

Service Bulletin

INFORMATION

Subject: 2017 Chevrolet Silverado and GMC Sierra 2500HD-3500HD Pickup Trucks New Model Features

Brand:	Models:	Model Year:		VIN:		Engine:	Transmission:
		from	to	from	to		
Chevrolet	Silverado 2500HD Silverado 3500HD Silverado 2500 High Country HD Crew Cab Silverado Chassis Cab HD and Box- Delete HD	2017	2017	All	All	Duramax® 8 Cylinder, V8, 6.6L, Turbocharged Diesel Engine — RPO L5P	Allison 1000 6- Speed Automatic Transmission — RPO MW7
GMC	Sierra 2500HD Sierra 2500HD All Terrain X Crew Cab Sierra 3500HD Sierra Denali HD Sierra Chassis Cab HD and Box-Delete HD	2017	2017	All	All	Duramax® 8 Cylinder, V8, 6.6L, Turbocharged Diesel Engine — RPO L5P	Allison 1000 6- Speed Automatic Transmission — RPO MW7

Involved Countries

United States, Canada and Israel

Overview



2017 Silverado 2500HD



2017 Sierra Denali 2500HD

Bulletin Purpose

This is a special bulletin to introduce the 2017 Chevrolet Silverado and GMC Sierra 2500HD-3500HD Pickup Trucks equipped with the next-generation Duramax® V8, 6.6L Turbocharged (TC) — RPO L5P diesel engine. The purpose of this bulletin is to help the Sales, Service and Parts Department Personnel become familiar with some of these vehicle's new features with a special emphasis placed on the newly redesigned engine and to assist them by providing some of the General Information, Training Courses and Special Tools they will need to service this vehicle.

Introduction

This all-new, next-generation clean-sheet redesign Duramax® TC engine has been developed wholly by General Motors, including an all-new engine management system and is offered on the 2017 Silverado 2500HD, 3500HD and the High Country HD and on the 2017 Silverado 2500HD, 3500HD and Denali HE pickup trucks. It is also available on Chevrolet and GMC Chassis Cab and Box-Delete Models.

Higher TC boost pressure compared to the previous engine allows it to produce an SAE Certified 445 horsepower (332 kW) and 910 lb.-ft. (1,234 Nm) of torque which enables increased hauling and trailering load capacity. Along with producing a 19 percent increase in maximum torque over the previous Duramax® 6.6L, the engine is quieter and has smoother performance, with the engine noise at idle being noticeably reduced by 38 percent.

The redesigned Duramax® 6.6L shares only the bore and stroke dimensions of the previous engine. The signature low-rpm torque production of the Duramax® still offers 90 percent of peak torque at a low 1,550 rpm and sustains it through 2,850 rpm.

Additional highlights include:



- A new, patent-pending vehicle air intake system distinguished on both vehicles by a bold hood scoop. (Both vehicles).
- New, stronger cylinder block and cylinder heads.
- New, stronger rotating and reciprocating assembly.
- Increased oil and coolant flow capacity.
- All-new electronic controls.
- New full-length damped steel oil pan that contributes to quietness.
- New rocker cover and fuel system acoustical treatments.
- Uses ultra-low sulfur diesel fuel and is B20 bio-diesel compatible.

2017 Sierra HD All Terrain X



GMC has introduced the all-new 2017 Sierra HD All Terrain X, the most off-road-capable model in the Sierra HD lineup. The Sierra HD All Terrain X 2500 Crew Cab with 4WD is offered with the all-new, next generation Duramax® TC diesel engine. The All Terrain X's customized appearance blends a premium package of monochromatic exterior trim and special equipment, complemented with GMC's latest technologies.

Content includes:

- 18-inch black painted aluminum wheels.
- LT275/65R18 Goodyear Duratrac MT rated tires that feature an aggressive tread pattern for outstanding off-road performance.
- A unique body-color grille surround with All Terrain insert and body-color door handles and bodyside moldings.
- Black power-adjustable heated and power-folding trailering mirrors with integrated turn signals, LED rear guidance lamps and LED amber clearance lamps.
- Black belt moldings, front bumper skidplate and B-pillars.
- 4-inch black sport side steps.
- Black sport bar (mounted in the bed) designed to support available GMC Accessories LED off-road driving lamps.
- Offered in Black Onyx and Summit White exterior colors.

