

banks

Owner's Manual with Installation Instructions

Banks Speed-Loader®

2007- 2008 Chevy/GMC 6.6L (LMM) Duramax Turbo-Diesel Pickups

THIS MANUAL IS FOR USE WITH KIT 63838

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THIS IS A HIGH PERFORMANCE PRODUCT. USE AT YOUR OWN RISK.

Do not use this product until you have carefully read the following agreement.

This sets forth the terms and conditions for the use of this product. The installation of this product indicates that the BUYER has read and understands this agreement and accepts it's terms and conditions.

Disclaimer of Liability

Gale Banks Engineering Inc., and it's distributors, employees, and dealers (hereafter "**SELLER**") shall in no way be responsible for the product's proper use and service. The **BUYER** hereby waives all liability claims.

The **BUYER** acknowledges that he/she is not relying on the **SELLER's** skill or judgment to select or furnish goods suitable for any particular purpose and that there are no liabilities which extended beyond the description on the face hereof and the **BUYER** hereby waives all remedies or liabilities, expressed or implied, arising by law or otherwise, (including without any obligations of the **SELLER** with respect to fitness, merchantability, and consequential damages) whether or not occasioned by the **SELLER's** negligence.

The **BUYER** is responsible to fully understand the capability and limitations of his/her vehicle according to manufacturer specifications and agrees to hold the **SELLER** harmless from any damage resulting from the failure to adhere to such specifications. The **SELLER** disclaims any warranty and expressly disclaims any liability for personal injury or

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Limitation of Warranty

Gale Banks Engineering Inc. (hereafter "**SELLER**"), gives Limited Warranty as to description, quality, merchantability, fitness for any particular purpose, productiveness, or any other matter of **SELLER's** product sold herewith. The **SELLER** shall be in no way responsible for the product's open use and service and the **BUYER** hereby waives all rights except those expressly written herein. This warranty shall not be extended or varied except by written instrument signed by **SELLER** and **BUYER**.

The warranty is limited to two (2) years from the date of sale and is limited solely to the Gale Banks Engineering parts contained within the products kit. Parts or devices outside the products kit, such as the Palm® Tungsten™ E2, are not covered under Gale Banks Engineering warranty. All products that are in

question of warranty must be returned shipping prepaid to the **SELLER** and must be accompanied by a dated proof of purchase receipt. All warranty claims are subject to approval by Gale Banks Engineering Inc.

Under no circumstance shall the **SELLER** be liable for any labor charged or travel time incurred in diagnosis for defects, removal, or reinstallation of this product, or any other contingent expense.

Under no circumstances will the **SELLER** be liable for any damage or expenses incurred by reason of the use or sale of any such equipment.

In the event that the buyer does not agree with this agreement:

The buyer may promptly return this product, in a new and unused condition, with a dated proof-of-purchase, to the place-of-purchase within thirty (30) days from date-of-purchase for a full refund.

The installation of this product indicates that the buyer has read and understands this agreement and accepts it's terms and conditions.

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Introduction

Dear Customer,

If you have any questions concerning the installation of your Banks Six-Gun Diesel Tuner, please call our Technical Service Hotline at (888) 839-2700 between 7:00am and 5:00pm (PST). If you have any questions relating to shipping or billing, please contact our Customer Service Department at (888) 839-5600.

Thank you.

The Six-Gun Diesel Tuner comes with a Six-Gun Switch that has six selectable power levels. The Six-Gun Switch is included in the Six-Gun Diesel Tuner. The optional Speed-Loader Module can be added to the Six-Gun, for off-road use only, to increase the power output of Levels 2-6. Level 1 is stock with or without Speed-Loader installed. Each additional higher level adds approximately 20% of the available power increase.

To prevent damage to the factory transmission, Banks recommends that automatic transmission vehicles do not exceed Level 3 with optional Speed-Loader while the vehicle is experiencing load (towing, climbing a steep grade, carrying a load, etc.).

To use the higher levels of the Six-Gun Diesel Tuner while towing or climbing, airflow and exhaust improvements must be made to lower the exhaust gas temperature (EGT) entering the turbo. The EGT should not exceed 1400° F for more than a few seconds. Elevated EGTS can damage the turbocharger and the engine.

