78 VW Scirocco 1.6L (75hp) body. The swap will result in the Scirocco moving up to TTE* (from TTH**) with a base weight listing of 2040 lbs.

VW Scirocco 2.0L 8v (ABA) (115hp) swapped into an '80 VW Scirocco 1.7L (74hp) body. The swap will result in the Scirocco moving up to the TTF* base class (from TTH**), with a base weight listing of 2040 lbs.

VW Scirocco 1.8 L 8v (90hp) swapped into an '81 VW Scirocco 1.7L (74 hp) body. The swap will result in the Scirocco moving up to the TTG** base class (from TTH**), with a base weight listing of 2040 lbs.

Appendix B—Technical Bulletins for Specific Models

Allison Legacy:

Maximum Dynojet 87 rwhp/120 ft-lbs

Minimum competition weight: 1625 lbs

Ford Mustang (TTS/TTU only):

"Upper subframe connectors" that penetrate and modify the floorpan will be assessed a -0.2 Modification Factor (seen commonly in American Iron Mustangs).

Lotus Elise and Exige:

The Lotus Elise and Exige optional rear toe link brace, along with the spherical joint that replaces the ball joint and attaches to the inboard end of the toe link bar are no-points modifications. OEM geometry, suspension mounting points, the outboard end joint on the toe link, and the toe link bar itself must remain stock.

Similar aftermarket braces that meet the above requirements will also be no-points modifications (even if they have spherical joints on the static ends of the brace itself). Aftermarket kits that include a replacement toe link bar will be assessed +1 point. Aftermarket kits that change the outboard toe link joint to a spherical/heim joint will be assessed an additional +3 pts. for "metallic replacement suspension bushings". Aftermarket kits that do not use the OEM mounting locations for the toe link ends will be assessed an additional +6 pts. for "relocation of rear suspension mounting points".

Mazda RX-7 (1st Generation):

A Watts link plate that puts the center pin into double shear for safety purposes only (and has been approved previously for Pro7 use in the SoCal region), is approved for use in PT and TT without a points assessment. Any other changes to the Watts link will require a points assessment per the PT/TT Rules.

Mazda RX-7 13B:

1. Modification of the Variable Dynamic Intake (VDI) by removal of the actuator mechanism, and permanently wiring the VDI open will be a No-Points Modification.
2. Modification of the 5th and 6th port runners, by removal of the actuator mechanism, actuator rods, and removal of the sleeves themselves, will be a No-Points Modification. As well, removal of the actuator mechanism and actuator rods, and fixing the sleeves in the open position will also be a No-Points Modification. However, under either circumstance, if there is any filler material added, non-OEM sleeves added, modification of the OEM sleeves, or other modification to the runners, the car will need to be re-classified based on Dyno testing.

Panoz GTRA:

'97-'99 Panoz GTRA 5.0l spec race car: PTB/TTB
maximum Dynojet rwhp: 235 hp
maximum Dynojet torque: 305 ft-lbs
minimum competition weight (with driver): 2925 lbs
maximum tire width: 275mm
permitted tires: all DOT approved available OTC in the USA
wheels: open
alignment: open to adjustment
ride height/corner balance: open via coilover adjustment
suspension/body/aero/cage/transmission: as built
(Koni non-adjustable coilovers, Tremec 3550 5 speed,
Brembo 325mm floating brakes--pads open)

Pro Challenge Road Race Car:

Pro Challenge Road Race Car Specs for ST1, ST2, TTS, TTU
modification factor: -0.2
maximum tire width: 225mm if using DOT approved tires
9.6 inches if using non-DOT approved slicks
wheels: 15" (model open)
alignment: open to adjustment
ride height/corner balance: open via coilover adjustment
suspension: Bilstein non-adjustable shocks
body/aero/cage: Fiberglass with race wing--as built by Pro Challenge
length: 14 feet
height: 48 inches
chassis: 1.5" reinforced steel tube frame
engine: open
transmission: sequential
differential: Winters quick-change or Toyota (locked)
brakes: 4 piston, up to 12" vented rotors front
Wilwood 2 piston, 10" solid rotors rear

Pro Challenge Road Race Car (TTA/PTA):

maximum Dynojet rwhp: 130 hp
maximum Dynojet torque: 85 ft-lbs
minimum competition weight (with driver): 1580 lbs
maximum tire width: 225mm (Hoosier ok)
permitted tires: all DOT approved available OTC in the USA
wheels: 15"x8" (model open)
alignment: open to adjustment
ride height/corner balance: open via coilover adjustment
suspension: Bilstein non-adjustable shocks
body/aero/cage: Fiberglass with race wing—as built by Pro Challenge
length: 14 feet
height: 48 inches
chassis: 1.5" reinforced steel tube frame
engine: open provided that maximum Dynojet hp and torque numbers are not exceeded
(if a restrictor is required to meet the 130 rwhp maximum, it must be clearly labeled as such)
transmission: sequential—motorcycle type
differential: Winters quick-change or Toyota (locked)
brakes: Wilwood 4 piston, 10" vented rotors front, Wilwood 2 piston, 10" solid rotors rear

Thunder Roadster:

The 2008 released updated body/wing type is not permitted in TTA/PTA. Those cars are approved for use in TTS/TTU/TTR (and Super Touring).

VRL and GAC Hoosier Tires:

Viper Racing League and Grand Am Cup Hoosier Spec. Tires are exempt from the -0.75 modification factor for Non-DOT approved tires in the calculation of Adjusted weight/power ratios for TTS/TTU and for TTA-TTF class limits on Adjusted weight/power ratio.