



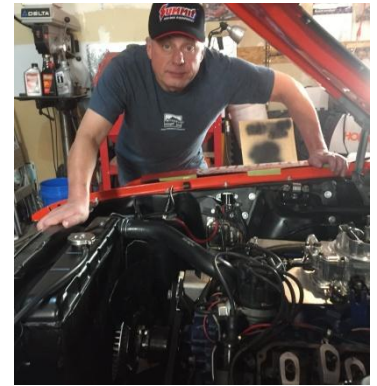
August, 2026

From the Editor...

At last I was able to pull the 351 Cleveland from my Mustang and haul it to a machine shop after a tragic cam wipe. Good machine shops are getting hard to find here in 2026. Whatever shop you have used for years is likely now gone or barely functioning while the owner eases into retirement. Or, worse, the shop will take your engine then sit on it for months or years leaving it untouched.

My friend Doug is a Greeley police officer. He has a Grabber Orange 1970 Boss 302 tribute some of you may have seen at the most recent Rocky Mountain Mustang Roundup. A couple of years ago one of his aluminum cylinder heads required some welding. Doug talked with multiple shops who wouldn't touch it. When Doug talked to the guys at Atlas Performance Machine in Longmont, Colorado, they were happy take it and quickly had that cylinder head fixed up in a jiffy. Doug recommended that shop so that's where I took my 351 Cleveland. As expected, it won't be ready for a few months as they disassemble, inspect, thoroughly clean and rebuild the engine with a roller cam. Atlas Performance Machine has an in-house dynamometer and they dyno test every engine they build. Thus, the Cleveland will get a proper break-in and tune on the dyno. It won't come cheap, but what does here in the 21st Century?

Patrick Germain



The Guys at Atlas Performance Machine Unload the 351 Cleveland

Continued...

Ford Mustang News

Ford Just Made It Legal To Modify Your Mustang Without Voiding The Warranty, But It's Not What You Think

<https://www.hotcars.com/ford-legal-mods-without-voiding-warranty-news-july-2026/>

Largest Ford Mustang Reproduction Parts Supplier Under New Ownership

<https://fordauthority.com/2026/07/largest-ford-mustang-reproduction-parts-supplier-under-new-ownership/>

From the Editor: Be aware CJ Pony Parts is an online “Drop Ship” engine. They don’t actually stock any parts. Their web site links to multiple vendors who actually sell and ship. This is the same business model as other Drop Ship engines such as Rock Auto. You can find some good prices at these web sites, but it’s very likely that if anything goes wrong, customer service is sparse or non-existent.

Liam Neeson Drives An S650 Ford Mustang Shelby Super Snake In New Movie: Video

<https://fordauthority.com/2026/07/liam-neeson-drives-an-s650-ford-mustang-shelby-super-snake-in-new-movie-video/>



July Cars & Coffee

The Rocky Mountain Mustangers met up at the 18 July Cars & Coffee at The Resource Exchange.







Lunch at the New Colorado Springs Pizza Ranch

On 18 August members of the Rocky Mountain Mustangers met up for lunch at the new Colorado Springs Pizza Ranch location near the intersection of Austin Bluffs and Academy Blvd. The board is looking for new locations for the monthly club meetings.

Pizza Ranch is brand new, squeaky clean and features an all you can eat buffet with a pizza bar, fried chicken bar, salad bar, dessert bar and my favorite, an auto dog! (That's what sailors call a soft serve ice cream machine.) There is also a large game room for fun requiring an extra charge.

This restaurant has a very large parking lot and private meeting rooms offered at no charge. The atmosphere is fun, casual and very family-friendly. Most members agreed the food is pretty good.

On the down side, everyone entering Pizza Ranch must pay for a buffet. The board is aware some members don't order food or drinks at the club meetings and are concerned about putting the meeting behind a pay wall. However, most restaurants won't accept a club on Saturdays and will charge hefty fees for a private room. Also, some restaurant managers have expressed displeasure when not everyone who attends a club meeting orders food. Stay tuned for discussions at a future club meeting. Be sure to speak up and let your voice be heard.





Upping the Ponies

And Other Mods for Your Early Street Mustang

By Patrick Germain

Introduction

Some people consider the Mustang to be a sports car while others will argue it's not. Either way, when thinking of a Mustang, the word "sporty" should come to mind. And sporty is associated with performance. So it makes sense that many proud owners of the Ford Mustang want to make their cars more powerful and handle better. Increasing power, or upping the ponies, makes a classic car not only more fun, but also significantly increases the cool factor. And if you're not interested in being cool, why are you driving a Mustang?

