



NASA Autocross (NASA-X)
Official 2018 National Rules
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1. Definitions and Claims

- 1.1. NASA AUTOCROSS (NASA X) is a timed competition in which drivers navigate one at a time through a defined temporary asphalt surface. It is a form of motorsports that emphasizes safe competition and active participation 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 AUTOCROSS ("NASA X)" and these rules are the property of the National Auto Sport Association, Incorporated ®; located at P.O. Box 2366, Napa Valley, CA 94558; 510-232-NASA (6272).

2. Sanctioning Body

- 2.1. The NASA X 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 NX Administration are final, except under certain conditions, as specified under Section 15 Protests.

3. Intent

- 3.1. 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 X Administration a guideline to use when making decisions regarding NASA X. 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.
- 3.2. If a performance 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 X Officials will attempt to use less invasive techniques for monitoring NX 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 NX 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-BTM (Base Trim Model) part they are unsure about, before competition, from their Regional NASA X Director or the National NASA X Director.

4. Purpose

- 4.1. NASA X provides a venue for spirited timed competition with a high degree of both safety and convenience. NASA X allows qualified individuals to compete in a "fastest time" format, as a form of motorsports that emphasizes safe competition and active participation where learning basic car control and techniques is emphasized.

5. General Rules and Info

- 5.1. NASA-X events are open to any street licensed driver in any car that will pass technical inspection. Registered drivers under the age of 18 will need to be cleared to participate in advance by NASA.

- 5.2. Each NASA-X region should recognize the following Officials at each autocross: NASA-X Director, Event Director, Control, Safety Steward, Chief of Course Design, Chief of Registration, Chief of Technical Inspection, Chief of Timing & Scoring and Chief of Wristbands/Security. Multiple duties may be performed by the same person. Chapter may compensate Chiefs in any way they deem appropriate. Officials shall be friendly, professional, polite, and respectful at all times.
- 5.3. The speed limit anywhere on site but not on course is 3mph (walking speed.)
- 5.4. Alcoholic beverages and illegal drugs are not permitted at any time.
- 5.5. Please leave with everything you brought to the site. Littering is prohibited.
- 5.6. Everyone must sign the waiver and get a wristband immediately upon arrival, including spectators.
- 5.7. Non-participating passengers are only allowed if they have signed the waiver, possess a wristband from registration, and are helmeted and seat-belted as if they were a driver.
- 5.8. If fun runs are provided, only registered drivers in cars that passed that day's tech inspection are permitted to do fun runs. Passengers are allowed, even for Novice drivers.
- 5.9. A limited number of loaner helmets should be available for drivers at each event.
- 5.10. Drivers shall immediately be held financially responsible for any and all damage they do to event equipment or property (including but not limited to: loaner helmets, timing sender/receiver boxes, timing cables, light poles, fences, etc.)
- 5.11. All participants, including crew and guests/spectators, shall behave in a respectful, orderly, and sportsmanlike manner at all times.

6. Required Safety Equipment

Disclaimer: Conformance to these regulations is the driver's responsibility. These regulations do not guarantee or imply that injuries or death will not occur. If there are any questions or problems with these regulations it is the reader's responsibility to contact the NASA office, or a NASA official immediately. All participants shall utilize equipment that meets or exceeds these minimum requirements, while driving on course (Note- passenger equipment must meet or exceed these minimum requirements; but do not necessarily have to match the driver's equipment):

- 6.1. Use a proper fitting helmet that meets Snell 2005 (SA2005; M2005) or newer (or equivalent) standards for cars or motorcycles. A full face helmet is required for all open wheel vehicles, karts or vehicle with less than stock sized windshield.
- 6.2. The driver and any passenger must utilize OEM or aftermarket style restraints. Seats belts (and harnesses if used) must be in good condition and properly installed. Non factory upper body restraints and harnesses are not allowed in open vehicles unless they have a roll bar installed AND the bar is not below the top of ALL drivers helmet when seated normally in the vehicle.
- 6.3. No open toed shoes or sandals.

7. Tech Inspection

- 7.1. All vehicles must be subjected to a technical inspection covered on the current NASA-X Technical Inspection Form. Drivers may need to print out, fill out, and bring the current NASA-X Technical Inspection Form. Chapters may opt to have drivers not submit tech forms as long as everything listed on the form is checked on each participating car before competition at every event.

8. When On Course

- 8.1. If red flagged: Stop the car, wait to be told to proceed, finish the lap at a reasonable speed, and come back through the finish timer. Re-runs will be issued for all drivers affected by the red flag, but not the driver who caused the red flag.

- 8.2. Downed/misplaced cone: Stop and point at the cone, wait for the course worker to acknowledge, finish the course at a reasonable speed and get a re-run.
- 8.3. Cone penalties shall be:
- 8.4. Knocked down and no longer upright = 2 seconds
- 8.5. Outside of chalk box (standing up or knocked down) = 2 seconds
- 8.6. Standing and touching box or still partially inside of box = no penalty
- 8.7. Miss a gate or slalom = Off Course
- 8.8. Mechanical or off course = Did Not Finish
- 8.9. Drivers shall be in control of their cars at all times - unsafe behavior on course is unacceptable and will be penalized harshly.
- 8.10. If a driver stops on course for any reason, he or she shall stay in the car unless it is on fire.

9. Vehicles and assigning classes

- 9.1. Lifted trucks, 4WD's, and SUV's are generally not allowed. Some sport trucks or minivans may be allowed on a case-by-case basis.
- 9.2. Correct vehicle classing is the competitor's responsibility. Participating drivers may be required to provide or complete classing forms at any time during an event. If a car is deemed to be in the wrong class, the national staff and/or regional staff reserve the right to adjust or penalize at any time. Please refer to section 6 of this document for more information.
- 9.3. Regions are encouraged to modify or create classes as needed to serve their individual needs and markets.

10. Protests, Scrutineering, and Impound

- 10.1. An official protest process shall be available to any registered competitor who wishes to challenge the conduct, performance, or classing of any other registered competitor at any time during, or within 30 minutes of the conclusion of competition (i.e. last timed/scored run) at an event. Protest results shall be decided before final results are published.
- 10.2. Protests shall be made in writing directly to the Event Director. All protests shall be confidential.
- 10.3. Participating drivers and their registered vehicles may be required to report to Tech/Impound at any time during an event.
- 10.4. Drivers may be required to provide or complete classing forms at any time during an event.
- 10.5. Vehicle scrutineering may be ordered by the Event Director or Chief of Tech Inspection at any time during an event. Fees may apply to any significant compliance check or teardown, and are entirely the responsibility of the car owner/driver.
- 10.6. Penalties may range from a warning to disqualification to ejection to financial penalty, depending upon the severity of the offense.

11. Timing, Event Format, Regional Championships

- 11.1. Runs should be timed with an electronic timing system capable of recording times to the thousandths of a second. Any variation from this shall be published to competitors before registration is opened for the event.
- 11.2. Regions are encouraged to adjust event format, run order, heats and other event operational issues as needed to suit their needs. Regions shall publish supplemental regulations for either events or the season.
- 11.3. Regional Championships
 - 11.3.1. If a region has a regional championship series, they are encouraged to adjust the program to fit their individual needs.
 - 11.3.2. Regions are **STRONGLY** encouraged to only allow NASA members to accrue points.

11.3.3. Regulations for any championship shall be made available to competitors before the event, series or season that the championship is applicable to.

11.4. Car Numbers and Class Designations

11.4.1. Regions are encouraged to use any car numbering format that suits their needs as long as requirements are made clear to competitors prior to the event.

11.4.2. The following are optional standards and suggestions that a region may choose to use:

- Numbers should be 8” tall with at least a 1.5” stroke width. Class letters should be at least 4” tall with a ¾” stroke.
- Numbers and letters should be the same color and contrast with the color of the car.
- Car numbers and letters should be displayed on each side of the car.

12. Additional Rules & Chain of Command

12.1. NASA-X chapters are encouraged to adjust and create operational rules as they see fit to best suit their members. NASA-X chapters shall publish these rules as Regional Supplemental Rules and ensure that they are available to all members.

12.2. Failure to abide by rules set forth in any related document at any time shall result in minor (i.e. DNF for one run) to major (i.e. permanent ban) consequences depending upon the severity of the infraction.

12.3. NASA-X Rules shall be followed in this order, with each subsequent line superseding the prior one:

12.3.1. NASA-X National Rules & Classes

12.3.2. NASA-X Regional Event Info & Supplemental Regulations

12.3.3. NASA-X Written Communication with Registered Participants

12.3.4. NASA-X Event Site Drivers Meeting (spoken or written)

12.3.5. NASA-X Event Officials’ Requests (spoken or written)

12.4. NASA Officials’ Requests shall be followed in this order, with each subsequent line superseding the prior one:

12.4.1. NASA-X Regional Event Staff (non-chiefs/non-directors)

12.4.2. NASA-X Regional Event Staff (chiefs/directors)

12.4.3. NASA-X Regional Control, Safety Steward, or Event Director \NASA-X Regional Director

12.4.4. NASA-X National Director

12.4.5. NASA Regional Director

12.4.6. NASA National Staff

13. Vehicle Classing

13.1. NASA-X Regions are encouraged to modify and develop classing systems to meet their individual needs in their particular markets for regional events.

13.1.1. Whatever classing model is used, it should be made available to all entrants as needed.

13.2. NXx Classes

There are a total of nine NASA X competition classes. Eight are combined production and non-production racecar classes and one is an unlimited class. The classes are: NXR (unlimited); NXU, NXS, NXA, NXB, NXC, NXD, NXE, NXF (based on Base classing and Modification Points). In addition, there are two classes (G & H) that are listed for purposes of base classing only (NXB-NXF competition vehicles only). There will be no competition in either NXG or NXH.

13.2.1. The classing rules for NASA X vehicles mirror those for the Super Touring/Super Unlimited and Performance Touring & Time Trial race cars. So, any car legal for a ST/SU or PT race class will

also be legal in the TT and corresponding NASA X class. The classes “map” to each other as follows:

NXU = Super Unlimited	NXB = ST4 – TT4	NXF = PTF - TTF
NXU= ST1 – TT1	NXC = ST5 – TT5	
NXS= ST2 – TT2	NXD = PTD - TTD	
NXA= ST3 – TT3	NXE = PTE - TTE	

13.2.2. The classing rules for NXR, NXU, NXS, and NXA are listed in Section 7.

13.2.3. The classing rules for NXB, NXC, NXD, NXE, and NXF are listed in Section 8.

13.2.4. Any four-wheel, fendered/closed-wheel vehicle that passes safety technical inspection that is not eligible to compete in NXB-NXF due to the more restrictive classing rules, will be eligible to compete in either NXR or NXU, NXS, or NXA, depending on the results of chassis dynamometer (Dyno) testing, and the resulting “Adjusted Weight/Power (Wt/Hp) Ratio”. The “Adjusted Wt/Hp Ratio” is a calculation based on a simple Wt./Hp ratio that is adjusted based upon “Modification Factors” listed in Section 7.

13.3. NXR, NXU, NXS, NXA Classing

13.3.1. Class Eligibility

13.3.1.1. Any four-wheel, fendered/closed-wheel vehicle that passes NASA safety technical inspection can be used to compete in NXR (NASA X Unlimited). There are no maximum power limits or minimum weight limits. Any type and size tires may be used. All types of transmissions, chassis, frames, bodies, suspensions, aerodynamic modifications, and braking systems are legal.

13.3.1.2. For NXU, NXS, and NXA, “Production” vehicle models are those manufactured by an automobile manufacturer and must be approved for street use by the U.S. D.O.T., T.U.V, or Japanese government. All other vehicles, as well as “kit” cars, purpose-built track/race cars, and tube-frame vehicles are considered “Non-Production” vehicles, and will be assessed the “Non-Production Vehicle” Modification Factor listed in 7.4.2 unless the vehicle model is listed in Section 7.5 of these rules, and has been approved to compete under “Production” vehicle status. Alternately, a competitor with a vehicle originally qualified as a “Production” model may use the Modification Factor assessment for “Non-Production Vehicle” to avoid all “Production vehicle only” limitations/restrictions.

13.3.1.3. All vehicles must comply with all NASA safety requirements in the CCR (see 7.2 exceptions), and all of the restrictions and limitations listed below in 7.2 and 7.3 to be eligible to compete. All competition is based on the “Adjusted Weight/Power Ratios” (section 7.4) below:

13.3.1.3.1. NASA X (NXU) = “Adjusted Wt/Hp Ratio” equal to, or greater than, 5.50:1

13.3.1.3.2. NASA X (NXS) = “Adjusted Wt/Hp Ratio” equal to, or greater than, 8.00:1

13.3.1.3.3. NASA X (NXA) = “Adjusted Wt/Hp Ratio” equal to, or greater than, 9.00:1

13.3.2. The National NASA X Director will determine and publish any additional Modification Factor(s), specific limitations, and/or restrictions placed on specific vehicle models. Performance enhancing modifications are otherwise unlimited.

13.3.2.1. Front driver and passenger side fixed/Lexan windows are permitted in NXR (only) if they are factory installed during the manufacturing of the vehicle or if they are made of non-shattering material (Lexan), can be removed from both the inside and outside of the vehicle with

no tools required, and allow the driver to comply with the driver emergency exit time requirements in the CCR. (does not apply to NXU, NXS, NXA)

13.3.2.2. 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. (Applies to NXU, NXS, NXA).

13.3.3. Vehicle Modification Restrictions/Limitations (NXU, NXS, NXA)

13.3.3.1. Restrictions and Limitations for All Vehicles (Non-Production and Production) All vehicles must adhere to the following modification restrictions and limitations:

13.3.3.2. Active aerodynamic devices and/or modifications (including, but not limited to, computerized, cockpit adjustable, self-adjusting, and OEM) are not permitted.

13.3.3.3. Nitrous Oxide use is prohibited. Pre-existing tanks must be removed.

13.3.3.4. Methanol/Alcohol-water injection is permitted provided that the mixture does not exceed 50% alcohol by volume. Methanol is not permitted as a fuel. (see CCR 15.19 and 18.3)

13.3.3.5. Sequential, 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.

13.3.3.6. Tire and wheel size are unlimited, but non-DOT approved tires will be assessed via the “Adjusted Weight/Power Ratio”. Tire treatments and softeners are not permitted.

13.3.3.7. 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.(supersedes Section 15.20 of the NASA CCR).

13.3.3.8. 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.) Any hardware that allows a competitor or crew member to wirelessly or directly connect to the ECU (or alter ECU maps) at any time during competition or post-competition impound is strictly prohibited, regardless of whether such hardware is external or internal to the ECU, and regardless of the direction of data flow.

13.3.3.9. Tube-frame chassis conversion (partial or complete) is permitted, but all tube-frame chassis conversion vehicles will be assessed the Modification Factor for “Non-Production” vehicles, and subsequently, none of the other rules specifically for “Production Vehicles Only” will apply (7.3.2). If a vehicle cannot be driven safely, at full speed, with any of the added tubes removed, it is considered a tube-frame chassis conversion.

13.3.4. Restrictions and Limitations for **Production Vehicles Only**

The following rules do not apply to any vehicle that is taking the Modification Factor assessment for “Non-Production Vehicle”, regardless of whether or not the vehicle was originally a Production vehicle.

“OEM” is defined as any part that comes from the vehicle manufacturer either as a standard feature, a factory option, or on a factory optional trim model/package of that generation of the street-legal (in the U.S.A.) version of the vehicle.

