

502 (12568782) Short Block Specifications

Specifications Part Number 19171883

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This publication provides general information on components and procedures that may be useful when installing or servicing a 502 engine. 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, component information, 502 engine specifications, additional parts that you may need to purchase, torque specifications, start-up and break-in procedures, and a service parts list.

This brand new partial engine includes forged premium quality reciprocating components as well as the balancer, oil pan and timing chain set. Just add GMPP or your custom cylinder heads, intake, carburetor and ignition system to complete. This partial engine comes with camshaft P/N 12366543 which is used in the ZZ502 and RamJet 502 engines. The camshaft must be changed to P/N 12552296 to match the HT502 specifications or P/N 24502611 to match the 502 HO specifications.

The 502 engine is manufactured on current production tooling; consequently you may encounter dissimilarities between the 502 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 502 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 502 engine and an older big block V8 engine. These differences may require modifications or additional components not included with the 502 engine. When installing the 502 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 502 engine can be installed, some procedures and recommendations may not apply to specific applications.

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 502 BBC short block 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 502 engine and related components. This manual also describes procedures and modifications that may be useful during the installation of a 502 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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General Motors Corporation.

Package contents:

<u>Item</u>	<u>Description</u>	<u>Quantity</u>	<u>GM Part Number</u>
1	Short Block Assembly (502)	1	12568782
2	Short Block Instructions	1	19171883

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

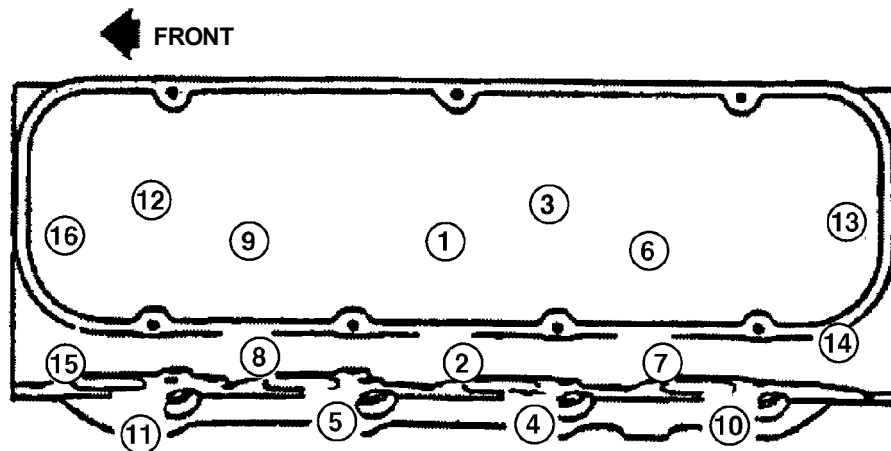
1. After installing the engine, ensure the crankcase has been filled with 5W30 motor oil (non-synthetic) to the recommended oil fill level on the dipstick. Also check and fill as required any other necessary fluids such as coolant, power steering fluid, etc.
2. The engine should be primed with oil prior 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" dill 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. If using the deluxe engine configuration, 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) when using the HEI distributor from the deluxe engine kit. 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 (non 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.

502 High Performance Engine Torque Specifications:

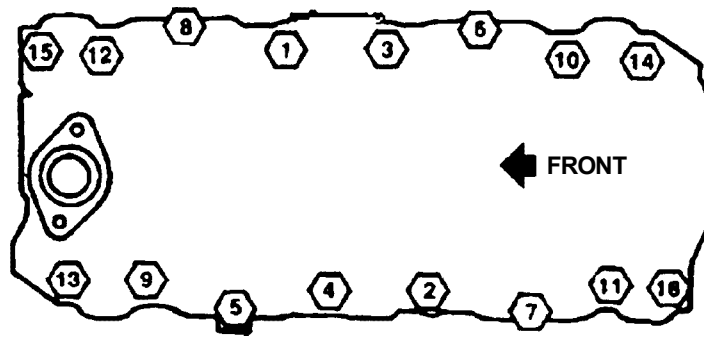
NOTE: These specifications are correct for the ZZ502 Deluxe engine. If using components different from that configuration, the specifications may be different.

