2008 E-85 Power Shootout Rules

Engines for this build are to be a maximum of 8 cylinders. Two strokes, diesel engines and Wankel configurations are not allowed. Titanium is not allowed in any part of the engine. E-85 is the term for motor fuel blends of 85 percent ethanol and just 15 percent gasoline.

Contestants are entering contest at their own risk and that AERA is not responsible for injury or damage to the engine or any other equipment. Contestants must abide by any rule formulated to protect their safety along with audience member's safety.

Only Active AERA members are eligible to enter contest. Any questions regarding these rules, please contact AERA at 847-541-6550.

ENTRY REQUIRMENTS

Official E-85 Power Shootout applications will be accepted by mail only, and must be postmarked no later than August 15, 2007. Applications submitted by facsimile or email will not be accepted. Applicants must be at least 18 years of age. Any person who meets the "Entry Requirements" can submit an Engine Builder Application for review. All applications will be reviewed to determine eligibility. As this competition is inaugural, AERA will select a maximum of 6 competitors by September 1, 2007, at their sole discretion. No preliminary elimination competition will be conducted prior to show finals. All applicants will be notified of the selections. Multiple shops may combine to form a single entry.

Section 1: Engine General

ENGINE

Any normally aspirated or fuel injected, E-85 powered engine not to exceed 8 cylinders is allowed. Diesel, rotary or two-stroke engines are not allowed. Power adders such as superchargers, turbochargers, nitrous oxide, or other such devices, are not allowed.

Any method of artificially heating and/or cooling engine fluids, fuel, and/or air is not allowed (not to include thermal or friction coatings). This includes, but is not limited to, heating and/or cooling by mechanical device such as an external cooler or radiator/heat exchanger, pre-heating or cooling of any fluids with an oil heater or fuel heater/cooler, or the addition of a temperature-altering device designed to cool or heat the incoming air charge by mechanical means such as an intercooler, chemical means such as a chemical to cool either the incoming air/fuel charge or intake manifold, or electrical means such as an electric oil heater inside or outside the engine.

Section 2: Cylinder Block

CYLINDER BLOCKS

Any OEM or aftermarket replacement, cast iron, or aluminum engine block is acceptable.

Section 3: Crankshaft / Connecting Rods / Pistons

CRANKSHAFT

Any commercially available crankshaft is acceptable.

CONNECTING RODS
Any commercially available steel or aluminum connecting rods are acceptable. Titanium or any other exotic materials are not allowed.

PISTONS
Any commercially available aluminum pistons are acceptable. Custom-made, modified, and/or coated pistons are acceptable. Compression is not limited.

Section 4: Cylinder Heads & Valve Train

CYLINDER HEADS

Any domestic or aftermarket cylinder heads are acceptable with a maximum of 2 valves per cylinder. Purpose-built racing heads such as; GM DRCE, Dart Big Chief and other similar racing heads are allowed. Multiple spark plugs per cylinder and/or overhead camshafts are allowed.

Any valve seat size and/or valve size is acceptable. Any commercially available stainless steel valve is acceptable. Titanium valves and/or springs and retainers are not allowed.

Unlimited porting and polishing is acceptable.

CAMSHAFT
Any commercially available camshaft is acceptable. Custom-designed and custom-ground camshafts are acceptable. Solid roller and hydraulic roller designs are acceptable. Offset lifters are acceptable.

ROCKER ARMS
Any OE or aftermarket available rocker arm system is allowed.

Section 5: Oiling System

OIL PAN
Any aftermarket available chassis-style wet-sump oil pan is acceptable so long as it is OE compatible. Dry sump systems and vacuum pumps are not allowed. External crankcase ventilation and/or oil drain-back systems plumbed externally that return oil to the pan are not allowed. Builders choosing to run windage screens or scrapers can do so only if they are already part of the as-manufactured oil pan design, or are attached without any modification to the block or oil pan. Oil system accumulators are not allowed.

OIL
Engines must be shipped "dry" to the dyno arena, along with unopened quarts of oil. Inspection of engine oil containers will be done before engine oil is installed.

OIL ADDITIVES
Any commercially available oil additive is acceptable but not required. Oil additives may not contain an oxygenating substance. Engines must be shipped "dry" to the dyno arena along with at least one unopened bottle of oil additive.

Section 6: Induction System

INTAKE MANIFOLD
Any OEM or aftermarket available intake manifold is acceptable. Porting, polishing, and/or sizing/matching of interior surfaces of the intake runners and/or ports are acceptable. Sheet metal intakes are allowed, but must be purchased assembled already and be a part number that can be purchased off of the shelf.

AIR FILTER
Engines must be equipped with an air filter while running on the dyno. Velocity stacks and/or stub stacks are not allowed.

Section 7: Fuel System

INJECTION & CARBURETOR
Any Fuel Injection system either electronic, mechanical or carburetor(s) are acceptable. Fuel line hookups need to be -8 male couplers. Line will be supplied by AERA.

FUEL PUMP
Fuel pump and regulator will be the responsibility of the competitor.

FUEL
Engines will be supplied with pump E-85 alternative fuel. E-85 is the term for motor fuel blends of 85 percent ethanol and 15 percent gasoline.

