CHEVY 60-DEGREE V6

BLOCKS

Chevrolet 60° V6
The Chevrolet 60° V6 is a compact powerhouse. This innovative engine has beaten both the competition and the elements in off-road racing. It is a proven winner in sports car racing, and it has a promising future on America's oval tracks in the Midget classes. A Chevy V6/60° engine is the perfect power-plant for a high-tech street rod or an ultralight autocross machine. GM Performance Parts offers the basic building blocks for a high-performance V6/60°, including light alloy engine cases, high-compression pistons, and high-volume oil pumps.

Chevrolet's 60° V6 has been produced in two distinct versions. First generation V6/60°'s have cast iron cylinder heads with inline valves; second generation engines have aluminum cylinder heads with splayed valves. First generation V6/60°'s are produced for front-wheel-drive and rear-wheel-drive chassis, while "Generation II" engines are installed in front-wheel-drive vehicles exclusively. Parts are interchangeable between the two versions except as noted in the part descriptions below.

Chevy V6/60° engines are available with 2.8-liter (173 cubic inch) and 3.1-liter (189ci) and 3.4-liter (207ci) displacements. 1985 and later V6/60° blocks have larger main bearings than pre-1985 engines; these late model blocks are recommended for high-performance and competition applications. All Chevy V6/60° engines use metric fasteners exclusively.

GROUP 0.001A ENGINE CONVERSION PACKAGES

12363230
GM Performance Parts has released an emission-legal (all states except California) 3.4-liter V6 engine conversion package designed for 1982-85 S-10 pickups and Blazers originally equipped with 2.8-liter V6 engines. The 3.4-liter (207ci) version of Chevy's popular 60° V6 offers nearly a 20% increase in displacement over the 2.8-liter (173ci) V6 by utilizing a bore that is .120" larger and a stroke that is .320" longer. In addition to the larger displacement, the 3.4-liter engine benefits from an improved camshaft profile and valvetrain upgrades, which help it produce nearly 40 more horsepower than the stock 2.8-liter engine.

The bigger 3.4-liter V6 is virtually a bolt-in for the above applications, utilizing the existing intake manifold, ignition system, emission system, and water pump from the original 2.8-liter engine. Some models may also require using the oil pan or front cover from the original engine. The 1982-83 models with manual transmission use a clutch cross shaft with a ball stud boss on the block. This new 3.4-liter does not have that clutch boss cast on the block. The 3.4-liter engine conversion package (PN 12363230) offers a considerable improvement in horsepower and torque over the 2.8-liter engine in an economical bolt-in package. This engine package includes the engine assembly, comprehensive installation instructions and decals.

3.4-LITER V6 ENGINE PACKAGE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Part Number: 12363230</th>
</tr>
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<tbody>
<tr>
<td>Displacement: 3.4-liter (207ci)</td>
</tr>
<tr>
<td>Horsepower: 160 at 5000 RPM</td>
</tr>
<tr>
<td>Torque: 194 at 2700 RPM</td>
</tr>
<tr>
<td>Bore &amp; Stroke: 3.62&quot; x 3.31&quot;</td>
</tr>
<tr>
<td>Compression Ratio: 9.0:1</td>
</tr>
<tr>
<td>Engine Block: Cast iron</td>
</tr>
<tr>
<td>Camshaft: Hydraulic flat tappet design</td>
</tr>
<tr>
<td>Valve Lift (Intake/Exhaust): .427&quot;/.454&quot;</td>
</tr>
<tr>
<td>Duration (Intake/Exhaust): 204/216 at .050&quot; lift</td>
</tr>
<tr>
<td>Cylinder Heads: Cast iron</td>
</tr>
<tr>
<td>Intake Valve Diameter: 1.60&quot;</td>
</tr>
<tr>
<td>Exhaust Valve Diameter: 1.43&quot;</td>
</tr>
<tr>
<td>Fuel Requirement: Unleaded regular</td>
</tr>
<tr>
<td>Technical Note: An in-line electric fuel pump is recommended for the conversion.</td>
</tr>
</tbody>
</table>
GROUP 0.033 ENGINE BLOCKS AND COMPONENTS

10065456 — Cast Iron Block (Rear Wheel Drive)
This cast iron cylinder case is used in 1985-up 2.8-liter engines for rear-wheel-drive vehicles. It is a bare block with two-bolt main bearing caps.
Technical Notes: This block has 89mm (3.50") cylinder bores and large 67mm main bearings. Block weight is 106 pounds.

