Tech Tip: Tuning the 1.9 Liter Opel Engine  
Part III: Revisiting the Opel Engine Rebuild

It seems that everyone who drives an Opel wants "More Power." (You are not alone!) Having acceleration on demand, affects how driving an Opel feels, and in turn, how you feel about your Opel.

The "Engine Performance" section of the tech tip index to back issues of OMC Blitzes (available at www.opelclub.com) shows this subject has been repeatedly revisited all the way back to 1985. Cal H.’s 6-part 24-page engine rebuilding articles of 1989-1992, the “big valve head” build article of Sept. 1988, and the other engine upgrade articles of the 1990’s, are among the most popular back issues ordered from the OMC Treasurer. The years since then have no doubt resulted in greater wear and tear to the original 30+ years-old Opel 1.9 engines, so it seems like a good time to review options that will get you more power.

It's presumed that your Opel already has a well-running Solex 32/32 DIDTA or a Weber 32/36 DGV-series carburetor, it has been tuned up and sealed against common vacuum leaks*, and maybe you've installed a Pertronix, Allison/Crane, or other ignition kit. But once you've performed all general maintenance-type parts replacements and minor servicing, it may be that your main limitation is the paltry 125lbs.(or less) of compression that your worn-out Opel motor can generate. (*Tune-up information is in the June 2006 OMC Blitz “tune-up guide,” including compression test procedures, downloadable for FREE online at www.opelclub.com). (Another clue: If your engine smokes, burns lots of oil, or throws oil back into your air filter).

There are many possible ways of machining the stock 1.9 liter Opel engine for more power. Many discussions mention upgrading the airflow capacity of the cylinder head with installation of non-Opel parts like Chevy Valves (big valve 1.72" or 1.84" intakes coupled with 1.50" exhausts from V8 engines). This is often combined with installing Chevy pistons (from the 265 or 305 engines), and others advocate stroking the engine by modifying the Opel crankshaft to achieve a 2.4 liter displacement. The lure is lower entry costs, but the obstacle is locating experienced professionals, who understand some of the more theoretical aspects of machining parts that were never intended for use together, to assure proper clearances and heat-expansion tolerances (that were never specified in any Opel service manual). Quality engine machinists who will work on an Opel are a rare breed (and their services are usually priced accordingly).

The downside of this approach, is a history of "shadetree mechanics" who have relied on collections of individual tech tips to guide them on projects of this sort -- which don't necessarily include comprehensive procedures such as measuring assembled parts (and fly-cutting piston-top valve reliefs for high RPM valve float, etc). -- and who have sometimes been left with a broken engine, and without the motivation or finances to disassemble and repair a motor for a second or even a third time. (Valve clearances are critical, as the Opel 1.9 Cam-In-Head is an “interference” design). Another less-demanding option, is to purchase a later model European 2.0, 2.2 or 2.4 engine, for what is largely a bolt-on installation into most U.S. model Opels. This takes advantage of Opel factory development, and is recommended when issues of cost, availability, and supplier reliability have been resolved. Consult other Opel owners before buying, to be assured your vendor has a track record of honesty, combined with the expertise to perform a thorough pre-sale inspection of the engine (and will stand behind the sale, to warranty its quality upon delivery).

Beyond that, any number of other non-Opel drivetrains (like Toyota 22R’s, Mazda 13B rotary’s, Ford V6’s, Buick 215V8’s, Chevy 350’s, and even larger engines) can be adapted to create a screaming dragster or a so-called "Franken-Opel" -- These are fun to see and dream about, but based on the amount of fabrication and skill required to finish a street-able weight-balanced vehicle, this option is not recommended for the vast majority of Opels (we’ll limit this topic to vehicles that won’t require frame-reinforcement, which is another topic entirely).
Recapping OMC's "Engine Overhaul"

Perhaps the most ambitious tech tip series ever printed in the OMC Blitz, was Cal H.’s 5-part compilation (plus 1-part reply) that described techniques for rebuilding an original 1.9 liter Opel engine. This series is one of the better-sellers of the OMC Blitz back issues, but as it's now over 15 years old, it's time for an updated review.

