



USST National Engine Rule Set (2010)

The USST National Series combines trucks from many different origins and blends them into a racing class that includes their different features. With the high expense of racing, fuel cost, and the economy in general, a USST goal is for its racers to be able to use and depreciate the existing equipment they have invested in while moving toward a common truck.

There is a variety of engines available from the root classes of USST, I-70, and Nashville. Engines are included as a performance factor in the USST rules to add or remove weight. This is a weight based rule set that is easily adjustable. Lead is the cheapest and most measurable equalizer.

The definitions and listing of all performance factors are described in the document “USST National Series Performance Factors” but this document pertains only to engines.

Each truck team will be given an assessment sheet to list these factors before events and their required weight will be calculated. This procedure is described in the separate document “USST National Series Procedures”.

Three important points to note:

1. Teams will be required to declare the type their engine at race registration and will be disqualified if they deviate from that engines rules listed in the latest version of this document.
2. The USST National Series Engine document contains the engine rules that USST will enforce. For USST events, it supersedes all earlier or later documents from the original series that created the engine rules. USST written rules will deviate from the original sanctioning body as necessary
3. USST Techs “Crate” or Sealed engines just like Built engines. All engines are subject to tear down and inspection.

Engines

The long term engine package will be selected from these engines currently being run. Each engine is defined and trucks will add or subtract weight based on the performance factor tables. Racers **MAY NOT** mix engine rules from two or more sets. The USST legal engines are listed below in no particular order and each section follows.

1. **USST MID-AM Engine**
2. **USST 9.5 to 1 South Engine**
3. **USST GM 604 Crate Engine**
4. **USST FORD Crate Engine**
5. **All other Engines**
6. **Required Carburetors For Engines**
7. **Ignition System**



Section 1 - USST Mid-Am Engine

GENERAL

- American made production V-8 engines only.
- No V-6 or 4 cylinders
- No coatings on engine parts, interior or exterior.
- No Carbon Fiber parts on the engine.
- ¾" pipe plug inspection hole must be installed in oil pan for inspection. If Windage Tray is used there must be a hole through it to view rod journal.
- 10.8 to 1 maximum compression ratio as measured on the 'whistler'.
- Maximum cubic inches 358 GM and Ford, 366 Mopar.

ENGINE BLOCK

- Must be cast iron block with standard external measurements in all respects with the exception of the permissible overbore. (.060 max.)
- No aluminum blocks permitted.
- No removing of identification numbers.
- No grinding or lightening.

CRANKS

- Minimum 50-lb. sportsman type magnetic cranks only.
- Unaltered except for normal cleanup and balancing.
- Cranks should not be gun drilled, contoured or sculptured.

RODS

- Magnetic steel type connecting rods only.
- No titanium or aluminum rods.
- 6.0" maximum length.
- 560 grams minimum weight.(except 302 Ford rod)

PISTONS

- Any flat top or dished piston may be used.
- Valve relief may be cut into piston.
- No portion of the piston may protrude above the top of the block.

CAMSHAFT & VALVETRAIN

- Any magnetic steel camshaft with a maximum 0.500" lift measured at the valve retainer.
- Standard timing chain only. No gear drive or belt drive.
- Stock diameter magnetic steel hydraulic or solid flat tappets only.
- No mushroom or roller tappets.
- Full roller rocker arms allowed.
- No shaft mounted rockers (except Mopar)



HEADS

- Cylinder heads must be a stock cast iron production.
- GM casting number 10239906 or 12558062 Vortec heads allowed.
- Ford Racing part #M-6049-N351 allowed.
- Mopar W2 #P4529446 allowed.
- Ford and Mopar must call for approval of other part numbers.
- No angle plug, Bowtie, Vortec Bowtie or 461X heads.
- No aftermarket heads.
- Limited to two valves per cylinder.
- No titanium valves or valve retainers permitted.
- Three angle valve job permitted.
- Valves must be stock size and in stock location and at stock angle.
- Maximum valve diameter measured across the face:
 - GM Vortec-- intake 1.94", exhaust 1.50".
 - ALL other heads-- Intake 2.02"; exhaust 1.60".
- Stock production valve spring diameter only.
- Screw in studs and guide plates allowed.
- Combustion chamber, intake and exhaust ports must be in the original 'as cast' configuration.
- Any evidence of sanding, polishing, relieving, grinding, porting, chemical treating, ceramic work, abrasive blasting, alteration of the original form or the addition of material to the ports or combustion chambers is prohibited.
- No external sanding, grinding, or removal of I.D. number or symbols.

INTAKE MANIFOLD

- Aluminum intakes unmodified in any way include:
 - GM (non Vortec)--Edelbrock Performer #2101 or Victor Jr. #2975, Weiand X-CELerator #7546 or #7547.
 - GM Vortec—Edelbrock Performer RPM #7116.
 - Ford (N351 and OE Windsor head)—Ford Racing Dual Plane #M-9424-C358, #M-9424-Z351, #M-9424-F302; Edelbrock Performer #2181, #2121 or Performer RPM #7181, #7121
 - Ford (OE Windsor head)-- Edelbrock Victor Jr.#2980, #2981, #2921.
 - Mopar (OE head)—Edelbrock Performer #2176 or Victor #2915.
 - Mopar (W2 head)--Weiand #8015.
- Any evidence of sanding, polishing, relieving, grinding, porting, chemical treating, abrasive blasting, ceramic work, addition of material or any alteration to original form is prohibited.
- Cooling bleed lines allowed.
- No turtles or other induction performance enhancing devices.
- Maximum height for carburetor spacer is 1 1/4" including gaskets.