10051141 — Bow Tie Aluminum Block
This heavy-duty aluminum block is 47 pounds lighter than a production rear-wheel-drive cast iron block. It has extra-thick cylinder walls with dry nodular iron sleeves. The head bolt bosses are reinforced to improve head gasket sealing. This block has wider main bearing bulkheads than a production cylinder case; four-bolt caps are installed on the two intermediate main bearings. These billet steel main caps have splayed outer bolts that provide additional bearing support.

The aluminum Bow Tie V6/60° block features a revised lubrication system. The "priority main feed" oiling is similar to a Chevrolet small-block V8, with three oil galleries above the camshaft; production V6/60° blocks have only two oil galleries. Oil is routed directly to the main bearings in a Bow Tie block to ensure proper lubrication at high rpm. The main bearing saddles are grooved to increase the flow of oil to the crankshaft journals through additional feed holes drilled in the upper bearing inserts. Block weight is 59 lbs.

Technical Notes: Aluminum Bow Tie V6/60° engine blocks have rough-bored 91mm (3.582") cylinders which can be safely overbored to 91mm (3.582"). Light alloy Bow Tie blocks have bosses for both front-wheel-drive and rear-wheel-drive engine mounts. The starter motor can be installed on either side of the block.

Chevrolet V6 60 Bow Tie Quick Reference Chart

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Block Material</th>
<th>Cylinder Wall Type</th>
<th>Cylinder Deck Height</th>
<th>Cylinder Bore Range</th>
<th>No Bearing Cap Bolts</th>
<th>Cap Bolt Orientation</th>
<th>Bearing Cap Type</th>
<th>Crankshaft Journal Dia.</th>
<th>Oil Sump Type</th>
<th>Crankshaft Seal Type</th>
<th>Design Max. Stroke</th>
<th>Weight (lbs. - bare)</th>
<th>Intended Usage</th>
<th>Non-Standard Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>10051141</td>
<td>Aluminum</td>
<td>Non-Siamesed</td>
<td>8.820&quot;</td>
<td>3.525-3.582&quot;</td>
<td>4</td>
<td>Splayed</td>
<td>Steel</td>
<td>2.65&quot;</td>
<td>wet</td>
<td>2 piece</td>
<td>3.20&quot;</td>
<td>59</td>
<td>Professional Competition</td>
<td>Bossed for front or rear drive engine mount</td>
</tr>
</tbody>
</table>

GROUPS 0.095 - .137 MAIN BEARINGS, CAPS, AND SEALS

10051177 — Four-Bolt Main Bearing Cap
This billet steel bearing cap is used on the #2 main bearing in a Bow Tie aluminum V6/60° block. Its outer bolt holes angle outward toward the oil pan rails. This splayed bolt design improves reliability in highly stressed racing engines by tying the cap to the strongest part of the block. It also reduces distortion of the main bearing bores by increasing the cap's resistance to closing up under high loads.
Technical Note: For 67mm diameter main bearings.

10051178 — Four-Bolt Main Bearing Cap
Same as above, for #3 main bearing.

14077802 — Front Main Bearing Cap
14077813 — Rear Main Bearing Cap

12480252 — Main Bearing Kit
Standard diameter for #1 and #4 main bearings, 1985 and later engines.

12480253 — Main Bearing Kit
Standard diameter for #2 main bearing, 1985 and later engines.

12480254 — Main Bearing Kit
Standard diameter for #3 main bearing, 1985 and later engines.

14085829 — Rear Crankshaft Seal Kit
One-piece rear crankshaft seal for 1985 and later engines.

476543 — Main Bearing Cap Bolt
11mm x 3.66" long, for cast iron production block.

10044990 — Main Bearing Cap Bolt
11mm bolt for outer holes on Bow Tie four-bolt caps.

10185054 — Washer
11mm washer for aluminum block studs.
CHEVY 60-DEGREE V6

HEADS

GROUP 0.269 CYLINDER HEADS

10048649 — Aluminum Cylinder Head
Production "Generation II" V6/60° transverse-mounted engines have aluminum cylinder heads with splayed intake and exhaust valves. This canted valve design enhances cylinder breathing by unshrouding the valves at maximum lift. The high-velocity intake runners and heart-shaped combustion chambers promote swirl in the cylinders for efficient combustion. Spark plugs are centrally located in the chambers.
Technical Notes: Aluminum cylinder heads are recommended for Midget racing classes and other applications where lightweight engines are preferred. Aluminum V6/60° heads are machined for 1.72" diameter intake valves and 1.42" exhaust valves.