ATTENTION! Before proceeding with these instructions, please carefully read the DISCLAIMER OF LIABILITY and LIMITATION OF WARRANTY statement located on page 2 of this manual.

TOOLS REQUIRED:

- Inch and metric sockets
- Inch and metric combination and open-end wrenches
- Wire cutters or scissors
- Center punch
- Drill or 90° drill
- R drill bit (0.339")
(A 5/16" drill bit (0.313") may be used if an R drill bit cannot be found)
- 1/8" NPT (National Pipe Thread) tap
- Torque wrench
- Penetrating oil or light lubricant spray
- Anti-seize compound

General Installation Practices

1. Before starting work, familiarize yourself with the installation procedure by reading all of the instructions.
2. The exploded views provide only general guidance. Refer to each step and section diagram in this manual for proper instruction.
3. Throughout this manual, the left side of the vehicle refers to the driver side, and the right side to the passenger side.
4. Disconnect the negative (ground) cable from the battery (or batteries, if there are two) before beginning work.
5. Route and tie wires and hoses a minimum of 6" away from exhaust heat, moving parts and sharp edges. Clearance of 8" or more is recommended where possible.
6. When raising the vehicle, support it on properly weight-rated safety stands, ramps or a commercial hoist.

Follow the manufacturer's safety precautions. Take care to balance the vehicle to prevent it from slipping or falling. When using ramps, be sure the front wheels are centered squarely on the topsides. When raising the front of the vehicle, put the transmission in park (automatic) or reverse (manual), set the parking brake, and block the rear wheels. When raising the back of the vehicle, be sure the vehicle is on level ground and the front wheels are blocked securely.

CAUTION: Do not use floor jacks to support the vehicle while working under it. Do not raise the vehicle onto concrete blocks, masonry or any other item not intended specifically for this use.

7. During installation, keep the work area clean. Do not allow anything to be dropped into intake, exhaust, or lubrication system components while performing the installation, as foreign objects will cause immediate engine damage upon start-up.
8. Save this Owner's Manual as a reference for system maintenance and service.
9. Banks recommends a Pyrometer (EGT) gauge and Boost gauge be installed with the Six-Gun Diesel Tuner to help monitor performance and exhaust gas temperature of the vehicle. To further increase engine life by lower EGT's, Banks also recommends installing a Ram-Air and Monster Exhaust® system.

Section 1

THERMOCOUPLE INSTALLATION (REQUIRED FOR SPEED-LOADER MODULE)

Note: The thermocouple must be installed in combination with the Speed-Loader. If the thermocouple is not installed, the Speed-Loader and Six-Gun Diesel Tuner will NOT add power, resulting in stock power level.

1. The thermocouple monitors the temperature of the exhaust gases entering the turbocharger at the turbine housing. Installation requires that the exhaust manifold be drilled near the manifold outlet. It is recommended that the manifold be removed from the engine to thoroughly clean out all metal chips from drilling. If the manifold is not removed from the vehicle, all chips must be removed from the manifold. This may be accomplished by using a magnet to extract the chips after drilling. The tap should be greased before use and the chips again removed with a magnet. All metal shavings must be cleaned from the manifold to avoid turbine damage.

2. To access the exhaust manifold, remove front passenger wheel well by removal of plastic retainers.

3. On the passenger side, remove the hardware retaining the turbine inlet exhaust pipe to the exhaust manifold. Then, remove the exhaust manifold from vehicle. Pay special attention to the orientation of the manifold outlet gasket. Retain the hardware and gaskets for re-assembly.

4. Center punch and drill through the passenger side exhaust manifold into the rear passage at the location shown in **Figure 1**. Use an "R" drill bit, keeping the drill perpendicular to the manifold surface.

5. Tap the drilled hole with a 1/8" NPT pipe tap. Check the thread depth as you tap by periodically removing the tap and screwing the thermocouple insert into the tapped hole. The thermocouple insert should be tight and snug when half it's threads are screwed into the manifold.

6. Install the thermocouple insert into the manifold using anti-seize compound on the threads. Install the probe in the thermocouple insert.

7. Make sure to remove all shavings from inside the exhaust manifold. Reinstall the exhaust manifold. Torque to 28 lb-ft (38 Nm) in the sequence shown in **Figure 1**.