Cal opened by explaining that signs that an Opel engine that is needing an overhaul, included oil burning, poor gas mileage, knocks and noises, low oil pressure, and poor performance. This is because internal tolerances (or clearances) between internal engine parts start to loosen up with use, and when this exceeds a critical point then parts start to hammer on each other -- and from there the rate of wear increases dramatically. Worn piston rings were then the most common issue. 

(Using thicker viscosity 20/50W oils and "motor honey" or "engine restore" type additives can help forestall engine failure, but only for a while).

In summary, Cal cautioned that although an Opel engine should last over 100,000 miles, "it's durable but not immortal."

Cal said an Opel 1.9 engine rebuild should always include replacement piston rings, rod & main bearings, timing chain & chain guides, freeze plugs, and a full gasket set. Cal figured a rebuild would cost up to about $1000., which hasn't appreciated disproportionately since 1989 (particularly compared to gasoline or housing). It can seem like a lot of money, since many Opel owners bought their project GT's for about that much, but it's a whole lot less than comparable German sports cars (think: BMW 320i or Porsche 911), or even parts for “common” Toyotas. One rule of thumb however, is that "going cheap, isn't cheap." History has shown that when Opel owners tried to cut corners in order to cut costs, that those decisions came back to haunt them and actually cost more than they originally thought they’d save.

The following excerpts some of the critical procedures from Cal’s series, and just as Cal did it, we’ve presented them in a convenient part-by-part review format. We’ve also added many of the performance parts modifications and tips that have since been learned. This is not intended as a complete service procedure (you should refer also to the service manuals), but we’ll mention some of the known errors and omissions, with an emphasis on details that are proven to be roadworthy by Opel owners.

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Read, research, and make choices wisely. You can enjoy driving a well-built Opel engine, providing performance, reliability, and durability, over the long roads ahead.

"I can sell you a genuine high-performance Opel engine, cheap!"
Basic Concepts:

Building an Opel engine for increased performance is not a new idea, as Opel was racing a Rekord “Sprint” 1.9 CIH back as far as 1967. The basic concepts of engine enhancement aren’t exclusive to Opel; as with any engine, you need fuel, air, compression and spark. To upgrade engine output, you need to increase flow & spark to ignite greater amounts of a combustible mixture. But 1960’s factory mandates were idle stability and meeting emissions regulations. Later Opel engines benefited greatly, with installation of larger valves in the cylinder head, better fuel flow & timing curves, and increased engine displacement capacity (as in, “there’s no substitute for cubic inches”). Retrofitting a 1960’s-design engine requires skilled machine work and related component upgrades (focusing on fuel, exhaust and ignition systems), details of which follow in this article.

What marks the difference between more common Chevy/Buick/“Goodwrench” type mechanics and the elite“Opel specialist,” is not only the ability to re-machine these old engines and install selected parts, but also to ensure the parts combination retains mixture velocity as it passes through an engine. This skill is best developed from years of trial and error, using objective measurements from a “flow bench” and on timed racetracks.

Another critical factor, is the knowledge required to maintain internal clearances, as the Opel is an “interference” type engine (meaning, the valves will destroy themselves on the piston tops, if the camshaft timing and other tolerances aren’t set up right). Sadly, other persons motivated more by making or saving a quick buck have relied instead on the “flow” of “salesmanship,” and numerous tales of “burned” clients (who quit mid-project) have been heard for decades in the Opel world.

Completing a successful project starts with knowledge. Functions involved are: Intake (Carb, Manifold, Valve sizes), Compression (Pistons, Rings, Head/Block/Crank work), Ignition (Camshaft & Sprocket, Distributor) and Exhaust (Manifold, Mufflers). While The Blitz has introduced many different permutations of how you could modify these parts for performance (including searching for exotic 1968-1969 Opel 1.5/1.9H heads, and 35 & 33-gear toothed 3.18/3.67 axle parts), what most Opel owners actually want is not an experiment, but an upfront plan for their time and money to get a reasonably defined result. So we’re also advocating here the most proven upgrade: Building a 1.9 Opel with available aftermarket 2.0 parts. Beyond that, what most Opel engine projects have in common is a need for drive-train removal and reinstallation, so that will covered in future Blitz articles, as well.