Camshaft retainer bolt/screw	10 ft.-lbs. / 14 N·m
Camshaft sprocket bolt/screw	25 ft.-lbs. / 34 N·m
Connecting rod nut	70 ft.-lbs. / 95 N·m
Crankshaft balancer bolt	110 ft.-lbs. / 149 N·m
Crankshaft bearing cap bolt/screw and stud	100 ft.-lbs. / 135 N·m
Crankshaft rear oil seal housing nut/bolt/screw	11 ft.-lbs. / 15 N·m
Cylinder head bolt /screw	Long / Short Bolts
First pass	25/20 ft.-lbs. / 34/27 N·m
Second pass	50/40 ft.-lbs. / 68/54 N·m
Final pass	75/65 ft.-lbs. / 102/88 N·m
Distributor bolt/screw	18 ft.-lbs. / 25 N·m
Engine block oil gallery plug	15 ft.-lbs. / 20 N·m
Engine front cover bolt screw	106 in.-lbs. / 12 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 filter adapter bolt/screw	18 ft.-lbs. / 25 N·m
Oil level indicator tube bolt/screw	106 in.-lbs. / 12 N·m
Oil pan assembly bolt/screw	18 ft.-lbs. / 25 N·m
Oil baffle nut	30 ft.-lbs. / 40 N·m
Oil pan drain plug	15 ft.-lbs. / 20 N·m
Oil pump bolt/screw to rear crankshaft bearing cap	66 ft.-lbs. / 90 N·m
Oil pump cover bolt/screw	106 in.-lbs. / 12 N·m
Spark plug	22 ft.-lbs. / 30 N·m
Starter motor bolt/screw	35 ft.-lbs. / 48 N·m
Valve lifter guide retainer bolt/screw	18 ft.-lbs. / 25 N·m
Water pump bolt/screw	30 ft.-lbs. / 40 N·m

502 High Performance Engine Specifications:



DATE	REVISION	AUTH



- Displacement: 502 cubic inches
- Bore x Stroke: 4.47 inch x 4.00 inch
- Deck Height: 9.800+from C/S centerline
- Block: Cast iron, four-bolt main caps
- Crankshaft: Forged steel, one piece rear seal
- Connecting Rods: Forged steel, 7/16" bolts
- Pistons: Forged aluminum
- Rings: Chrome Moly
- Camshaft (ZZ502): Hydraulic roller tappet
 - Lift:527" intake, .544" exhaust
 - Duration: 224(intake, 234(exhaust @ .050" tappet lift
- Centerline: 104(ATDC)intake, 109(BTDC) exhaust
- Timing Chain: Single roller design
- Oil Pan: 6 . quart
- Recommended Oil: 5W30 synthetic motor oil (after break-in)
- Oil Pressure (Minimum): 6 psig @ 1000 RPM
 - 18 psig @ 2000 RPM
 - 24 psig @ 4000 RPM
- Oil Filter: AC Delco part # - PF 454
- Maximum Engine Speed: 5800 RPM
- Firing Order: 1-8-4-3-6-5-7-2

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

DATE	REVISION	AUTH

502 Service Parts List:

<u>Part Number</u>	<u>Quantity</u>	<u>Name</u>
10237292	1	Block Asm, Eng
10181306	1	Bearing, Cr/Shf Upr/Lwr
12529885	3	Bearing, Cr/Shf Upr/Lwr
10181307	1	Bearing, Cr/Shf Thr Upr/Lwr
10183723	1	Crankshaft Asm
10101164	1	Seal Asm, Cr/Shf Rr Oil
14097040	1	Deflector, Cr/Shf Oil
10216339	1	Balancer Asm, Cr/Shf
10114166	1	Key, Torsional Dpnr
10126796	1	Bolt/Screw, Cr/Shf Balr
3864814	1	Washer, Cr/Shf Balr
10185034	1	Flywheel Asm
3727207	6	Bolt/Screw, Flywhl
10198922	8	Rod, Conn
3963571	1	Cap, Conn Rod
14096148	2	Bolt/Screw, Conn Rod
3942410	2	Nut, Conn Rod
12533507	8	Piston Asm, (W/ Pin & Rings)
10181277	16	Bearing, Conn Rod
10240721	1	Pan Asm, Oil
24100042	1	Plug Asm, Oil Pan Drn
3536966	1	Seal, Oil Pan Drn Plug
10106407	1	Gasket, Oil Pan
12555167	1	Pump Asm, Oil (W/ Scrn)
10230954	1	Cover Asm, Eng Frt (W/ T)
10191640	1	Seal Asm, Cr/Shf Frt Oil
10198910	1	Gasket, Eng Frt Cvr
12366543	1	Camshaft Asm
12560176	1	Sprocket, Cm/Shf
9424877	3	Bolt/Screw, Cm/Shf Spkt
12560177	1	Sprocket, Cr/Shf
10114177	1	Chain Asm, Tmg
17120061	16	Lifter Asm, Vlv
12551397	8	Guide, Vlv Lftr

