Sloppy stage 2 turbo cam dyno

budget cam that seems to tick all boxes, cheap, efficient, lower lift, good for all mechanical and turbo applications, making it easy to go it.sold as jegs, trickflow, elgin and more, available on Amazon, ebay and morenow if you hunt around or wait for deals sometimes you can find this cam on ebay or jegs on 238/sloppy stage 2 jegs/sloppy stage 2 on Amazon/on comp product website/sloppy stage 2 sold as a trickflow cam on summitElgin Hydraulic Camshaft – E1840PChev Gen III/IV (LS Series) 3-Bolt '97-PresentAdv. Duration: 283/286Duration @ .050: 228/230Lift: .585/.585Lobe separation: 112 LC2200-7000, great medium action torque and power.hey remind me again how that sloppy stage 2 sounds due to the EU Global Data Protection Regulation, our website is currently not available to visitors from most European countries. We apologize for this inconvenience and invite you to visit www.motortrend.com for the latest on new cars, car reviews and news, concept cars and car show coverage, awards and much more. Having previously run the Summit Pro LS Stage 4 cam on the 5.3L, we were excited about testing this stick for a larger 6.2L L92. (Image / Richard Holdener) Why are we so excited about swapping cams for the all aluminum L92? For many reasons. The first was that we had previously run the Summit Stage 4 Pro LS cam (SUM-8711) successfully for a lower 5.3L. In fact, we broke the 500 horsepower mark with this cam on the little LM7, so we certainly had high hopes for a higher 6.2L. We also liked the fact that the cam test 5.3L was run by ported cathedral port heads, but this 6.2L L92 featured factory rectangular-port heads. There is a lot of misinformation about cam profiles favoring one head design over another and it would be interesting to see how well these cam specs worked on each application. In addition to differences in displacement and cylinder head

design, we enjoyed a refreshing change from running another junkyard to 5.3L. All aluminum LS engines are hard to come by in the junkyard because they are quickly hijacked by savvy enthusiasts and resell companies. Most of all, we were excited to see if the extra displacement and head flow allowed a healthy summit cam profile to shine. The complete discovery of the L92 test mule doesn't belong to us, although our good friend Jason Trejo at Fort Meade, FL-based JTFab, gave us permission to go wild with it. We're sure he had a boost and/or nitrous mind, but we decided to start a mild end to the destructive scale, with a simple cam test. After all, although the L92 offers a lot of displacement and head flow, it, like all LS engines, was a much needed cam swap. Even if nitrogen and boost happen to follow, each engine deserves to produce decent power before the adders come into play, right? To prep our test, the loaner L92 required some changes, namely the removal of VVT and DBW throttle body. Holley HP's control system prevents Run variable cam time so it does replaced by fixed LQ4 cam. Similarly, the DBW throttle body was ditched in favor of a manual 92-mm FAST throttle body. The last two changes before testing included replacing the factory exhaust manifolds with long pipe headers and installing a two-valve spring assembly from COMP Cams. A healthy Stage-4, Pro LS cam definitely needs a spring upgrade. After our change of stock engine, the rest of the test was a breeze. All it took was to call the tune on the LQ4 cam, then perform the same procedure after swapping the Summit Stage 4 cam. Speaking of the Stage 4 cam, the summit grind was a healthy customer with a .625/.605-lift split, a 234/247 degree duration split, and 113+ 3.5 LSA. The summit offers two different Stage 4 LS cams. Compared to the slightly more aggressive Stage 4 LS grind (SUM-8709), which offered a .625/.605-lift split, a 237/246 degree duration split and a 113-degree LSA, the Stage 4 LS3 cam (SUM-8711) offered a little more (.015) piston-clearance valve. It's important for LS guys to want a mill head. Initially, we chose the Stage 4 LS3 cam to provide adequate piston-to-valve clearance and work with LS3-style heads. Increased piston-to-valve clearance was given, but given the success of the LS3 cam on cathedral-port 5.3L, our concern about matching the cam profile with the respective port style seemed all but unfounded. Is it possible these cams work well on both heads? There we go, opening pandora's case! By no means was the LQ4 cam an exact replacement for the stock VVT cam. First, the fixed cam didn't benefit from the extra power offered by the above/retard features of VVT, but we needed the starting point for our cam test. Holley HP ECU couldn't control the VVT cam, so we swapped it for LQ4 to build our base. Run with 1 7/8 inch header power supplying a 3.0-inch exhaust, the LQ4-equipped L92 produces a maximum number of 445 zs at 5,600 rpm and 