

VOLUME 9

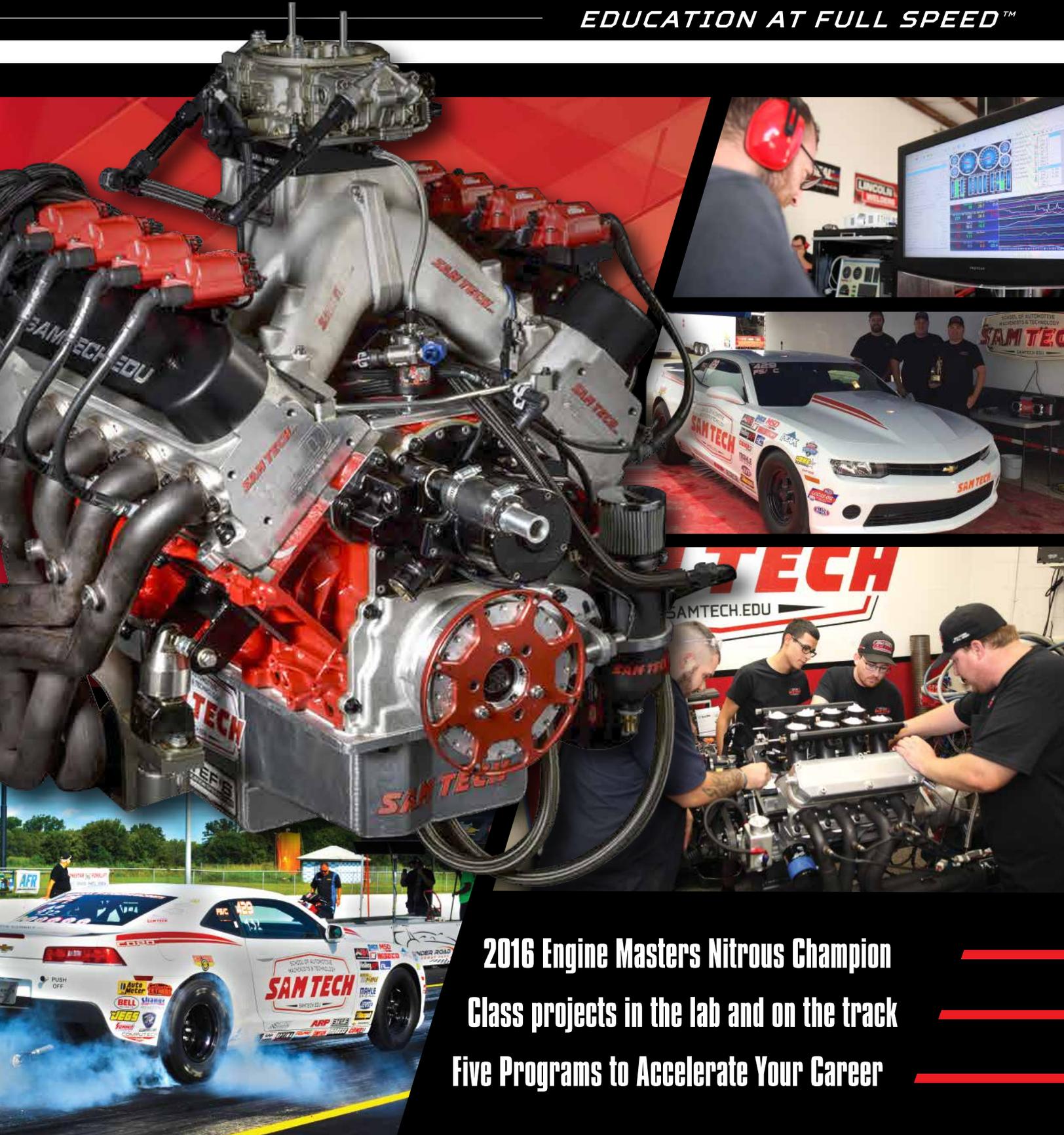
# 2017 RACE REPORT

SCHOOL OF AUTOMOTIVE  
MACHINISTS & TECHNOLOGY

# SAM TECH

EST 1985

EDUCATION AT FULL SPEED™



**2016 Engine Masters Nitrous Champion**  
**Class projects in the lab and on the track**  
**Five Programs to Accelerate Your Career**