Additional All Terrain equipment includes a spray-on bedliner, Front and Rear Park Assist, the Z71 off-road suspension package, underbody shield, heated steering wheel and all-weather floor liners. The Eaton™ automatic locking rear differential is also standard. The 2017 Sierra 2500HD All Terrain X also features GMC IntelliLink® with an 8-inch (203 mm) diagonal color touchscreen, Teen Driver, remote-locking tailgate, remote starting system, Rear Vision Camera, adjustable pedals, leather-appointed seats, heated front seats and wireless charging.

Engine — Duramax® 8 Cylinder V8 6.6L TC Diesel

Duramax® 8 Cylinder V8 6.6L TC Diesel



Shown is a typical view of the top and front of the engine.



Shown is a typical view of the top and rear of the engine.

Engine Components and Description

This engine has the following features for increased performance and emissions reduction:

• **B20 Biodiesel Capable:** Biodiesel can be blended and used in many different concentrations. B20 is a blend between 6% to 20% biodiesel blended with petroleum diesel. B20 is popular in the United States because it represents a good balance of cost, emissions, cold-weather performance, materials compatibility, and ability to act as a solvent. Extensive testing and validation was performed using B20 to meet ASTM International's standard D7467, covering biodiesel blends between B6 and B20. To make the engine and its fuel system compatible with B20, GM made seal and gasket upgrades to withstand the ester content of biodiesel and included an upgraded fuel filter with a coalescing element to improve the separation of any water that may b present in the fuel.

A listing of certified marketers can be found at www.bq-9000.org

- Bore x Stroke: 103 mm x 99 mm
- Combustion Chamber Type: Direct Injection (DI).
- Compression Ratio: 16.0:1
- Cylinder Block: The new Duramax® block features a strong cast-iron foundation with induction-hardened cylinder walls and five nodular iron main bearings. A deep-skirt design and four-bolt, cross-bolted main caps help ensure the block's strength and enable more accurate location of the rotating assembly. The engine block incorporates larger-diameter crankshaft connecting rod journals than the previous version, enabling the placement of a stronger crankshaft and increased bearing area to handle higher cylinder loads. A die-cast aluminum lower crankcase also strengthens the engine block and serves as the lower engine cover, while reducing its overall weight. An enhanced oiling circuit, with higher flow capacity and a dedicated feed for the turbocharger (TC), provides increased pressure at the TC and faster oil delivery. Larger piston-cooling oil jets at the bottom of the cylinder bores spray up to twice the amount of engine oil into oil galleries under the crown of the pistons, contributing to lower engine temperature and greater durability.
- Cylinder Head: The redesigned engine retains the Duramax's signature first-in-class aluminum cylinder head design, with six head bolts per cylinder and four valves per cylinder. The aluminum construction helps reduce the engine's overall weight, while the six-bolt design provides exceptional head-clamping strength, a must in a high-compression, turbocharged application. A new aluminum head casting uses a new double-layer water core design that separates and arranges water cores in layers to create a stiffer head structure with more precise coolant flow control. The airflow passages are also heavily revised to enhance airflow, contributing to the engine's increased horsepower and torque.
- Crankshaft Connecting Rods Pistons: A tough, forged micro-alloy steel crankshaft anchors the new Duramax's stronger rotating assembly. Cutthen-rolled journal fillets contribute to its durability by strengthening the junction where the journals — the round sections on which the bearings slide meet the webs that separate the main and rod journals. The connecting rods are stronger and incorporate a new 45-degree split-angle design to allow

the larger-diameter rod bearings to pass through the cylinder bores during engine assembly. They're forged and sintered with a durable powdered metal alloy, with a fractured-cap design enabling more precise cap-to-rod fitment. A new, stronger cast aluminum piston design tops off the rotating assembly. It features a taller crown area and a remelted combustion bowl rim for greater strength. Remelting is an additional manufacturing process for aluminum pistons in which the bowl rim area is reheated after casting and pre-machining, creating a much finer and more consistent metal grain structure that greatly enhances thermal fatigue properties. The Duramax's pistons don't use pin bushings, reducing reciprocating weight to help the engine rev quicker and respond faster to throttle changes.