460 (459.9) ft of lbs. torque at 4600 rpm. With our base set up, it was time to upgrade the cam. With the Summit Pro LS Stage 4 cam, maximum power numbers jumped to 568 zs at 6,700 rs per minute and 510 feet. torque at 5500 rpm. (Image/Richard Holdener) Note that wilder cam time pushed the maximum power into the higher rev range, but did so without losing low-speed torque. Summit cam out-powered LQ4 cam even down 3200 rpm. This does not mean that a more aggressive summit cam will offer the same idle vacuum or torque production of 2000 rpm, but it does show the versatility of the larger cam. Upstaging stock cam with a lot of energy growth is always welcome, and adding 123 zS definitely qualifies as great, but the gains are even more impressive when they come without a loss of power down low. Originally housed in the engine bay of Cadillac, and sporting a 6.2L displacement, the all-aluminum L92 featured high-flow, rectangular-port cylinder heads and equally impressive rec-port inlets (Image / Richard Holdener) From the factory, the L92 featured variable valve time (VVT), which we replaced with a fixed cam profile. (Image / Richard Holdener) The factory's drive-by-wire throttle body was also replaced by a manual FAST throttle body. (Image / Richard Holdener) Our base, stock VVT cam was replaced by the early 6.0L LQ4 cam. (Image / Richard Holdener) After that, we install the assembly of the three screw time circuit. Note that there is no 4X cam sensor as we ran the engine in a batch of fire mode with our stand-alone ECU. (Image / Richard Holdener) Both of our cams were run with the same 1 7/8 inch, hooker swap headers and 3-inch exhaust. (Image / Richard Holdener) Calling A/F and time values was holley HP's control system. (Image / Richard Holdener) Since we could increase capacity significantly with our cam swap, we replaced the factory's L92 injectors with a set of 75 lb. (Image / Richard Holdener) Of course, the Summit Stage 4 cam would require a spring upgrade, so we replaced the factory's L92 springs with this dual spring kit from COMP Cams. (Image / Richard Holdener) Run on Dyno first with the factory LQ4 cam, the 6.2L L92 produces a maximum number of 445 zs at 5600 rpm and 459 feet. torque at 4600 rpm. (Image / Richard Holdener) Summit Pro LS Stage 4 (SUM-8711) cam offers a .625/.605 lift split, a 234/247 degree duration split and 113+ 3.5 LSA. (Image / Richard Holdener) To facilitate the installation of the summit's stage 4 cam, we removed the stock la push to allow access to the front cover. (Image / Richard Holdener) Removing the front cover then provided access to the 3-screw time circuit. It was necessary to release the tension on the factory circuit retractor before removing the cam chain. (Image / Richard Holdener) Using an Allen wrench, we pinned the tensioner out of it and removed the time chain. Four Torx bolts secured the factory cam-retaining plate. (Image / Richard Holdener) Out came the LQ4 cam and went for a new Summit Pro LS Stage 4 cam. (Image / Richard Holdener) Run with the new Summit Stage 4 cam, the power output of the L92 jumped from 445 zS and 459 feet. torque to 568 zs and 510 ft lbs. Torque. This simple cam swap improved the maximum power of 123 zs without loss of torque, even down as low as 3200 rpm. (Image / Richard Holdener) Is it really possible to add more than 100hp to your LS motor with cam swap? The answer is obviously yes, whether it be one very short and disappointing tech story. Before we test, we first need to understand why it might be possible to get such a big profit on a simple cam swap. How much is the cam really worth on a streetable turbo LS application? Of course, the presence of forced induction plays most part, but LS engines have a lot more to go for them than just their inclination to swallow large amounts of positive pressure. As for responsiveness to changes in cam time, GM engineers set the scene with the LS platform. do we mean by this? Well, any LS engine is basically everything else that is needed to provide premium performance except cam. Our test engine is one of the most common LS engines found in junkyards. Junkyard 5.3L retained all the factory components for our test, including short block and factory 706 heads. Before testing, the engine received an enlarged ring gap, new head gaskets and ARP head studs. Although, none of this was mandatory in this capacity and increase the level. We are prepping for further testing. No component can carry an engine, but almost any single component can break one. All it takes to ruin an otherwise perfectly good performance engine is one of the wrong part. Install the wrong inlet, cylinder head, or (in our case) camshaft, and you will have less than ideal results. When you cure one of the missing components, the results can be amazing. LS has a lot of displacement, head flow, and more