➤➤➤➤➤ NEW 10218168 — Cylinder Head V6/60°
These Gen III cylinder heads are used on late model V6/60° engines for improved performance. They feature an increase of 0.040" in intake valve diameter and a reshaped port for a flow improvement of 16.7% at 0.450" of valve lift. The exhaust port has been reshaped into a "D" port configuration for a flow improvement of 31.7% at 0.450" of valve lift.

14054884 — Cast Iron Cylinder Head
This high-performance cast iron cylinder head is used on High Output transverse-mounted and fuel–injected rear-wheel-drive V6/60° engines. It is machined for 1.72" diameter intake valves and 1.42" exhaust valves. (Standard heads have 1.60" intakes and 1.30" exhausts.) This cylinder head is recommended for off–road V6/60° racing engines.

GROUP 0.289 CYLINDER HEAD GASKETS

10134322 — Cylinder Head Gasket
Cylinder head gasket for V6-60° with cast iron heads.

GROUP 0.293 CYLINDER HEAD BOLTS AND STUDS

475643 — Long Cylinder Head Bolt
11mm x 3.66" for cast iron heads.

475672 — Short Cylinder Head Bolt
11mm x 2.68" for cast iron heads.

10227593 — Long Cylinder Head Bolt
11mm x 4.33" for aluminum heads.

10100033 — Short Cylinder Head Bolt
11mm x 3.50" for aluminum heads.

10051155 — Washer
For V6/60° studs.

14024244 — Cylinder Head Dowel Pin
For all V6/60° engines.

12346004 — Sealer
For all cylinder head bolt threads.

VALVETRAIN

GROUP 0.296 -.297 INTAKE AND EXHAUST VALVES

14024249 — Intake Valve
1.6" diameter, standard stem, for production cast iron cylinder heads.

14031328 — Intake Valve
1.72" diameter, standard stem, for High Output V6/60° engines with cast iron cylinder heads.

14091805 — Intake Valve
1.72" diameter, standard stem, for 1987 and later aluminum heads.

14024254 — Exhaust Valve
1.3" diameter, standard stem, for production 1980–84 iron cylinder heads.

14031332 — Exhaust Valve
1.42" diameter, standard stem, for High Output V6/60° engines with cast iron heads.

10070124 — Exhaust Valve
1.42" diameter, standard stem, for 1987 and later aluminum heads.

GROUP 0.303 -.310 VALVE SPRINGS, RETAINERS, AND LOCKS

10207475 — Valve Spring
Production design valve spring and damper for cast iron cylinder heads.
Technical Note: Suitable for .420" maximum valve lift.

10166343 — Valve Spring
Production design valve spring and damper for 1987 and later aluminum heads.

12363215 — Valve Spring
This valve spring is used in the new 3.4-liter engine conversion package (P/N 12363230) and designed for moderate performance usage. Manufactured from chrome silicon wire, this spring produces 105 pounds of seat pressure at an installed height of 1.70" and 296 pounds open pressure at a height of 1.20".
Technical Note: Use with retainer P/N 12363216.

330585 — Heavy-Duty Valve Spring
This dual valve spring is recommended for competition camshafts with .560" maximum valve lift. It produces 140 pounds seat pressure at an installed height of 1.75".
Technical Notes: This spring is 1.379" in diameter. Spring pockets on V6/60° cylinder heads must be machined to fit this spring. Umbrella-type valve stem seals are recommended. Use with aluminum valve spring retainer P/N 330586.

14004099 — Valve Spring Retainer
For cast iron cylinder heads with production valve springs.

14094168 — Valve Spring Retainer
For 1987 and later aluminum cylinder heads with production valve springs.

12363216 — Valve Spring Retainer
This heavy-duty valve spring retainer is used in the new 3.4-liter engine conversion package (P/N 12363230). Manufactured from 4140 heat-treated steel, this retainer has a diameter of 1.233" and is designed for use with an 11/32" valve stem.
Technical Note: Use with valve spring P/N 12363215.
12353919 — Camshaft Kit
All models car and truck Chevrolet V6/60° (2.8L & 3.1L) for off-highway use. Smooth idle, daily usage, off road, towing, economy, mild turbo-charged 8.0 - 9.5 to compression ratio, 2200 - 2600 cruising RPM. Basic RPM range 1500 - 4000, 6500 RPM attainable with proper valve springs and lifters.