The reality is a basic, low-horsepower Mustang can still be a lot of fun when cruising to Dairy Queen. If that's all you need, good on you. For those who want some grunt when they push the pedal which is narrow, read on.

In this multi-part series, I will cover some basics for modifying early Mustangs. For the proud owners of later model Mustangs, well, you have the benefit of having more power and handling from the factory than all but a tiny few early cars. If you want to see an article about modifying late model Mustangs, by all means let me know.

Part 3: The Critical Bump Stick

In this chapter we will get into that mysterious component with multiple lobes that make the valves open and close; the camshaft. No part of an internal combustion engine generates more discussion, disagreement and outright mythology. My hope is cover some basics and clear up a few misunderstandings about this most critical bolt-in.



Three-Quarters of What?

In my high school days I was excited to up the ponies in my first car, a 1971 Mustang fastback with a 302, 2V and automatic transmission. In retrospect, this was a really nice car I didn't fully appreciate. The white paint and blue interior were nearly mint. The slotted wheels looked really good. But I wanted more power!

Loaded with information from many a nonsensical discussion among my classmates, I ventured to a local speed shop to talk to my friend Mark about how to turn my nice car into a fire-breathing street terror. Mark was extremely knowledgeable about performance and was also the proud owner of a gorgeous Calypso Coral 1970 Boss 302. Fortunately, as a fellow Ford and Mustang guy in a world of Chevrolet fans, Mark was always happy to talk to me about cars. We talked about intake manifolds. We talked about carburetors. We talked about headers. Then came the subject of camshafts. "I think I'd be OK with a

three-quarter cam”, I proudly announced. Mark had been very patient with me, but it was at this point that he looked up and rolled his eyes.

“Back up there, Patrick,” said Mark. “Three-quarters of what?” At this I was somewhat perplexed. It became clear I didn’t know. I had believed there were only a few cam choices: factory, three-quarter and “full race”. Rarely had I ever been so wrong. Mark went on to explain the infinite variables of valve timing, lift, duration, lobe separation angle and ramp speeds. I paid close attention but actually grasped very little.

In the end, when I told Mark my car had a factory automatic trans, power steering and air conditioning, he explained my choices were very limited to keep all that working properly. “Maybe an Edelbrock cam,” he surmised. Mark reached below the counter to pull out a huge book like all good parts guys did back then. He flipped the pages to a brand new camshaft called the Performer Plus. Checking the specs, Mark nodded and said, “Just barely”.

As it turned out, I never had the cash to modify my 1971 fastback, but six years later I was rebuilding the 351 Windsor in my 1969 Cougar. That car also had a factory automatic, power steering and A/C. I remembered what Mark had told me and ordered an Edelbrock Performer carburetor, intake manifold and camshaft. It all worked brilliantly. So thanks, Mark!

This story has many lessons. First and foremost is, for a proper performance engine build, all the parts must work together for a cohesive and potent package. Getting just one part wrong will destroy that cohesion. And no part is easier to get wrong than the camshaft.

Basically, the basics...

- **Lift:** How far the cam lobe pushes the valve open. More lift lets more air flow.
- **Duration:** How long the valve stays open as the cam spins, measured in degrees of rotation.
- **Lobe Separation Angle (LSA):** The distance in degrees between the middle of the intake lobe and the middle of the exhaust lobe.

These really are the basics of which complete camshaft specifications go far beyond. Designing a performance camshaft for a particular application requires vast technical knowledge and real world experience. This is why I recommend ordering a custom camshaft. Sure, there is no shortage of “off the shelf” cams. But considering all the variables, what are the chances that cam is the best choice for your car and what you want to do with it?

A custom camshaft will cost only slightly more than an off the shelf cam. And a good cam designer can eek out every last bit of performance and drivability just for you.

Basic Flat or Roller Boogie?

Among the multiple, critical components of a pushrod engine valve train are the tappets or lifters. Again, most basically, there are flat and roller lifters. Among roller lifters are “Dog Bone” and link bar lifters. Ford first installed Dog Bone lifters in the 1985 Mustang 5.0 liter high output V8. Engineers had hopes of improving fuel economy, but that didn’t really work out. The roller lifters did allow for more aggressive lobe ramps, but it’s not like the factory 5.0 HO cam was all that aggressive. Most significantly, motor oil

manufacturers were starting to reduce the amount of ZDDP, or zinc, in their formulas. This was to protect catalytic converters which can be poisoned by the zinc from motor oil.