than a sufficient intake manifold. The only thing missing an otherwise-perfect combination is enough cam time! Knowing we had a cam swap coming up, we replaced the factory truck springs with a set of 26,918 springs from COMP Cams. So how much power did GM leave on the table when designing cams for different LS applications? In all honesty, design criteria engineers have never had to increase power, but believe me, they certainly could. Factory offers (by project) were easy compared to what was ultimately possible. But even factory cams differed in their operating capabilities. The low-man on-power totem pole was obviously a cam used in our 5.3L LM7 (shared with 4.8L LR4 and early 6.0L LQ4). The LM7 cam, designed for low-speed per-minute truck use, offered a .466/.457 lifting distribution, a 190/191-degree length distribution and a 116-degree lobe separation angle (LSA). We chose a set of FAST 89-pound injectors and FAST fuel rails for TBSS intake to supply the necessary fuel for our turbo engine. Let's put this gentle cam time in perspective. LS9 - the most powerful of the factory LS cams - offers a .558/.562 lift split, 211/230 degree lsa, and 122.5 degree lsa. Although it was designed to compile the application, the LS9 cam was all but identical to the 427-inch LS7 cam. The difference is the LS7 cam offered more lift because of the 1.8:1 ratio factory for LS7 rockers. The other production chambers (LS1-LS6) fell somewhere between these two extremes. Given the mild factory cam time, it actually comes as no surprise that a cam swap on a naturally aspirated 5.3L can give 40, 50, or even 60-extra horsepower. The benefits offered by cam swaps for LS are well documented. But what makes getting 40-60hp for a naturally aspirated LS to exceed 100hp for a sharpened one? The answer is a multiplier effect. The natural impregnated motor is already operating at an atmospheric pressure of 14.7 psi. So, all we need to do to double the output power of, say, a 300hp engine, is twice or not? Do not? we apply a 14.7 psi boost to the same 300hp naturally aspirated engine, we can see 600hp. Calling in air/fuel and time values was holley HP's engine management system. A/F and time curves were kept constant for two cams. Why don't we always see that much power is often a function of things like tune, charge cooling, and turbo efficiency, but be sure it's possible. In fact, it is possible to exceed this simple formula with sufficient charge for cooling (using things like ice water). The real exciting part is when we increase the power of our naturally impregnated engine. Let's say we add a cam to our 300hp test engine and increase power to 350hp. If we use the same 14.7 PSI boost to 350hp, we can now reach 700hp. The additional 50hp offered by cam swaps increased to 100hp under the boost! The key here is to do everything possible to improve the power of the naturally aspirated engine before adding a boost that includes cam time. To get things started, we ran a 5.3L engine naturally aspirated with a set of Hooker 1 7/8 inch headers. Not a perfect mild 5.3L, but that's what we were laying around. For our test we made a cam swap on a turbo engine. We also included a naturally aspirated base run with stock cam before installing a turbo kit. We did it primarily for our own good – making sure our DIY-turbo system performed as it should before performing a cam swap. The test engine was your basic bread-n-butter beater – a junkyard 5.3L kidnapped from a local LKQ Pic-a-Part. Run on a dyno naturally aspirated finish with a TBSS inlet manifold and stock LM7 cam, the 5.3L produces 359thp at 5300 rpm and 384 lb-ft of torque at 4,200 rpm. The 5.3L LM7 is a favorite among turbo LS enthusiasts. Before our test, 5.3L received an enlarged ring crack, new Fel Pro head gaskets, and ARP head studs. With the cam swap in mind, we also upgraded stock truck valve springs to a set of 26,918 springs from COMP Cams. We replaced the stock (early) truck with a Trailblazer SS (TBSS) collector equipped with FAST 89 pound injectors. TBSS intake was fed with FAST 92mm throttle in the body. Run with a set of 1 7/8 inches, Hooker Headers, a naturally aspirated 5.3L producing 357hp at 5600 rpm and 383 lb-ft of torque at 4200 rpm. After NA baseline operation, we installed hooker turbo collectors. To run our turbo cam test, we configured 5.3L with a home, DIY-turbo system. Our turbo set of basics included hooker cast collectors, a custom 2.5-inch pair under combine pipe, and a 7675 PTE turbo. Precision turbo was able to support more than 1200hp, or more than enough for our little 5.3L. PTE 7675 nourishes the boost through the dimensions of the air-water intercooleru of the Procharger. Like turbo, the intercoded was ungasted in our application and was fed with a smooth diet of 85 degrees of dyno water. Collectors cross-under pipe to divert