<table>
<thead>
<tr>
<th>Duration .050</th>
<th>Lift</th>
<th>Lobe Centerline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int.</td>
<td>Exh.</td>
<td>Int.</td>
</tr>
<tr>
<td>204°</td>
<td>216°</td>
<td>.427°</td>
</tr>
</tbody>
</table>

12364059 — Camshaft Kit
Applicable to all 1980-94 Chevrolet 60° V6 (2.8-liter & 3.1-liter) engines, this performance-oriented camshaft kit is designed to significantly improve mid-range torque and horsepower without sacrificing idle quality. The basic RPM range is 1500-4500 with 6500 RPM attainable using proper valve springs. Cruise RPM is designed for 2200-2600 RPM, and a compression ratio of 8.0-9.5 to 1 is recommended. This kit is not legal for pollution-controlled vehicles.

Technical Note: This is a hydraulic flat tappet camshaft kit which includes tappets.

<table>
<thead>
<tr>
<th>Duration .050</th>
<th>Lift</th>
<th>Lobe Centerline</th>
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<tbody>
<tr>
<td>Int.</td>
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<tr>
<td>204°</td>
<td>216°</td>
<td>.427°</td>
</tr>
</tbody>
</table>

12453171 — Camshaft Bearing
This small-block V8 cam bearing provides a wider bearing surface than standard V6/60° bearings. This bearing should be installed in the front and rear bearing housings.

Technical Notes: Check bearing position in block after installation. Oil hole should be located between 4 o’clock and 5 o’clock position when viewed from front of block.

12453172 — Camshaft Bearing
Small-block V8 cam bearing for #2 and 3 bearing housings.

Technical Notes: See above.

17120070 — Roller Tappet
These roller tappets are used on late model V6/60° engines for improved performance.

Technical Note: Must be used with late model cylinder blocks.

GROUP 0.603 CONNECTING RODS

12515767 — Connecting Rod
This forged steel connecting rod is used in all V6/60° Chevrolet engines. It has a 5.700” center-to-center length.

Technical Notes: Production rods are suitable for off-highway V6/60° engines which operate at a maximum engine speed of 7000 rpm. See the Chevy Power manual for recommended modifications. Use bolt P/N 466337 and nut P/N 361970 for service.

12480255 — Connecting Rod Bearing
Standard diameter, for all V6/60° engines.
## CRANKSHAFTS

**GROUPS 0.646 - .649 CRANKSHAFTS AND PILOT BEARINGS**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>10048682</td>
<td>Crankshaft</td>
<td>This 76mm (2.99”) stroke cast nodular iron crankshaft is used in 1985-87 2.8-liter V6/60° engines.</td>
</tr>
<tr>
<td><strong>Technical Notes:</strong></td>
<td>This crank has 67mm main bearings, and is recommended for heavy-duty applications. Its rod and main bearing journals have rolled fillets. This crankshaft is externally balanced, and requires a counter-weighted flywheel for proper engine balance.</td>
<td></td>
</tr>
<tr>
<td>14085481</td>
<td>Crankshaft</td>
<td>This 76mm (2.99”) stroke cast nodular iron crankshaft is used in 1987 and later 2.8-liter Generation II V6/60° engines with aluminum cylinder heads. It has an integral timing disc that provides reference signals for an ignition control module.</td>
</tr>
<tr>
<td><strong>Technical Notes:</strong></td>
<td>This crankshaft has 67mm main bearings. It is internally balanced; use with a neutral balanced flywheel for proper engine balance.</td>
<td></td>
</tr>
</tbody>
</table>

## OIL PANS & GASKETS

**GROUPS 1.426 - .429 OIL PANS AND GASKETS**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Details</th>
</tr>
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<tbody>
<tr>
<td>14077878</td>
<td>Oil Pan</td>
<td>For 1982-86 Camaro and S-10 truck. Technical Note: Use rear oil seal P/N 476591.</td>
</tr>
<tr>
<td>10078999</td>
<td>Oil Pan</td>
<td>For 1987 Camaro and S-10 truck. Technical Note: Use rear oil seal P/N 476591.</td>
</tr>
<tr>
<td>14089825</td>
<td>Oil Pan Reinforcement</td>
<td>Front pan reinforcement for all 1987 and later V6/60° engines. Technical Note: This unit does not include oil pump screen.</td>
</tr>
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</table>

### FUEL PUMPS

**GROUP 3.900 FUEL PUMPS**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>6471930</td>
<td>Fuel Pump</td>
<td>For carbureted V6/60° engines in Camaros and S-10 trucks.</td>
</tr>
<tr>
<td>6472020</td>
<td>Fuel Pump</td>
<td>For transverse-mounted carbureted V6/60° engines.</td>
</tr>
<tr>
<td>14033175</td>
<td>Fuel Pump Pushrod</td>
<td>16mm diameter for all carbureted models.</td>
</tr>
</tbody>
</table>