13.3.4.1. Other than the listed exceptions, every Production vehicle must retain its unmodified:

- OEM frame rails/rear frame cross beam, and/or Unibody, and Sub-frames/
- suspension cross-members (in their OEM locations)

- Strut/shock towers
- Inner/inboard side of the fender wells (any non-horizontal aspect)
- Rocker panels
- Transmission tunnel
- Floor pan
- Windshield frame location

13.3.5. The following are permitted exceptions to 12.3.3 above:

- 13.3.5.1. Frame rails, sub-frames/suspension cross-members, and unibodies may have maximum diameter 0.75 (3/4) inch holes drilled into them for purposes other than lightening, such as for the attachment of ancillary parts. Cutting and channeling is not permitted.
- 13.3.5.2. Frame rails may have maximum diameter 1.25 (1-1/4) inch holes drilled solely for the purpose of the placement of jacking lugs/plates.
- 13.3.5.3. Suspension sub-frames/suspension cross-members may be updated or backdated utilizing any OEM factory produced item that is a direct replacement piece for that model, regardless of year or street-legality, provided that it can be installed in the same location and the same manner as on the donor vehicle without modifications.
- 13.3.5.4. Strut tower reinforcement plate addition is permitted.
- 13.3.5.5. Slotting and removal of material from the top surface of the OEM strut/shock tower to the extent necessary to allow simple camber/caster adjustment is permitted.
- 13.3.5.6. The inner/inboard side of the fender well (any non-horizontal aspect) may have holes cut specifically for the purpose of the passage of brake ducts, external shock reservoirs, and brake lines/ABS wires. Plastic fender liners may be modified and/or removed. If the fender well itself is constructed of plastic, it is not considered a “liner”. The front, top, and rear aspects of the fender well may have modifications to allow vent holes for aero and/or cooling purposes (and specifically not for tire height clearance). As such, a component of the topmost aspect of the fender well must remain in the OEM location (but can be made of non-OEM material/venting).
- 13.3.5.7. Modification of the rocker panels solely for the placement of air jacks.
- 13.3.5.8. The transmission tunnel may be modified for the purpose of installing a competition driver seat. The floor pan must remain in its original position.
- 13.3.5.9. Modifications of the floor pan for purposes of exhaust clearance only, and/or the rocker panel for side exit exhaust only are permitted and will be assessed a Modification Factor in the “Adjusted Weight/Power Ratio”.
- 13.3.5.10. Removal of the floor section of the rear hatch/trunk space and either replacement with a sheet metal cover or placement of a fuel cell is permitted without an additional Modification Factor.
- 13.3.5.11. Floor pans may have maximum diameter 0.75 (3/4) inch holes drilled into them for purposes of the attachment of ancillary parts, safety gear, seats, and for the passage of wires and hoses, and specifically not for the passage of suspension components.

13.3.6. Production Vehicle Aerodynamics

- 13.3.6.1. A rear wing (or rear spoiler for wagon-style bodies) may not exceed a height of eight (8) inches above the roof-line (or OEM windshield height for convertibles).
- 13.3.6.2. Modification of the OEM roof line is permitted, but will be assessed via a Modification Factor in the “Adjusted Weight/Power Ratio”.

13.3.7. Production Vehicle Additional Items

- 13.3.7.1. Floor pan modifications to include items such as sub-frame connectors, roll cage bracing, and fuel cell placement may be approved on a case-by-case basis by the National NASA-X Director, and are subject to possible Modification Factor assessments.

- 13.3.7.2. Relocation of suspension mounting points is permitted, provided that the modifications do not violate any of the other rules above. One possible method is via the use of modified mounting point brackets attached to OEM mounting locations.
- 13.3.7.3. Modifications of transmission cross-members and mounts, differential mounts, and radiator core supports are permitted.
- 13.3.7.4. Modification of the OEM front bumper frame cross beam is permitted if a modified or replaced bumper beam remains that is equally strong for crash protection.
- 13.3.7.5. Modification and/or relocation of components of the firewall with engine relocation ten (10) inches or less (i.e. no mid or rear engine conversion) is permitted, but is significantly limited by the requirement to retain the unmodified transmission tunnel and floor pan.

13.3.8. NXA Only Production Vehicle Aerodynamics (does not apply to NXR, NXU, NXS)

- 13.3.8.1. The addition of non-OEM aerodynamic aides or modification of OEM body lines (unless specifically stated otherwise in these rules), will be assessed a Modification Factor to the “Adjusted Weight/Power Ratio” (7.4).

13.3.9. The following are permitted exceptions, and will not necessitate the assessment of the TT3 Non-OEM Aero Modification Factor:

- 13.3.9.1. Undertray/belly pan forward of the centerline of the front axle.
- 13.3.9.2. Removal of a convertible soft top/frame and/or adding a hardtop to a convertible provided that the hardtop uses a sealed rear window and is either OEM, an OEM option, or the same shape and size of an OEM/OEM option top.
- 13.3.9.3. Lexan front, rear, and rear side windows without uncovered holes.
- 13.3.9.4. Front wing window/frame removal and replacement with Lexan.
- 13.3.9.5. Hood replacement/modification for venting and/or weight reduction (“aero” hood pins are permitted).
- 13.3.9.6. Removal/cutting/drilling of the fascia for engine cooling, air intake, and brake ducting purposes.
- 13.3.9.7. Removal of rain gutters/drip edges, windshield wipers, and mirrors.
- 13.3.9.8. Flared and/or rolled fenders.
- 13.3.9.9. NACA ducts, air ducts, or air hoses placed in a side window frame solely for the purpose of driver cooling.
- 13.3.9.10. Headlamp, headlight covers, and fog lights may all be removed. The holes may be left open, used for brake ducts, or must be covered with material that replicates the shape of the OEM light/cover, leaving the shape of the OEM fascia intact.

13.3.10. “Adjusted Weight/Power Ratio” Calculation (NXU, NXS, NXA only)

13.3.10.1. Definitions (NXU, NXS, NXA only)

The “Adjusted Weight/Power Ratio” for each vehicle will be calculated based on a simple competition weight to peak chassis dynamometer (Dyno) 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 competes in a qualifying session or race. Note: peak chassis dynamometer horsepower and dynamometer testing procedures are defined in Section 9.

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 (not contact patch) will be used. All DOT-approved tires must be available for purchase by the general public through Federal or state licensed tire dealers.

13.3.10.2. Modification Factors (NXU, NXS, NXA only)

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.

Non-Production Vehicle: NXU & NXS = -0.4
TT3 = -0.7

Production Vehicle Body Type: 4-door Sedan or 5-door Wagon = +0.2
(none of these apply to Modification of the OEM roof line/shape = -0.3
Non-Production vehicles) Modification of the floor pan for exhaust clearance only
and/or the rocker panel for side exit exhaust only = -0.2
NXA ONLY: Non-OEM Aero (see 7.3.2.D) = -0.4

Engine: Rotary with a maximum of two rotors and one turbocharger turbine = +0.3
Naturally aspirated (non-rotary) engine with displacement 1.9L or less = +0.3
Rear Engine Location ('99+ year only) w/Comp. Wt. less than 2700 lbs = -0.2
Rear Engine Location ('99+ year only) w/Comp. Wt. 2700-2900 lbs = -0.1
(Rear Engine = Behind rear axle only—See Appendix A)

Transmission: Dog-ring/straight-cut gears (non-synchromesh),
and/or sequential/paddle shift/semi-automatic = -0.2
(no assessment for automatic utilizing a torque converter)

Drivetrain: AWD = -0.3
FWD = +1.0

Tires: Non-DOT approved tires = -0.7 (CTSC EC-Dry Continentals see App. A)
Size 10.5” (267mm) to 9.6” (244mm) non-DOT approved = +0.3
Size 9.5” (241mm) or smaller non-DOT approved = +0.7
Size 275 to 250 (DOT approved) = +0.3
Size 245 or smaller (DOT approved) = +0.7

Competition Weight:
Less than:

2999-1800 lbs	1799 lbs or less
3000 lbs -0.1	1800 lbs -2.0
2600 lbs -0.2	
2200 lbs -0.3	

Equal to or Greater than:

3300-3599lbs	3600lbs +
3300 lbs +0.1	3600 lbs +0.4
3400 lbs +0.2	3700 lbs +0.5
3500 lbs +0.3	3800 lbs +0.6

Note: If between 3000 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.

The following vehicles will not use the above tables if the vehicle Competition Weight is less than 1800 lbs. The Competition Weight Modification Factor for these vehicles shall be = -0.3:

Allison Legacy, Baby Grand, Bauer L.P. Catfish, Brunton Stalker, Caterham 7, Exomotive Exocet, Legends, Lotus 7, MNR VortX RT, MNR GM 3, Pro Challenge, Thunder Roadster, Westfield Super 7

13.3.11. Non-Production Vehicles Approved for “Production” Vehicle Status

13.3.11.1. The following vehicles are approved to use “Production” vehicle status in NXU, NXS and NXA, provided that the frame/chassis, body/aero remain in the original manufactured configuration as specified by the manufacturer. Both the “Non-Production Vehicle” Modification Factor and the “Production Vehicle Body Type” Modification Factors will not be assessed, but the vehicle specific Modification Factor listed below for each model will apply:

No Modification Factor Models:

Backdraft Cobra RT3 (no TD body/no aero, no hardtop, FF Challenge air dam ok) = -0.0
Dodge SRT10 Viper ACR-X = -0.0 (may have additional Aero/Body mods)
Dodge Viper Competition Coupe = -0.0 (may have additional Aero/Body mods)
Ferrari 348, 355, and 360 Challenge Series = -0.0 (NXU & NXS) (may have additional Aero/Body mods)
Factory Five Roadster (no aero, no hardtop, FF Challenge air dam ok) = -0.0
Legends = -0.0 (may have additional Aero mods)
Porsche 996 GT3 Cup & 997 GT3 Cup = -0.0 (NXU & NXS), and = -0.4 (NXA)(may have additional Aero/Body mods)
Thunder Roadster pre-'08 body/no-wing type = -0.0

With Modification Factor Models:

Allison Legacy = -0.2 (NXU & NXS), and = -0.5 (NXA)
Baby Grand = -0.2 (NXU & NXS), and = -0.5 (NXA)
Backdraft Cobra RT3 (TD, hardtop, or any aero mods) = -0.2 (NXU & NXS), and = -0.5 (NXA)
Brunton Stalker (no aero) = -0.2 (NXU & NXS), and = -0.4 (NXA)
Caterham 7, Lotus 7, Westfield Super 7 (no aero) = -0.2 (NXU & NXS), and = -0.4 (NXA)
Exomotive Exocet (no aero/wing/splitter) = -0.2 (NXU & NXS), and = -0.4 (NXA)
Ferrari 430, 458 Challenge = -0.2 (NXU & NXS) (may have additional Aero/Body mods)
Factory Five Roadster (if any aero mods, wing, or splitter) = -0.2 (NXU & NXS), and = -0.5 (NXA)
Factory Five Type 65 Coupe = -0.2 (NXU & NXS), and = -0.5 (NXA)
Lotus 2-Eleven = -0.2 (NXU & NXS), and = -0.5 (NXA)
MNR VortX RT (no aero) = -0.2 (NXU & NXS), and = -0.4 (NXA)

Panoz GTRA & GTWC = -0.2 (NXU & NXS), and = -0.5 (NXA) (may have additional Aero mods)
Panoz GTS = -0.3 NXU & NXS), and = -0.6 (NXA) (may have additional Aero mods)
Porsche 991 GT3 Cup = -0.2 (NXU & NXS) (may have additional Aero mods)
Pro Challenge = -0.2 (NXU & NXS), and = -0.5 (NXA)
Thunder Roadster ('08+ aero body/wing type) = -0.2 (NXU & NXS), and = -0.4 (NXA) (may have additional Aero mods including wing removal)

13.3.12. Example Calculations

Example: 2006 Chevrolet Corvette Z06, with OEM transmission, on DOT approved 345 size tires, weighing 3000 lbs, with 375 peak rwhp: $3000/375 = 8.0$ (NXS)

Example: 2003 Dodge Viper Comp Coupe, with OEM transmission, on non-DOT approved 345 size tires, weighing 3600 lbs, with peak chassis dyno power of 620 rwhp: $3600/620 = 5.81$, minus -0.7 (non-DOT's), plus 0.4 (3600 lbs or greater) = 5.51 (NXU)

Example: 2005 Ford Mustang, with dog-ring gearbox, frame/subframe/floor pan mods, on non-DOT 10.5" slicks, weighing 3300 lbs, with peak chassis dyno power of 515 rwhp: $3300/515 = 6.41$, minus 0.4 (Non-Production), minus 0.2 (dog box), minus 0.7 (slicks), plus 0.3 (10.5" non-DOT's), plus 0.1 (3300 lbs or greater) = 5.51 (NXU)

Example: 2005 Subaru STI (awd, 4-door sedan), with OEM transmission, on DOT approved 275 size tires, with TT3 aero mods, weighing 2902 lbs, with 312 peak awhp: $2902/312 = 9.3$, plus 0.2 (4-door sedan), minus 0.5 (TT3 aero), minus 0.3 (AWD) plus 0.3 (275 DOT's), = 9.0 (NXA)

Example: 2009 Thunder Roadster (aero type) with OEM sequential transmission, on DOT approved 245 size tires, weighing 1500 lbs, with 166 peak rwhp: $1495/168 = 8.9$, plus 0.3 (engine displacement less than 1.9L), minus 0.2 (sequential transmission), plus 0.7 (245 DOT's), minus 0.3 (weight factor for TR), minus 0.4 (Production status approval in TT3) = 9.0 (NXA)

Example: 2008 Porsche 997 GT3 Cup, with OEM sequential transmission, on non-DOT approved 320 size tires, weighing 2700 lbs, with 409 rwhp: $2700/409 = 6.60$, minus 0.1 (rear engine), minus 0.2 (sequential transmission), minus 0.7 (non-DOT's), minus 0.1 (less than 3000 lb), minus 0.0 (Production status approval) = 5.50 (NXA) Same car but on 345mm DOT's at 2900 lbs and 345 rwhp = 8.0 (NXS)

Example: Mazda GT tube-frame with sequential transmission, on DOT approved 245 size tires, weighing 2250 lbs, with 247 peak rwhp: $2250/247 = 9.11$, minus -0.7 (Non-Production TT3), plus 0.3 (2 rotor), plus 0.7 (245 DOT's), minus 0.2 (sequential), minus 0.2 (weight) = 9.01 (NXA)

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, 8.00, or 9.0 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 Ford Mustang example above:

$$-0.4 - 0.2 - 0.7 + 0.3 + 0.1 = -0.9$$

$5.5 - (-0.9) = 5.5 + 0.9 = 6.4$ (note that subtraction of the negative number here results in addition) $3300/6.4 = 515.6 = 515$ max hp for NXU $3300/8.9 = 370.8 = 370$ max hp for NXS (note: watch for rounding errors that could lead to non-compliance—If one used 371 hp above, the result would be $3300/371 = 8.894 - 0.9 = 7.994$ which is less than 8.00:1)

13.4. NXB, NXC, NXD, NXE, NXF Classing

13.4.1.1. Base Classes and Modification Points

13.4.1.2. NASA NXB-NXF consists of 5 competition classes, NXB, NXC, NXD, NXE, and NXF. 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. Vehicle model groups are defined for classification purposes in Section 8.2 by those vehicles 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 U.S. domestic market base trim model (BTM), 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 NASA X Director for base classification. Vehicle model groups in Classes B to H, and "NXUSA" (NXU, NXS, NXA, or NXR) are listed as follows below under their base classification in Section 8.2. One asterisk * denotes a seven (7) point initial assessment, and two asterisks ** denotes a fourteen (14) point initial assessment that gets added to the total number of Modification Points for the purpose of up-classing.

13.4.1.3. Cars may be up-classed as defined below in Section 12.4.3 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 8.2 to assign a NASA X base class), must be assessed Modification Points as in Section 8.3. OEM special edition cars that are not listed under the base classifications need to be verified with National NASAX Director 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 NASA X Director will determine the classifications, and they will be posted on the NASA WWW.NASAPRORACING.COM in the Rules section.

13.4.1.4. Once a vehicle exceeds the limits of the NXB class (by initial base classing into "NXUSA", up-classing due to Modification Points, or surpassing the "Adjusted Weight/Horsepower Ratio" limit), it will be classed in either NXR, NXU, NXS, NXA, based on the criteria set forth in Section 7 of these rules. The definition of the term "Adjusted Weight/Power Ratio" and the method of calculation used in NXB-NXF are located in Appendix B of these rules. Note that the weight tables and Modification Factors used to calculate the "Adjusted Weight/Power Ratio" in NXU, NXS, NXA and Super Touring differ from those used in NASA X B-F (and Performance Touring). The minimum "Adjusted Weight/Power Ratio" for any car in NXB is 10.50:1, regardless of how many points it has, or which base class it begins in.

Any car with an “Adjusted Wt/Hp Ratio” lower than this cannot compete in NXB-NXF, and moves to one of the NXR/NXU/NXS/NXA classes.

13.4.1.5. Some NASA race classes and NASA guest classes for purpose-built racecars have been assigned a NASA X competition classification in 8.2.1. Provided that a vehicle complies with all of the rules for its race class, it is exempt from up-classing in Section 8.3. 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 NASA X Director. Drivers of those vehicles must have an official copy of those rules at the track, available for use during tech inspection. Purpose built racecars and kit cars that do not have a base classification may run in the NXR/NXU./NXS./NXA classes, depending on their “Adjusted Weight/Power Ratio”. However, some could possibly be classed into lower level classes on an individual basis as they present for competition. Competitors seeking base classification of their vehicle should contact the National NASA X Director by e-mail (dave@wcsllc.net). New cars will be classified as they enter competition on a provisional basis.