# SAM Tech PROGRAMS



**BLOCK MACHINING** The objective of the **Automotive Engine/Block Machining** program is to qualify the student as an automotive machinist/race team crew member. Although the actual machining process will be the emphasis of the program, a thorough education on theory of operation of the modern race engine will be presented. The student will explore the basic theory and concepts of internal combustion engine operation, then move into more specific and complex areas including cylinder pressure, airflow, volumetric efficiency, high RPM valve train geometry, and horsepower/torque as demonstrated on both engine and chassis dynos. Although no previous experience is required, this program is intended for the mechanically inclined student with a serious work ethic. Students will work directly on the School race cars, in the facility and at the track. They will be exposed to true race engines and drivetrains. This will include data acquisition, weather station correction factors, MSD ignition systems, EFI programming, carburetion tuning, clutch set-up, gear and converter combinations.

**CYLINDER HEAD MACHINING** The objective of the **Automotive Engine/Cylinder Head Machining** program is to train the student as a performance cylinder head machinist for the race engine industry. The theory and role of the cylinder head in the engine operation will be thoroughly covered in the classroom. Airflow characteristics and their effect on performance will be highlighted in all areas of this program. The complex relationship of flow bench numbers versus horsepower will be examined during lab hours. Students will learn the how and why of the many components of a cylinder head assembly. Intake manifold design from cast to fabricated sheet metal will be studied in terms of cubic inch and RPM range in relationship to cross sectional area and runner taper. The art of creating maximum efficiency and horsepower through precision component assembly combinations will be taught to the students. The knowledge learned will facilitate the student's success in the motorsports industry.



**CNC MACHINING** The program objective of the **Automotive Engine/CNC Machining** course is to qualify graduates to be capable of understanding and performing machining operations utilizing Computer Numerically Controlled Machining Centers. The program will include both classroom and hands-on lab instruction. The primary emphasis of this program will be the application of CNC machining techniques to improve performance of cylinder heads and engine blocks. Students will thoroughly explore the utilization of 5-Axis CNC Machining Centers as well as Coordinate Measuring Machine digitizing hardware and software applications and interfacing. Machine set-up, operation, and work piece preparation will be covered in detail. Special emphasis will be given to modification of high-performance and racing cylinder heads. Students will analyze and evaluate completed projects to quantify improvements, using racing industry standard equipment and techniques.

**MOTORSPORTS EFI TUNING** The objective for the **Motorsports EFI Tuning** program is to qualify the student as an Automotive Performance Engine Tuner. The student will be capable of calibrating and troubleshooting the Engine Management System on the engine dynamometer, chassis dynamometer and at the racetrack. This program includes instruction in adding performance accessories, modifying power trains, tuning custom engines, suspension, exhaust systems, and using dynamometers and other diagnostic equipment. This program is intended for mechanically inclined students with a solid background in the mechanical system of an automotive engine and desire to extend that knowledge into the electronic control system in the automotive industry. The program will include both classroom and hands-on lab instruction. The student will learn and explore how to utilize various engine control software and dynamometers to alter engine operating parameters while observing the physical changes in real time. Specific tuning topics such as High Performance Naturally Aspirated, Turbo Charged, Supercharged, Nitrous, and data acquisition will be covered in detail. The student will learn to analyze and evaluate completed projects to quantify improvements, using racing industry standard equipment and techniques.



**ASSOCIATE OF APPLIED SCIENCES** The objective of the **Associate of Applied Sciences Degree** in Automotive Engine/Block & Cylinder Head Machining is to qualify the student as an automotive block and cylinder head machinist. In addition to the technical courses, students will take Introduction to Communications, College Algebra, Introduction to Physics, English Composition, and Sociology to complete the degree. The program provides an ideal foundation for professional development and continuing higher education. The addition of this degree program represents a significant, additional educational commitment by the school and a huge opportunity for the students. Former graduates of the **Automotive Engine/Block & Cylinder Head Machining** programs may return to school to complete the Associate of Applied Science Degree.