- Displacement: 6.6 L (403 ci) 6,599 cc
- Electronic Throttle Valve and Cooled EGR: The engine employs an electronic throttle valve to regulate intake manifold pressure in order to increase exhaust gas recirculation (EGR) rates. It also contributes to smoother engine shutdown. Additionally, a cooled exhaust gas recirculation (EGR) system enhances performance and helps reduce emissions by diverting some of the engine-out exhaust gas and mixing it back into the fresh intake air stream, which is fed through the cylinder head for combustion. This lowers combustion temperatures and improves emissions performance by reducing NOx formation. The exhaust is cooled in a unique heat exchanger before it's fed into the intake stream through a patented EGR mixing device, further improving emissions and performance capability. An integrated bypass allows non-cooled exhaust gas to be fed back into the system to help the engine more quickly achieve optimal operating temperature when cold.
- Emissions Controls: Cooled EGR, Diesel Particulate Filter (DPF) system, Selective Catalytic Reduction (SCR) system and Electronic Throttle Valve.
- Engine Control Module: Management of the Duramax® 6.6L L5P is directed by the new, GM-developed E41 controller.
- Engine Oil Capacity: 10 quarts (9.46 liters)
- Engine Oil Cooler: There is an integrated engine oil cooler with 50 percent greater capacity than the previous generation engine, ensuring more consistent temperatures at higher engine loads.
- Engine Oil Pan: A new, two-piece oil pan contributes to quieter engine operation. It consists of a laminated steel oil pan with an upper aluminum section. The aluminum section provides strength enhancing rigidity for the engine and a laminated steel lower section is added to dampen noise and vibration.
- Engine Orientation: Longitudinal.
- Exhaust Brake: The integrated exhaust brake system makes trailering less stressful by creating additional backpressure in the exhaust, resulting in negative torque during deceleration and downhill driving, enhancing driver control and prolonging brake pad life. The amount of negative torque generated is usually directly proportional to the back pressure of the engine.
- Fuel Filter: A unique filtration medium inside the fuel filter canister separates emulsified water in the fuel, reducing the likelihood of water entering the high pressure fuel system. Compared to earlier filter designs, this design can extend fuel filter life by up to 33 percent. Easy underhood access to the fuel filter involves simply raising the hood and leaning into the engine compartment.
- Fuel System with Solenoid Injectors: The engine uses a common-rail direct injection fuel system with new high-capability solenoid-type injectors. High fuel pressure of 29,000 psi (2,000 bar) promotes excellent fuel atomization for a cleaner burn that promotes reduced particulate emissions. The new injectors also support up to seven fuel delivery events per combustion event, contributing to lower noise, greater efficiency, and lower emissions. Technology advancements enable less-complex solenoid injectors to deliver comparable performance to piezo-type injectors.
- Horsepower: 445 horsepower (332 kW) @ 2,800 rpm (SAE Certified).

Torque: 910 lb.-ft. (1,234 Nm) @ 1,600 rpm (SAE Certified).

- Maximum Powered Engine Speed: 3,450 rpm
- Maximum Braking Engine Speed: 4,800 rpm
- Valves: Valve configuration is OHV with 4 valves per cylinder.
- Valve Lifters: Mechanical roller.
- Venturi Jet Drain Oil Separator: A new Venturi Jet Drain Oil Separator employed with this engine, is the first of its type in the segment and is designed to ensure oil control in sustained full-load operation. The totally sealed system collects the fine mist of oil entrained in the blow-by gas and uses a small portion of the boosted air generated by the turbocharger to pump the collected oil back to the engine oil sump for re-use by the engine. Less-sophisticated systems are not able to return this oil during full-load operation, which can result in oil carryover into the cylinders during combustion.

Fuel System

Fuel System Diagram



1) Secondary Fuel Tank (with RPO N2N): The secondary fuel tank is located in the rear of the vehicle.