13.4.1.6. 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 individually by the NASA National NASA X Director to determine the correct base class. The competitor must send an e-mail to the National NASA X Director (dave@wcsllc.net) to request the re-classification. (section 8.4)

13.4.1.7. Minimum “Adjusted Weight/Power Ratios” for each Class

Each competition 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 (Section 14) may be assessed.

NXB	10.50:1
NXC	12.00:1
NXD	14.25:1
NXE	16.50:1
NXF	19.50:1

13.4.1.8. The “Adjusted Weight/Power Ratio” is calculated using the actual chassis dynamometer maximum horsepower of the vehicle (rounded to the nearest whole number), the actual, measured post-race/qualifying minimum competition weight with driver (Or, at the discretion of the Series Director, the Minimum Competition Weight listed on the TT Car Classification Form if the vehicle was either not weighed in impound, or the Dyno inspection was done at a random time), and other factors such as body type, transmission type, tire type and size. The method used to calculate the “Adjusted Weight/Power Ratio” is fully described in Appendix B. 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.

13.4.1.9. 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. All (AWD) Dyno test results using a Mustang or Dyno Dynamics dynamometer will have 10% added to the maximum horsepower reading to obtain the number that will be used to calculate the “Adjusted Weight/Power Ratio” (Mustang/Dyno Dynamics Dyno awhp x 1.1 = Maximum awhp for wt/hp calculation).

13.4.1.10. **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 Ratio” 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.

13.4.1.11. Vehicles that have more than one fuel/timing program or “map” in the computer/ECU/PCM must submit their estimated horsepower level for each of those fuel/timing “maps” regardless of which one will be used during competition. As well, the method used to switch between these “maps” must be clearly written on the TT Car Classification Form.

13.4.1.12. Any hardware that allows a competitor or crew member to wirelessly or directly connect to the ECU (or alter ECU maps) at any time during competition or post-competition impound is strictly prohibited, regardless of whether such hardware is external or internal to the ECU, and regardless of the direction of data flow.

13.4.2. Base Classifications

13.4.2.1. Approved NASA Racecar and Guest Racecar Competition TT Classes

13.4.2.1.1. 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 C (see Appendix C for details).

<u>Race Class</u>	<u>NX Class</u>
Allison Legacy	NXD (see Appendix C)
Legends (all)	NXC
Panoz '97-'99 GTRA	NXB (see Appendix C)
RSR	NXB
Spec Racer Ford	NXB

13.4.2.1.2. Base Classification Table and Listed Base Weights

13.4.2.1.2.1. 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 OEM frame rails and rear frame cross beam and/or unibody*, strut towers, floor pan, inner/inboard side of the fender wells (any non-horizontal aspect)**, transmission tunnel, rocker panels, windshield frame location, and sub-frame/suspension cross-member, or is converted (partially or wholly) to a tube-frame design, that is not otherwise classed below or in Appendix A, will default to the NXR/NXU/NXS/NXA classes until evaluated by the National NASA X Director for possible homologation into another class. Individual cars may be approved for classing or re-classing by the National NASA

X Director using the vehicle's actual dynamometer measured maximum chassis horsepower and torque, and the Minimum Competition Weight of the vehicle (with driver).

13.4.2.1.2.2. Frame rails, sub-frames/suspension cross-members, and unibodies may have maximum diameter 0.75 (3/4) inch holes drilled into them for purposes other than lightening, such as for the attachment of ancillary parts. Cutting and channeling is not permitted. b) Frame rails may have maximum diameter 1.25 (1-1/4) inch holes drilled solely for the purpose of the placement of jacking lugs/plates. Modification of the BTM/OEM front bumper frame cross beam is permitted if a modified or replaced bumper beam remains that is equally strong for crash protection. Modification Points may apply as indicated in 8.3.

13.4.2.1.2.3. ** The inner/inboard side of the fender well (any non-horizontal aspect) may have holes cut specifically for the purpose of the passage of brake ducts, external shock reservoirs, and brake lines/ABS wires. Plastic fender liners may be modified and/or removed, provided that the fender well itself is not constructed of plastic.

13.4.2.1.2.4. Any vehicle that has been re-classed by the National NASA X Director and has had a change to either its base class or its base weight in this table since the re-classification was approved MUST be re-submitted for re-classification.

13.4.3. Up-Classing System (NXB-NXF only)

13.4.3.1. Modifications and Point Assessments:

If a car accrues 20 or more points it 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

One (1) asterisk * on a base class assignment denotes a 7 point initial assessment, and two (2) asterisks ** 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 by the National TT Director based on Dyno testing are exempt from this additional five (+5) point assessment.)

All factory options and other modifications by the factory that are not included in the base trim model (BTM) of the Vehicle Model Group must be assessed points. In general, if a BTM item is either removed or re-located, it shall be considered to have been “modified”.

13.4.3.2. **TIRES:**

- 13.4.3.2.1. The following DOT-approved R-compound tires: BFG R1S, Goodyear Eagle RS AC (auto- cross), Hoosier A7, Hankook Z214 (C90 & C91 compounds only), Hoosier Wet DOT (if used in dry conditions—see section 5.6) +22
- 13.4.3.2.2. The following DOT-approved R-compound tires: Hoosier A7 +17
- 13.4.3.2.3. The following DOT-approved R-compound tires and those with a UTQG treadwear rating of 40 or less not listed otherwise in these rules: BFG R1, Goodyear Eagle RS, Hankook Z214 (C71, C70, C51, C50), Hoosier R7, Kumho V710 +10
- 13.4.3.2.4. The following DOT-approved R-compound tires: Hoosier SM7 +9
- 13.4.3.2.5. The following DOT-approved R-compound tires: Hoosier R7, Hoosier SM7 (note: Continental Tire Sportscar Challenge EC-Dry tires (225, 245, 275) OK) +8
- 13.4.3.2.6. The following DOT-approved R-compound tires: Toyo Proxes RR, Hankook TD +7
- 13.4.3.2.7. The following DOT-approved R-compound tires and those with a UTQG treadwear rating over 40: Maxxis RC-1 (examples: Kumho V700, Michelin Pilot Sport Cup & MPS Cup 2, Nitto NT01, Pirelli PZero Corsa, Toyo R888, Toyo RA-1, Yokohama A048, etc.) +6
- 13.4.3.2.8. DOT-approved (non-R-compound) tires with a UTQG treadwear rating of 120-200 (examples: BFG g-Force Rival, Toyo R1R, Dunlop Direzza Sport Z1 Star Spec, Bridgestone Potenza RE070, Kumho Ecsta XS, Yokohama Advan A046 & Neova AD08, Hankook R-S3) +2
- 13.4.3.2.9. Non-DOT-approved racing slicks +30 (of any origin--re-caps and re-treads are not permitted)
- 13.4.3.2.10. 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) or their Final Competition Class. All vehicles in a given base class may use this tire size (or smaller) without a points assessment:
- NXB: 265mm, NXC: 255mm, NXD: 245mm, NXE: 235mm, NXF: 215mm, NXG: 195mm, NXH: 175mm
- 13.4.3.2.11. 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:
- 13.4.3.2.12. 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
Equal to or less than: -10mm -1, -20mm -4, -30mm -7, -40mm -10,
- 13.4.3.2.13. Tire width is determined by the number printed on the tire sidewall by the manufacturer, unless stated otherwise in these rules. If a tire does not have a manufacturer's printed number on the sidewall, then actual tread width measurement (not contact patch) will be used. UTQG tread wear ratings are as of the date of the current version of the TT rules. Any new tire or tire with a changed UTQG tread wear 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. Tire treatments and softeners are not permitted.
- 13.4.3.2.14. Exception(s) to A.8): The Hoosier 255/35-18 (A7 & R7 only) will be assessed points based on its actual 275mm size (and not the 255mm listed on the sidewall)

13.4.3.3. WEIGHT REDUCTION:

13.4.3.3.1. 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 8.2.2). Removal or lightening of engine parts is permitted only as listed elsewhere in these rules. The exterior surface of the roof, hood, body panels, and doors must maintain their BTM size and shape unless listed otherwise in these rules.

13.4.3.3.1.1. If the base weight used for base classing purposes (above in 8.2.2) 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, 470 lbs +32, 485 lbs +33, 500 lbs +34, 515 lbs +35, etc...

13.4.3.3.1.2. *Minimum Competition Weight is the vehicle's lightest weight with the driver and safety gear, during any competition session. Any driver/team whose vehicle at impound does not meet the minimum weight that they have declared on their Car Classification Form will be disqualified if the number of Modification Points based on the lighter actual weight puts the car in a higher competition class. As well, additional penalties may be assessed (sections 8.4.4 and 14) for failing to meet the listed weight on the Car Classification Form.

13.4.3.4. ENGINE:

13.4.3.4.1. Engine swap: All engine swaps must be evaluated for new base classification by the National NASA X Director on an individual basis. Competitors must submit an e-mail request for re-classification of the vehicle. A printed copy of the Official Re-Class e-mail from the National NASA X Director must be attached to the NASA X Car Classification Form.

13.4.3.4.2. Almost all engine swaps will require chassis Dyno testing of the competition-ready vehicle (See section 8.4 for Dyno Re-classing, Testing, and Re-class request procedures).

13.4.3.4.3. Increased number of camshafts, non-BTM (non-stock) head(s)/hybrids, port modified rotary engines, and non-BTM/upgraded/modified turbo or superchargers all require Dyno Re-classing by the National NASA X Director. A printed copy of the Official Re-Class e-mail from the National NASA X Director must be attached to the NASA X Car Classification Form. (See section 8.4 for Dyno Re-classing, Testing, and Re-class request procedures). This includes all OEM/BTM forced induction vehicles with an upgraded or modified turbo or supercharger. 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-classed again.

13.4.3.4.4. Aftermarket computer system (any non-BTM "stand-alone" or "piggyback"): +3 naturally aspirated, +10 forced induction

- 13.4.3.4.5. Modification of the BTM air intake/box, air filter location, air piping to the turbo/supercharger/intercooler/throttle body/carburetor, or hood/fascia/fender air inlet(s), outlets, or vents +1 (air filter upgrade alone—0 pts.)
- 13.4.3.4.6. Non-BTM, deleted, or modified/porting throttle body +2; independent throttle bodies +4
- 13.4.3.4.7. Non-BTM or modified carburetor, fuel rail, fuel injectors, fuel pump(s), and/or fuel pressure regulator +2 (no points for fuel pump alone if using BTM fuel and timing maps, sensor inputs and ignition timing)
- 13.4.3.4.8. Non-BTM, modified/porting, or deleted intake manifold: 4 cyl. +1, 6cyl. +2, 8 cyl. +3, 12A & 13B rotary +2, all other rotary +3
- 13.4.3.4.9. Water injection system +6 (alcohol-water mixtures are not permitted)
- 13.4.3.4.10. Nitrous oxide injection is not permitted.
- 13.4.3.4.11. Replacement pulleys (other than for supercharger) or non-electrical fan removal +1
- 13.4.3.4.12. Replacement pulley for BTM supercharger or replacement of any pulley that affects BTM supercharger speed +4
- 13.4.3.4.13. Aftermarket boost controller or modification/alteration of BTM vacuum lines that serve to function as a boost controller +4
- 13.4.3.4.14. Aftermarket or modified wastegate actuator, wastegate, or vacuum line(s) that serve to control the wastegate actuator function or increase peak boost +3
- 13.4.3.4.15. Add aftermarket intercooler +7
- 13.4.3.4.16. Non-BTM or modified intercooler +4 (Intercooler sprayers are not permitted unless they came on the OEM base trim model of the vehicle).
- 13.4.3.4.17. 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: 1852cc/1799cc = 1.029 minus 1 = .029 x 100 = 2.9% (+4 pts.)*
- 13.4.3.4.18. Modified or non-BTM camshaft(s), rocker arms, push rods, lifters, or cam timing gears +6 (for one or more)
- 13.4.3.4.19. Valve size change, modified, porting or polished BTM head (other than simple shaving of the head only) +6
- 13.4.3.4.20. 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
- 13.4.3.4.21. De-stroked engine +4
- 13.4.3.4.22. Added dry sump oil system +7 (+14 if motor is lowered from BTM location)
- 22) Modification, porting, or replacement of the BMT exhaust manifold or header(s) (includes any/all other exhaust and catalytic converter modifications) +5
- 13.4.3.4.23. Any modification to the BTM exhaust piping and/or catalytic converter (includes muffler modification or replacement) +3
- 13.4.3.4.24. Non-BTM or modified resonator(s) or muffler(s) only (no exhaust piping modifications) +1
- 13.4.3.5. **DRIVETRAIN:**
 - 13.4.3.5.1. Non-BTM sequential (semi-automatic) or dog-ring (non-synchromesh) transmission (includes altered gear ratios) +7 (does not include automatic transmissions utilizing a torque converter)
 - 13.4.3.5.2. Double clutch transmissions with altered gear ratios +6 (do not also assess 13.8.3 & 13.8.4)
 - 13.4.3.5.3. Modify number of forward gears in transmission or altered gear ratios +3
 - 13.4.3.5.4. Added paddle/electronic shift +3
 - 13.4.3.5.5. Added limited slip differential or welded/locked differential +3

- 13.4.3.5.6. Changed or modified limited slip differential (or welded/locked BTM LSD) +1
- 13.4.3.5.7. Added traction control +3 (no points if proven disabled during competition)
- 13.4.3.5.8. Relocation of engine/transmission between 1 and 10 inches of the BTM location +7 (note: Relocation of less than 1 inch is not assessed points. Original engine location shall be based on the BTM rear face of the engine block and the BTM crankshaft centerline.)
- 13.4.3.5.9. Modification/upgrade from a fixed to a floating rear axle +3

13.4.3.6. SUSPENSION:

- 13.4.3.6.1. Non-BTM shocks/struts/dampers with an external reservoir or more than two ranges of adjustment—must still take points for springs below +8 (example: compression (bump) and both high & low rebound adjustments).
- 13.4.3.6.2. Non-BTM shocks/struts/dampers with a “Piggy Back” external reservoir (fixed reservoir without a connecting hose) OR with shaft diameter 40mm or greater—must still take additional points for the springs below +5
- 13.4.3.6.3. Non-BTM or modified/re-valved shocks/struts/dampers +3 (all others)(springs not included)
- 13.4.3.6.4. Changing the mounting orientation/design of the BTM shock and/or spring perch in order to invert the front shocks/struts (includes non-BTM inverted shocks/struts) +1
- 13.4.3.6.5. Non-BTM or modified coil springs, leaf springs/spacers/brackets, or torsion bars +2
- 13.4.3.6.6. Conversion of torsion bar/leaf spring suspension to coil spring and strut/shock suspension +2
- 13.4.3.6.7. Add, replace, remove, or modify anti-roll bars (“sway” bars—front, rear, or both) or end links—may have spherical joints on the end links and/or relocation of the mounting points without additional points assessment +2
- 13.4.3.6.8. Non-BTM driver/cockpit adjustable sway bar or suspension settings +4
- 13.4.3.6.9. Replace, modify, or remove control arms (including toe arms/links) (other than plates, shims, or eccentric bolts/bushings for simple camber/caster adjustment only) or RWD/AWD rear trailing arms (may have spherical/metallic joint for the connection to the spindle/knuckle) +4
- 13.4.3.6.10. Non-BTM rear control arms on FWD vehicles (for stiffness and wheel alignment only, no change in suspension mount or pick-up points from stock) +1 (if both front and rear use 13.9.9)
- 13.4.3.6.11. Non-BTM rear trailing arms on FWD vehicles (for stiffness only, no change in suspension mount or pick-up points from stock) +1
- 13.4.3.6.12. Using the alternate control arm mounting location on cars equipped BTM with multiple choices (example: to increase track width) +6
- 13.4.3.6.13. Relocation of front suspension mounting points +6
- 13.4.3.6.14. Relocation of rear suspension mounting points +6
- 13.4.3.6.15. Front steering tie rod bump steer modifications or shimming of the steering rack +2
- 13.4.3.6.16. Alteration of ball joints/dive angles +2
- 13.4.3.6.17. Add panhard rod or Watts link (regardless of whether or not the Watts link replaces a BTM panhard rod or the panhard rod replaces a BTM Watts link) (may have spherical joints without an additional points assessment) +4
- 13.4.3.6.18. Replace or modify a BTM panhard rod or Watt’s link (may have spherical joints without an additional points assessment) +2
- 13.4.3.6.19. Add torque arm (may have spherical joints without an additional points assessment) +4