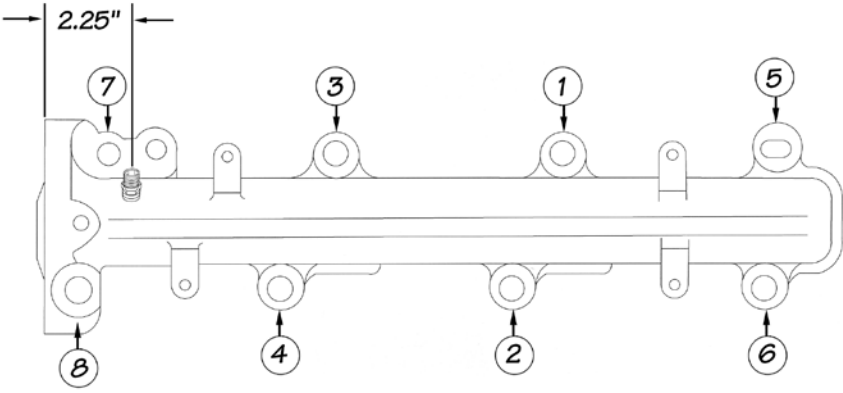
8. Route the thermocouple connector along the factory harness to the driver's side and connect it to the Six-Gun's EGT connector. Use the supplied cable ties to secure the harness.

Note: Once the Six-Gun Diesel Tuner is powered up at key-on, it will 'learn' that a thermocouple is installed and automatically enable the EGT limiting function.

If the thermocouple is removed after being installed and run on the vehicle, the Six-Gun Diesel Tuner will assume that the sensor or connection has gone bad and will cease adding power while triggering the [2,3] diagnostic code (see Troubleshooting Section). To ensure that the Six-Gun Diesel Tuner operates properly after removing a previously installed thermocouple, see the 'Clearing Learned Information' **Section 6**. EGT limiting will not be operational and excessive EGTs may develop at higher power levels.

-END, SECTION 1-

Figure 1



Section 2

SPEED-LOADER MODULE INSTALLATION

CAUTION: When a Speed-Loader is installed, Level 6 is re-calibrated for maximum possible power output—this includes removal of the 5th gear power de-rate, and a raised EGT limit (to 1500 °F). With a Speed-Loader installed, Level 6 should only be used in unloaded, off-road conditions for short amounts of time, NEVER on-road or under heavily loaded conditions where extremely high exhaust gas temperatures could lead to turbocharger and engine damage.

WARNING: If excessive torque converter slip is detected then a Limp Home Mode (LHM) override will be set by the ECU. This LHM will be active until torque slippage is no longer detected or is reset by a diagnostic tool.

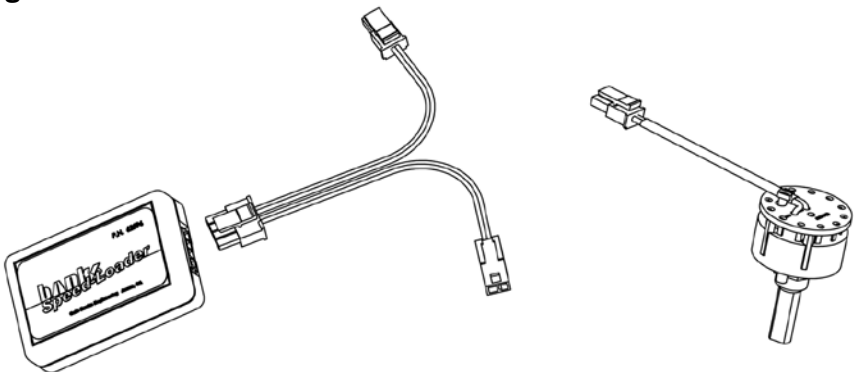
1. Install the 4-terminal connector of the Speed-Loader harness to the 4-terminal connector on the Speed-Loader module. See **Figure 2**.
2. Verify the Banks wire harness, Six-Gun Diesel Tuner and Six-Gun Switch are installed as specified in the Owner's Manual. Disconnect the Six-Gun Switch from the 2-terminal plug on the Six-Gun Diesel Tuner's In-Cab cable.

3. Connect the Six-Gun Switch's 2-terminal receptacle to the Speed-Loader's 2-terminal plug. Connect the Speed-Loader's 2-terminal receptacle to the 2-terminal plug on the Six-Gun Diesel Tuner's In-Cab cable.

