



A look at Summit Racing's new Ford engine packages

MAIL-ORDER MISSILES

By **Mark Houlahan** • Photography by **Justin Cesler** and courtesy **Summit Racing**

If you're anything like us, you have Summit Racing Equipment on your speed dial list (below the wife or girlfriend though!) and you're on a first-name basis with your UPS driver. Don't let the word "racing" in their company name fool you though. Sure, Summit has hard-core racing parts like slicks, rollbars, and safety equipment, but they also stock a huge inventory of street-performance items like carb and intake kits, and headers. Now, Summit even stocks replacement parts like water pumps, engine mounts, and the like for your daily drivers. As a dealer for many of the big name performance parts companies we know and love (Edelbrock, Ford Racing, Aeromotive, and many more), Summit Racing's catalog and website make upgrading or servicing your car easy with one-stop shopping.

Recently, the folks at Summit embarked on the buildup of a Factory Five Racing (FFR)

Mk4 Roadster as a company test mule and display vehicle. Readers surely know Factory Five for its popular Cobra replicas and hot-selling '33 Ford street rod replica, too. Once the Summit Cobra build got underway, it was evident that just dropping an engine into one of these replicas (and frankly, any car project) requires more than just the engine. There are all sorts of ancillary items like ignition and fuel system parts, plumbing fittings, and more that many enthusiasts don't give much thought to until the day of the engine installation. These are the type of things that sends their cohorts/helpers scrambling to the nearest auto parts store hoping they have the right parts on the shelf. Sound familiar?

To come up with a better plan, Summit Racing worked with Factory Five on assembling an engine package that included all of these parts. In a nutshell, Summit did all the

scrambling and all you have to do is order a single part number.

We know, you're asking yourself, "what good does this do me and my '65 Mustang; I'm not building one of those replicas." That is true, but the more we looked at the kit contents, as well as having experience building our own Factory Five Roadster (anyone remember Project Snake Charmer?), we realized that these kit packages could really work for just about anything on four wheels. Sure, you'll still need to purchase headers that'll fit your chassis, but these combos will save a lot of headaches if you're looking for a fresh bullet for your classic Ford.

Back in February, we had the chance to actually drive three Factory Five Roadsters powered by these very engines. The FFR semi-trailer was headed back east after a big test session in Las Vegas for sister magazine

► Talk about your unique experiences! We testdrove each of the Summit Racing engine combo packages as installed in these Factory Five Racing Cobra replica kits.



Hot Rod, and Dave Smith, President of FFR, asked us if we'd like to get a little time behind the wheel of these three Roadsters to sample these engine packages first hand. What do you think we said? The same thing you would have too—heck yeah! So the FFR semi rolled in on a Friday afternoon and we

got to spend the next five days driving the wheels off of these hand-built cars without a single hiccup. Between lunch runs, taking them home for the night, 'round the block blasts with coworkers in tow, and finally a half-dozen or so dyno runs on each car on our in-house DynoJet 248, to say we were

impressed would be putting it lightly. All of these engines have their own, vastly different, qualities, but all three were very fun and easy to drive on the street. Check out the offerings in the three engine sections below along with our "behind the wheel" comments and dyno numbers.

SUMMIT 306

SUM-CSUMFFC09
\$5,368.97

The 306ci pushrod 5.0L offering is Summit's base engine package. The combo starts with a Ford Racing "X302" engine as its base. The X302 is a popular pushrod engine that Ford Racing builds using a seasoned stock 5.0L iron block with new internals. It's topped off with Ford Racing aluminum cylinder heads and churns out an honest 340hp. Summit adds several key components to make this affordable crate engine a complete package for your classic Ford build.

Summit begins by topping the engine with a Summit Racing Street & Strip Stage 1 intake manifold with a Holley 670-cfm Street Avenger carburetor, dual feed fuel line, and a fuel pressure gauge. An Edelbrock polished water pump, a remanufactured distributor, 8mm plug wires, and NGK spark plugs finish off the engine. The combo also includes an Aeromotive fuel pump and fuel pressure regulator to help plumb your fuel system. An MSD Digital-6 Plus ignition box completes the combo's ignition system.