Above: General 4-Stroke Engine Combustion Pattern (Note: Opels use non-canted valves, unlike those illustrated)
Important Factors:

Accuracy of Bolt Torque Measurements:
Service manual specifications presume use of new factory parts. Used parts with dirty or worn threads, artificially increase torque-wrench readings. To assure correct torque specs, use taps to clean hole threads, use dies to “chase” bolt threads, and lightly lubricate the threads (with light oil, or thread-locker in some applications) just prior to assembly.

Assure Clearances to Prevent Valve Interference:
Opel CIH’s are “interference” engines, defined as engines where the valves will hit the pistons if the timing chain breaks. Although Opel timing chains are very sturdy (they can stretch and jump a cam gear tooth, but very rarely break), when engines are re-machined or when oversized parts (larger valves, taller pistons, or higher-lift camshafts) are installed, minimum clearances must be measured and verified (piston tops can be coated with putty, then the crank is turned by hand, to measure for valve impacts). Minimum Intake clearance is 2mm (.080”); Exhaust 2.5mm (.100”). “Valve reliefs” can also be fly-cut into piston tops to obtain proper clearance.

Cam Timing (Head Milling, Block Decking):
If an Opel head is milled (which is a machining procedure done on its lower surface, generally to remove a warp or sometimes to increase compression by reducing the size of the combustion chamber), and/or an Opel cylinder block is decked (which is a separate machining procedure, done to flatten a warped top surface), then the camshaft timing will be slightly retarded by these procedures (Tony Fall’s estimate, was that for every .025” (~.635mm) milled, cam timing is retarded 2 degrees). If the machining is that amount or more, you can help restore low-end torque with installation of a degree-advanced cam or an adjustable camshaft sprocket.

General Preparation/Organization:
Disassemble, bag, and label or tag, parts as they are removed. Keep parts in cylinder number order. Because surfaces “mate,” make sure to keep the camshaft & lifters arranged in their EXACT orientations to each other. Also mark each rod and rod cap, and main caps, in their original orientation relative to each piston & to cylinder number. This helps when a project takes longer than planned. Don't leave parts at a shop -- they often get misplaced or lost.

Cleaning:
Soak parts in solvent to cut grease, rinse with hot soapy water, then wipe and blow dry with compressed air. Pay particular attention to reaming oil passages clean using stiff brushes. Immediately wipe or spray with clean oil or penetrating lube (like WD40) to prevent rust, and place in clean plastic bags (with ID marks on tape on outside of bags).

Make Your Part Supplier(s) and Your Machinist(s) Your New Friend(s)
Be nice! Our society is faster-paced than ever, but stress & snap decisions, cause details to get overlooked. It’s important that you communicate effectively, as your results are only as good as the parts you obtain and the actions of your machinist. When you can, buy parts in advance to avoid last-minute panic buys and pricey overnight shipping fees (exceptions would be for parts that require teardown to measure oversizes, like rod & main bearings). Bring Opel engine information, and a checklist or work-plan, to a scheduled conference with the shop (s) you choose. Get work authorizations and specifications in advance, in writing. Prepare for unplanned delays and additional costs, by reserving extra time and money for contingencies.

Remounting
Be aware, that unlike other vehicles, the Opel GT drivetrain is designed to “tilt” so that the passenger side is lower than the driver’s side. This is seen on the engine and transmission mount brackets, and on the offset location of the bolt hole for the motor mount to engine brackets. (Mount hole centerline is closer (9/16” to bracket edge) on passenger-side, than on the driver’s side (7/8” to bracket edge)). Do not try to “correct” this intended tilt, or your motor mounts won’t last long and your air filter cap may rattle the underside of the hood.
Evaluating What You've Got

Where you start on a project like this, will affect the choices and options you have to select. Some have acceptable candidate engine heads and blocks already in their vehicles, while others will have to do some shopping and swapping, to get what they need. There are also some lesser-known Opel-specific tricks involved, which are also addressed here.