OIL SYSTEM

- Aftermarket oil pans and breather allowed.
- Oil pump must remain in stock location.
- No dry sump systems.
- Single stage external pump allowed as OE replacement on Ford only.
- Oil coolers may not be mounted inside the Drivers compartment.
- Stainless steel braided oil lines with AN type fittings must be used.

Section 2 - USST 9.5 to 1 ENGINE

General

- No four or six cylinder engines allowed.
- All engines will be a maximum of 9.5 to 1 compression ratio. USST can determine which cylinder to check. USST inspectors will perform or oversee the compression checking process to verify tools are used properly and crankshaft/piston are positioned TDC.
- Maximum displacement, including wear and clearance, is: 365 cubic inches. Blueprinting of engine components allowed per factory specifications. (Formula: Bore x Bore x .07854 x Stroke x 8 Cylinders = Total Cubic Inch Displacement.)

ENGINE BLOCK

- Cast iron blocks only.
- Mechanical fuel pump in stock location. No belt-driven fuel pumps allowed. No electric fuel pumps.

CRANKS

- Harmonic balancer must be bolted to the crank.

RODS

- Steel connecting rods only.
- No titanium or aluminum rods.

PISTONS

- Flat top or dish top only.



CAMSHAFT AND VALVE TRAIN

- Camshaft and lifters must be of a flat tappet design only.
- No Roller camshafts, lifters, mushroom camshaft, or mushroom lifters.
- Lifters must match block (i.e. No Ford lifters in Chevy block).
- Lifters must rotate individually.
- No rounded nose lifters.
- Timing chains will be OEM type only.
- Double roller chain and gears will be allowed.
- No gear drives or belt drives allowed.

HEADS

- Any cast iron cylinder head.
- No porting, grinding, or polishing of any type; in any location.
- Chevy must be a 23-degree head.
- Heads may be surfaced.
- Heads must remain in stock location, No moving or offsetting of dowels in block or heads.
- Pocket under valves may be opened up with cutters only up to a maximum of 80 degrees.
- No removing of exhaust lip on lower floor of exhaust port.
- Type of Roller rockers, guide plates, and stud girdles are optional.
- Heads must match block manufacturer. (Examples: Any approved GM heads on any approved GM block, etc. No big block heads on small blocks or vice-versa. No Ford on GM, etc.)
- 1st generation Ford 351N head allowed. Ford 352 head Not allowed. Check with USST for other variations and legal casting numbers.
- Doublehump Head Rule: Exemption on compression for Non-Vortec or Non-Bowtie GM head engines. All other rules apply including pistons must be flat or dished and max 365 cid.
- No titanium parts allowed except valve spring retainers.

INTAKE MANIFOLD

- No hand-built fabricated sheet metal or aluminum intake manifold will be allowed.
- Intake manifold may not be any taller than seven inches at center of carburetor pad including any gaskets and spacers. Intake may not be altered to achieve height.
- Intake may be port matched, but grinding may not exceed over 1" into the manifold port.

OIL SYSTEM

- No aluminum oil pans allowed.
- Wet or dry sump systems allowed.
- Dry sump tank must be located behind drivers compartment.



Section 3 - USST GM 604 Crate Engine

GENERAL

- Crate engines are tech inspected the same as any built motor and subject to tear down.
- USST does not honor seal bolts.
- ASA parts rules apply.
- All parts must be GM 604 original OEM parts, except ASA modifications optional.
- No coatings or modifications to the GM parts.
- Engines may be Dyno tested to ensure power ratings are within USST specifications.
- All parts must match GM specifications for dimensions, weight, material, ect.

Section 4 - USST FORD Crate Engine

GENERAL

- Crate engines are tech inspected the same as any built motor and subject to tear down.
- USST does not honor seal bolts.
- ASA parts rules apply.
- All parts must be Ford original OEM parts, except ASA modifications required.
- No coatings or modifications to the Ford parts.
- Engines may be Dyno tested to ensure power ratings are within USST specifications.
- All parts must match Ford specifications for dimensions, weight, material, ect.

Section 5 – All other Engines

The USST reserves the right to allow any engine combination with adequate weight penalties/breaks and carburetor sizes. Below are Engines that have been allowed in the past, please call for approval. If your engine is not listed please call for approval.

Nashville Machined Engine

- After review of the rules, these engines can easily be converted to fit the USST Mid-AM package by changing the camshaft and adjusting the compression ratio to 10.8 to 1
- If not converted this motor will be required to run a Holley #4412 500cfm 2 barrel or Holley #80507 390cfm 4 barrel.
- Weight break TBD



GM 603 and 602

- Call for approval
- Weight break TBD

Wegner Crate Engine

- Call for approval
- Weight break TBD

Colorado Engines

- Call for Carburetor size
- Weight TBD

Section 6 – Required Carburetors for all Engines

USST Mid-Am

- Holley HP 650 4 barrel

USST 9.5 to 1

- Holley HP 600 4 barrel

USST GM 604 Crate Engine

- Holley HP 650 4 barrel

USST GM 603 Crate Engine

- Holley HP 650 4 barrel

USST GM 602 Crate Engine

- Holley HP 650 4 barrel

USST Wegner Crate Engine

- Holley HP 650 4 barrel

USST Ford Crate Engine

- Holley HP 650 4 barrel

Nashville Machined Engine

- If the engine has not been converted to a Mid-Am Engine the following applies.
- Holley #4412 500 2 barrel
- Holley #80507 390cfm 4 barrel.



Colorado Engine

- TBD

All Carburetors must match Holley specifications on all internal and external dimensions. Carburetors will be checked with a “Go-No-Go” gauge.

Section 7 – Ignition System

General

- Distributor type ignition systems mounted in stock location on the engine must be used.
- No Crank Triggers
- No Traction Control devices in the ignition system or wiring.