Caractéristiques techniques du bloc moteur embiellé 502 (12568782)

Numéro de pièce de caractéristiques techniques 19171883

Merci d'avoir choisi les pièces de GM Performance Parts. GM Performance Parts s'est engagée à offrir une technologie de rendement éprouvée et novatrice qui est réellement beaucoup plus que de la puissance. Les pièces de GM Performance Parts ont été conçues, élaborées et mises à l'essai de manière à dépasser vos attentes d'ajustage précis et de fonction. Prière de se reporter à notre catalogue pour trouver le centre de GM Performance Parts agréé le plus près, ou aller sur notre site Web à www.gmperformanceparts.com.

La présente publication offre de l'information d'ordre général sur les composants et les procédures pouvant s'avérer utile lors de l'installation ou de l'entretien du moteur 502. Prière de lire cette publication tout entière avant d'entamer le travail. S'assurer également que tous les composants énumérés sous la rubrique Contenu de l'emballage ci-dessous ont été expédiés dans la trousse.

Les renseignements ci-dessous sont répartis sous les rubriques suivantes : le contenu de l'emballage, les renseignements sur les composants, les caractéristiques techniques du moteur 502, les pièces supplémentaires que l'on pourrait devoir acheter, les couples de serrage, les procédures de démarrage et de rodage et une liste de pièces de rechange.

Ce moteur partiel tout nouveau comporte des composants forgés alternatives de première qualité, ainsi que l'ensemble d'amortisseur, de carter d'huile et de chaîne de distribution. On ne peut qu'ajouter GMPP ou les culasses, admission, carburateur et système d'allumage personnalisés pour compléter. Ce moteur partiel est accompagné de l'arbre à cames de n/p 12366543 qui est utilisé dans les moteurs ZZ502 et RamJet 502. Cet arbre à cames doit être changé au n/p 12552296 pour correspondre aux caractéristiques techniques HT502 ou au n/p 24502611 pour correspondre aux caractéristiques techniques 502 HO.

Le moteur 502 est fabriqué à l'aide de l'outillage de la production en cours; par conséquent, on pourrait rencontrer certaines dissimilitudes entre l'ensemble du moteur 502 et les versions antérieures du moteur V-8 à gros bloc. En général, des composants tels que les supports du moteur, les entraînements des organes secondaires, les collecteurs d'échappement, etc., peuvent être transférés à un moteur 502 lorsque celui-ci est installé dans un véhicule qui était muni à l'origine d'un moteur V8 à gros bloc. Toutefois, tel que mentionné aux sections suivantes, il peut exister des différences significatives de la pompe à eau, de l'amortisseur à torsion, etc., d'un moteur 502 et d'un moteur V8 plus ancien à gros bloc. Ces différences peuvent nécessiter des modifications ou des composants supplémentaires qui ne sont pas compris avec le moteur 502. Lors de l'installation du moteur 502 dans un véhicule qui n'était pas muni à l'origine d'un moteur V8 à gros bloc, il peut s'avérer nécessaire d'adapter ou de fabriquer différents composants pour les systèmes de refroidissement, d'alimentation, électrique et d'échappement. Compte tenu de la grande variété de véhicules dans lesquelles un moteur 502 peut être installé, certaines procédures et recommandations peuvent ne pas s'appliquer à certaines applications.

Ces caractéristiques techniques ne sont pas destinées à remplacer les pratiques d'entretien complètes et détaillées expliquées dans les manuels d'atelier GM.

Pour obtenir de l'information sur l'étendue de la garantie, prière de communiquer avec le concessionnaire GM Performance Parts de sa localité.

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