2) Fuel Filter with Water in Fuel Sensor: The fuel filter assembly is located near the left frame rail and contains the following components: Fuel Filter/Water Separator, a Fuel Heater, Fuel Temperature Sensor and Water in Fuel Sensor.

3) Fuel Heater: The fuel heater is controlled by the ECM. When the temperature of the fuel is cold the ECM will command the fuel heater relay ON, to assist in cold weather operation.

4) Fuel Temperature Sensor: The fuel temperature sensor is a thermistor that is located in the fuel filter assembly. The ECM monitors the fuel temperature sensor through the fuel pump driver control module to calculate the temperature of the fuel entering the fuel injection pump.

5) Fuel Pressure Sensor: The fuel pressure sensor is located in the fuel feed pipe. The fuel pressure sensor monitors the fuel pressure in the fuel line. The ECM monitors the voltage signal from the fuel pressure sensor then uses the information for fuel pressure control.

6) Exhaust Aftertreatment Fuel Injector: The exhaust aftertreatment fuel injector is located on the passenger side frame rail. The exhaust aftertreatment fuel injector is used to inject fuel into the exhaust system to generate the required heat needed by the diesel oxidation catalyst (DOC) to function properly.

7) Dual Fuel Rail Pressure Sensor: This sensor contains Fuel Rail Pressure Sensor 1 and Fuel Rail Pressure Sensor 2. The fuel rail pressure (FRP) sensor in located in the front of the passenger side fuel rail. The FRP sensor provides the ECM a signal of the actual FRP. The ECM uses this information to regulate the fuel pressure, by commanding the fuel pressure regulators to the desired fuel pressure.

8) Fuel Rail Assembly: The left and right fuel rails attach to the cylinder heads. The fuel rails distribute pressurized fuel to the fuel injectors through the fuel lines.

9) Fuel Rail Pressure Regulator 2: Fuel pressure regulator 2 is located on the rear of the drivers side fuel rail and meters the amount of fuel being returned to the fuel tank.

10) Fuel Pressure Regulator 1: Fuel pressure regulator 1 is located within the fuel injection pump and meters the amount of fuel that enters the high pressure side of the pump.

11) Fuel Injection Pump: The fuel injection pump is a mechanical high pressure pump. The fuel injection pump is located at the front of the engine below the intake manifold. The fuel is pumped to the fuel rails at a specified pressure controlled by the two fuel pressure regulators.

12) Fuel Injectors: The fuel injectors are solenoid devices, controlled by the ECM, and each one meters the pressurized fuel to a single engine cylinder. Fuel from the fuel injector tip is sprayed directly into the combustion chamber on the compression stroke of the engine.

13) Primary Fuel Tank: The primary fuel tank is located on the left side of the vehicle and constructed from high density polyethylene.

14) Electric 3–Phase Fuel Pump: The fuel pump is mounted in the primary fuel tank module reservoir. The ECM supplies voltage to the fuel pump driver control module for 30 seconds when the ignition is turned ON and continuously when the engine is running.

15) Fuel Transfer Pump (with RPO N2N): The fuel transfer pump is located in the secondary fuel tank.

16) Fuel Pump Driver Control Module: The primary fuel tank contains a 3-phase electric fuel pump that is controlled by the fuel pump driver control module and ECM. It is under the vehicle, mounted to the bracket above the spare tire.

Fuel Level Sensor (Not Shown): The fuel level sensor consists of a float, a wire float arm, and a ceramic resistor card. The position of the float arm indicates

the fuel level. The variable ceramic resistor changes resistance according to the amount of fuel in the fuel tank. The ECM sends the fuel level information to the instrument panel cluster, which is used for fuel gauge operation and the low fuel warning indicator.

Fuel Tank Fuel Pump Module (Not Shown): The fuel tank fuel pump module is located inside of the primary fuel tank. The fuel tank fuel pump module consists of the fuel level sensor, the fuel pump and reservoir assembly and the fuel strainer. The fuel strainer attaches to the lower end of the fuel tank fuel pump module. The fuel strainer is made from woven plastic.