- 13.4.3.6.20. Replace or modify a BTM torque arm (may have spherical joints without an additional points assessment) +2
- 13.4.3.6.21. Add a third link to the rear suspension that does not penetrate the floor (may have spherical joints without an additional points assessment) +4
- 13.4.3.6.22. Metallic and/or spherical-design replacement suspension bushings +3 (except for pillow ball camber plate joints, sway bar end links already assessed points in E.7) above, control arm spindle/knuckle joints already assessed points in 13.9.9) above, and panhard rod, Watts link, torque arm, and third links already assessed in 13.9.17), 13.9.18), 13.9.19), 13.9.20), and 13.9.21) above.)
- 13.4.3.7. BRAKES/CHASSIS
 - 13.4.3.7.1. Non-BTM, modified, or relocated brake calipers and/or brake caliper brackets and/or brake rotor diameter +2
 - 13.4.3.7.2. Add front lower stress/arm brace (two attachment points maximum) +1
 - 13.4.3.7.3. Add a third or fourth attachment point to a front or rear strut tower bar (or replace an existing/BTM three point bar) +1 (Additional attachment points must not be tied to any other type of mounting point with anything other than sheet metal)
 - 13.4.3.7.4. Add or modify other chassis stiffening devices or fabricated parts (such as lower stress/arm braces with greater than two attachment points, sub-frame connectors, sub-frame braces, sub-frame mounts, and non-rubber/non-Poly sub-frame bushings, etc.) +3
 - 13.4.3.7.5. Increase in track width greater than four (4) inches due to non-BTM 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)
- 13.4.3.8. AERODYNAMICS:
 - 13.4.3.8.1. Add, replace, or modify front fascia and/or air dam +3 (except as provided for in I.c.3), I.f.3), I.h.14) of the No-Points Modification list) The air dam must be vertical (5° tolerance) and must not protrude from the side of the vehicle or it will be assessed an additional +3 points. Additional points must be assessed below for any component of the added, replaced, or modified fascia or air dam that performs the functions of G.2) and G.3) below.
 - 13.4.3.8.2. Add, replace or modify a single flat, horizontal, front splitter +3 This part may extend horizontally past the side of the vehicle no greater than five inches, with no limit on frontward protrusion. 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 G.4) below. No material, filler, or part may extend the vertical reach of the BTM front fascia without taking fascia/air dam modification points above (G.1).
 - 13.4.3.8.3. Add or modify canards/winglets (includes portions of an added/modified/replaced fascia that provide a downward force other than that listed in G.2) above) +2
 - 13.4.3.8.4. Add, replace, or modify rear wing and/or spoiler +4 (a rear wing or spoiler may not exceed a height of eight (8) inches above the roofline (or BTM windshield height for convertibles), or a width greater than the width of the car body. (note: additional points must be assessed for end plates that are greater than twelve inches in height---G.8) below)
 - 13.4.3.8.5. Add or fabricate flat bottom/belly tray (rearward of the centerline of the front axle) +5
 - 13.4.3.8.6. 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---G.8) below) +2

- 13.4.3.8.7. Replace or modify BTM 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---G.8) below) +1
- 13.4.3.8.8. Add rear vertical panels in any location (note: see G.3), G.6), G.7), and G.10)) +2
- 13.4.3.8.9. Add or modify side skirts (side skirts must be vertical or an OEM option only, and cannot connect to any other aero component) +2
- 13.4.3.8.10. Add vortex generator to roof, rear window, or rear deck lid (note: additional points must be assessed for any vertical panels incorporated into a vortex generator that are greater than five inches in height---G.8) above) +1
- 13.4.3.8.11. Removal of the front windshield/windshield frame +7 (raking is not permitted)
- 13.4.3.8.12. Front side window frame air dams/diverters (driver and/or passenger side) +2
- 13.4.3.8.13. Add a non-OEM hardtop to a convertible that is not the identical shape and size of either the BTM or OEM option hardtop for that car model +5 (note: The top must not extend rearward of the front edge of the rear deck lid.)(“Fastback” tops and tonneau covers are not permitted.)

Note: Active aerodynamic modifications (including, but not limited to, computerized, cockpit adjustable, self-adjusting, and OEM/BTM, etc.) are not permitted.

13.4.3.9. ROLL CAGES:

- 13.4.3.9.1. 4-point roll bar and 6-point (two main hoop, two rear brace, two forward hoop) roll cage designs constructed per the NASA CCR may be utilized without a TT Modification Point assessment. Two additional attachment points for either two foot-well bars or two bars to the front firewall (one on each side) may be added without a NASA X Modification Point assessment. Additional bars and/or gusseting within the structure of the cage are permitted without a NASA X Modification Point assessment. Gusseting of the 6 (CCR) attachment points listed above is permitted without a NASA X Modification Point assessment provided that the gussets are attached to the tube no further than six (6) inches from the end of the tube, and to the chassis no further than six (6) inches from the end of the tube where it terminates at the plate. Up to three additional attachment points solely for the purpose of bars connecting “NASCAR” style driver-side door bars to the rocker panel are permitted without a NASA X Modification Point assessment. Additional attachment points within the driver’s compartment that exceed these allowances are also permitted, but will be assessed points as follows:
 - 13.4.3.9.2. One or more bars that penetrate the front bulkhead/firewall +2
 - 13.4.3.9.3. Any other attachment point to the chassis +2
(Note: It is considered a safety hazard to cut through bars without removing them in order to avoid the Modification Point assessments above.)

13.4.3.10. NO-POINTS MODIFICATIONS:

- 13.4.3.10.1. Tires
 - 13.4.3.10.1.1. Tire pressure monitoring systems (TPMS) (Pressure release valves are not permitted.)
- 13.4.3.10.2. Weight Reduction
 - 13.4.3.10.2.1. Sun/moonroof removal and cover roof hole.
 - 13.4.3.10.2.2. Battery replacement/lightweight battery/dry cell
 - 13.4.3.10.2.3. Air bag removal (must be removed or disabled)
 - 13.4.3.10.2.4. Floor mat removal (required)
 - 13.4.3.10.2.5. BTM jack and spare tire removal, pneumatic/air jack(s) addition

- 13.4.3.10.2.6. BTM air conditioner system removal with or without A.C. delete pulley--no point assessment for C.10).
- 13.4.3.10.2.7. Lexan windshield, rear window, and rear passenger side windows (windshield must be 3/16" minimum thickness). (See section 7 Safety regarding front side windows) No uncovered holes are permitted in rear windows. Holes covered with tape or other non-porous material preventing air movement are permitted. Rear window removal without replacement is not permitted.
- 13.4.3.10.2.8. Front wing window/frame removal and replacement with Lexan

13.4.3.10.3. Engine

- 13.4.3.10.3.1. 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 with the exception that rotary engine vehicles may add any commercially available oil designed for two-stroke engines as a "pre-mix. Retail available E-85 is permitted.
- 13.4.3.10.3.2. Air filter upgrade (without modification of the air filter housing or air intake system)
- 13.4.3.10.3.3. 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), and/or radiator core support modification/replacement.
- 13.4.3.10.3.4. Starter motor replacement
- 13.4.3.10.3.5. Alternator replacement and/or relocation
- 13.4.3.10.3.6. Spark plug wires, plugs, coil, ignition replacement/upgrade

13.4.3.10.4. BTM ECU/PCM reprogramming via reflashing or replacement/aftermarket ROM chips or simple ROM boards (The BTM ECU/PCM box/housing and hardware must be used).

- 13.4.3.10.4.1. SAFC or VAFC (Super Air Flow Converter/VTEC Control Air Flow Converter)
- 13.4.3.10.4.2. Non-BTM sensors or alteration of sensor inputs (such as non-programmable MAF or MAP voltage "clamps")
- 13.4.3.10.4.3. Ignition timing adjustments
- 13.4.3.10.4.4. Drive by wire to cable throttle conversion (throttle body must remain identical to BTM in both size and shape to avoid a +2 throttle body assessment).
- 13.4.3.10.4.5. Oil systems and coolers other than added dry sump
- 13.4.3.10.4.6. Oil catch tanks/cans
- 13.4.3.10.4.7. Valve cover replacement or modification
- 13.4.3.10.4.8. Carburetor jetting modification
- 13.4.3.10.4.9. Carburetor vacuum port blocking
- 13.4.3.10.4.10. The addition of a second fuel pump, serving only as a transfer pump to help prevent fuel starvation, that is not connected to the fuel line providing fuel to the engine in any way, and does not increase the maximum fuel flow or pressure provided by the BTM fuel pump
- 13.4.3.10.4.11. 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, they must be of equal or heavier weight than the BTM parts, and 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.) If forged internals used are lighter than the BTM internals, then Dyno Re-classing (Section 8.4) should be used to prevent disqualification.

- 13.4.3.10.4.12. Engine balancing and blueprinting
- 13.4.3.10.4.13. Removal of the engine balance shaft and/or balance shaft drive mechanism
- 13.4.3.10.4.14. Non-BTM valve springs and retainers, piston rings, and rotary apex seals
- 13.4.3.10.4.15. Turbo blow-off valve upgrade, modification, or addition
- 13.4.3.10.4.16. Header and exhaust piping external wrapping, coatings, and/or paint. (The original OEM identification markings must still be legible on all exhaust components that are not assessed points on the Car Classification Form.)
- 13.4.3.10.4.17. EGR, smog pump, charcoal canister and associated vacuum line and hose removal.
- 13.4.3.10.4.18. Cryogenic treatment of engine components.
- 13.4.3.10.4.19. Removal of BTM coolant hoses to the throttle body (without throttle body modification.)
- 13.4.3.10.4.20. Re-routing of BTM coolant hoses, and/or removal of heater core.

13.4.3.10.5. Drivetrain

- 13.4.3.10.5.1. Wheels, wheel studs, wheel bearings replacement/upgrade, hub modification/replacement, axle modification or replacement (unless otherwise assessed points above). Spindles/steering knuckles may be modified or replaced as a No-Points modification to allow for hub size change provided that there are no changes in suspension geometry or mounting point locations (such as tie rod connection height, ball joint connection location/height, etc.)
- 13.4.3.10.5.2. Replaced or lightweight flywheel, clutch assembly, and/or driveshaft
- 13.4.3.10.5.3. Motor, transmission, and differential mounts and inserts/bushings replacement/upgrade or modification (with up to 1 inch of relocation of the motor/transmission)
- 13.4.3.10.5.4. Final drive ratio modification
- 13.4.3.10.5.5. Cryogenic treatment of transmission and differential components
- 13.4.3.10.5.6. Transmission and Differential coolers
- 13.4.3.10.5.7. Differential housings (see D.5) & D.6) if there are LSD modifications)

13.4.3.10.6. Suspension

- 13.4.3.10.6.1. 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--such as control arm, ball joint, and relocated mounting point modifications). Slotting of the BTM bolt holes and removal of material from the top surface of the BTM strut/shock tower to the extent necessary to allow simple camber/caster adjustment is permitted.). Bolt on camber/caster plates are not assessed points.
- 13.4.3.10.6.2. Ride height adjustment (must still take points for springs and torsion bars above)
- 13.4.3.10.6.3. Non-metallic and/or non-spherical type replacement suspension bushings
- 13.4.3.10.6.4. 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.)
- 13.4.3.10.6.5. Inverted rear shocks/struts.

13.4.3.10.7. Brakes/Chassis

- 13.4.3.10.7.1. Non-BTM brake pads and rotors (BTM rotor diameter may not be changed; otherwise, F.1 shall apply)
- 13.4.3.10.7.2. Brake lines, boosters, proportioning valves, and master cylinder modification, replacement, and bracing.
- 13.4.3.10.7.3. 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 C.4).
- 13.4.3.10.7.4. ABS (anti-lock braking system)--Only OEM systems offered specifically for the car model as a factory option. No OEM systems offered for a different car model or aftermarket systems are permitted.
- 13.4.3.10.7.5. Emergency brake removal
- 13.4.3.10.7.6. 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. (supersedes Section 15.20 of the NASA CCR)
- 13.4.3.10.7.7. Seam welding of the body/unibody
- 13.4.3.10.7.8. Shock tower reinforcement plate (to strengthen tower shock mount location only--no bars)
- 13.4.3.10.7.9. Add front strut tower bar (two attachment points—bolted in or as component of the cage)
- 13.4.3.10.7.10. Add rear strut tower bar (two attachment points—bolted in or as a component of the cage)
- 13.4.3.10.7.11. Rubber and Polyurethane sub-frame bushings (not Delrin, metal, or other materials)
- 13.4.3.10.7.12. Modification of the BTM front bumper frame cross beam is permitted if a modified or replaced bumper beam remains that is equally strong for crash protection.

13.4.3.10.8. Aerodynamics

- 13.4.3.10.8.1. Undertray/ belly pan forward of the centerline of the front axle
- 13.4.3.10.8.2. No aero points for removal of convertible soft top/frame and/or adding a hardtop to a convertible provided that the hardtop must be either a BTM, OEM option, or BTM/OEM option shape and size only, and must use a sealed rear window. (i.e., lightweight ok, but no tops with non-OEM aero features).
- 13.4.3.10.8.3. Windshield wiper blade removal.

13.4.3.10.9. Body

- 13.4.3.10.9.1. Rolled fender lips
- 13.4.3.10.9.2. Flared fenders (Alteration of the inner aspect of fender wells is not permitted, i.e. “tubbing”)
- 13.4.3.10.9.3. Steering wheel replacement
- 13.4.3.10.9.4. Mirror addition, removal, or replacement
- 13.4.3.10.9.5. Gear shifters and shift knob replacement/upgrade
- 13.4.3.10.9.6. Seat harnesses (must be compliant with NASA CCR)
- 13.4.3.10.9.7. Non-BTM driver’s seat
- 13.4.3.10.9.8. Non-BTM front passenger seat
- 13.4.3.10.9.9. Relocated Battery

- 13.4.3.10.9.10. Accelerator, brake, and clutch pedal modification or replacement.
- 13.4.3.10.9.11. Steering rack replacement or modification (without geometry change unless taking points for E.18). Rack ratio change is permitted. Change from BTM power steering to manual, and/or modification of the power steering pump requires the point assessment for engine pulley in C.10).
- 13.4.3.10.9.12. NACA ducts, air ducts, or air hoses placed in a side window frame solely for purposes of driver cooling.
- 13.4.3.10.9.13. Headlamps, headlight covers, and fog lights may all be removed, and the holes may be covered with material that replicates the shape of the BTM light/cover, leaving the shape of the BTM 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 C.4).
- 13.4.3.10.9.14. Removal of the spare tire floor section of the rear hatch space for the purpose of placement of a fuel cell (only).
- 13.4.3.10.9.15. The transmission tunnel may be modified for the purpose of installing a competition driver seat. The floor pan must remain in its original position.
- 13.4.3.10.9.16. Data acquisition systems—Telemetry directly or indirectly from/to the ECU is not permitted.
- 13.4.3.10.9.17. Dashboard modification, removal, and/or replacement
- 13.4.3.10.9.18. Hood pin addition or replacement, including “Aero” type hood pins.
- 13.4.3.10.9.19. Fiberglass/carbon fiber doors are permitted provided that the exact BTM body lines are maintained, the doors are still on hinges, and they have an operational external handle.

Note: For NASA racecars/guest classes that are given a base classification in 8.2.1, these modifications must also be legal under the racecar’s class rules. The race class rules for these cars 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.

13.5. BTM (Base Trim Model) Definition, Updating and Backdating Rules

13.5.1. For the purposes of NASA X Modification Points assessments, the term BTM 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 trim model as it is listed in section 8.2 Base Classifications (factory options and specialty model parts are considered non-BTM) or is listed as a standard replacement part by the manufacturer (OEM). 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 BTM 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 NASA X Director prior to competition is advised for any driver using a vehicle with replacement parts that fall under this exception.

13.5.2. **All factory optional parts, upgrades, and modifications to 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 8.2 for a non-base trim model.

13.5.3. Updating of parts between different model years of the same vehicle model is legal provided that the competing vehicle is both in the same model group listing (same line) in the Table in 8.2.2, and in the same generation of that vehicle model, and that the entire assembly is replaced. Backdating of parts between different model years of the same vehicle model is legal provided that the competing vehicle is both in the same generation and is in the same or higher base class. No interchange of parts between assemblies is permitted in order to create a new assembly. Updating or backdating (without a points 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 NASA X 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 specific approval by the National NASA X Director.

14. Website Posting

14.1. A variety of useful information pertaining to our regional and National NASA X programs will be posted on the National NASA X website **REMOVED** 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.