# SAM Tech Named Military Friendly School for Fifth Time



2017 is the fifth straight year that SAM Tech has been designated a Military Friendly® School by Victory Media, the leader in successfully connecting the military and civilian worlds. The Military Friendly® Schools designation is awarded to the top 15 percent of colleges, universities and trade schools in the country that are doing the most to embrace military students, and to dedicate resources to ensure their success in the classroom and after graduation

Being named a Military Friendly School for five years in a row is an honor in which we are very proud,” said Linda Massingill, Executive Director of the School of Automotive Machinists & Technology. “We appreciate all these veterans have sacrificed in defending this great country of ours. We are glad to be able to help them and their families in any way possible. We at SAM Tech understand the importance of continuing one’s education in an effort to find a career after military service.”

## GRADUATES IN ACTION

**SAM TECH GRADUATES ARE WORKING WITH THE BEST IN THE INDUSTRY FOR OUR EXTENDED LIST OF EMPLOYERS, VISIT US AT: [WWW.SAMTECH.EDU](http://WWW.SAMTECH.EDU)**

A.J. Foyt Racing • Automotive Specialists • BES Racing Engines • Brodix Cylinder Heads • Cosworth • CP-Carillo • Dart Machinery • Don Prudhomme Racing  
 Don Schumacher Racing • Durham Racing Engines • Élan Motorsports Technologies • Elite Performance • Engine Power | PowerNation • Ferrea Racing Components  
 GM Global Propulsion System Racing • Gray Motorsports • Hendrick Motorsports • Ilmor Engineering • Indy Cylinder Head • Innovation Marine • Jesel • Joe Gibbs Racing  
 John Force Racing • Johnson & Johnson Racing • Jon Kaase Racing • Kalitta Motorsports • Katech Engine Development • KB Racing • Keith Kraft Performance Engines • Kuntz & Co.  
 Late Model Engines • Lingenfelter Performance • Livernois Motorsports • MAST Motorsports • McLaren Engines, Inc. • MTI Racing • Pat Musi Performance • Patterson Racing  
 Penske Racing • Procharger • Proline Racing • Reher-Morrison Racing • Richard Childress Racing • Roush-Yates Industries • Shafiroff Race Engines • Sonny’s Racing Engines  
 Sterling Performance • Sunset Performance • Toyota Motorsports • Trick Flow Specialties • Wilson Manifold



**Adam Torres** *Sergeant USMC*  
*Rods & Pistons and Cylinder Heads Patron Funny Car*

**Current Employment:**  
 Kalitta Motorsports

**Programs Completed:** Automotive Engine/Block Machining  
 Automotive Engine/Cylinder Head Machining

After spending 6 years in the Marines and reaching the rank of Sergeant, Adam Torres decided to continue his education. “I wanted more advanced courses on engines, so I decided to attend SAM Tech using my GI Bill,” said Adam. In order to get the career he wanted Adam took the Block and Head combo program. After finishing the Block and Head programs at SAM Tech Adam was hired by Kalitta Motorsports in the NHRA. The last two seasons Adam has been on Alexis DeJoria Patron Funny Car for Kalitta Motorsports. Adam’s duties for the Patron funny car include the rods and pistons as well as working on the cylinder heads. While with Kalitta Adam has helped the team win two races one with Alexis and the Patron team and one with Del Worsham and the DHL team. The skills Adam learned at SAM Tech helped prepare him for his job with the world champion Kalitta Motorsports team.



**Johnny O’Neil** *(Left)*  
*Cylinder Head Technician*

**Carl Monkhouse** *(Right)*  
*Engine Builder*

**John Gwinn** *(Below)*  
*Performance Dynamometer Technician*

**Current Employment:**  
 Roush Industries

**Programs Completed:** Automotive Engine/Block Machining,  
 Automotive Engine/Cylinder Head Machining

Although John, Carl, and Johnny work in different departments at Roush Industries the skills they learned at SAM Tech bring their jobs together. While in the Cylinder Head Program Johnny learned porting skills which he uses as a Cylinder Head Technician, Johnny’s jobs include machining and assembling heads. As a student in the Block Program Carl learned the theory and machining expertise that helps him every day. Carl assembles special prototype engines as well as crate engines. John is a Performance Dynamometer Technician, a skill he learned while working with the SAM Tech dyno. John tests every engine to ensure they make the proper torque and power numbers. Additionally, John inspects for leaks and handles any minor issues that may arise before the engine is shipped. While attending SAM Tech these graduates experienced firsthand how each class and department worked together to prepare an engine for the dyno, race track, or street. They now work together using skills learned at SAM Tech for one of the premier engine builders in the world.