The goal, is to either determine how to get the most out of what you've got (or to plan now to buy major replacement parts that you will need).

If an engine is installed in the car and running, you can test the following:

1. **Compression**: You want 125psi or more (up to about 190psi), as measured by a correctly-performed compression test, with variations of no more than 20% higher or lower, among each of the 4 cylinders. You also do not want a variation of more than 10% between the “dry” and “wet” compression tests, or the piston rings may need to be replaced. The valves must be properly adjusted, as they will affect the results of this test. Generally the higher the compression, the more the power and efficiency of the engine (although at 150psi and above you should consider using higher octane fuels or additives).

2. **Oil Pressure**: Adequate oil pressure is important, to help prevent wear at critical rod and main bearings. With “fresh” 30W or 10-40W oil in the engine, run at idle, verify the reading is a minimum “1” on the dashboard oil gauge (at 10 lbs of pressure for every 1000 rpm, “1 bar” = 15 lbs.) When driving on the road, a good reading is 2 1/2 to 4 1/2. If numbers are appreciably lower, and if the “quick-fixes” of replacing the oil pump cover (and possibly the oil pump gears) doesn’t bring the pressure up, then you need to verify the timing cover isn’t worn at the oil pump housing (it’s either that, or a possibility the engine bearings are excessively worn). If the timing cover is worn, then the challenge would be to find either a new cover, or to locate a known good used timing cover to bolt to a freshly rebuilt engine.

3. **Noises**: Verify there are no unusual noises, such as piston slap, 2000rpm rattle (could be a timing chain wearing on the metal backing of original timing chain rails), pinging (detonation, which could be caused by timing that is too advanced or by fuel that is too low an octane rating) or a low knocking noises (wear at piston rod or engine bearings)

4. **Oil Leaks**: There should not be more than a light film of oil, if you have the common front-end leak (particularly where the timing cover meets the bottom of the cylinder head). If leaks are substantial, the engine should be re-gasketed.

Seek external clues as to the condition of an Opel when it is still in a vehicle. The best engines are sometimes found in wrecked cars (that were otherwise low mileage and maintained or even rebuilt). This presumes that the engine still has the spark plugs in it, and where a part was removed, that someone stuffed rags in the port (or otherwise insulated it from outside moisture). Those engines are worth evaluating. Engines from high-mileage cars (with less-damaged bodies, that may have been junked for mechanical reasons other than a wreck) are far riskier. Even worse, are those engines from cars that are just abandoned outside and exposed to the elements. Chances are these have substantial internal rust (which can take a lot of machining to deal with). Even when the asking price is low, in the long run, it can be best to just pass on those.

If an engine is out of a car, you can place it on an engine stand for testing. Connect a 12-volt battery with a starter switch then crank the starter to do a compression test. You can connect an oil pressure gauge and then use a shaft tool (length 14”, tip size 7/16” by 1/8,” from a disassembled distributor, or a cut off screwdriver, and driven with a hand-drill) down the distributor hole to run the oil pump drive gears to get an oil pressure reading. (Some of the better-equipped shops, pre-make engine stands to more easily be able to perform these sort of tests)

If the cylinder head is removed from the engine block, you can perform a preliminary visual inspection. Additional checks should be of cylinder wear, that there is minimal “deck” (engine block top) warpage, and no rust within the cylinders or at freeze plugs. Inspection results should direct your attention to problem areas. Once a block is disassembled, hot tank to remove coolant scale.
Valves:
While stock Opel 1.9 valves provide reliable service, observations are that they are dramatically undersized relative to the power potential of the cylinder head.