Appendix A—Technical Bulletins for Specific Models/Items

Allison Legacy: (NXD):

Maximum Dynojet 105 rwhp/140 ft-lbs

Minimum competition weight: 1675 lbs

All vehicles must comply with the Allison Legacy Race Series 2010 Rule Book

(note: Allison Legacy cars built for the 2012 Pro 4 Stock Car Road Racing Series have not been approved for NXD at the time of this publication. They can compete in NXU,S,A)

BMW E46 models in the 1999–2006 range:

Allowance of repair and/or prevention of rear sub-frame connection point failures as noted in the settlement of the class action lawsuit settled 8-10-09 with BMW. The following modifications are permitted without a Modification Point or Modification Factor assessment, and are not intended as performance enhancing modifications:

The material used cannot exceed 0.110” (inches) in thickness. Plates may be trimmed to fit the area being repaired or reinforced. Any vertical offset of the sub-frame or suspension caused by the use of these plates is legal. Holes are allowed for the existing fasteners and for additional holes for rosette welds. Existing cracks or damage may be welded before the repair.

1. One plate (A) not to exceed 206MM x 108mm in size. Two bends are allowed to contour to chassis but must be included in overall size.

2. One plate (B) not to exceed 163mm x 81mm in size. One bend allowed to contour to chassis but must be included in overall size.

3. Two plates (C) not to exceed 134mm x 73mm in size, (one plate per side).

4. Two plates (D) not to exceed 66mm x 42mm in size, (one plate per side).
5. Two plates (E) not to exceed 82mm x 92mm in size, (one plate per side).

Plates (A), (B), (C), and (D), must be placed between the sub-frame and differential carrier and can be attached to the underbody by welding or bonding. Plate (E) can only be used in the trunk area to cover the access hole made to weld the top of the sub-frame connections, and can be attached by welding or bonding.

Chevrolet Corvette C5 & C6:

Removal of the B-pillars (and OEM arch) above the window sill lines is permitted if replaced with a NASA-legal full competition race cage. Any changes to the roof line will result in the Modification Factor assessment listed in the rules above.

The OEM driver side floor top layer of fiberglass and balsa wood under the seat may be removed without a Modification Factor assessment for the purpose of gaining head room for the driver. When inspected from the underside, the OEM floor pan must be unchanged, and the OEM metal supports where the seat studs attach must be unaltered.

The OEM balsa wood floors may have the wood removed and substitute meta flooring in the same location as the OEM wood floors with an additional Modification Factor of -0.2. It is not permitted to raise or lower the floor from the OEM height compared to the rest of the body/chassis, without taking the "Non-Production Vehicle" Modification Factor. If the wood flooring is left intact, metal plating may be placed over the wood, inside the cockpit, without an additional Modification Factor.

CTSC Tires:

Continental Tire Sports car Challenge EC-Dry tires (225, 245, 275 only) are exempt from the -0.7 Modification Factor for Non-DOT approved tires when calculating the "Adjusted Wt/Hp Ratio". They will use the tire size Modification Factors for DOT approved tires. As well, they are +8 point tires under section 8.3.A.5. (Does not include "Rolex series" tires).

Factory Five Roadster and Backdraft Cobra (NXU/NXS/NXA only):

No Modification Factor for FF Challenge "standard front air dam" or exact replica built with different material on Production status approved vehicles.

Ford Mustang and BMW E-36 M3 (NXU/NXS/NXA only):

"Upper sub-frame connectors" that penetrate and modify the floor pan 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/BTM mounting locations for the toe link ends will be assessed an additional +6 pts. for "relocation of rear suspension mounting points".

Mazda Miata ('90-'97):

Replacement of the OEM/BTM '90-'93, '95 (with VIN's higher than 14193), '96-'97, and '99-'00 Mazda Miata ECU 4.0MHz "clock" crystal, and the OEM/BTM '94 and '95 (with VIN's lower than 14193) Mazda Miata ECU 8.0MHz "clock" crystal with an aftermarket crystal of different frequency, sometimes referred to as "overclocking" of the ECU, is permitted as a no-points modification.

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, TT and NASA X without a points assessment. Any other changes to the Watts link will require a points assessment per the NASA X 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-BTM sleeves added, modification of the BTM sleeves, or other modification to the runners, the car will need to be re-classified based on Dyno testing.

Nissan Sentra:

The Scott Russell linkage shall be deemed to be equivalent to a BTM Watts link when assessing points for Suspension mods E.17 and E.18.

Panoz GTRA (NXB):

'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
(may use either Koni yellow 30-1695 (front) and 30-1696 (rear) rebound adjustable shocks, OR Koni black 30-1695 SP8 (front) and 30-1696 SP8 (rear) rebound adjustable shocks, Tremec 3550 5 speed, Brembo 325mm floating brakes--pads open)

Rear Engine Location (NXU/NXS/NXA only):

This Modification Factor applies only to vehicles with engines that are behind the rear axle, with model years from 1999 to present, and with the listed Minimum Competition Weight. Vehicles with rear engine location that are from prior to 1999, or weigh more than 2900 lbs or already take the Modification Factor assessment for Non-Production vehicle are not assessed a Modification Factor for Rear Engine Location.

S2000 and Adjustable Ball Joints:

S2000's, and all other cars, that are using aftermarket adjustable ball joints to gain camber, must take the +2 point assessment for "Alteration of ball joints/dive angles".

Appendix B—"Adjusted Weight/Power Ratio" Calculation for NXB-NXF

All TTB-TTF cars are subject to a limit on their "Adjusted Weight/Power Ratio", where exceeding that limit would bump the car into a higher NASA X class or into the NXU/NXS/NXA classing system.

Note: The weight tables for NXB-NXF listed here are different than for NXU/NXS/NXA.

The "Adjusted Weight/Power Ratio" for each vehicle can 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 competes in a timed session.

Note: Peak chassis dynamometer horsepower and dynamometer testing procedures are defined in Section 9.

(All horsepower measurements are rounded to the nearest whole number.)

(AWD cars utilizing a Mustang or Dyno Dynamics Dyno for testing must multiply the hp result by 1.1)

The "Modification Factor" listed after each item below is added or subtracted from the actual measured wt/hp ratio to determine the "Adjusted Weight/Power Ratio" that determines vehicle legality in each TTB-TTF class.

_____ Base Wt/HP Ratio (_____ lbs competition weight / _____ peak chassis horsepower)

_____ Body Type: 4-door Sedan or 5-door Wagon = +0.2

_____ Transmission: Dog-ring/straight-cut gears (non-synchromesh), sequential/paddle shift/semi-automatic = -0.2

Note: There is no assessment for an automatic transmission utilizing a torque converter.

_____ Drivetrain: AWD = -0.3
FWD = +1.0

_____ Tires: Non-DOT approved tires = -0.75 (*Note: CTSC EC-Dry tires exempt*)
Size 10.5" (267mm) to 9.6" (244mm) non-DOT approved = +0.4
Size 9.5" (241mm) or smaller non-DOT approved = +0.8
Size 275 mm to 250 mm (DOT approved) = +0.4
Size 245 mm or smaller (DOT approved) = +0.8

Note: The tire Modification Factors are additive, if two or more are applicable.

Note: The tire Modification Factors are applied based on the widest tire on the car.

_____ Competition Weight:

Equal to or **less** than:

3200 lbs - 0.05	2750 lbs - 0.50	2300 lbs - 0.95	1850 lbs - 1.40
3150 lbs - 0.10	2700 lbs - 0.55	2250 lbs - 1.00	1800 lbs - 1.45
3100 lbs - 0.15	2650 lbs - 0.60	2200 lbs - 1.05	1750 lbs - 1.50
3050 lbs - 0.20	2600 lbs - 0.65	2150 lbs - 1.10	1700 lbs - 1.55
3000 lbs - 0.25	2550 lbs - 0.70	2100 lbs - 1.15	1650 lbs - 1.60
2950 lbs - 0.30	2500 lbs - 0.75	2050 lbs - 1.20	1600 lbs - 1.65
2900 lbs - 0.35	2450 lbs - 0.80	2000 lbs - 1.25	1550 lbs - 1.70
2850 lbs - 0.40	2400 lbs - 0.85	1950 lbs - 1.30	1500 lbs - 1.75
2800 lbs - 0.45	2350 lbs - 0.90	1900 lbs - 1.35	1450 lbs - 1.80

Equal to or **greater** than:

3400 lbs +0.05	3650 lbs +0.30	3900 lbs +0.55
3450 lbs +0.10	3700 lbs +0.35	3950 lbs +0.60
3500 lbs +0.15	3750 lbs +0.40	4000 lbs +0.65
3550 lbs +0.20	3800 lbs +0.45	
3600 lbs +0.25	3850 lbs +0.50	

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.

_____ “ADJUSTED WEIGHT/POWER RATIO”

NXB 10.50:1 minimum

NXC 12.00:1 minimum

NXD 14.25:1 minimum

NXE 16.50:1 minimum

NXF 19.50:1 minimum

Example Calculations of “Adjusted Wt/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 (NXS)

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 (NXU)

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 (NXR)

<u>Make</u>	<u>Model</u>	<u>Class</u>	<u>Wt.</u>	<u>Make</u>	<u>Model</u>
Acura	CL 2.2L	NXG	3064	Audi	S8 ('01-'03)(AWD)
Acura	CL V6	NXF*	3470	Audi	TT (180 hp)('00-'06)
Acura	CL-S	NXE	3510	Audi	TT (225 hp)('02-'06)(AWD)
Acura	CL-S (6 spd)	NXE	3446	Audi	TT (250 hp)('04-'06)(AWD)
Acura	ILX 2.4L ('13)	NXE	3000	Audi	TT Quattro 3.2L ('08-'09)(AWD)
Acura	Integra 1.6L ('86-'89)	NXF	2300	Audi	TT RS 2.5 Coupe ('12-'13)(AWD)
Acura	Integra 1.8L (non-VTEC)('90-'93)	NXF*	2575	Austin	Mini 1L (<40hp)
Acura	Integra 1.8L (non-VTEC)('94-'01)	NXF*	2625	Austin	Mini 1L, 1.1L (40 to 47hp)
Acura	Integra GS-R	NXE	2667	Austin	Mini Cooper (55hp)
Acura	Integra Type-R	NXD	2600	Austin	Mini Cooper 1071S
Acura	NSX 3.0L ('91-'96)	NXC**	3047	Austin	Mini Cooper 1275S
Acura	NSX	NXC**	3153	BMW	128i Coupe ('08-'09)
Acura	RL ('05-'07)	NXE	3984	BMW	135i Coupe ('08-'12)
Acura	RL (pre'05)	NXG**	3920	BMW	135i Convertible ('08-'12)
Acura	RSX	NXF**	2734	BMW	1 M Coupe ('11)(3.0L turbo)
Acura	RSX-S	NXD	2770	BMW	2002 ('68-'74)
Acura	TL ('04-'05)	NXE*	3465	BMW	2002 ('75-'76) (2403 lb)
Acura	TL 3.2L ('06-'07)	NXE	3580	BMW	2002tii
Acura	TL Type-S 3.5L ('07-'08)	NXE**	3559	BMW	228i ('14-'15)(2.0L turbo)
Acura	TL (pre '04)	NXF*	3487	BMW	318 1.8L (E30)(pre-'92)
Acura	TL-S ('02-'03)	NXE	3558	BMW	318 (E36)('92-'98)(1.8L & 1.9L)
Acura	TL 6-spd MT SH-AWD ('10-'11)	NXD**	3840	BMW	318 ti ('95-'99)
Acura	TSX ('04-'07)	NXF**	3257	BMW	323 ('98-'00)(2.5L)
Alfa Romeo	164 ('91-'93)(FWD) (183 hp)	NXF*	3325	BMW	325e (121 hp)
Alfa Romeo	1600 Spider	NXF	2250	BMW	325 (E30)('87-'91)(168hp)
Alfa Romeo	2000 Spider	NXE	2288	BMW	325is (E30)('87-'91)(168hp)
Alfa Romeo	2600 Spider	NXF**	2683	BMW	325ic ('92)(168 hp)

Alfa Romeo	Milano 2.5L ('87-'89)	NXF*	2907	BMW	325 ('92-'95)(189 hp)
Alfa Romeo	Milano 3.0L ('87-'89)	NXE	2907	BMW	325 ('01-'06)(2.5L184 hp)
Audi	90 Quattro ('90-'91)(AWD)	NXF*	3100	BMW	325i ('06)(3.0L 215hp)
Audi	A3 2.0T (200 hp)('06-'07)	NXF**	3263	BMW	328 2.8L ('96-'98)(E36)
Audi	A3 3.2 AWD (250 hp)('06-'07)	NXE*	3660	BMW	328 2.8L ('99-'00)(E46)
Audi	A4 1.8T (150 hp)('97-'00)	NXF	2992	BMW	328i ('07-'12) (3.0L 230 hp)
Audi	A4 1.8T (150 hp)(AWD)('97-'99)	NXF	3241	BMW	328i ('12-'14) (2.0L turbo)
Audi	A4 1.8T (170 hp)	NXF	3252	BMW	330 ('01-'06)(225hp)
Audi	A4 2.0T (197 hp)('05-'07)	NXF*	3428	BMW	330 ('06)(255hp)
Audi	A4 2.0T AWD (200 hp)('05-'07)	NXF**	3549	BMW	335i ('07-'12) (3.0L turbo)
Audi	A4 2.8L (190 hp)	NXF**	3263	BMW	5 series (<226hp)(RWD)(inc '07)
Audi	A4 3.0L (220 hp)	NXF**	3462	BMW	5 series (RWD)('08)
Audi	A4 3.2L (255 hp)(AWD)('07)	NXE**	3671	BMW	540 ('97-'03)
Audi	A6 2.7T (AWD)	NXE	3958	BMW	M Coupe/Roadster (240hp)
Audi	A6 4.2L ('00-'04)(AWD)	NXE*	4024	BMW	M Coupe (315 hp)
Audi	A6 4.2L ('05-'06)(AWD)	NXE**	4145	BMW	M Roadster (315 hp)
Audi	A6 4.2L ('07)(AWD)	NXD	4222	BMW	M235i Coupe ('14-'15)(3.0L)
Audi	A8 4.2L (AWD)('97-'03)	NXE**	4068	BMW	M3 (E30)(pre-'89)
Audi	A8 4.2L (AWD)('03-'06)	NXE**	4288	BMW	M3 (E30)('89-'91)
Audi	A8 4.2L (AWD)('07)	NXD	4288	BMW	M3 (E36)('95-'99)
Audi	A8 6.0L (AWD)('05-'07)	NXC	4729	BMW	M3 (E46)('01-'06)
Audi	Coupe (110 hp)('80-'88)	NXG**	2507	BMW	M3 Convertible (E46)('01-'06)
Audi	Coupe (130 hp)('80-'88)	NXF	2507	BMW	M3 (E90, E92, E93)('08-'13)

Audi	RS 4 (4.2L) (AWD)('07)	NXB*	3957	BMW	M3 (E80)('15)
Audi	S4 ('03- '07)(AWD)	NXC	3869	BMW	M4 (E80)('15)
Audi	S4 (pre '03)(AWD)	NXD*	3593	BMW	M5 E28,E34('85- '93)
<u>Make</u>	<u>Model</u>	<u>Class</u>	<u>Wt.</u>	<u>Make</u>	<u>Model</u>
BMW	M5 E39 ('00- '03)	NXC**	3792	Chevrolet	Camaro 5.0L carb (170 hp)('87)
BMW	M5 E60 ('06- '08)	NX123	4012	Chevrolet	Camaro SS ('98-'02)
BMW	M6	NXE*	3570	Chevrolet	Camaro SS ('96-'97)
BMW	M6 ('06-'08)	NX123	3909	Chevrolet	Camaro SS ('10-'11)
BMW	MINI Clubman S ('08-'10)	NXE*	2800	Chevrolet	Camaro SS ('12)
BMW	MINI Clubman Works ('09-'11)	NXD**	2890	Chevrolet	Camaro Z28 ('98- '02)
BMW	MINI Clubman Works ('12-'13)	NXC	2830	Chevrolet	Camaro Z28 (pre '98)
BMW	MINI Cooper ('01-'04)	NXF	2315	Chevrolet	Camaro ZL1 ('12)
BMW	MINI Cooper ('05-'10)	NXG**	2546	Chevrolet	Cavalier
BMW	MINI Cooper ('11-'12)	NXF	2535	Chevrolet	Cavalier Z24
BMW	MINI Cooper S ('02-'04)	NXE**	2513	Chevrolet	Cobalt 2.2L ('05- '08)
BMW	MINI Cooper S ('05-'10)	NXE**	2678	Chevrolet	Cobalt 2.4L ('06- '08)
BMW	MINI Cooper Works ('06-'08)	NXD*	2720	Chevrolet	Cobalt SS 2.0L (S/C)('05-'07)
BMW	MINI Cooper Works ('09-'11)	NXC*	2680	Chevrolet	Cobalt SS (turbo)('08)
BMW	MINI Cooper Works ('12-'13)	NXC*	2710	Chevrolet	Corvair (140hp)
BMW	Z3 4-cyl	NXF*	2701	Chevrolet	Corvair (95,100hp)
BMW	Z3 6-cyl (2.5L)	NXE	2932	Chevrolet	Corvair Corsa Turbo
BMW	Z3 6-cyl (2.8L)	NXE*	2943	Chevrolet	Corvair Monza GT Spyder
BMW	Z3 6-cyl (3.0L)	NXD	2943	Chevrolet	Corvette '63-'82 (>200, <330 hp)
BMW	Z4 2.5L	NXE	2932	Chevrolet	Corvette '63-'82 (>330,<425 hp)
BMW	Z4 3.0L ('03- '05)	NXD	3000	Chevrolet	Corvette '63-'82 (>425 hp)
BMW	Z4 3.0L (215 hp)('06-'08)	NXE*	3020	Chevrolet	Corvette '63-'82 (200hp)