## 2016 ACCSC School of Excellence Accreditation Award

In 2008 ACCSC introduced the School of Excellence Award which recognizes schools for their commitment to the expectations and rigors of ACCSC accreditation, as well as efforts in maintaining high levels of achievement among their students. In order to be eligible for the award, a school must meet all of the criteria established by the Commission for its School of Distinction Award and the school’s graduation and employment rates from all programs offered must meet or exceed the average rates of graduation and employment among all ACCSC accredited institutions. In 2011 SAM Tech was one of only thirteen schools in the country to receive this prestigious award for the 2011-2012 school year. SAM Tech was proud to receive the award a second time in 2015-2016. The School of Automotive Machinists & Technology was awarded School of Excellence.





## **SAM Tech CLASS PROJECTS HELP TRAIN NASA ASTRONAUTS**

We know how the racing industry wants to hire grads from The School of Automotive Machinists & Technology, but the school's reputation has also led to its involvement in a monumental space exploration project. NASA is currently building the Orion spacecraft which, in a few years, will take astronauts to an asteroid and one day on to Mars. It will be the safest and most advanced space craft ever built. The SAM Tech CNC class is designing and fabricating pieces for the crew module mock-up, which is used in spacecraft design and astronaut training. NASA's first unmanned Orion flight happened in 2014, 3,600 miles into space at speeds of more than 20,000 MPH. – Horsepower TV For the last several years, SAM Tech's CNC programs have been working hand in hand with NASA engineers, staff, and even astronauts designing and fabricating a shoulder bolster for the Orion spacecraft seat system which provides critical protection to the crew during launch and landing. Over the summer, the School of Automotive Machinists & Technology was visited by one of the astronauts from NASA. While visiting, he met with faculty, staff, and even held a Q & A with the students.



“The partnership with SAM Tech has turned out to be a tremendous benefit to NASA. The creative design work that SAM Tech is doing has the potential to help NASA reduce the mass of the system, which is always a goal with spacecraft. Also, the manufacturing work that SAM Tech is doing is outstanding, providing NASA with some very high quality hardware to use in testing and training. We are thrilled to have this opportunity to share a little of what NASA is doing with the students.”



Christie Sauers, NASA Orion Mockup Lead



## **OVER \$4 MILLION IN SCHOLARSHIPS Awarded to HRT**

Over the last several years, the School of Automotive Machinists & Technology has awarded over 4 million dollars in scholarships to hundreds of high school students on automotive teams competing at the Hot Rodders of Tomorrow championship events across the country. “It is great to see so many young men and women challenging themselves in this engine building competition,” said Brian Massingill, Director of Student Motorsports for SAM Tech. “We at the School of Automotive Machinists & Technology, are more than excited to see a program like this exist. We feel it gives these high schoolers an unparalleled advantage, especially when coupled with a SAM Tech education, to finding not just jobs, but careers in the high performance racing industry.”

For more information on the Hot Rodders of Tomorrow, please visit their website: [www.hotroddersoftomorrow.com](http://www.hotroddersoftomorrow.com).



## Nitrous Engine

The 2016 Amsoil Engine Masters Challenge presented by Hot Rod Magazine followed the new format that began in 2015, multiple classes with smaller more specific fields. 2016 marked the first year to introduce a power adder class. The minute Hot Rod Magazine announced the Nitrous Small Block Class, SAM Tech started planning.

There was a cubic inch maximum limit of 367. The nitrous team chose an LS based combination, starting with an OEM 6.0 liter block. The cylinder heads and intake manifold were CID LS7 castings. The heads were developed by the SAM Tech Head Class and machined by the SAM Tech CNC students to work with nitrous. A Braswell carburetor set on top of a Nitrous Outlet .078 jetted (200 horsepower) plate system as stated by the rules.

Dyno pulls were made testing headers, collectors, fuel and timing curves, and a number of cams to optimize the engine from 4200 – 7200 RPM. With careful flow testing on a custom test bench built by the students, Nitrous Outlet's stinger configuration showed the most uniform and highest flow. On the engine dyno the Nitrous Outlet configuration also produced the most horsepower gains.

In addition to winning the Nitrous Class SAM Tech won the Torque Monster and Horsepower King awards.