It would be easy to assume that roller lifters offer far less friction in a valve train. This would be an invalid assumption. There's an old story about legendary race car mechanic Smokey Yunick putting an engine on a dynamometer then replacing every component possible with a roller component for a second dyno run. The difference was... Nothing.

The reality is a film of oil is extremely slick and causes no more friction than a roller. However, the roller lifter does allow for much different lobe patterns which flat tappets cannot handle. It would also be easy to assume a roller cam offers far greater performance potential compared to a flat tappet cam. This too would be a mostly invalid assumption. At a camshaft's maximum RPM range, the flat tappet cam will hold its own against the roller cam. In very high performance applications at extreme RPMs, the roller cam will offer advantages over the flat tappet cam. Roller cams can also offer improved performance below the cam's maximum range or, "under the curve".



Dog Bone Roller Lifters As Featured In the Ford 5.0 High Output and Link Bar Roller Lifters

Yet another variable among lifters is whether they are solid or hydraulic. Solid lifters are just that; they are solid components between the camshaft and pushrods with no variation beyond expansion and contraction based on heat. Thus, solid lifters require an intentional gap, or "lash", in the valve train to compensate for that expansion and contraction. Hydraulic lifters use engine oil pressure to "pump up" and fill the gap between the cam lobe and pushrod.

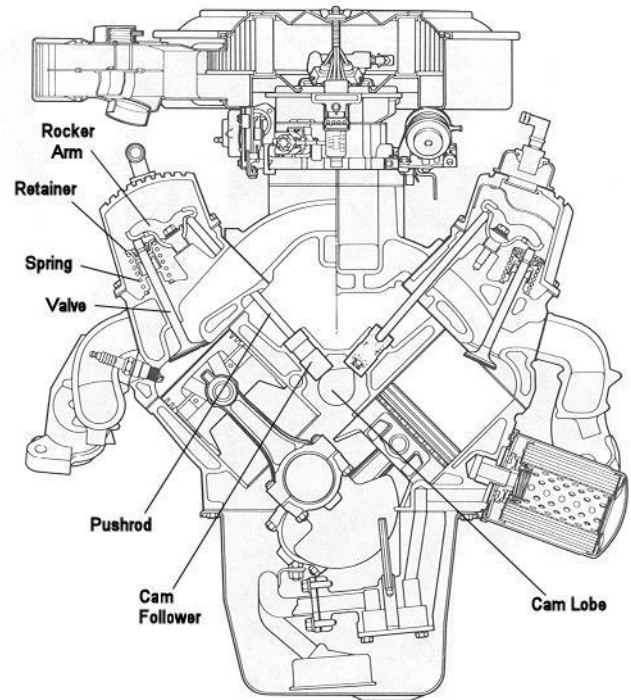
Solid lifters also require periodic adjustment of the valve lash as the engine wears. This lash is evident as a rapid "tickety-tick" sound at idle. Among performance enthusiasts, it also suggests the engine means business. Hydraulic lifters compensate for most valve train wear and typically require adjustment only when initially installed.

Historically, high performance engines had solid lifters since they offer an advantage in valve train stability at high RPMs. In the early Mustang world, the HiPo 289, Boss 302 and Boss 351 were equipped with solid lifters from the factory. In 1969, the first model year of the Boss 429, the engine had hydraulic lifters from the factory. After owner complaints that the car really wasn't living up to Ford's advertising hype, the 1970 Boss 429 featured a solid lifter cam. Ford did not change the advertised horsepower, but it's likely the noise of the solid lifter cam improved the engine's reputation. (Independent dyno testing has suggested the solid lifter cam offered an extra 15 horsepower. There is a lot more to the Boss 429 story which goes far beyond the scope of this article. If you'd like to see a specific article about the Boss 429, please let me know.)

Cam Challenges

Since a camshaft does not operate independently, all the components of the engine, as well as the specifications of the car in which it is installed, must be considered. A few points:

- Factory rocker arms may bind under the additional lift from a performance camshaft. Therefore, aftermarket rocker arms allowing more range of motion must be installed.
- Factory valve springs may not have enough tension to support a more aggressive camshaft. Stiffer valve springs matching the cam's profile are required.
- A mild performance camshaft may work with a non-adjustable valve train, but adjustable rocker arms are optimal and essential with a more aggressive cam.
- When a factory, non-adjustable valve train is converted to being adjustable, hardened push rods with guides are required.
- Higher lift and greater valve spring tension may require a dual roller timing chain and gears.
- A performance camshaft may require a higher idle speed and higher RPMs to get the car moving. When paired with an automatic transmission, such a cam will not work with the factory torque converter. An aftermarket torque converter with a higher "stall speed" is required to match the camshaft.
- Aggressive camshaft profiles require higher static compression to create the proper dynamic compression when the engine is spinning at higher RPMs.