Do's and Don't's:
DO: Match correct hardware (keepers, seals, etc.) to valves
DO: Install new hardened valve seats (for unleaded gasoline) with new valves
DO NOT: Install late-model valves in early-style head (before #19S-0498917), unless the combustion chamber is re-machined, to remove “oil shedder” lips

Original Parts, Year to Year:
“Early” Intake & Exhaust Valves: Intake valves notched ~.250” from stem top (valve keeper groove) and .500” from stem top (round “donut” O-ring seal).
“Middle” Intake & “Late” Exhaust Valves: Top notch ~.170” from stem top, and a lower groove (book indicates possible intake change, at #19S-0739120)
“Late” Intake Valves: Top notch ~.170” from stem top (“umbrella” ring)

Performance:
There are 2 basic oversize options: Opel 2.0 valves, or larger Opel or Chevy valves. Most common service is to replace worn out original 1.9 valves with Opel 2.0 valves, as they cost the same as 1.9 valves but greatly increase performance.

With a “combination” camshaft and Opel pistons, 2.0 valves typically won’t require cutting of piston valve reliefs. You should add 2.0 keepers, and “short style” retainers when installing Opel 2.0 valves (do this using 2.2 parts, with 2.2 valves). Machine work includes removing the valve seat, machining head to open up guide hole & bowl area for a larger valve, then properly blending bowl area to new seats. Then do a standard 3-angle valve job: Drill the valve guide, do a 45-degree 3-angle cut on valves; then hand-lap each valve with coarse, then fine, lapping compounds.

More extensive work is required to install larger Opel 2.2/2.4 or Chevy valves. It’s best to deal with someone who has experience working on Opel heads.
When using stock springs and a moderate street performance camshaft, the ideal result is a proportion of for the exhaust flow to be about 75% of the intake flow. Chevy Options: Most install 1.72” (or 1.84”) intake and 1.50” exhaust valves. Components are cheap, but machine work can cost more than replacing with Opel valves. Chevy valves do require different springs, retainers, and keepers.

When installing larger valves, especially when combined with higher-lift cams, higher-profile pistons, or when decking block or milling the head; You need to verify you have sufficient clearance between the top of the piston and bottom of valves (when valves are fully opened at high engine speed).

To check clearance, you can install light springs on valves, bolt head on block with a spare used head gasket, sequentially torque down to 72 ft. lbs., then slowly turn engine and manually push down valve every 2 degrees.
If needed, you can also coat piston tops with clay (lightly oil the valve bottoms), hand-rotate engine, then disassemble and check clay for depth of any impressions. (Note that when the engine is at TDC for a cylinder, both rocker arms there will be “tight.”)
Camshaft Specifications:

What is the “best” profile camshaft? That depends on how an engine is used. Questions include if the car is to be driven on the street or racetrack, whether the fuel system is carbureted or injected (and if larger valves are installed), what octane fuel blends are available, what will be the ignition timing, what transmission is installed, and other related engine factors such as compression ratio and piston-top design.

Camshafts are measured in terms of lift (how far lobes will open the valves), duration (length of time valves will be open) and separation (relative opening and closing of intake valves compared to exhaust).

Factory stock Opel 1.9 camshaft specifications were never published, but were about .390” lift, 240 to 250 degrees duration, 110.5 separation & 1 degree retarded. (For identification, stock Opel cam part #’s: 3 bearing #636151; #4 bearing #636164).

Performance:

In general, for street applications, most aftermarket higher-profile Opel camshafts actually installed have .430” lift and 110 degree separation. Camshafts with even higher lift, greater duration, and a lower separation, require additional parts like stiffer valve springs (which help prevent high RPM “valve float”) and maybe a mechanical -advance distributor or “fly-cutting” of pistons. You should always insist on having cam specifications (a.k.a. the “cam card”) before buying a performance camshaft! (For solid lifters, you’ll also need valve adjustment settings, for correct tuning).