Emission and Particulate Control Technology

Advanced emission control technology makes the new Duramax® one of the cleanest diesels in the segment. The diesel exhaust aftertreatment system is designed to reduce the levels of hydrocarbons (HC), carbon monoxide (CO), oxides of nitrogen (NOx), and particulate matter (PM) remaining in the vehicle's exhaust gases. NOx emissions are controlled via a Selective Catalyst Reduction (SCR) after-treatment system that uses urea-based Diesel Exhaust Fluid (DEF). Electrically heated lines feed the DEF to the emission system to ensure adequate delivery in cold weather. The engine also includes GM's latest Diesel Particulate Filter (DPF) system, which regenerates its diesel particulate filter using a downstream injection of diesel fuel directly into the exhaust stream. Downstream injection also helps improve engine life by eliminating the possibility of diesel fuel contaminating engine oil, which can happen when fuel used for regeneration is introduced directly into the cylinder. A complex ceramic-type exhaust gas filter is installed behind the oxidizing catalyst in the exhaust system, replacing the conventional muffler with hundreds of small, porous tubes blocked at one end. This forces the exhaust gas through the walls of the tubes, trapping PM, which is then burned off by the heat of the exhaust.

Engine Cold Start System

Glow Plug System Operation

Control of the glow plugs is performed by the glow plug control module (GPCM). The nominal voltage for the glow plugs is 5.4 V. When the ignition is turned ON the GPCM applies 7.2 V for 2.2 seconds, then 5.7 V for 0.8 seconds and then 5.4 V until a temperature of 2,192°F (1200°C) is reached. The maximum voltage or the system is 10 V. When the engine is running the voltage will vary between 4.7–10 V when in closed loop control, to maintain a glow plug temperature that ranges from 2,102° to 2,156°F (1,150° to 1,180°C). The temperature and the power consumption is controlled between the ECM and the GPCM within a wide range to suit the engine's pre–heating requirements. Each glow plug is energized individually. This capability yields more optimum heat times for the glow plugs thus pre–glow times can be kept to a minimum for short *wait to crank* times and maximum glow plug durability.

Ceramic Glow Plugs

Today's demanding high requirements made on modern diesel engines, in terms of low emissions and outstanding performance usually results in poorer starting characteristics. Ceramic glow plugs (CGPs) respond to these challenges with a very rapid temperature rise to a high maximum temperature and highdurability with long life. The key advantage of a CGP is that it heats up much faster than a conventional glow plug with their heating element being inside the glc pin. The design of the ceramic heating rod is a heating element that consists entirely of electrically conductive ceramic. Because its surface has a higher specific resistance than the material of the supply and return conductors, the glow rod only glows at the tip (cap) and thus reaches high temperatures much faster. The glow pin contact consists of an internal and external conductor separated by an insulator. The new Duramax® also provides outstanding coldweather performance, with microprocessor-controlled glow plugs capable of gas-engine-like starting performance in fewer than 3 seconds in temperatures as cold as -20°F (-29°C) without an engine block heater. The system is enhanced with automatic temperature compensation, a first-in-class feature providing improved robustness and capability. The automatic BorgWarner temperature compensation assesses and adjusts the current to each glow plug for every use, providing optimal temperature for cold start performance and durability.

Engine Oil

Engine Oil

Engine oil is an important factor in determining engine performance and longevity. Be sure to use only the specified oil and oil filters. The engine oil level must b checked and the oil should be changed regularly according to the computerized Oil Life Monitor System.

American Petroleum Institute (API) Symbol



This doughnut-shaped logo (symbol) is used on most oil containers to help you select the correct oil. It means that the oil has been certified by the American Petroleum Institute. Look for this on the oil container, and use only those oils that display this logo. Use only engine oils that have the designation CJ-4 for the dissel engine.

Specification

Oils designated as API CJ-4 are required for this engine. The CJ-4 designation can appear either alone or in combination with other American Petroleum Institute (API) designations, such as API CJ-4/SL. These letters show API levels of quality.

Viscosity Grade

Use SAE 15W-40 viscosity grade engine oil. When temperatures are cold such as below 0°F (-18°C), use SAE 5W-40 to improve cold starting performance. *Do not* add anything to the oil.