By now, it should be clear that installing a high performance camshaft can easily create the proverbial domino effect. The more aggressive the camshaft, the more components must be replaced to match the camshaft profile to achieve greater performance. There is an additional challenge with Ford engines from

1969 and later which had non-adjustable, positive stop rocker arms. Converting the factory cylinder heads for an adjustable valve train requires machining for screw-in, adjustable rocker studs.

Then there's the elephant in the high performance room. Flat tappet cams have had a tendency to "wipe" over the past decade or so. This means one or more lobes and lifters destroy themselves while the engine is running. This causes fine metal particulates to circulate through the engine oil which can cause significant damage to bearings and other components. Sometimes you can get away with only installing a new cam and lifters, but a complete engine teardown and thorough cleaning is optimal.

There are many theories floating around suggesting cam wipes are caused by inferior cam blanks, inferior lifters or inferior oil. None of these theories have been proven beyond any doubt.

Roller tappets are by no means indestructible, but they do not wipe like flat tappets. Therefore, if you want to eliminate the chances of your cam wiping, spend the extra money for a roller cam. Running a roller cam also eliminates the stress of making sure the engine oil has enough zinc to protect the cam.

Whew, that was a lot to cover. And yet, we are just scratching the surface of performance camshafts. I hope you found this article helpful. If you did, or if you have any questions, please let me know by replying to my email.

Club code of Conduct

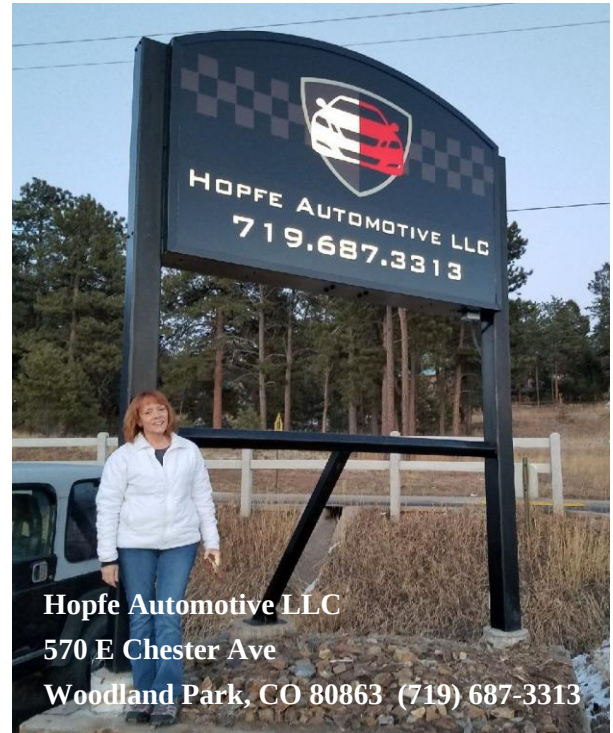
The Rocky Mountain Mustangers take pride in our Club being an organized club with monthly meetings and events. We enjoy having members of all ages participate and show their love for the Mustang, from a new car to a classic car, a show car and a race car, and up and coming cars. We have had numerous members come and go from the Club for various reasons. The Board of Directors does not want to see any of our members treat other members, or potential members inappropriately, with comments or actions. In accordance with our By-Laws, the Board of Directors will ask anyone found causing embarrassment to the Club to resign.



411 Hwy 105, Monument, Co 80132
(719) 232-3287



Colorado Sports 2935 N Prospect St
Colorado Springs, CO 80907
(719) 553-5770



Hopfe Automotive LLC
570 E Chester Ave
Woodland Park, CO 80863 (719) 687-3313

Chris Richards
General Sales Manager
Phil Long Ford of Chapel Hills

1565 Auto Mall Loop
Colorado Springs, CO 80920
Direct 719.572.4514
Office 719.572.2329
Cell 505.659.2810
crichards@phillong.com

Phil Long Ford
Chapel Hills
Since 1949
PhilLongFord.com

Ford



5950 Omaha Blvd,
Colorado Springs, CO

Brandon Short ASE Cert Mechanic (719) 653-7791
Marc Short General Sales Manager (719) 434--2184



4709 Chromium Dr,
Colorado Springs, CO 80918
(719) 428-8649

TRANSMISSION CLINIC
OF COLORADO SPRINGS LLC

3925 Interpark Dr A
Colorado Springs, Co 80907
(719) 471-0777