The hottest camshafts are meant for racing only, as they produce too “choppy” of an idle for street use. (On automatic transmission Opels, high-duration cams may also require installation of a high-stall torque converter). Because all cams in Opel CIH heads could use better oiling, a good protection tip, is to install an inexpensive cam “oil dam” in a rear head oil drain hole to raise the oil level in the cylinder head. Cams can be hardened or “Parkerized.” Cams also can be ground with a 3-degree advanced timing profile (which is another option to combat timing chain stretching).

Modified Camshaft Timing:

When an engine is “milled” or “decked”, Tony Fall’s estimate was that for every 0.025” (~.635mm) of height removed, cam timing is retarded 2 degrees (raising speeds needed to reach the “torque band” up 500 RPM’s). Sometimes, even normal stretch of the timing chain can also cause this much cam timing retard. To regain low-end torque, some Opel owners have re-drilled their used camshaft sprocket to advance the timing in steps of about 3 and 6 degrees. (This is done, by laying a second sprocket over the one to be modified, measuring the space between gear teeth in increments of 1/3, slightly widening the 3 mount holes and adding 2 cam index 6mm holes and adding 2 timing marks on the outer ring). Alternatives, include using Chevy offset bushings, or purchase of an adjustable cam sprocket (from England’s Kent or Piper Cams, or Germany’s Risse). Alternatively, a camshaft can be ground with a 3 degree timing advance profile. A “degree wheel” can be used, to verify valve timing on a modified installation (as exhaust valves will get hit on an excessively retarded engine).

Installation and Break-In Procedure:

When disassembling a head, mark valve lifters and keep in exact sequence with the same camshaft they were running with. Because used lifters have “mated” lobe-to-lobe with a used camshaft, they can only be re-installed together in the exact same sequence. (Otherwise, just replace lifters, the camshaft, preferably both, with new parts).

Prior to installation or re-installation, use liberal amounts of engine assembly lube on the camshaft, all the bottom surfaces of the valve lifters, and around the valve lifter bores in the cylinder head.

To break in a new cam, run engine continuously, varying only from 2000 to 2500 rpm’s, for 15 minutes.

Opel cam specifications have been developed by Cam Techniques, Crane Cams, Isky, Norris, Opel, Piper, Steinmetz, and others (current suppliers and profiles vary).
Consider Building a 2.0 Liter Opel Motor
The most common and proven Opel engine rebuild combined with the best “easy” valve upgrade is the bottom-end 2.0 liter piston replacement mated with a cylinder head 2.0 valve installation. The main argument for this, is that the 2.0 upgrade doesn't cost a large percentage more than what is required to machine and rebuild a 1.9 liter engine with original type replacement parts -- yet this can result in 30 or more horsepower (from about 65 to over 95), particularly on original low-compression 1971-1973 engines. It’s not cheap, but it is reasonable

Coupled with smart choices like a hotter camshaft, manifold porting, and options of direct-g geared Weber 38DGAS carburetor and/or freer-flowing exhaust, this provides plenty of available "hot but streetable" power with low risk at a fairly predictable price.

Why build to a 2.0 and not to a 2.2/2.4? The larger engines are stroked, and require crankshaft modification or replacement. In the hands of anyone but an experienced machinist, this invites less than reliable reassembly issues. If your patience and budget allow that, it can be done, but again the 2.0 is, statistically, the most “proven” build size.

The alternative is to install a later-model European Opel engine. For most applications they are comparatively a “bolt-on,” however there may be some modifications and part upgrades required to complete your specific installation. (You can read past OMC Blitz “engine performance” articles, which contain more detail on necessary modifications). Be aware, imported engine prices vary with the value of the Euro, so consult current currency exchange rates, and consider buying prior to any anticipated price hikes. Verify European engine displacement, by serial number on block.