Engine — Turbocharger



Turbocharger (TC) Component Overview

- (1) Turbine Housing
- (2) Lower Vane Ring
- (3) Vane Ring Assembly Spacer
- (4) Upper Vane Ring Assembly
- (5) Adjusting Ring Assembly
- (6) V-Band Nut
- (7) V-Band
- (8) Compressor Housing Bolt
- (9) Core Assembly
- (10) Linkage Assembly
- (11) Linkage Assembly Nut
- (12) Compressor Housing O-Ring
- (13) Actuator Nut
- (14) Compressor Housing
- (15) Actuator

Turbocharger

The TC is a single stage, water cooled, electronically controlled, variable geometry turbocharger (VGT) capable of producing 31 psi (220 kPa) boost pressure and additional TC revisions enhance the capability of the exhaust brake system. With a new engine camshaft profile and improved cylinder head design, the new TC enables the engine to deliver more power with lower exhaust emissions. It uses a more advanced variable vane mechanism, allowing a 104°F (40°C) increase in exhaust temperature handling capability. The self-contained mechanism decouples movement from the turbine housing, allowing operation at higher temperatures. That feature enables the engine to achieve higher power at lower cylinder pressure. The new TC has lower internal leakage, allowing more exhaust energy to be captured during exhaust braking. The integrated exhaust brake system makes trailering less stressful by creating additional backpressure in the exhaust, resulting in negative torque during deceleration and downhill driving, enhancing driver control and prolonging brake pad life.

Transmission — Allison 6-Speed Automatic

Transmission General Description



The vehicles use the Allison 6-speed automatic transmission with an updated torque converter to handle the increased torque produced by the engine. The Allison 1000 Series transmissions are torque converter driven, fully automatic, transmission systems. The 1000 Series transmissions have 6-FORWARD speeds, NEUTRAL, and REVERSE. The fifth and sixth range has overdrive gear ratio. The 1000 Series incorporates a variety of standard and optional design features. These design features include the following:

- Direct mount to engine block
- An external, spin-on transmission filter simplifies service intervals. The internal filter only requires replacement in the event of an overhaul.
- Flexplate drive
- Torque converter with a torque converter clutch (TCC) and integral vibration damper
- 3 constant-mesh planetary gear sets with helical gears
- 5 multiple disk clutches 2 rotating and 3 stationary
- Common hydraulic system for all transmission functions
- 2 transmission fluid filtration systems
- Electrohydraulic control valve assembly
- Electronically controlled automatic gear selection and clutch apply
- Fill tube/dipstick provision on both sides of transmission
- Parking pawl
- Power takeoff (PTO) provision on both sides of transmission
- PTO is optional in the 3500HD cab and chassis trucks. The PTO is driven off the torque converter turbine and is rated for 250 lb-ft (339 Nm) of torque.

Automatic Transmission Fluid

Use DEXRON® - VI Automatic Transmission Fluid.

Special Tools

Special Tools — Tool Number and Description

Tool Number	Description
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EN-46091-25	Duramax Engine Pressure Test Adapter	
EN-51987	Injector Remover	
EN-52074	Glow Plug Bore Reamer	
GE-52098	Adapter, Coolant System Pressure Test	

Training Courses

The majority of the systems found on this vehicle are taught in GM's core curriculum from a conceptual theory and operation perspective. The North American technical training core curriculum structure is system based.

To access all of the available training courses in the United States, visit the following website: www.centerlearning.com

In Canada, Go to: GM GlobalConnect and select Centre of Learning

Training Course Name or System — Course Number and Description

Course Name or System	Course Number and Description	
New Model – HD Truck	#10317.18W: New Model – HD Truck (WBT) (United States and Canada)	
Engine	#16410.16H: Duramax (DMax) Engine (Hands-On) (Canada) #16415.00H: Diesel Engine Performance (Hands-On) (United States) #16440.21D: New and Updates for RPOs L5P, LH7 and LGZ	
Transmission	#17030.24H: Allison LCT 1000 Automatic Transmission (United States) #17030.24H: Allison Transmission (Hands-On) (Canada)	

Version Information

Version	1
Modified	

Trademark Footnotes

Eaton[™] is a Trademark of Eaton Corporation

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Duramax[™] is a Trademark of General Motors LLC

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