

ZZ502 Engine (12496962 Deluxe) Specifications

Specifications Part Number 19171884

This ZZ502 Deluxe Crate Engine documentation should be used in conjunction with the ZZ502 short block, GM part number 19171883, and ZZ502 long block, GM part number 12487523. The documentation included within this information packet builds on the ZZ502 short block and ZZ502 long block information. Please locate the ZZ502 short block and ZZ502 long block information and begin there. This is the final (third) section of the instruction for the ZZ502 deluxe engine assembly.

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This publication provides general information on components and procedures that may be useful when installing or servicing a ZZ502 deluxe assembly. Please read this entire publication before starting work. Also, please verify that all of the components listed in the Package Contents section below were shipped in the kit.

The information below is divided into the following sections: package contents, torque information, ZZ502 deluxe engine assembly specifications, engine start-up and break-in procedures, component information, and a service parts list.

The ZZ502 deluxe engine assembly includes additional components to the long block assembly which make up the deluxe engine. Additional key items include the intake manifold, carburetor, distributor, and the water pump. The ZZ502 deluxe engine is a fully assembled engine. This engine is assembled using brand new, premium quality components. The ZZ502 deluxe engine is manufactured on current production tooling; consequently you may encounter dissimilarities between the ZZ502 deluxe engine assembly and previous versions of the big block V8. In general, items such as motor mounts, accessory drives, exhaust manifolds, etc. can be transferred to a ZZ502 deluxe engine when installed in a vehicle originally equipped with a big block V8 engine. However, as noted in the following sections, there may be significant differences in the water pump, torsional damper, etc., between a ZZ502 deluxe engine and an older big block V8 engine. These differences may require modifications or additional components not included with the ZZ502 deluxe engine. When installing the ZZ502 deluxe engine in a vehicle not originally equipped with a big block V8, it may be necessary to adapt or fabricate various components for the cooling, fuel, electrical, and exhaust systems. Due to the wide variety of vehicles in which a ZZ502 deluxe engine can be installed, some procedures and recommendations may not apply to specific applications.

GM recommends that you use a minimum octane rating of 92 (R+M/2) fuel in the ZZ502 (9.6:1 compression ratio) to prevent preignition.

It is not the intent of these specifications to replace the comprehensive and detailed service practices explained in the GM service manuals.

For information about warranty coverage, please contact your local GM Performance Parts dealer.

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	10AP07	Initial Release - Rusty Sampsel	
	15JA08	Revised - Rusty Sampsel	

Observe all safety precautions and warnings in the service manuals when installing a ZZ502 Big Block Chevrolet (BBC) deluxe assembly in any vehicle. Wear eye protection and appropriate protective clothing. Support the vehicle securely with jackstands when working under or around it. Use only the proper tools. Exercise extreme caution when working with flammable, corrosive, and hazardous liquids and materials. Some procedures require special equipment and skills. If you do not have the appropriate training, expertise, and tools to perform any part of this conversion safely, this work should be done by a professional.

The information contained in this publication is presented without any warranty. All the risk for its use is entirely assumed by the user. Specific component design, mechanical procedures, and the qualifications of individual readers are beyond the control of the publisher, and therefore the publisher disclaims all liability incurred in connection with the use of the information provided in this publication.

Legal and Emissions Information

This publication is intended to provide information about the ZZ502 engine and related components. This manual also describes procedures and modifications that may be useful during the installation of a ZZ502 engine. It is not intended to replace the comprehensive service manuals and parts catalogs which cover General Motors engines and components. Rather, it is designed to provide supplemental information in areas of interest to do-it-yourself enthusiasts and mechanics.

This publication pertains to engines and vehicles which are used off the public highways except where specifically noted otherwise. Federal law restricts the removal of any part of a federally required emission control system on motor vehicles. Further, many states have enacted laws which prohibit tampering with or modifying any required emission or noise control system. Vehicles which are not operated on public highways are generally exempt from most regulations, as are some special interest and pre-emission vehicles. The reader is strongly urged to check all applicable local and state laws.