Section 8: Cooling System

WATER PUMP
Any commercially available mechanical water pump is acceptable. Engines using a mechanical water pump must be equipped with an operational belt and pulley drive system. Water pumps must be mounted in the OEM location. Commercially available or custom-fabricated water pump adapter plates will be permitted as long as they do not alter the OEM block mount or pump location. Remote-mounted water pumps are not allowed. **Use of a cooling system thermostat is not allowed.**

Section 9: Ignition System

IGNITION
Commercially available point's style, programmable ignition system including electronic or capacitive discharge that utilize a single battery-powered distributor and coil are acceptable. OEM coil on plug is acceptable. **Magnetos are not allowed.** Spark plug wires must be commercially available and their design must remain unmodified. Electrical power will be supplied to the ignition system by a single 12-volt system.

STARTER
Starters will not be used in the competition and are not allowed. The dyno is equipped with a built-in starter.

Section 10: Exhaust System

HEADER/MANIFOLD
Commercially available exhaust headers or manifolds are required. Cross-over tubes are not allowed. Port matching of the header flange is acceptable. Any diameter primary tubes and collectors are acceptable. Header sets that were designed and manufactured with slip-on style collectors are acceptable. Headers or Manifold will need to have proper connection to the mufflers and piping used in the competition. Exhaust size will need to be 3" and the type of connection will be published to the competitors at a later date.

Crankcase ventilation systems that vent to any component of the exhaust system are not allowed. Thermal header wraps (such as Kevlar fabric) are not allowed. Headers and mufflers must provide a minimum of 17-inches of inside clearance to properly fit on the dyno chassis. Exhaust systems must be properly sealed from the header flange to the muffler inlet.

Section 11: Miscellaneous

COATINGS
Commercially available performance coatings are acceptable. The application of thermal and/or friction coatings can be performed at any time prior to the competition on any part. Coating a part is not considered a modification, and parts that cannot be legally modified, may be coated.

FLYWHEEL/FLEXPLATE / DAMPER
Dyno will hook up directly to the rear of the crankshaft. Bolt patterns need to be supplied to AERA to get the proper hookups to the dyno. Flex plates and flywheels are not permitted. Contestant will need to provide bolts for proper hook up to the dyno drive.

BELLHOUSING
Bell housings will not be used in the competition and are not allowed.

Section 12: General Information

TOOLS & PARTS
Contestants are required to supply all necessary tools, spare parts, laptops, ECU's, gaskets, timing light, shop towels, etc. in order to complete their final engine assemblies, tuning adjustments, modifications and/or repairs. Tools, jets, power valves, spare parts, laptops, ECU's, gaskets, timing lights, shop towels, etc will not be supplied by AERA, except those needed to install and remove the engine from the dyno.

TRANSPORTATION
Participants are responsible for coordinating and funding their engine transportation to and from the E-85 Power Shootout competition at the Indiana Convention Center (ICC). All engines must be delivered to the ICC no later than February 27 2008. Any engine that arrives "late" may be disqualified from the competition.

All competing engines, parts and tools must be crated and delivered to the following address. The maximum allowable engine crate size is 36" x 39" x 45" tall, including the pallet. Each competitor will be allowed to ship and/or deliver a maximum of 2 engine crates.

Indiana Convention Center
100 S Capitol Ave
Indianapolis, IN 46225
ATTN: HOT ROD & RESTORATION SHOW
AERA E-85 POWER SHOOTOUT

PARTICIPANTS

Participants are responsible for their own transportation, lodging and food expenses that may be incurred while attending E-85 Power Shootout.

DYNO PULLS

Contestants must be present or represented during their dyno testing, no exceptions. Dyno pulls during the qualifying and final rounds will be conducted as follows. Engines will be placed on engine dyno and contestants will assist the on-site officials and dyno personnel in completing the necessary dyno connections and final engine assemblies. Each engine will be warmed to a specified operating temperature of 160 degrees minimum for water (water tower temperature). If the engine is unable to achieve these temperatures in a reasonable time period (not more than 5 minutes). Competitors will be allowed a couple of test pulls and tuning time, approximately 15 minutes, to make sure that the engine is ready for the competition pull and to check and set ignition advance with laptop or timing light and o make any tuning adjustments and/or repairs. Engines will be run from 2500-6000 RPM and the scoring will be figured out. Before any engine is pulled on the dyno, the engine will be brought up to 1200 RPM and a vacuum reading will be taken. Engines must meet a **minimum 10" of vacuum** to continue onto the dyno pull for competition. If the engine does not meet the 10" of vacuum requirement, the competitor will have the opportunity to fix or change anything that needs to be within the time allowed. If after a certain time period the engine is brought to 1200 RPM and still can not meet the 10" of vacuum requirement, the competitor will be eliminated from the competition.

Method Of Scoring

Performance rankings for competition pulls will be computed using a dynamometer and software supplied by Stuska Dynamometers. Competition pulls will consist of three, consecutive acceleration pulls ranging from 2500 rpm to 6000 rpm. After the three pulls are completed, the average torque and horsepower numbers will be added together. We will then take the two highest average combined numbers and add them together and divide by cubic inch for a final number. This will be the procedure for both days of the competition. Both days' final numbers will be added together and divided by 2 to figure out a winner of the competition.