Being based on a stock 5.0L pushrod engine means that the X302 has the same dimensions as any 289/302 small-block, and makes for an easy fit into just about any classic Ford like a Falcon, Fairlane, Mustang, or pickup truck. Our experience with the X302 is based on the *X Marks the Spot* three-part engine swap story in the Sept., Oct., and Nov. '11 issues of *MM&F*. The series detailed the installation of one of these engines in a '65 Falcon Ranchero and from that build, we know that this X302-based combo will require swapping oil pans and oil pump pickups to a front-sump style to clear the typical classic Ford steering linkage (which we ordered from Summit by the way). You'll also need to come up with a front dress for the engine, such



Note that the engine is shown with optional EFI hardware, intake manifold, and valve covers installed.

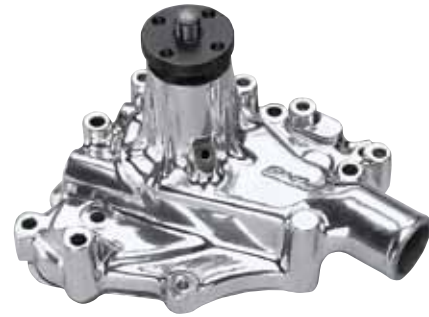
as a serpentine bracket setup from the likes of March Performance, Concept One, or Vintage Air, and you'll be all set.

The Summit 306 was installed in the Factory Five Mk 2 Challenge Roadster of Jim Schenck, director of R&D at Factory Five. Jim's Challenge car is a seasoned, race-winning Roadster with track patina that only a true race enthusiast can appreciate. The Summit 306 combo is not only right at home under the hood of the Challenge Roadster, but now takes these spec-racers up a notch and are NASA/Challenge Series legal. We hopped into the Challenge car (literally, the doors are bolted shut and it has an extra safety cage for track use) and

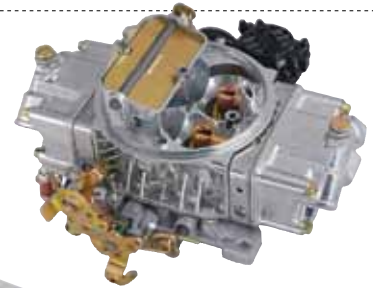
with the push of a button, the Summit 306 crackled to life. Throttle response was quick and the Challenge car idled beautifully. Power was perfect for such a light car and we're certain even in a heavier car like a '65-'68 Mustang the Summit 306 would offer grin-inducing fun on the street or track.



The heart of the 306 combo is of course Ford Racing Performance Parts' 306ci crate engine. This is essentially a 0.030-inch overbore on a stock iron block with new rods, pistons, bearings, E303 roller camshaft, and aluminum GT-40X heads. The PR shot shows a reverse rotation water pump, but Ford does not include any water pump on the X302.



Summit uses this nice, polished Edelbrock water pump in its 306 combo kit. The pump is a driver-side inlet with standard rotation drive arrangement and features a CNC-machined housing and impeller. The standard rotation is perfect for classic Fords with V-belt setups, but the driver-side inlet might require radiator modifications or a new radiator in some installs.



Topping the 306 is Summit's own cast aluminum Street & Strip Stage 1 dual-plane intake manifold and a Holley Street Avenger 670-cfm carburetor with electric choke and vacuum secondaries. The Street Avenger features Holley's popular quick change secondary spring housing and center-hung float bowls with external adjustments.