Many of the parts described or listed in this manual are merchandised for off-highway application only, and are tagged with the Special Parts Notice reproduced here:

Special Parts Notice

This part has been specifically designed for Off-Highway application only. Since the installation of this part may either impair your vehicle's emission control performance or be uncertified under current Motor Vehicle Safety Standards, it should not be installed in a vehicle used on any street or highway. Additionally, any such application could adversely affect the warranty coverage of such an on-street or highway vehicle.

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Package contents:

<u>Item</u>	<u>Description</u>	<u>Quantity</u>	<u>GM Part Number</u>
1	Deluxe Engine Assembly (ZZ502)	1	12496962
2	Short Block Instructions	1	19171883
3	Long Block Instructions	1	12487523
4	Deluxe Engine Instructions	1	19171884
5	Starter Motor Package	1	9000852
6	Carburetor Package	1	12366996

NOTE: A packing check sheet is included that indicates each individual loose part included with this engine assembly.

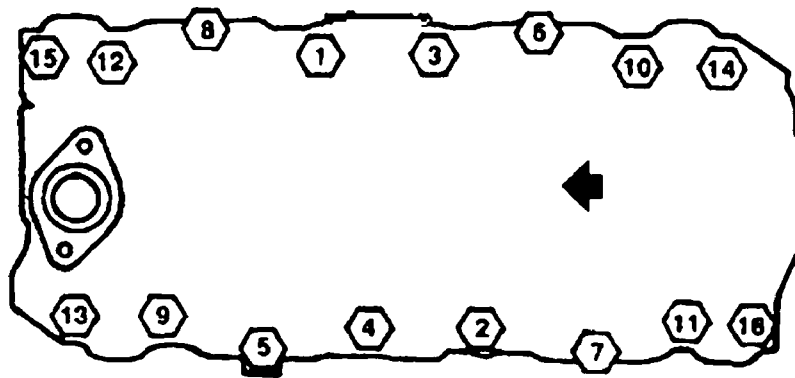
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ZZ502 Engine Torque Specifications:

Distributor bolt/screw	18 ft.-lbs. / 25 N·m
Flywheel bolt/screw	65 ft.-lbs. / 90 N·m
Intake manifold bolt/screw	
First pass	10 ft.-lbs. / 14 N·m
Second pass	25 ft.-lbs. / 34 N·m
Oil level indicator tube bolt/screw	106 in.-lbs. / 12 N·m
Oil pan drain plug	15 ft.-lbs. / 20 N·m
Spark plug	22 ft.-lbs. / 30 N·m
Starter motor bolt/screw	35 ft.-lbs. / 48 N·m
Water pump bolt/screw	30 ft.-lbs. / 40 N·m

Note: These torque values are in addition to those documented within the short and long block instructions.



Information may vary with application. All specifications listed are based on the latest production information available at the time of printing.

Caution

This engine assembly needs to be filled with oil and primed. You should add the specified oil (see start-up instructions) to your new engine. Check the engine oil level on the dipstick and add accordingly.