4. If necessary, wire tie the Speed-Loader module and harness under the dash away from pedals or any moving components.

NOTE: The optional Speed-Loader provides access to an additional power level of the Six-Gun Diesel Tuner. Installing the Speed-Loader will allow Levels 2 through 6 to experience an increase in power above that of the Banks Six-Gun Diesel Tuner alone. Level 1 remains at stock power output regardless if the Speed-Loader is installed. Once the Speed-Loader is installed and detected, the GREEN LED on the Six-Gun Tuner will flash twice at power up. Refer to the "Speed-Loader Learning Sequence" section for more details.

Figure 2



Speed-Loader Learning Sequence

Once the Speed-Loader Module is installed or removed from the vehicle, the following learning sequence will need to be performed so that the Six-Gun Diesel Tuner can correctly identify whether or not the Speed-Loader is present.

- 1.** Start the engine
- 2.** Turn the Six-Gun Switch to the highest level (position 6) and stay there for five (5) seconds.
- 3.** Rotate the Switch to the lowest level (position 1) and stay for five (5) seconds.
- 4.** Rotate the Switch again to the highest level (position 6) and stay there for five (5) seconds.

NOTE: To determine if the Six-Gun Diesel Tuner has learned the presence of the Speed-Loader and is running the Speed-Loader programming, watch the GREEN LED on the Tuner and turn the ignition switch to the ON position (BUT DO NOT START THE ENGINE). If the GREEN LED flashes twice, immediately after key on, the Six-Gun Diesel Tuner will run with the Speed-Loader programming; otherwise, the Six-Gun Diesel Tuner will run the standard programming. If the Six-Gun Diesel Tuner has not learned the presence or removal of the Speed-Loader correctly, repeat steps 1-4.

-END, SECTION 2-

Section 3

AUTOMATIC TRANSMISSION LEARNING

The 6.6L Chevy Duramax Trucks equipped with the Allison 1000 6-speed automatic overdrive transmission use an adaptive shift control logic. This will require the transmission to adapt to the additional power created by the Banks Power products before it will shift properly. Failure to follow the sequence can result in damage to the transmission.

Perform the following sequence at a location where it is safe to accelerate without exceeding the posted speed limit.

- 1.** Set Six-Gun Tuner to Level 1 power setting, start the truck and allow the engine to reach normal operating temperature.
- 2.** Adjust Six-Gun to Level 2, power setting.
- 3.** Drive vehicle for 5 to 10 miles ensuring a complete shift cycle though each gear. (The transmission shift adaptation learning process requires 15 to 30 complete shift cycles to learn new shift program.)
- 4.** Increase power level by one and repeat Step 3 until the desired power level is achieved.

WARNING: Take particular care not to do wide open runs in 5th gear when in Automatic transmission Learning Mode, especially if Speed-Loader is installed.

The Allison 1000 6-speed automatic transmission will continually adapt to the power output of the engine to optimize shift quality. The transmission will quickly adapt to the power setting if the driving cycle includes regular gear changes at high loads. The transmission learning procedure will need to be repeated when switching back to the higher power settings once the transmission adapts to the lower power settings. It will be apparent when the transmission adapts to the lower settings by monitoring the feel of the gearshift. Gear changes will be noticeably harder when initially switching from a higher to lower power setting. This will soften as the transmission adapts to the new setting.

-END, SECTION 3-

Section 4

CHECKING ENGINE PERFORMANCE

The Six-Gun Diesel Tuner requires the engine coolant temperature (ECT) to be above 110° before it will add fuel. If the optional Banks DynaFact® gauges are installed, observe the operation of the boost and pyrometer (EGT) gauge values while driving under varying conditions. Turbocharger boost pressure will increase as a function of load and engine RPM, thus the engine will produce little boost while cruising at light throttle, with maximum boost while climbing hills, heavily loaded, and/or during acceleration. Note the boost level seen during hard acceleration with a given load. If performance seems to have deteriorated sometime in the future, the maximum boost figures may be compared to see if boost has dropped off. Lower boost may be caused by turbo ducting leaks, a malfunctioning wastegate or fuel injection pump, or dirty air filter. Typical maximum boost pressure settings will vary considerably between automatic transmissions, year model of vehicle, and altitude.