BMW	Z4 3.0L (255 hp)('06-'08)	NXD*	3108	Chevrolet	Corvette C4 ('85-'91)
BMW	Z4 M ('06-'08)	NXB	3197	Chevrolet	Corvette C4 ('92-'96) (LT1)
BMW	Z4 sDrive28i ('12-'14) (turbo)	NXD**	3260	Chevrolet	Corvette C4 (LT4 option) (330 hp)
BMW	Z4 sDrive30i ('09-'11)	NXD*	3240	Chevrolet	Corvette C5 (inc. FRC w/o Z51)
BMW	Z4 sDrive35i ('09-'14) (turbo)	NXC**	3500	Chevrolet	Corvette C5 (all w/ Z51)
BMW	Z4 sDrive35is ('11-'14) (turbo)	NXB*	3500	Chevrolet	Corvette C6 ('05-'07)(Z51 ok)
BMW	Z8	NXB*	3500	Chevrolet	Corvette C6 ('08)(LS3)
Buick	Gran Sport 455 ('70)	NXC*	3600	Chevrolet	Corvette GS ('96)
Buick	Regal 3.8L ('97-'04)	NXF**	3300	Chevrolet	Corvette GS ('10+)
Cadillac	ATS 2.0L (turbo)('13)	NXC	3360	Chevrolet	Corvette Z06 ('01-'04)
Cadillac	ATS 2.0L AWD (turbo)('13)	NXC	3540	Chevrolet	Corvette Z06 ('06-'08)
Cadillac	ATS 2.5L ('13)	NXE*	3360	Chevrolet	Corvette ZR-1 ('90-'95)
Cadillac	ATS 3.6L ('13)	NXB	3360	Chevrolet	Cruze 1.4L Turbo ('11-'12)
Cadillac	ATS 3.6L AWD ('13)	NX	3540	Chevrolet	Cruze 1.8L ('11)
Cadillac	Catera	NXG**	3762	Chevrolet	Cruze 1.4L Turbo Eco ('11-'12)
Cadillac	CTS 2.8L ('05-'07)	NXF*	3509	Chevrolet	HHR SS ('08-10)
Cadillac	CTS 3.6L ('03-'07)	NXE*	3509	Chevrolet	Impala SS ('04-'05)
Cadillac	CTS-V ('04-'07)	NXC**	3847	Chevrolet	Impala SS ('06-'08)
Cadillac	CTS-V ('09-'11)	NX123	4220	Chevrolet	Impala SS ('94-'96)
Cadillac	CTS-V Sports Wagon ('11)	NX123	4400	Chevrolet	Malibu ('08-'11)
Cadillac	STS (4.6 V8) AWD ('05)	NXD	4295	Chevrolet	2.4L Malibu LS ('04-'05)
Cadillac	STS (V6)('05-'07)	NXF**	3858	Chevrolet	3.5L V6 Monte Carlo 3.9L LTZ ('06)
Cadillac	STS (V8)('05-'07)	NXE**	3940	Chevrolet	Monte Carlo SS 3.8L ('04-'05)
Cadillac	STS-V ('06-'07)	NXC*	4233	Chevrolet	Monte Carlo SS 5.3L ('06-'07)
Cadillac	XLR ('04-'07)	NXD**	3647	Chevrolet	Monte Carlo SS (pre '04)
Cadillac	XLR-V 4.4L V8 ('07)	NXB	3810	Chevrolet	S10 Extreme (180hp)

Caterham	Super 7 (240 hp)	NX123	1150	Chevrolet	Sonic (1.4L turbo)('12)
Chevrolet	Aveo ('04-'07)	NXG*	2365	Chevrolet	Sonic (1.8L)('12)
Chevrolet	Camaro 3.1L	NXG*	3105	Chevrolet	Spark ('13-'14)
Chevrolet	Camaro 3.4L	NXG*	3306	Chevrolet	Volt ('11-'12)
	Camaro 3.6L ('12-'15)	NXD*	3760	Chrysler	300 (3.5L) ('05-'07)
Chevrolet	Camaro 3.8L	NXF*	3307	Chrysler	300C (5.7L)('05-'07)

<u>Make</u>	<u>Model</u>	<u>Class</u>	<u>Wt.</u>	<u>Make</u>	<u>Model</u>
Chrysler	300C (5.7L) (AWD)('05-'07)	NXE**	4273	Ferrari	308
Chrysler	300C SRT8 ('05-'07)	NXC	4160	Ferrari	328
Chrysler	Cirrus 4-cyl Conquest (turbo)	NXG*	3141	Ferrari	355
Chrysler	Conquest Tsi (turbo)	NXF**	2900	Ferrari	360
Chrysler	Crossfire (215hp) ('04-'07)	NXF**	3050	Ferrari	430
Chrysler	Crossfire SRT6 ('05-'06)	NXE	3010	Ferrari	550
Chrysler	PT Cruiser	NXC**	3240	Ferrari	612
Chrysler	PT Cruiser GT	NXG	3147	Ferrari	348 (<305 hp)
Datsun	510 (96 hp)	NXF**	3364	Ferrari	348 (320 hp)
Datsun	510 (L20B swap)	NXF*	2040	Ferrari	360 Challenge
Datsun	1600 Roadster ('66-'70)(96hp)	NXF**	2150	Ferrari	456GT
DeTomaso	Pantera	NXF	2030	Ferrari	575M
Diasio	D962R	NXC*	3300	Ferrari	Enzo
Dodge	Caliber RT 2.4L AWD ('07-'08)	NXR	1400	Ferrari	F430
Dodge	Caliber SRT4 2.4L Turbo ('07-'08)	NXF	3308	Ferrari	Superamerica
Dodge	Challenger R/T ('09-'10)	NXD**	3200	Ferrari	Testarossa
Dodge	Challenger SRT8 ('08-'10)	NXD**	4140	Fiat	124 Spider 1400
Dodge	Charger 3.5L ('06-'07)	NXC*	4140	Fiat	124 Spider 1600
Dodge	Charger 5.7L ('06-'07)	NXF**	3800	Fiat	124 Spider 1800
Dodge	Charger SRT8 ('06-'10)	NXD*	4031	Fiat	124 Sport Spider 2000
Dodge	Charger SRT8 ('06-'10)	NXD*	4031	Fiat	2000
Dodge	Charger SRT8 ('06-'10)	NXC*	4140	Fiat	128 (55-60 hp)

Dodge	Dart 1.4L Turbo ('14)	NXF	3180	Fiat	500 ('12-13)(USA)
Dodge	Dart 2.0L ('13-'14)	NXG**	3180	Fiat	500 Abarth (1.4L T)('12-'13)(USA)
Dodge	Dart 2.4L ('14)	NXF*	3180	Fiat	X1-9 1.3L
Dodge	Magnum RT	NXE*	4180	Fiat	X1-9 1.5L
Dodge	Magnum RT AWD	NXE**	4393	Fiat	X1-9 2000
Dodge	Magnum SRT8	NXC	4260	Ford	Contour SVT
Dodge	Neon DOHC Coupe	NXF	2550	Ford	Escort 1.9L
Dodge	Neon DOHC Sedan	NXF	2550	Ford	Escort 2.0L
Dodge	Neon SOHC Coupe	NXF	2400	Ford	Escort GT (1.8L)
Dodge	Neon SOHC Sedan (1st gen)	NXF	2400	Ford	Escort ZX2
Dodge	Neon SOHC Sedan (2nd gen)	NXF	2450	Ford	Escort ZX2 S/R
Dodge	Neon SRT4 ('03-05)	NXE*	2970	Ford	EXP 1.6L ('82-'85)
Dodge	Neon SRT4	NXE**	2900	Ford	F150 SVT
Dodge	ACR	NXE**	2900	Ford	Lightning
Dodge	Shelby Charger (110hp)	NXG**	2296	Ford	Festiva
Dodge	Shelby Charger (146hp)	NXF*	2500	Ford	Fiesta ('11-'14)
Dodge	Shelby Charger GLHS (turbo)	NXE	2550	Ford	Fiesta ST ('14)(turbo)
Dodge	Shelby Lancer	NXF	3000	Ford	Focus (2.0L 16v)('00-'04)
Dodge	Shelby Omni GLH (146 hp)	NXF*	2500	Ford	Focus (2.0L 16v)('05-'11)
Dodge	Shelby Omni GLHS	NXE	2540	Ford	Focus (2.0L 16v)('12-'13)
Dodge	Stealth (DOHC)	NXE	3153	Ford	Focus (2.0L 8v)('00-'02)
Dodge	Stealth (SOHC)	NXF	3086	Ford	Focus (2.3L 16v)('04)
Dodge	Stealth Turbo ('91-'93)(AWD)	NXD	3803	Ford	Focus ST 2.3L 16v ('07)
Dodge	Stealth Turbo ('94-'96)(AWD)	NXC	3671	Ford	Focus ST 2.0L (turbo)('13-'14)
Dodge	Stratus 4-cyl	NXG	3192	Ford	Focus SVT (2.0L)('02-'04)
Dodge	Stratus RT	NXF	3219	Ford	Focus ZX4 ST (2.3L)('05-'06)
Dodge	Viper	NX123	3410	Ford	GT
Dodge	Viper ACR	NX123	3325	Ford	Mustang 2.3L turbo ('15)

Dodge	Viper Comp. Coupe	NX123	2995	Ford	Mustang Boss 302 ('12)
Eagle	Talon 2.0L (135-140hp)	NXG**	2739	Ford	Mustang Boss 302 ('13)
Eagle	Talon Turbo ('90-'94)	NXE	2789	Ford	Mustang Cobra ('93)
Eagle	Talon Turbo ('95-'98)	NXE*	2866	Ford	Mustang Cobra ('94-'95)
Eagle	Talon Turbo AWD ('90-'94)	NXE*	3108	Ford	Mustang Cobra ('96-'98)
Eagle	Talon Turbo AWD ('95-'98)	NXE*	3153	Ford	Mustang Cobra ('99 & '01)

<u>Make</u>	<u>Model</u>	<u>Class</u>	<u>Wt.</u>	<u>Make</u>	<u>Model</u>
Ford	Mustang Cobra R ('00)	NXB*	3590	Honda	Accord 2.3L
Ford	Mustang Cobra R ('93)	NXD*	3248	Honda	Accord 2.4L ('03-'07)
Ford	Mustang Cobra R ('95)	NXC*	3325	Honda	Accord 2.7 V6 ('95-'97)
Ford	Mustang Cobra SVT ('02+)	NXB*	3665	Honda	Accord 3.0 V6 ('03-'07)
Ford	Mustang GT ('05-'06)	NXD**	3450	Honda	Accord 3.0 V6 ('98-'02)
Ford	Mustang GT ('07-'09)	NXC	3356	Honda	Accord 3.5 V6 ('08-'12)(AT ok)
Ford	Mustang GT ('10)	NXC	3530	Honda	Civic 1.6L SOHC ('88-'91)
Ford	Mustang GT ('11-'12)	NXB	3770	Honda	Civic Base ('88-'91)
Ford	Mustang GT ('13+)	NX123	3480	Honda	Civic Coupe 1.8L ('06-'08)
Ford	Mustang I4	NXH**	2699	Honda	Civic CX ('92-'95)
Ford	Mustang I4 turbo	NXG*	3065	Honda	Civic del Sol S (<107hp)
Ford	Mustang I6	NXG	2800	Honda	Civic del Sol Si (<128hp)
Ford	Mustang Mach 1	NXD**	3450	Honda	Civic del Sol VTEC (DOHC 1.6L)
Ford	Mustang SVO ('84-'86)	NXE	3036	Honda	Civic DX 1.5L 16v ('88-'91)
Ford	Mustang V6 (pre-'99)	NXG**	3065	Honda	Civic EX 1.6L ('92-'95)
Ford	Mustang V6 ('99-'04)	NXF**	3351	Honda	Civic EX 1.6L ('96-'00)
Ford	Mustang V6 ('05-'09)	NXF**	3351	Honda	Civic EX 1.7L ('01-'05)
Ford	Mustang V6 ('10)	NXE	3350	Honda	Civic Non-VTEC (92hp)

Ford	Mustang V6 ('11-'12)	NXD**	3600	Honda	Civic Si 1.6L ('92-'95)
Ford	Mustang V6 ('13-'14)	NXC*	3400	Honda	Civic Si 1.6L ('99-'00)
Ford	Mustang V6 ('15)	NXC*	3500	Honda	Civic Si 2.0L ('01-'05)
Ford	Mustang V8 ('64-'68 <272 hp)	NXF*	2980	Honda	Civic Si 2.0L ('06-'11)
Ford	Mustang V8 ('69-'70 <291 hp)	NXF*	3250	Honda	Civic Si 2.4L ('12)
Ford	Mustang V8 ('71-'73 <286 hp)	NXF	3560	Honda	Civic Si 2.4L ('13-'14)
Ford	Mustang V8 ('79-'86 <226 hp)	NXE	3075	Honda	Civic Type R ('07)(JDM)(225 hp)
Ford	Mustang V8 LX ('87-'93 <226 hp)	NXE	3075	Honda	Civic VX (92hp)
Ford	Mustang V8 GT ('87-'93 <226 hp)	NXE	3120	Honda	CRX DX 1.5L 16v ('88-'91)
Ford	Mustang V8 ('94-'98 <226 hp)	NXE*	3075	Honda	CRX DX 12v ('85-'87)
Ford	Mustang V8 ('99-'04)	NXE**	3273	Honda	CRX HF CRX Si 1.5L ('85-'87)
Ford	Pinto 1.6L	NXG	2000	Honda	
Ford	Pinto 2.0L ('71-'74)	NXG	2235	Honda	CRX Si ('88-'91)
Ford	Pinto 2.3L	NXG*	2250	Honda	CRX 1.6L DOHC VTEC CR-Z (1.5L Hybrid)('11)
Ford	Pinto 2.8L	NXG*	2570	Honda	
Ford	Probe GT	NXF*	2875	Honda	Fit ('07-'08)
Ford	Probe Turbo	NXF*	2730	Honda	Fit ('09-'12)
Ford	Sierra Cosworth 2.0L T (204 hp)	NXE**	2756	Honda	Prelude S ('92-'96)
Ford	Sierra Cosworth AWD (220 hp)	NXD*	2816	Honda	Prelude Si ('92-'96)
Ford	Shelby GT500 5.4L S/C ('07-'09)	NX123	3920	Honda	Prelude Si (pre-'92)
Ford	Shelby GT500 5.4L S/C ('10-'11)	NX123	3820	Honda	Prelude VTEC ('93-'01)
Ford	Taurus GL	NXH**	3326	Honda	S2000 (2.0L)('00-'03)

Ford	Taurus SHO Thunderbird Super	NXF**	3379	Honda	S2000 (2.2L)('04-'08)
Ford	Coupe/Turbo Thunderbird	NXF**	3536	Honda	S2000 CR (2.2L)('08)
Ford	Turbo Coupe Thunderbird V6	NXF*	3450	Hyundai	Accent 1.5L (105hp)
Ford	(pre-'02) Thunderbird V8	NXH**	3536	Hyundai	Accent 1.6L ('01-'08)
Ford	('02) Thunderbird V8	NXF**	3775	Hyundai	Elantra 1.6L
Ford	('03+) Thunderbird V8	NXE	3775	Hyundai	Elantra 1.8L
Ford	('90-'97)	NXF*	3536	Hyundai	Elantra 2.0L ('00-'08)
Geo	Metro 1.0L	NXH**	1804	Hyundai	Genesis 3.8L ('09-'10)
Geo	Metro 1.3L	NXH**	1940	Hyundai	Genesis 4.6L ('09-'10)
Geo	Prizm	NXF	2359	Hyundai	Genesis Coupe 2.0L Turbo ('10-'12)
Geo	Storm	NXG	2282	Hyundai	Genesis Coupe 2.0L Turbo ('13)
Geo	Storm GSI Accord 2.0L	NXF*	2480	Hyundai	Genesis Coupe 2.0L T Track ('10-'12)
Honda	(120hp) Accord 2.2L	NXG*	2670	Hyundai	Genesis Coupe 3.8 V6 Track ('10-'12)
Honda	('90-'97)(130hp)	NXG*	2800	Hyundai	Genesis Coupe 3.8 V6 Track ('13)