306 ENGINE COMBO DYNO RESULTS (With Summit/Trick Flow EFI components)

| RPM | HP | TORQUE |
|-------|--------|--------|
| 2,400 | 127.96 | 280.03 |
| 2,600 | 144.44 | 291.78 |
| 2,800 | 159.43 | 299.05 |
| 3,000 | 177.78 | 311.23 |
| 3,200 | 191.47 | 314.26 |
| 3,400 | 206.82 | 319.48 |
| 3,600 | 221.98 | 323.85 |
| 3,800 | 235.95 | 326.12 |
| 4,000 | 249.15 | 327.15 |
| 4,200 | 263.59 | 329.62 |
| 4,400 | 278.85 | 332.85 |
| 4,600 | 291.56 | 332.89 |
| 4,800 | 303.01 | 331.55 |
| 5,000 | 311.48 | 327.19 |
| 5,200 | 320.61 | 323.82 |
| 5,400 | 328.12 | 319.14 |
| 5,600 | 333.26 | 312.56 |
| 5,800 | 335.23 | 303.57 |

For fuel delivery, Summit includes an Aeromotive electric pump (external mount) and a fuel pressure regulator with gauge. The fuel pump free-flows 140 gph with a maximum pressure rating of 14 psi. Inlet and outlet fittings are easy-to-find 3/8-inch NPT. The included regulator is adjustable from 5-12 psi and is easy to verify settings with its stainless steel fuel pressure gauge.



SUMMIT 427

SUM-CSUMFFC01
\$6,053.84

The Cobra is synonymous with Ford's 427 FE big-block, but what many people don't realize is that the 427 Cobra was a body designation (not all 427 Cobras had 427 side-oilers in them). In today's world, it's easy to get big-block power and torque from a stroker engine, while offering up lighter weight, more room, and better handling in a replica. Of course, you don't have to be building a FFR kit to use a 427ci-based Windsor small-block stroker. The 351-based 427 Windsor will be just as much at home between the front fenders of a Mustang, Torino, Fairlane, or Galaxie as well. To build upon the short-block combo, Summit offers several additional combo kits, including a cylinder head and valvetrain combo, induction and fuel combo, ignition combos, and more. For our 427 Windsor entry, we'll be focusing on the three main combos that make up a complete engine.

The Ford Racing Performance Parts Boss 427 short-block is packaged with a Trick Flow Track Max camshaft, Trick Flow OE-style roller lifters, a Trick Flow billet timing chain set, a Trick Flow harmonic damper, and a full gasket set. Additional parts included in the combo are a new timing chain cover from Edelbrock, a Ford Racing roller lifter installation kit, and a full ARP engine accessory bolt kit. That's quite a bit of hardware for calling it a "short-block" combo, but we're not going to argue!

Adding on the Windsor cylinder head and valvetrain combo tops off your short-block with everything you need to button up the engine. Crack open the SUM-CSUMFFC03 combo box (\$2,279.99) and you'll find a set of Trick Flow Twisted Wedge 185cc cylinder heads, a set of Trick Flow 1.6:1 roller rockers, Trick Flow chrome-moly pushrods, ARP head bolts, ARP valve cover bolts, and a sweet set of Trick Flow cast-aluminum valve covers with Summit Racing logo'd breathers.

Finally, you can make your 427 a complete engine with the inclusion of Summit's Windsor induction and fuel system combo, SUM-CSUMFFC04 (\$1,189.58). Summit has put together all the right pieces to ensure your 427 breathes right with a Summit Stage 2



Once again Summit tapped the guys at FRPP for the basis of its Ford 427 Windsor combo. In this case, it wasn't one of Ford Racing's crate engines, but a Boss short-block that Summit adds several key parts to the box before shipping it to you.



The Summit 427 doesn't start with a complete crate engine, so there's a little more wrenching involved.



The cylinder head combo includes top notch hardware like Trick Flow aluminum cylinder heads, ARP fasteners, and fully adjustable aluminum roller rockers. You'll have to spin a few wrenches to button your 427 up on your own, but a Saturday afternoon in the garage is never a bad thing!

dual-plane aluminum intake, a Holley 770-cfm Street Avenger carburetor with fuel line kit, a Lokar throttle cable bracket, an Aeromotive fuel pump and regulator kit (just like the 306 combo), and a Summit fuel filter along with a billet air cleaner assembly to top off the build.