Start-up and Break-in Procedures

1. After installing the engine, ensure the crankcase has been filled with 5W30 motor oil (non-synthetic) to the recommended oil fill level on the dipstick. Also check and fill as required any other necessary fluids such as coolant, power steering fluid, etc.
2. The engine should be primed with oil prior to starting. Follow the instructions enclosed with the tool. To prime the engine, first remove the distributor to allow access to the oil pump drive shaft. Note the position of the distributor before removal. Install the oil priming tool, GM part number 12368084. Using a 1/2" drill motor, rotate the engine oil priming tool clockwise for three minutes. While you are priming the engine, have someone else rotate the crankshaft clockwise to supply oil throughout the engine and to all the bearing surfaces before the engine is initially started. This is the sure way to get oil to the bearings before you start the engine for the first time. Also, prime the engine if it sits for extended periods of time. Reinstall the distributor in the same orientation as it was removed.
3. Safety first. If the vehicle is on the ground, be sure the emergency brake is set, the wheels are chocked and the car cannot fall into gear. Verify everything is installed properly and nothing was missed.
4. Start the engine and adjust the initial timing. Set the ignition timing to 10° before top dead center (BTDC) at 650 rpm with the vacuum advance line to the distributor disconnected and plugged. This setting will produce 32° of total advance at wide-open throttle (WOT). The HEI vacuum advance canister should remain disconnected. This engine is designed to operate using only the internal centrifugal advance to achieve the correct timing curve. Rotate the distributor counterclockwise to advance the timing. Rotate the distributor clockwise to retard the timing.
5. When possible, you should always allow the engine to warm up prior to driving. It is a good practice to allow the oil sump and water temperature to reach 180°F before towing heavy loads or performing hard acceleration runs.
6. Once the engine is warm, Double check the total advance timing is 32° at 4000 RPM if using the deluxe engine configuration.
7. The engine should be driven at varying loads and conditions for the first 30 miles or one hour without wide open throttle (WOT) or sustained high RPM accelerations.
8. Run five or six medium throttle (50%) accelerations to about 4000 RPM and back to idle (0% throttle) in gear.
9. Run two or three hard throttle (WOT 100%) accelerations to about 4000 RPM and back to idle (0% throttle) in gear.
10. Change the oil and filter. Replace with 5W30 motor oil (not synthetic) and a PF454 AC Delco oil filter. Inspect the oil and the oil filter for any foreign particles to ensure that the engine is functioning properly.
11. Drive the next 500 miles under normal conditions or 12 to 15 engine hours. Do not run the engine at its maximum rated engine speed. Also, do not expose the engine to extended periods of high load.
12. Change the oil and filter. Again, inspect the oil and oil filter for any foreign particles to ensure that the engine is functioning properly.
13. Do not use synthetic oil for break-in. It would be suitable to use synthetic motor oil after the second recommended oil change and mileage accumulation. In colder regions, a lower viscosity oil may be required for better flow characteristics.

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ZZ502 Component Information

Ignition System

The HEI distributor (GM Part Number 93440806) included with the ZZ502 deluxe engine is a self-contained ignition system that includes a magnetic pickup, a module, a coil, a rotor, and a cap. The HEI's large diameter cap minimizes arcing and cross firing between adjacent spark plug terminals. The cap's male terminals provide a reliable, positive connection for the spark plug leads. However, the HEI's large diameter cap may interfere with other underhood components in vehicles not originally equipped with HEI ignition systems. Check for adequate clearance before installation. The HEI distributor supplied with the ZZ502 deluxe engine has a hardened drive gear that is compatible with a steel camshaft. Use of a non-hardened distributor gear will result in excessive wear.

The HEI system requires a 12-volt power supply for proper operation. The HEI ignition system should be connected directly to the battery with 10 or 12 gauge wire through a high quality ignition switch. If you are installing an HEI ignition in an early-model vehicle originally equipped with a point-type ignition, be sure to remove or bypass the resistor in the wiring harness to ensure the HEI receives 12 volts continuously. Use distributor connector package GM Part Number 12167658, which includes connectors and wires for the HEI's tachometer and 12 volt terminals.

Water Pump

The ZZ502 deluxe engine comes with an aluminum, short style water pump, GM Part Number 14058915. The pump included with this kit has a standard rotation impeller that is used with conventional accessory drives. Some serpentine belt systems require a water pump with a reverse-rotation impeller. In these instances, install a water pump specified for the original application.

Timing Information

Set initial spark timing at 10° before top dead center (BTDC) at 650 rpm with the vacuum advance line to the distributor disconnected and plugged. This setting will produce 32° of total advance at wide-open throttle (WOT). The HEI vacuum advance canister should remain disconnected. This engine is designed to operate using only the internal centrifugal advance to achieve the correct timing curve. The HEI distributor supplied with the ZZ502 deluxe engine has mechanical centrifugal spark advance with the following curves:

Mechanical Advance:

<u>RPM</u>	<u>Advance</u>
1100	0.0°
1600	12.0°
2400	16.0°
4600	22.0°

Carburetor

The carburetor included with the ZZ502 deluxe engine is a Holley 4-barrel Model 4150 dual feed fuel inlet, vacuum secondary carburetor. This carburetor features center hung float bowls, electric choke, power valve blow-out protection, and a secondary power valve. It has the correct calibration for ZZ502 crate engines. For more information and carburetor set up instructions, see the specific carburetor instruction sheet or visit www.holley.com.