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Hyundai	Sonata 2.4L ('09-'10) (auto ok)	NXG**	3260	Lexus	LS460 ('07-'08)
Hyundai	Tiburon 2.0L ('03-'07)	NXG	2940	Lexus	SC300
Hyundai	Tiburon 2.0L ('97-'01)	NXF	2633	Lexus	SC400
Hyundai	Tiburon V6 2.7L ('03-'07)	NXF*	2986	Lexus	SC430 ('02-'08)
Hyundai	Tiburon V6 GT LTD 2.7L ('06-'08)	NXF	3150	Lincoln	LS (V8) ('03-'06)
Hyundai	Veloster 1.6L ('12-'13)	NXF	2584	Lotus	Elan M100 ('91-'92)(turbo)
Hyundai	Veloster 1.6L Turbo ('13)	NXE	2925	Lotus	Elise ('05-'07)
Infiniti	G20 ('93-'02)	NXG	2990	Lotus	Esprit (V8) TT
Infiniti	G20 ('91-'92)	NXF	2535	Lotus	Esprit 4 Turbo

Infiniti	G35 (incl. 6MT) (pre-'05)	NXD	3435	Lotus	Exige ('06)
Infiniti	G35 (incl. 6MT)('05-'06)	NXD	3524	Lotus	Exige S ('07)
Infiniti	G35 Coupe 6MT ('07)	NXD	3524	Lotus	Exige 240R, S240, S260
Infiniti	G35 (306 hp)(incl. Sport)('07-'08)	NXD*	3532	Maserati	GranTurismo
Infiniti	G35x (AWD)('07-'08)	NXD**	3650	Mazda	323 (pre'95--82hp)
Infiniti	G37 (7 sp auto)('09-'11)	NXC**	3630	Mazda	323 GTX (1.6L T)
Infiniti	I30 ('00-'01)	NXF**	3342	Mazda	626 2.0L
Infiniti	I30 ('96-'99)	NXF*	3090	Mazda	626 2.5L V6
Infiniti	I35	NXE*	3342	Mazda	Mazda2 ('11)
Infiniti	Q45 ('02-'07)	NXE*	4153	Mazda	Mazda3 (2.0L)('04- '06)
Infiniti	Q45 (pre-'02)	NXF**	3895	Mazda	Mazda3 (2.0L)('07- '10)
Jaguar	S-Type 3.0L (235 hp)	NXF**	3777	Mazda	Mazda3 (2.3L)('04- '06)
Jaguar	S-Type 4.0L, 4.2L	NXE**	3874	Mazda	Mazda3 (2.3L)('07- '09)
Jaguar	S-Type R 4.2L S/C ('03-'04)	NXD**	4046	Mazda	Mazda3 (2.5L)('10)
Jaguar	S-Type R 4.2L S/C ('05-'07)	NXC	4075	Mazda	Mazda6 2.3L ('03- '06)
Jaguar	XJ Vanden Plas (<301 hp)	NXE*	3819	Mazda	Mazda6 2.3L ('07- '08)
Jaguar	XJ8 3.5L	NXE	3613	Mazda	Mazda6 3.0L (V6) ('03-'05)
Jaguar	XJ8 4.2L	NXE**	3613	Mazda	Mazda6 3.0L (V6) ('06-'08)
Jaguar	XJ8 S/C ('00- '07)	NXC	4001	Mazda	Mazdaspeed Protegé (Turbo)
Jaguar	XJR ('98-'07)	NXC	3958	Mazda	Mazdaspeed3 (turbo)('07-'09)
Jaguar	XJS ('88-'91)	NXF**	3915	Mazda	Mazdaspeed3 (turbo)('10-'13)
Jaguar	XKR-SC ('00- '06)	NXC*	3865	Mazda	Mazdaspeed6 (AWD)('06-'07)
Jaguar	XKR-SC ('07)	NXC**	3781	Mazda	Miata 1.6L
Jaguar	XKE	NXD*	3100	Mazda	Miata 1.8L ('94-'97)
Jaguar	X-Type ('02- '07) AWD	NXE	3538	Mazda	Miata 1.8L ('99-'00)
Jensen- Healey	2.0L ('73-'76)	NXE*	2240	Mazda	Miata 1.8L VVT ('01-'05)
Kia	Forte (2.0L) ('10-'12)	NXF	2780	Mazda	Miata MX-5 ('06- '13)

Kia	Forte 5-door (2.0L) ('11-'12)	NXF	2780	Mazda	Miata MX-5 turbo (04-'05)
Kia	Rio ('06-'11)	NXG**	2355	Mazda	MX-3
Kia	Rio ('12-'13)	NXF*	2440	Mazda	MX-3 GS
Kia	Sephia	NXF	2472	Mazda	MX-6
Kia	Spectra	NXG*	2701	Mazda	(2.2L)(110hp)
Lamborghini	Diablo VT	NX123	3582	Mazda	MX-6 GT (turbo)
Lexus	GS300 ('06)	NXE	3536	Mazda	MX-6 V6 ('92-'97)
Lexus	GS300 ('93-'05)	NXF*	3649	Mazda	Protegé 1.6L
Lexus	GS350 ('07-'08)	NXD	3704	Mazda	Protegé 1.8L
Lexus	GS400	NXE**	3693	Mazda	Protegé 2.0L
Lexus	GS430 ('01-'07)	NXE**	3745	Mazda	Protegé 5
Lexus	GS460 ('08)	NXD	3945	Mazda	Protegé MP3
Lexus	IS250 ('06-	NXF	3450	Mazda	RX-3 ('72-'78)
Lexus	'08)(6sp man.)	NXF**	3650	Mazda	(12A)
Lexus	IS250	NXB*	3780	Mazda	RX-7 12A
Lexus	(AWD)('06-'08)	NXF**	3255	Mazda	RX-7 13B
Lexus	IS F ('08-'09)	NXB*	3780	Mazda	RX-7 13B GSL-SE
Lexus	IS300	NXF**	3255	Mazda	(1st Gen)
Lexus	LS400	NXE	3890	Mazda	RX-7 TT (3rd Gen)
Lexus	LS430	NXE	3990	Mazda	RX-7 Turbo II (2nd Gen)
					RX-8 ('04-'08)

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Mazda	RX-8 ('09-'11)	NXD*	3045	Mitsubishi	Eclipse Turbo AWD (92-'94)
Mazda	RX-8 R3 ('09-'11)	NXC	3045	Mitsubishi	Eclipse Turbo AWD (95-'98)
Mazda	RX-8 (197 hp)(Auto)('04-'05)	NXE	3053	Mitsubishi	Eclipse Turbo AWD (99)
Mazda	RX-8 (212 hp)(Auto)('06-'07)	NXE*	3075	Mitsubishi	Galant 2.4L ('94-'03)
Mercedes	190E 2.3 (16v)	NXF**	3030	Mitsubishi	Galant 2.4L ('04-'07)
Mercedes	190E 2.6L ('86-'93)	NXF**	2955	Mitsubishi	Galant 3.0L V6 (195hp)
Mercedes	C230 ('02-'05)	NXF**	3305	Mitsubishi	Galant 3.8L (230 hp)('02-'07)
Mercedes	C230 ('06-'07)	NXF**	3405	Mitsubishi	Galant 3.8L Ralliart (07)
Mercedes	C280 ('94-'00)	NXF**	3316	Mitsubishi	Galant VR4 (AWD) (91-'92)
Mercedes	C280 ('06-'07)	NXE	3460	Mitsubishi	Lancer 2.0L ('02-'07)

Mercedes	C300 ('08)	NXE	3460	Mitsubishi	Lancer 2.0L DE, SE ('08)
Mercedes	C32 AMG ('02-'04)	TTC*	3540	Mitsubishi	Lancer 2.4L ('04-'07)
Mercedes	C320 ('01-'05)	NXE	3428	Mitsubishi	Lancer Evo VIII ('03-'05)(AWD)
Mercedes	C43 AMG ('98-'00)	NXC	3450	Mitsubishi	Lancer Evo VIII MR ('05)(AWD)
Mercedes	C55 AMG ('05-'06)	NXC**	3540	Mitsubishi	Lancer Evo IX ('06)(AWD)
Mercedes	CL55 AMG (5.4L)('01-'02)	NXC	4100	Mitsubishi	Lancer Evo MR ('06)(AWD)
Mercedes	CL65 AMG ('06)	NX123	4654	Mitsubishi	Lancer Evo RS ('06)(AWD)
Mercedes	CLK55 AMG ('04-'06)	NXC	3960	Mitsubishi	Lancer Evo X GSR ('08-'14)(AWD)
Mercedes	CLK430 ('99-'01)	NXD*	3323	Mitsubishi	Lancer Evo X MR ('08-'14)(AWD)
Mercedes	CLK430 ('02-'03)	NXD	3485	Mitsubishi	Lancer Ralliart ('09)
Mercedes	CLK500 ('03-'06)	NXD*	3585	Mitsubishi	Mirage
Mercedes	CLK550 ('07)	NXC*	3965	Mitsubishi	Mirage 1.8L
Mercedes	CLK63 AMG ('07)	NX123	3960	Mitsubishi	Starion (turbo)
Mercedes	E55 AMG ('03-'06)	NXB*	4087	Mitsubishi	Starion ESI-R (turbo)
Mercedes	E55 AMG ('99-'02)	NXC*	3768	Nissan	200SX 1.6L
Mercedes	E63 AMG ('07)	NX123	4035	Nissan	200SX 2.0L ('80-'81)
Mercedes	SL55 AMG ('03-'06)	NXB*	4280	Nissan	200SX 2.0L Turbo
Mercedes	SL55 AMG ('07)	NXB*	4365	Nissan	200SX SE-R (2.0L)
Mercedes	SL65 AMG ('07)	NX123	4564	Nissan	240SX
Mercedes	SLK 320 ('01-'04)	NXE*	3120	Nissan	240SX HICAS
Mercedes	SLK32 AMG ('02-'04)	NXB*	3220	Nissan	240SX SOHC ('89-'90) (140hp)
Mercedes	SLK 350 ('05-'08)	TTC	3230	Nissan	240Z
Mercedes	SLK55 AMG ('05-'07)	NXB	3420	Nissan	260Z
Mercury	Capri 1.6L (75hp)	NXG	2135	Nissan	280Z
Mercury	Capri 2.0L ('71) (100hp)	NXF	2135	Nissan	280ZX
Mercury	Capri 2.0L ('72-'74)	NXG*	2275	Nissan	280ZX Turbo

Mercury	Capri 2.3L ('76-'77)	NXH**	2491	Nissan	300ZX all (Z31--'84-'88) NA
Mercury	Capri 2.6L, 2.8L ('72-'74)	NXF	2275	Nissan	300ZX Turbo (Z31--'84-'89)
Mercury	Capri 2.8L ('76-'77)	NXH*	2800	Nissan	300ZX NA (Z32) 2+2
Mercury	Cougar 2.5L V6	NXF*	2892	Nissan	300ZX NA (Z32--'89-'96)
Mercury	Marauder	NXE	4195	Nissan	300ZX TT
Merkur	XR4Ti	NXE	2920	Nissan	350Z (287hp)('03-'05)(enth. ok)
MG	Midget 1.1l, 1.3l, 1.5l	NXF	1515	Nissan	350Z (300hp)('06)(enth. ok)
Mitsubishi	3000 VR-4 ('91-'93)(AWD)	NXD	3803	Nissan	350Z (306hp)('07-'08)(enth. ok)
Mitsubishi	3000 VR-4 ('94-'99)(AWD)	NXD**	3760	Nissan	350Z Nismo ('07-'08)
Mitsubishi	3000GT (NA-DOHC)	NXE	3219	Nissan	350Z Roadster ('06)
Mitsubishi	3000GT (NA-SOHC)	NXF	3131	Nissan	350Z Track ('05-'06),35ann, GT
Mitsubishi	Eclipse 2.4L (pre-'06)	NXG**	2965	Nissan	350Z Track Model ('03-'04)
Mitsubishi	Eclipse 2.4L ('06-'08)	NXG*	3274	Nissan	370Z ('09)(6 sp. manual)
Mitsubishi	Eclipse GT 3.8L ('06-'08)	NXE*	3472	Nissan	370Z Sport Model ('09)
Mitsubishi	Eclipse GT 3.0L ('00-'05)	NXF**	3142	Nissan	370Z Nismo ('09)
Mitsubishi	Eclipse Turbo ('90-'94)	NXE	2778	Nissan	Altima 2.4L
Mitsubishi	Eclipse Turbo ('95-'98)	NXE*	2877	Nissan	Altima 2.5L ('02-'09)
Mitsubishi	Eclipse Turbo ('99)	NXE	2970	Nissan	Altima 3.5L ('02-'06)
<u>Make</u>	<u>Model</u>	<u>Class</u>	<u>Wt.</u>	<u>Make</u>	<u>Model</u>
Nissan	Altima 3.5L ('07-'08)	NXE**	3268	Pontiac	GTO ('05-'06)
Nissan	Altima 3.5L SE-R ('05-'06)	NXD	3279	Pontiac	Solstice ('06-'08)
Nissan	GT-R ('09+)	NX123		Pontiac	Solstice GXP (turbo)('07-'08)
Nissan	Juke 1.6L (turbo) ('11-'15)	NXF**	3000	Pontiac	Trans Am ('98-'02)
Nissan	Juke 1.6L (turbo)(AWD) ('11-'15)	NXF**	3160	Pontiac	Trans Am (pre-'98)

Nissan	Maxima 3.5L ('02-'03)	NXE*	3239	Pontiac	Trans Am Turbo V6
Nissan	Maxima 3.5L ('04-'06)	NXE*	3471	Pontiac	Vibe 1.8L ('03-'07)
Nissan	Maxima 3.5L ('07-'08)	NXE	3591	Pontiac	Vibe GT ('04-'06)
Nissan	Maxima SE 3.0L ('00-'01)	NXE	3150	Pontiac	Vibe GT ('03)
Nissan	NX2000 Pickup ('90-'97)(2WD)	NXF	2520	Porsche	911 ('63-'69)
Nissan	Pulsar NX 1.8L	NXF	2566	Porsche	911 ('70-'73)
Nissan	Sentra 1.6L ('87-'88)(8v)(69hp)	NXG	2250	Porsche	911 ('73-'77)
Nissan	Sentra 1.6L (16v)	NXF	2299	Porsche	911 ('78-'83)
Nissan	Sentra 1.8L ('00-'06)	NXG*	2590	Porsche	911 ('84-'89)
Nissan	Sentra 2.0L ('07-'08)	NXG**	2853	Porsche	911 Carrera ('73-'77)
Nissan	Sentra SE ('98-'01)	NXF	2617	Porsche	911 Turbo 3.0L ('74-'77)
Nissan	Sentra SE-R 2.0L ('91-'94)	NXF	2520	Porsche	911 Turbo 3.3L ('77-'89)
Nissan	Sentra SE-R 2.5L ('02-'06)	NXF*	2800	Porsche	911S ('67-'69)
Nissan	Sentra SE-R 2.5L ('07-'08)	NXF	3102	Porsche	911S ('70-'73)
Nissan	Sentra Spec V ('02-'06)	NXF**	2710	Porsche	912
Nissan	Sentra Spec V ('07-'08)	NXF**	3078	Porsche	914-4
Noble	M12 GTO-3R (352 hp 3.0L V6)	NX123	2380	Porsche	914-6
Noble	M400 (425 hp 3.0L V6)	NX123	2337	Porsche	924 ('77-'79)
Oldsmobile	Cutlass Calais 2.3L Int. (150hp)	NXF	2700	Porsche	924S ('87)
Oldsmobile	Cutlass Calais 2.3L Int. (180hp)	NXF**	2730	Porsche	924S ('88)
Oldsmobile	Cutlass Calais 2.3L Quad442	NXF**	2730	Porsche	924 Turbo
Oldsmobile	Quad442 W41	NXE*	2625	Porsche	928 ('78-'82)(4.5L)
Opel	GT 1100	NXG	1918	Porsche	944 ('83-'87)
Opel	GT1900	NXG*	2138	Porsche	944 2.5L ('88)
					944 2.7L ('89)(162 hp)