As noted with the 306 combo, your choice of oil pan will be determined by the chassis that the engine is going into. Unlike the 306 combo, however, the 427 combo does not include an oil pan (there is an oil pan combo kit available that should work for most applications though). Also, unlike the 306 combo, the 427 combo does not include a water pump (though an accessory combo with water pump, starter, and more will be offered). You'll be on your own to source one, though Summit has several to choose from in both standard and reverse rotation (depending upon your pulley system) and left and right inlet.

We got to taste the 427 combo in Summit Racing's own Mk 4 Roadster. The gray with red stripe beauty was a fresh build and drove like it was on rails; that is until you put your right foot down. There was no way any sort of rail, track, guide, or chain and anchor was going to keep this rocket from breaking loose with the low-rpm torque that

the 427 Windsor strokers are famous for. Throttle response, even for being carbureted, was sharp and the little gray monster (as we began to call it) would strike hard like a pitbull with each stab of the go-pedal when we were dyno testing it. Having a 427 Windsor in our own project car, we know first-hand how quickly things can go south with such a short wheelbase and nearly 500 lb-ft of torque. That being said, a 427 Windsor in a bit heavier car with some sticky tires would be very manageable for even a daily driver.

427 WINDSOR ENGINE COMBO DYN0 RESULTS

| RPM | HP | TORQUE |
|-------|--------|--------|
| 2,400 | 199.14 | 435.78 |
| 2,600 | 208.14 | 420.43 |
| 2,800 | 242.44 | 454.73 |
| 3,000 | 260.52 | 456.09 |
| 3,200 | 277.52 | 455.49 |
| 3,400 | 289.21 | 446.75 |
| 3,600 | 305.24 | 445.32 |
| 3,800 | 316.04 | 436.83 |
| 4,000 | 332.57 | 436.69 |
| 4,200 | 340.47 | 425.76 |
| 4,400 | 347.41 | 414.69 |
| 4,600 | 356.69 | 407.26 |
| 4,800 | 362.42 | 396.56 |
| 5,000 | 369.78 | 388.42 |
| 5,200 | 369.40 | 373.10 |
| 5,400 | 362.86 | 352.92 |
| 5,600 | 357.16 | 334.97 |
| 5,800 | 343.85 | 311.37 |



The third combo that finishes off the engine is the induction and fuel combo. This package nets you a dual-plane intake, a Holley carb, Aeromotive electric fuel pump with regulator, a dual-feed fuel line, and more.

While only briefly mentioned above, Summit's oil pan combo kit includes a Milodon 7-quart front sump oil pan (which should work fine in most classic Fords), a Milodon oil pickup assembly, and a Melling high-volume oil pump. ARP oil pump bolts and an ARP pump driveshaft ensure your 427's bearings are continuously fed.



SUMMIT 5.0L COYOTE

SUM-CSUMFFC12
\$9,300.84

The Coyote crate engine from Ford Racing has been nothing short of a grand slam for the FRPP boys. We've seen the 5.0L DOHC all-aluminum engine being dropped into countless classic Fords, Factory Five models like the Roadster and '33 Hotrod, and even some "out there" projects like a BMW sedan! The 412hp crate engine comes directly off the Ford assembly line as it would be installed in the '11-'13 Mustang and is a modern engineering marvel. The engine uses variable cam timing that is independent of each of the four cams. This variable timing allows for great low-end torque, while still making plenty of steam at the top-end of the tach. Summit Racing's combo kit starts with this very same engine and tosses in such goodies as the wiring and ECM kit, a Moroso oil pan, Powermaster starter, Vortech EFI fuel pump with an AEM adjustable regulator, and more.

Dropping a Coyote into a classic Ford isn't the easiest thing. For all but trucks and some fullsize applications, you'll be looking at removing the shock towers in favor of an aftermarket IFS system like



The Summit 5.0L Coyote combo ships with the production intake manifold and plastic engine "halo" cover. However, Dave Smith, President of FFR wanted a little more rpm for his personal Mk4 Roadster and upgraded his Coyote build with a Boss 302 composite intake manifold and matching injector/wiring covers.

the TCI, Heidts, and Rod & Custom Motorsports offerings to gain the valuable clearance you'll need to fit the wider modular engine family. However, don't think of installing one of these IFS systems as simply a means to install the Coyote, because with such IFS system upgrades, you're also upgrading to rack-and-pinion steering, true double A-arm with coil spring or coilover shock on the lower arm, disc brakes, and more all in one fell swoop.