Note: Before key-off, check the Six-Gun Tuner for error codes. Use your Banks EGT gauge to monitor exhaust gas temperature (EGT) in the engine. At idle, exhaust gas temperature will be very low, perhaps only 300°F. As the engine is accelerated for higher speeds with greater loads, the EGT will rise. The highest EGT will be seen under maximum load at full throttle, such as climbing a steep grade with a heavily laden vehicle. To avoid heat damage to various engine components it is recommended that the exhaust gases cool below 400°F before the engine is shut down. Your Six-Gun Diesel Tuner is calibrated to maintain EGTs depending on power level.

Level	EGT
1-5	1350°F
6	1400°F
7 or SL	1500°F

You may experience brief excursions slightly above the temperatures listed under acceleration. This is normal and the EGT should return to or below the proper temperature within a few seconds. If you find that EGT remains high for any length of time, check for boost leaks or a dirty air filter.

-END, SECTION 4-

Section 5

TROUBLESHOOTING

If you feel that your Six-Gun Diesel Tuner is not functioning properly, some diagnostics can be performed. Your Six-Gun Diesel Tuner is equipped with diagnostic features that will detect and display certain errors.

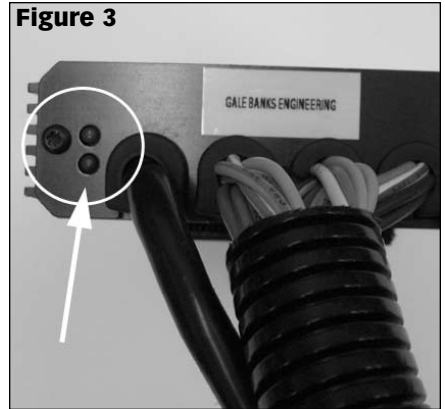
Remove the Six-Gun Diesel Tuner from its mounting location while keeping all connectors plugged in, and position it in such a way that you can view the end of the Six-Gun housing that contains the LEDs from the driver's seat (**Figure 3**). Turn the vehicle key to the ON position. Observe the two LEDs mounted on the end of the Six-Gun Diesel Tuner:

- A steady GREEN LED will illuminate if all wire connections are correct, the engine is running, and the engine coolant temperature is within its normal operating range.
- The GREEN LED will flash if all wire connections are correct, the engine is running, but the engine coolant temperature is not within its normal operating range. The GREEN LED will stop flashing once the engine coolant temperature is within its normal operating range (not to be confused with Speed-Loader flash on power-up).
- No LEDs will illuminate if the fuse on the Six-Gun wiring harness is blown or the wiring harness is not properly connected. If the fuse and all connections are okay, contact Banks Technical Service.

- The RED LED will flash in a certain sequence if a connection is incorrect or if there is a problem with the system – this sequence will identify one or more diagnostic codes. A Six-Gun Diesel Tuner's diagnostic code is comprised of 2 digits. Each code is expressed in a sequence of 2 sets of the flashing RED LED separated by a brief flashing of the GREEN LED in between. Each set of a number of RED LED flashes represents a digit. A longer flashing of the GREEN LED separates the sequences. The LEDs will continue to flash to display all the errors, and then repeat. Refer to the Troubleshooting section in your Six-Gun Tuner owner's manual for specific diagnostic code information.

-END, SECTION 5-

Figure 3



Section 6

CLEARING LEARNED INFORMATION

If the Six-Gun Diesel Tuner has been moved to a different vehicle, or you are instructed to do so by Banks Technical Staff, it is possible to reset all of the parameters that the Six-Gun has 'learned' - presence of an EGT thermocouple or Speed-Loader, etc.

CAUTION: The following procedures can only be carried out with the engine OFF!

- 1.** Turn the vehicle key to ON but DO NOT start the engine.
- 2.** Fully depress the throttle pedal and then release it completely. Repeat 5 times. The Tuner's GREEN LED will flash when this is completed successfully.

- 3.** Turn the key OFF. Wait 60 seconds and make sure the GREEN LED goes off and stays off. Turn the key back to the ON position but DO NOT start the engine.

- 4.** Fully depress the throttle pedal and then release it completely. Repeat 5 times.

- 5.** The Six-Gun Tuner has now been cleared of all 'learned' parameters and will now be in a factory-default state, as it was originally shipped.

-END, SECTION 6-

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