### Nitrous Winning Engine

**Peak HP 922 @ 7100 RPM**

**Peak TQ 832 @ 4700 RPM**



## Vintage Engine

The first year of the Vintage Class was a big hit with contestants and viewers as well as SAM Tech Students. Because of student interest it was decided to enter the vintage class with last year's runner-up Chrysler Poly engine. Most engine builders, including the SAM Tech faculty, have never built or seen a Polyspherical Chrysler V8. So, initially it was interesting and challenging for the team. As the engine progressed, it proved to employ all the classes that SAM Tech offers.

Last year's engine with its extensively modified cast iron heads proved to be a problem with leaks. The instructors and students wanted to make a second attempt. After an enormous effort, including welded raised intake runners and fabricated steel exhaust port plates, the heads held and dyno testing and tuning went well. The engine picked up from last year's entry and we were ready to go.

After a baseline pull the timing and fuel were adjusted and a solid second pull was made. As expected the horsepower and torque numbers were up from last year. After looking at the data another change to the tune was made, again power and torque went up, but around 5500 rpm the power fell off quickly. A check of the engine revealed the water leak had returned on one head. With great disappointment we made a final qualifying pull, losing even more power.

SAM Tech finished second to Ted Eaton of Eaton Balancing. He built a great combination. SAM Tech was short 25 points which was 5 horsepower and 5 torque averaged across the pulls.

### Vintage Runner Up - Poly Engine

**Peak HP 602 @ 6000 RPM**

**Peak TQ 618 @ 4300 RPM**

### SAM TECH EMC STANDINGS

| Winner                | Runner - Up           |
|-----------------------|-----------------------|
| 2016 Nitrous Shootout | 2016 Vintage Shootout |
| 2015 LS Shootout      | 2015 Vintage Shootout |
| 2012 Xtreme Street    | 2015 LS Shootout      |
| 2011 Street           | 2011 Xtreme Street    |
| <b>Finalist</b>       |                       |
| '06-'09, '11-16       |                       |

SAM Tech had many great supporters and it was a total group effort to come home with a championship trophy. We would like to thank AMSOIL, ARP, Braswell, Callies, CID, Comp Cams, Crank-Scrapers.com, Earl's, Fel-Pro, Holley Performance, Hot Rod Magazine, Jesel, Mahle-Clevite, Morel Lifters, MSD, Nitrous Outlet, Scat, Stef's, Schumann Oil Pumps, Total Seal, and UNOH. In addition to all the SAM Tech instructors and students, we would like to thank instructors Chris Bennett, Shawn Hooper, Jonathan Waitt, Cody Alexander, and Zack Nelson, as well as students Shane Barron, Matt Petz, Steven Skrobarczyk, Conner Statler, and Oscar Zabek for the extra time, energy, and expertise they put into this year's competition.

# CLASS PROJECTS:



**2012 COPO 8.90@150.16 MPH**  
2016 FS/C Class Champion NHRA Texas Fall Nationals

**Engine & Drivetrain**

**CAMSHAFT:** Comp Cams Solid Roller  
**COMPRESSION RATIO:** 13:1  
**CONVERTER:** Coan  
**CRANKSHAFT:** Callies  
**CYLINDER HEADS:** Chevrolet DR SAM Tech fully CNC'd  
**DISPLACEMENT:** 440 cid  
**ENGINE BLOCK:** Chevrolet LSX Cast Iron Machined at SAM Tech  
**EXHAUST:** American Racing Headers  
**FUEL PUMP:** Aeromotive  
**FUEL:** Renegade 116  
**HORSEPOWER – FLYWHEEL:** 875  
**IGNITION:** Holley EFI  
**INJECTORS:** 58 lbs/hr run @ 55 psi  
**INTAKE:** CFE Cast tunnel ram  
**MANAGEMENT:** Holley EFI  
**PISTONS:** Wiseco  
**REAR END:** Strange Engineering 9 inch  
**ROCKER ARMS:** Jesel 1.8 ratio  
**RODS:** Callies  
**SHOCKS:** JRI rear and Strange front  
**SUSPENSION:** Stock COPO 4 Link  
**THROTTLE BODY:** Accufab 2.00"x4  
**TIRES:** Mickey Thompson 9.0/30.0 R  
**TRANSMISSION:** Joel's on Joy  
**VALVE TRAIN:** Jesel lifters  
**WEIGHT:** 3350 – Race  
**WHEELS:** Bogart Racing 15x3.5 Front 15x10 Rear