Aspects of Factory Opel 2.0E:
Est. 109HP at 5200rpm, 117 ft. lbs. of torque (measured at the wheels), Est. 94CFM Cylinder Head Flow
Requires electric fuel pump (no hole in timing chain cover for mechanical fuel pump rod)
Can be bolted-on with all other 1.9 components, including US factory 8.0 inch Opel clutch
Cylinder head and timing cover are 12-bolt style (Has unique 2.0 E head bolts)
2.0 cylinder head can be bolted onto 1.9 engine block
2.0 engine block can have 1.9 cylinder head installed onto it (with 2.0 head gasket)
Can run with stock US Opel transmissions (in excellent condition, with a good clutch)

Aspects of Factory Opel 2.2E:
Est. 113HP at 5200rpm, 130 ft. lbs. of torque (measured at the wheels), Est. 122CFM Cylinder Head Flow
Requires clutch upgrade to 9”, requires intake manifold modified for (non-Opel EFI) carb use (see Oct 2004 OMC Blitz)
Cylinder head and timing cover are 12-bolt style (Has unique 2.2 head bolts)
2.2 cylinder head is not recommended for installation on 1.9 engine or 2.0 engine blocks
(The 2.2 combustion chamber is larger than earlier 1.9 & 2.0 liter Opel heads, causing too low of a compression ratio)
2.2 and 2.4 cylinder heads, are almost identical (same approximate valve sizes)
2.2 engine block is not recommended with 1.9 or 2.0E cylinder heads (compression ratio too high)
Not recommended for stock US Opel 4-speed transmissions,
Is recommended for use with GETRAG 5-speed (and a good clutch) or automatic transmission.

Aspects of Factory Opel 2.4:
Est. 126HP at 5200rpm, 151 ft. lbs of torque (measured at the wheels), Est. 110CFM Cylinder Head (at Intake) Flow
Requires clutch upgrade to 9”, requires intake manifold modification for carburetor use (see Oct 2004 OMC Blitz)
Requires US 1971-1975 Steel Oil Pan and matching internal oil pickup tube with dipstick (see June 2004 OMC Blitz)
Cylinder head and timing cover are 12-bolt style (Has unique 2.4 head bolts & 2.4 134mm length rods)
2.4 cylinder head is not recommended for installation on 1.9 or 2.0 engine blocks
(The 2.4 combustion chamber is larger than earlier 1.9 & 2.0 liter Opel heads, causing too low of a compression ratio)
2.2 and 2.4 cylinder heads, are almost identical (same approximate valve sizes)
2.4 engine block is not recommended with 1.9 or 2.0E cylinder heads (compression ratio too high)
Not recommended for stock US Opel 4-speed transmissions,
Is recommended for use with GETRAG 5-speed (and a good clutch) or automatic transmission.

www.opelclub.com 9/07
OPEL MOTORSPORTS CLUB

OMC is an independent US-based auto club, that specializes in German-made 1968-1975 Opels. OMC was founded in 1980 by Opel enthusiasts who wanted to share information and promote their marque in motorsports. A newsletter was established to promote Opel events, report Opel-related news, provide technical tips, discuss vehicle upgrades, and give members a free place to advertise.

New “Full Memberships” receive:
A year of bi-monthly print issues of OMC newsletter “The Blitz,” a roster of club members, an OMC decal and a window emblem. Members can also participate in local OMC chapter activities, held all over the USA.

OMC Newsletters: “THE BLITZ”
(Print version black/white; Online in color)

OMC Activities & Annual Meeting

Opel Motorsport Club is the longest-established Opel club in the U.S.A. Members travel great distances to attend the OMC Annual Meeting, a mid-Summer gathering and display of classic and restored Opels. Benefits of membership also include information from other Opel owners on the maintenance and improvement of their Opel(s), and the ability to contact fellow members on their common interests. OMC funds help maintain our website (with helpful Opel information) at: http://www.opelclub.com

OMC’s peer-reviewed technical information helps owners avoid common and costly errors on Opel repair jobs! OMC is officially recognized by the Opel factory of Russelsheim, Germany, and OMC “SOLO II” racing activities are also sanctioned by the SCCA (Sports Car Club of America) for racing nationwide in the USA.

“Full” U.S. Membership: $45.00 (Includes bi-monthly b/w print issues of The Blitz, postage & benefits listed above)
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