We've driven our fair share of Coyote-based late-model Mustang GTs, so we weren't expecting anything earth shattering when we slid into the leather bucket seats in the bright red Mk 4 Roadster that is the demo mule of FFR's President, Dave Smith. Ironically, a mule is the perfect description for this car, as Dave beats it like a rented mule and doesn't hesitate to drive it anywhere or do crazy drifting, burnouts, or donuts with it when more than two people are together watching (and there's plenty of YouTube videos to back that statement up!). What that means is that the Coyote can take a beating at the track and then calmly drive you home with perfect driveability and good gas mileage, too. While it doesn't have the monstrous torque of the 427 Windsor, the Coyote idles like a kitten, starts every time thanks to its modern EFI and custom Ford Racing wiring/tuning, and makes for the perfect daily driver engine swap in a classic Ford—with a little extra on the side when you want or need to spice things up.



For the modular engine combo, Summit went to the Ford Racing well one more time and grabbed the 5.0L DOHC crate engine as the starting point for the Coyote combo.

Because the Coyote is a modern fuel-injected V-8, you need a special wiring kit, which Ford calls a Control Pack, to run the engine. The Control Pack includes a minimalized wire harness for an easy plug-n-go installation with just a few wiring connections. The kit also comes with a flash-programmed PCM, a drive-by-wire throttle pedal, and the stock Mustang induction tube and air filter housing, which may or may not be usable in your particular application.



SOURCES

FACTORY FIVE RACING
(508) 291-3443
www.factoryfive.com

SUMMIT RACING EQUIPMENT
(800) 230-3030
www.summitracing.com



The Coyote uses direct-installed accessories—no mounting brackets are used. Summit includes the Ford Racing alternator kit and a Powermaster XS gear reduction starter. If you opt for power steering and/or A/C for your classic swap, you'll have additional hardware to buy. Several companies now offer A/C and power steering add-on kits for the popular Coyote engine.

The included oil pan in the Coyote combo is this Moroso fabricated-steel model designed with a shallow rear sump to hold an extra 1½-quarts of oil (7½-quarts total capacity). The pan is designed for street, or track use with multiple trap doors and utilizes the stock oil pickup in the Coyote engine. We feel confident that this pan would work quite well in most classic applications that have been converted to a modern IFS setup. **MMMP**



5.0L COYOTE ENGINE COMBO DYNO TEST

| RPM | HP | TORQUE |
|-------|--------|--------|
| 2,400 | 118.54 | 259.40 |
| 2,600 | 141.88 | 286.61 |
| 2,800 | 158.44 | 297.19 |
| 3,000 | 173.63 | 303.97 |
| 3,200 | 190.19 | 312.16 |
| 3,400 | 208.74 | 322.45 |
| 3,600 | 222.91 | 325.21 |
| 3,800 | 231.91 | 320.53 |
| 4,000 | 240.42 | 315.67 |
| 4,200 | 254.19 | 317.87 |
| 4,400 | 271.37 | 323.92 |
| 4,600 | 288.63 | 329.55 |
| 4,800 | 299.85 | 328.09 |
| 5,000 | 313.83 | 329.65 |
| 5,200 | 329.23 | 332.53 |
| 5,400 | 347.36 | 337.85 |
| 5,600 | 359.40 | 337.07 |
| 5,800 | 365.17 | 330.68 |
| 6,000 | 370.79 | 324.57 |
| 6,200 | 375.87 | 318.41 |
| 6,400 | 378.77 | 310.84 |
| 6,600 | 383.36 | 305.07 |
| 6,800 | 385.69 | 297.90 |