Opel	Manta	NXG	2230	Porsche	944 S
Peugeot	505 Turbo 2.2L (86-'88)(150hp)	NXF*	2850	Porsche	944 S2
Peugeot	505 Turbo 2.2L (88-'89)(180hp)	NXF**	2950	Porsche	944 Turbo ('86-'88)
Plymouth	Laser Turbo (90-'94)	NXE	2756	Porsche	944 Turbo S ('88-'89)
Plymouth	Laser Turbo				
Plymouth	AWD ('92-'94)	NXE*	3073	Porsche	959
Plymouth	Prowler	NXD*	2857	Porsche	964 Carrera 2
Pontiac	Fiero (4-cyl)	NXG	2590	Porsche	964 Carrera 4 (AWD)
Pontiac	Fiero (V6)	NXF*	2778	Porsche	964 RS
Pontiac	Firebird 3.4L (V6)	NXG*	3306	Porsche	964 RS America
Pontiac	Firebird 3.8L	NXF*	3306	Porsche	965 3.3L (Turbo II-- '90-'92)
Pontiac	Firebird				965 3.6L (Turbo II-- '93-'94)
Pontiac	Firehawk	NXC*	3481	Porsche	968
Pontiac	Firebird WS6	NXC	3499	Porsche	
Pontiac	Formula ('98-'02)	NXD**	3452	Porsche	968 Turbo S
Pontiac	Formula (pre-'98)	NXE**	3408	Porsche	993 C2 ('94-'95)
Pontiac	Formula '87 (5.0L, 215hp)	NXF**	3383	Porsche	993 C2 ('96-'99)
Pontiac	Grand AM 2.3L (170,180hp)	NXF**	2852	Porsche	993 C2S
Pontiac	Grand Am 3.4L (V6)	NXG**	3091	Porsche	993 C4 (AWD)
Pontiac	Grand Prix GT 3.8L ('98-'04)	NXF	3484	Porsche	993 C4S (AWD)
Pontiac	Grand Prix GT 3.8L ('05-'06)	NXE	3484	Porsche	993 Cup
Pontiac	Grand Prix GTP (99-'03)	NXF*	3464	Porsche	993 RS 3.8L
Pontiac	Grand Prix GTP (04-'06)	NXE	3583	Porsche	993 Turbo (AWD)
Pontiac	Grand Prix GXP (05-'08)	NXE**	3600	Porsche	993 Turbo S (AWD)
Pontiac	Grand Prix SE 3.1L	NXG*	3384	Porsche	996 C2 (3.4L) ('99-'01)
Pontiac	GTO ('04)	NXD*	3725	Porsche	996 C2 (3.6L)('02-'04)

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Porsche	996 C4 (3.4L)	NXB	3034	Saturn	Ion ('05-'07)
Porsche	996 C4 (3.6L)	NXB	3267	Saturn	Ion Redline ('04-'07)
Porsche	996 C4S (3.6L)	NX123	3240	Saturn	Sky ('07-'08)
Porsche	996 GT2	NX123	3130	Saturn	Sky Redline ('07-'08)
Porsche	996 GT3	NX123	2976	Saturn	S-Series (DOHC) ('91-'02)
Porsche	996 Cup	NX123	2550	Saturn	S-Series (SOHC) ('91-'02)
Porsche	996 Turbo	NX123	3388	Scion	tC ('05-'10)
Porsche	996 Turbo S	NX123	3505	Scion	tC ('11)
Porsche	997 C4 ('06-'07)	NX123	3197	Scion	xA ('04-'06)
Porsche	997 C4S ('06-'07)	NX123	3252	Scion	xB ('04-'06)
Porsche	997 Carrera ('05-'07)	NXB*	3075	Scion	FR-S Coupe ('13)
Porsche	997 Club Coupe	NX123	3053	Subaru	BRZ Coupe ('13)
Porsche	997 CS ('05-'07)	NX123	3131	Subaru	Forester XT ('04-'05) (AWD)
Porsche	997 GT3 ('07)	NX123	3076	Subaru	Forester XT ('06-'07) (AWD)
Porsche	997 GT3 Cup	NX123	2536	Subaru	Impreza 1.8L (AWD)
Porsche	997 Turbo AWD ('07)	NX123	3495	Subaru	Impreza 1.8L (FWD)
Porsche	Boxster ('97-'99)	NXE*	2822	Subaru	Impreza 2.2L (AWD)
Porsche	Boxster ('00-'02)	NXE**	2900	Subaru	Impreza 2.5L ('98-'01)(AWD)
Porsche	Boxster ('02-'04)	NXD	2920	Subaru	Impreza 2.5L ('02-'05)(AWD)
Porsche	Boxster ('05-'06)	NXD*	2855	Subaru	Impreza 2.5L ('06-'08)(AWD)
Porsche	Boxster ('07-'08)	NXD**	2855	Subaru	Legacy 2.2L ('90-'94)(AWD)
Porsche	Boxster ('09-'10)	NXC	2880	Subaru	Legacy 2.2L ('95-'99)(AWD)
Porsche	Boxster S ('05-'06)	NXC*	2965	Subaru	Legacy 2.2L T AWD ('91-'94)
Porsche	Boxster S ('00-'02)	NXD**	2950	Subaru	Legacy 2.5L ('00-'08)(AWD)
Porsche	Boxster S ('03-'04)	NXC	2911	Subaru	Legacy GT ('05-'08)(AWD)(Turbo)
Porsche	Boxster S ('07-'08)	NXC**	2965	Subaru	Legacy 3.0 AWD ('08)
Porsche	Boxster S ('09-'10)	NXB	2985	Subaru	Outback 3.0 ('01-'04)(AWD)
Porsche	Boxster Spyder ('11)	NXB**	2880	Subaru	Outback 3.0 ('05-'07)(AWD)

Porsche	Carrera GT	NX123	3043	Subaru	Outback XT ('05-'06)(AWD)
Porsche	Cayenne S ('03-'06)(AWD)	NXF*	4950	Subaru	Outback XT ('07)(AWD)
Porsche	Cayenne Turbo ('08)(AWD)	NXC	5191	Subaru	SVX (AWD)
Porsche	Cayman 2.7L ('07-'08)	NXC	2900	Subaru	WRX 2.0L ('02-'05)(AWD)
Porsche	Cayman 2.9L ('09-'12)	NXC**	2920	Subaru	WRX 2.0L ('15)(AWD)
Porsche	Cayman S 3.4L ('06-'08)	NXB	3075	Subaru	WRX 2.5L ('06-'08)(AWD)
Porsche	Cayman S 3.4L ('09-'12)	NXB**	3150	Subaru	WRX 2.5L ('09-'14)(AWD)
Porsche	Cayman S 3.4L ('14)	NX123	2910	Subaru	WRX STi ('04-'07)(AWD)
Porsche	Cayman R 3.4L ('11-'12)	NX123	2900	Subaru	WRX STI ('08-'14)(AWD)
Renault	Alliance 1.4L (60hp)	NXG	2030	Subaru	XT
Renault	Alliance 1.7L (85hp)	NXG*	2030	Subaru	XT6 (AWD)
Renault	Alliance 2.0L				
Renault	GTA (95hp)	NXG**	2161	Sunbeam	Tiger
Rosion	Q1	NX123		Suzuki	Swift ('94-'01)
Saab	900 Turbo SPG ('85-'89)	NXF**	2875	Suzuki	Swift 1.3L GT ('89-'94)
Saab	900 Turbo SPG ('90-'91)	NXF**	2900	Suzuki	SX4 Sport ('08-'09)
Saab	9000 Aero 2.3L Turbo ('93-'97)	NXE	3265	Suzuki	SX4 Sport ('10)
Saab	9-2X Aero ('05)(AWD)	NXD	3179	Toyota	Camry 2.4L ('02-'06)
Saab	9-2X Aero ('06)(AWD)	NXD*	3208	Toyota	Camry 2.4L ('07-'08)
Saab	9-2X Linear ('05-'06)(AWD)	NXE	3030	Toyota	Camry 3.0L (V6)('97-'01)
Saab	9-3 Aero 2.0T & 2.0T ('04-'07)	NXF**	3175	Toyota	Camry 3.0L (V6)('03-'05)
Saab	9-3 Aero 2.8L ('06-'07)	NXE**	3285	Toyota	Camry 3.3L (V6)('04-'05)
Saab	9-3 Viggen ('99-'02)	NXE*	3170	Toyota	Camry 3.3L (V6)('06)
Saab	9-5 2.3T	NXE*	3470	Toyota	Camry 3.5L (V6)('07-'08)
Saab	9-5 Aero 2.3T & 2.3T ('02-'06)	NXE	3470	Toyota	Celica AllTrac ('88-'89)
Saab	99 EMS ('72-'76)(2.0L)	NXG*	2560	Toyota	Celica AllTrac ('90-'93)
Saturn	Ion ('03-'04)	NXF	2653	Toyota	Celica GT ('00-'05)

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Toyota	Celica GT ('77-'82)	NXG**	2460	Volvo	S40 T5 ('05)
Toyota	Celica GT ('83-'86)	NXG*	2500	Volvo	S40 T5 ('06-'07)
Toyota	Celica GT ('87-'89)	NXG**	2455	Volvo	S40 T5 ('05-'07)(AWD)
Toyota	Celica GT ('90-'99)	NXF	2600	Volvo	S60 2.4L
Toyota	Celica GT-S ('00-'05)	NXE*	2500	Volvo	S60 2.5L Turbo ('04-'06)(AWD)
Toyota	Celica GT-S ('83-'85)	NXG	2566	Volvo	S60 2.5L Turbo ('07)(AWD)
Toyota	Celica GT-S ('86-'93)	NXF	2679	Volvo	S60 2.5L Turbo ('04-'06)(FWD)
Toyota	Celica ST ('90-'93)	NXG	2600	Volvo	S60 2.5L Turbo ('07)(FWD)
Toyota	Celica Supra (1st gen)	NXF**	2789	Volvo	S60 R ('04-'05)(AWD)
Toyota	Corolla 1.8L ('03-'07)	NXF	2530	Volvo	S60 R ('06-'07)(AWD)
Toyota	Corolla FX-16 GT-S	NXF	2390	Volvo	S60 2.4L T5 ('05-'07)
Toyota	Corolla GT-S 1.6L 16v ('84-'87)	NXF**	2200	Volvo	S60 2.3L T5 ('01-'04)
Toyota	Corolla GT-S 1.6L 16v ('88-'89)	NXF	2390	Volvo	S60 3.0L T6 R ('13-'14)(AWD-T)
Toyota	Corolla SR5 ('79-'83)(3TC)	NXG	2185	VW	Beetle 1.8L T (150hp)('99-'05)
Toyota	Corolla XRS	NXF**	2670	VW	Beetle 1.9L TDI ('98-'03)
Toyota	Echo	NXF**	2035	VW	Beetle 1.9L TDI ('04-'06)
Toyota	Matrix ('03-'07)	NXG*	2673	VW	Beetle 2.0L ('98-'05)
Toyota	Matrix XRS (180 hp)('03-'04)	NXF*	2800	VW	Beetle 2.0L Turbo ('12-'15)
Toyota	Matrix XRS ('05-'06)	NXF	2800	VW	Beetle 2.5L ('06-'08)
Toyota	MR Spyder	NXE*	2195	VW	Beetle Turbo S ('02-'04)
Toyota	MR2 (1st Gen NA)	NXF*	2380	VW	Corrado 1.8L DOHC, 2.0L DOHC
Toyota	MR2 2.2L DOHC	NXF*	2657	VW	Corrado 2.0L SOHC
Toyota	MR2 SC	NXF**	2605	VW	Corrado G60 1.8L S/C
Toyota	MR2 Turbo	NXE**	2825	VW	Corrado VR6

Toyota	Paseo	NXG**	2025	VW	Golf 1.6L, 1.8L Golf 1.8L DOHC,
Toyota	Prius	NXH	2932	VW	2.0L DOHC
Toyota	Solara 3.3L (04-'06)	NXF*	3419	VW	Golf 1.9L TDI ('99- '03)
Toyota	Solara 3.3L (07-'08)	NXF	3440	VW	Golf 1.9L TDI (04- '06)
Toyota	Supra NA ('88- '92)	NXF**	3430	VW	Golf 2.0L TDI ('10)
Toyota	Supra NA ('94- '98)	NXE*	3265	VW	Golf 2.0L, 1.4L & 1.6L DOHC
Toyota	Supra T	NXE	3534	VW	Golf 2.0L ('99-'06)
Toyota	Supra TT	NXC**	3450	VW	Golf 2.5L I5
Toyota	Tacoma X- Runner ('05-'10)	NXF	3805	VW	Golf 2.8L V6
Toyota	Tercel ('88-'90) (78hp)	NXG	2020	VW	Golf 2.8L VR6 Golf R ('12) 2.0L Turbo
Toyota	Yaris ('07-'11)	NXG**	2280	VW	Golf R32 (AWD)('04)
Toyota	Yaris ('12)	NXG**	2280	VW	Golf R32 (AWD)('08)
Triumph	GT6 MK I	NXF**	1905	VW	GTI 1.8L 8v ('85- '92)
Triumph	GT6 MK III Spitfire MK 2 (75hp, 1147cc)	NXE	1904	VW	
Triumph	TR4 ('61-'64)	NXF*	1564	VW	GTI 1.8L DOHC GTI 1.8L turbo (150 hp)
Triumph	TR6 ('69- '76)(2.5L S6 US Carb)	NXF*	2240	VW	GTI 1.8L turbo (180hp)
Triumph	TR6 ('69- '76)(2.5L S6 Fuel Inj)	NXD	2360	VW	GTI 2.0L 8v ('95- '98)
Volvo	242 (2.3L) ('83- '85)	NXG	2840	VW	GTI 2.0L 8v ('99- '00)
Volvo	242 GLT ('81- '85)(turbo)	NXF	3072	VW	GTI 2.0L DOHC (134 hp)
Volvo	850 2.4L n.a. (93-'97)	NXF	3180	VW	GTI 2.0L Turbo (06-'09)(200hp)
Volvo	850 T-5R ('95), R ('96-'97)	NXE*	3240	VW	GTI 2.0L Turbo (10-'14)(200hp)
Volvo	C30 T5 2.5L turbo ('08)	NXE**	2970	VW	GTI 2.0L Turbo (15)(210hp)
Volvo	C70 T5 2.3 T Coupe ('01-'02)	NXE*	3200	VW	GTI 2.8L V6 (174hp)
Volvo	C70 T5 2.3 T				GTI 2.8L V6 (200hp)
Volvo	Conv. ('99-'04)	NXF**	3450	VW	
Volvo	C70 T5 ('06-'07)	NXF	3772	VW	GTI 337 (turbo)
Volvo	P1800 ('61-'62)	NXF	2215	VW	Jetta 1.6L

Volvo	S40 1.9 L ('00-'04)	NXF**	2767	VW	Jetta 1.8L DOHC
Volvo	S40 2.4L ('04-'06)	NXF	3084	VW	Jetta 1.8L SOHC
Volvo	S40 2.4L ('07)	NXG**	3234	VW	Jetta 1.8L turbo GLI

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VW	Jetta 1.9L TDI ('04-'06)	NXH**	2950	VW	Passat 3.6L ('06-'08)(AWD)
VW	Jetta 2.0L GLi DOHC	NXF*	2438	VW	Passat W8 (AWD)
VW	Jetta 2.0L SOHC	NXH	2934	VW	Rabbit 1.6L
VW	Jetta 2.0L turbo ('06-'08)	NXF*	3259	VW	Rabbit 1.6L Diesel (<'92)
VW	Jetta 2.5L I5 ('05-'07)	NXG	3230	VW	Rabbit 1.6L Turbo-Diesel (<'93)
VW	Jetta 2.5L I5 ('08)	NXG**	3230	VW	Rabbit 1.7L (74hp)
VW	Jetta 2.8L VR6 12v ('94-'98)	NXF	2927	VW	Rabbit 2.5L ('06-'07)
VW	Jetta 2.8L VR6 12v ('99-'02)	NXG**	3113	VW	Rabbit 2.5L ('08)
VW	Jetta 2.8L VR6 24v	NXF*	3179	VW	Rabbit GTI 1.8L (90hp)
VW	Passat 2.0L turbo ('06-'08)	NXF*	3305	VW	Scirocco 1.6L (75-78hp)
VW	Passat 2.8L	NXF*	3151	VW	Scirocco 1.7L (74hp)
VW	Passat 3.6L ('06-'08)	NXE*	3576	VW	Scirocco 1.8L DOHC
VW	Passat 3.6L ('12-'14)	NXE**	3400	VW	Scirocco 1.8L SOHC