Air Cleaner

The ZZ502 deluxe engine does not include an air cleaner assembly. GM Part Number 12342080, is a chrome, 14 inch, low profile air cleaner assembly with CHEVROLET on its cover. This part number is supplied with a 3 inch tall air cleaner element, GM Part Number 6421746. A taller 4 inch air cleaner element is available as GM Part Number 8997189.

ZZ502 Service Parts List:

<u>Part #</u>	<u>Quantity</u>	<u>Name</u>	<u>Part #</u>	<u>Quantity</u>	<u>Name</u>
09000852	1	Motor Asm, Start	10181306	1	Bearing, Cr/Shf Upr/Lwr (Std)
12366996	1	Carburetor Pkg, 850 Cfm 4 Bbl	12529885	3	Bearing, Cr/Shf Upr/Lwr (Std)
12366985	1	Gasket Pkg, Int Manif	10181307	1	Bearing, Cr/Shf Thr Upr/Lwr Thrust
12494151	1	Pump Kit, Wat	10183723	1	Crankshaft Asm
19145286	8	Sparkplug	10101164	1	Seal Asm, Cr/Shf Rr Oil
12495078	1	Wire Pkg, Splg*Perf Parts Logo*	14097040	1	Deflector, Cr/Shf Oil
93440806	1	Distributor Asm	10216339	1	Balancer Asm, Cr/Shf
12167658	1	Connector Pkg, Distr Hei Pwr	10114166	1	Key, Torsional Dpnr
12363407	1	Manifold Pkg, Int*Holley Base	10126796	1	Bolt/Screw, Cr/Shf Balr
10202456	1	Thermostat Asm-Eng Cool	3864814	1	Washer, Cr/Shf Balr
10108470	1	Outlet-Wat	10185034	1	Flywheel Asm
10105135	1	Gasket-Wtr Otlt	3727207	6	Bolt/Screw, Flywhl
06487532	1	Valve, Pcv	10198922	8	Rod, Conn
12363390	2	Head Asm, Cyl (Oval Port) W/Val	3963571	1	Cap, Conn Rod
12366987	4	Intake Valve	14096148	2	Bolt/Screw, Conn Rod
12366988	4	Exhaust Valve	3942410	2	Nut, Conn Rod
12366993	1	Valve Stem Seals	12533507	8	Piston Asm, (W/ Pin And Rings)
12462970	1	Inner/Outer Valve Spring	12524293	8	Ring Kit
3947880	16	Valve Locks	10181277	16	Bearing, Conn Rod
3875916	8	Valve Spring Shim	10240721	1	Pan Asm, Oil
3921912	8	Rocker Arm Stud	24100042	1	Plug Asm, Oil Pan Drn
3860038	4	Guideplate	3536966	1	Seal, Oil Pan Drn Plug
12363411	2	Gasket, Cyl Hd	10106407	1	Gasket, Oil Pan
12495488	1	Cover Pkg, Rkr Arm	12555167	1	Pump Asm, Oil (W/ Scrn)
14085759	2	Gasket Asm-Vlv Rkr Cvr	3998289	1	Shaft, O/Pmp Drv
12366994	2	Decal, Eng Displ*502 Performanc	3764554	1	Retainer, O/Pmp Drv Shf
12557083	1	Indicator Asm-Oil Lvl	10230954	1	Cover Asm, Eng Frt (W/ T
12550533	1	Tube Asm-Oil Lvl Ind	10191640	1	Seal Asm, Cr/Shf Frt Oil
274244	1	Seal-O Ring	10198910	1	Gasket, Eng Frt Cvr
12363407	1	Manifold, Int*Holley Base Cncø	12366543	1	Camshaft Asm
12368081	1	Rod Asm Pkg, Vlv Push(Qty 16)	12560176	1	Sprocket, Cm/Shf
10227762	8	Rod Asm-Vlv Push	9424877	3	Bolt/Screw, Cm/Shf Spkt
10227763	8	Rod,Exh Vlv Push	12560177	1	Sprocket, Cr/Shf
12368085	1	Arm Kit, Vlv Rkr	10114177	1	Chain Asm, Tmg
12368082	16	Arm Kit, Vlv Rkr(Qty 1)	17120061	16	Lifter Asm, Vlv
10237292	1	Block Asm, Eng	12551397	8	Guide, Vlv Lftr
6264902	1	Seal, Rr Brg Cap (O Ring)			

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