**2016 Cobra Jet 8.62@156.10 MPH**  
Driver Austin Ford / Owner Chuck Parker

**Engine & Drivetrain**

**CAMSHAFT:** Comp Cams  
**COMPRESSION RATIO:** 13.1:1  
**CONVERTER:** Coan  
**CRANKSHAFT:** OEM Ford  
**CYLINDER HEADS:** OEM Ford  
**DISPLACEMENT:** 316 cid  
**ENGINE BLOCK:** OEM Ford Sleeved  
**EXHAUST:** American Racing Headers  
**FUEL PUMP:** Aeromotive  
**FUEL:** VP C16  
**HORSEPOWER - REAR WHEEL:** 1000+  
**IGNITION:** Holley EFI  
**INJECTORS:** 95 lbs/hr @55 psi  
**MANAGEMENT:** Holley EFI  
**PISTONS:** MAHLE  
**REAR END:** Strange Engineering 9 inch  
**ROCKER ARMS:** OEM Ford  
**RODS:** Callies  
**SHOCKS:** Strange  
**SUPERCHARGER:** 2.9 liter Whipple  
**SUSPENSION:** Strange  
**THROTTLE BODY:** Ford Performance Cobra Jet Oval  
**TIRES:** Mickey Thompson 9.0/30.0 R  
**TRANSMISSION:** Joel's on Joy  
**VALVE TRAIN:** Comp Cams  
**WEIGHT:** 3550  
**WHEELS:** Weld Racing 15x3.5 Front 15x10 Rear



**1957 Bel Air Build by SAM Tech students in 56 days.**  
Featured in Hot Rod Magazine & PowerNation TV

**Engine & Drivetrain**

**BLOCK:** OEM LS3  
**DISPLACEMENT:** 376  
**CYLINDER HEADS:** PRC Small bore LS7 SAM Tech CNC Ported  
**CAM SHAFT:** Comp Cams Hydraulic Roller 228/236 @ .050 114 LSA  
**INTAKE MANIFOLD:** Twin throttle body modular billet designed & fabricated by SAM Tech CNC  
**ENGINE MANAGEMENT:** Holley EFI  
**EXHAUST:** 1 7/8 Hooker Headers  
**FUEL SYSTEM:** Holley and Earls  
**HORSEPOWER - FLYWHEEL:** 620  
**LS SWAP KIT:** BRP HotRods  
**THROTTLE BODY:** Dual Nick Williams 102mm DBW  
**TRANSMISSION:** T6060  
**CLUTCH:** McLeod dual disc  
**REAR END:** Currie 9 inch 3.70 gear  
**WHEELS:** Fisk

**1999 Camaro 8.01@171.12 MPH, 2975 lbs**  
Five time Chevrolet Performance All-Motor Champion

**Engine & Drivetrain**

**BLOCK:** GM LSX (4.175 x 4.00-in stroke)  
**DISPLACEMENT:** 438  
**CYLINDER HEADS:** CID LS7 ported & CNC'd by SAM Tech Programs  
**CAM SHAFT:** Comp Cams 60mm Solid Roller  
**HORSEPOWER – FLYWHEEL:** 1085  
**INTAKE MANIFOLD:** CID Cast Manifold ported by SAM Tech  
**ENGINE MANAGEMENT:** Holley EFI, MSD Power Grid  
**EXHAUST:** American Racing Headers 2 1/8 – 2 1/4  
**FUEL SYSTEM:** Aeromotive with 58lb/hr Fuel Injectors  
**THROTTLE BODY:** Single Accufab 8500 TB  
**TRANSMISSION:** Liberty 5 Speed  
**CLUTCH:** East-West 8" Dual Disc  
**REAR END:** Moser 9-in, Dewco 5.33 gear  
**SUSPENSION:** Torque Arm  
**TIRES:** 10.5 inch Mickey Thompson



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The wildly popular School of Automotive Machinists & Technology NHRA Factory Stock Showdown returns for the 2017 season with an additional event added to the schedule. This series of events have seen increased car counts at races across the country and rabid interest from fans of the series.



March  
16-19



April  
28-30



June  
22-25



Aug 30  
Sep 4



Sept 29  
Oct 1