exhaust from driver driver converges on the passenger's side into the manifold. We finished one 90-degree bend that connected the T4 turbo-lapel at one end with a 3.0-inch V-band to the output hooker turbo collector. This customized adapter also showed the rule of a single 45mm Hypergate wastegate from TurboSmart. In addition to the wastegate, TurboSmart also supplies a race port blowing valve and manual waste controller. However, we relied on 10 psi spring for this test. The exhaust from the turbo passes through one 4.0-inch V-band exhaust equipped with an oxygen sensor drum. Run with stock cam at a maximum boost of 11.0 PSI, turbo 5.3L produces 603hp at 5600 rpm and 612 lb-ft of torque at 4600 rpm. Now it was time for stage 2. The exhaust energy was delivered to one Precision 7675 turbo. The GT42 PTE turbo featured a 76mm preform wheel, an 88mm turbine, and a 1.28 AR, divided into a T4 turbine casing. After letting it cool down, we tore into 5.3L to make a cam swap. Off came the la push, front cover, and cam gear, followed by cam fixation plates, rockers, and pushrods. Using custom tools (no longer available), we talked to keep the hoists in place during the cam swap. Out came the stock bat and went LJMS Stage 2 turbo cam supplied by Brian Tooley Racing. The Stage 2 cam offered a significant increase in specs, jumping to a .605/.598 elevator split, a 226/231 degree duration split and a 113 degree lsa. The lift increased by about 0.140 and the duration was about 36 degrees per inlet and 40 degrees per discharge. Lsa shifted by 3 degrees, but an important point is that the opening and closing steps were developed specifically for the turbo LS application. Boost was controlled by one Hyper-Gate45 wastegate from Turbo Smart. The wastegate was equipped with a 10-psi spring. After installing the DIY-turbo system, the turbo 5.3L produces 603hp at 5,600 rpm and 612 lb-ft of torque at 4,600 rpm. Now it was time for a cam shift. To provide access to the cam, off came the factory load la pusher, followed by the front cover. Removing the front cover provides access to the factory time gear. After lining up to the sign of TDC, we removed the cam tool, followed by a cam support plate. Out came the wimpy stock LM7 cam to be able to install something significantly stronger. Designed by LJMS and made by Brian Tooley Racing, the Stage 2 turbo cam was a particularly turbo application. The Stage 2 cam offered a .605/.598 lift split, a 226/231 degree duration split, and a 113 degree lsa. In went LJMS / BTR stage-2 turbo cam. Run with a new turbo cam, the boosted 5.3L produces 730hp (actually 729.8hp) at 6,600 rpm and 649 lb-ft of torque at 4,900 rpm. The peak was almost identical (11.0 vs. 11.3 psi), so the cam offered peak-to-peak gains of nearly 130hp. The benefits in the last 6,000 rpm exceeded 150theal (same increase!), which apparently sets the stage for even more power. Apparently, they did their over at LJMS, the turbo cam improved output output by 5.3L to 730hp (729.8) at a higher 6600 rpm and 649 lb-ft of torque at 4,900 rpm. Wilder cam time traded off some lb-ft of torque below 4,300 rpm, but offered peak-to-peak gains of 127hp and 37 lb-ft of torque. The benefits exceeded the 150zp higher rev range and all the extra power is true if it can be fully used off the drag strip (or any run through the gears). Since we ran this test only in PSI 11, the stage is set to further power from this LJMS-cammed 5.3L with a higher boost! 5.3L-NA vs. Turbo (11.0 psi) Add boost to any LS engine improves power significantly, even one with stock at the lower end, stock cam, and stock heads. This 5.3L featured all stocks (original) insiders with an additional ring gap (on the original stock rings), stock 706 heads with spring upgrade, and stock TBSS inlet collector. Run with stock LM7 cam, header, and Holley HP management system, the naturally aspirated 5.3L produces 357hp at 5,300 rpm and 383 lb-ft of torque at 4,200 rpm. After adding an 11.0 psi boost from the Holley turbo system, precision 7675 turbo, and Procharger intercooler, power jumped to 603hp at 6,500 rpm and 612 lb-ft of torque at 4,600 rpm. Although it was a solid increase, we couldn't help but wonder how much stock the cam was holding us back. Turbo 5.3L Cam Test-Stock LM7 vs BTR/LJMS Stage 2 Turbo Seems clear from the look of the chart that the stock LM7 cam really holds us back. After installing the BTR/LJMS Stage 2 turbo cam, the output turbo 5.3L jumped from hair over 600hp to 730hp at 6600 rpm and 649 lb-ft of torque at 4900 revolutions per minute. Cam improved output capacity by almost 130hp, with profits in excess of 150zp in the higher speed range. Not only did the engine make significantly more power at the same boost level, but it allowed us to rev the engine past 6,500 rpm. The extra RPM definitely came in handy at the drag strip. Strip.