

banks

with Installation Instructions
Owner's Manual

**Banks
Speed-Loader®**

**2001-2004 Chevy/GMC 6.6L Duramax
(LB7) Turbo-Diesel Pickups**

THIS MANUAL IS FOR USE WITH SYSTEM 62958

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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 its terms and conditions.

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Gale Banks Engineering Inc., and its 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.

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The BUYER is responsible to obey all applicable federal, state, and local laws, statutes, and ordinances when operating his/her vehicle, and the BUYER agrees to hold SELLER harmless from any violation thereof.

The SELLER assumes no liability regarding the improper installation or misapplication of its products. It is the installer's responsibility to check for proper installation and if in doubt, contact the manufacturer.

The BUYER is solely responsible for all warranty issues from the automotive manufacturer.

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 parts contained within the products kit. 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 its terms and conditions.



Table of Contents

General Installation Practices	6
Recommended practices, tools, and supplies for installation	
Section 1	8
Installation of Exhaust Gas Thermocouple	
Section 2	10
Installation of Speed-Loader Module	
Section 3	12
Troubleshooting	

Speed-Loader Introduction

The Speed-Loader module is added to the Six-Gun for off road, short duration use only to increase the power output of Levels 2-6. 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.

To prevent factory torque converter damage, Banks recommends that automatic vehicles do not exceed Level 3 with Speed-Loader installed while the vehicle is experiencing load (towing, climbing a steep grade, carrying a load, etc.). To protect the factory clutch, manual transmission vehicles should not exceed Level 2 with Speed-Loader installed if the vehicle is loaded.

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

Also, the factory clutch or torque converter will need to be upgraded to an aftermarket unit that can handle the increased torque and horsepower of the higher levels.

Failure to upgrade the clutch or torque converter prior to using the upper levels while the vehicle is loaded may result in damage to the factory clutch or torque converter. Banks is **NOT** responsible for clutch, torque converter and/or transmission damage.

Attention!

Before proceeding with these instructions, please carefully read the **DISCLAIMER OF LIABILITY** and **LIMITATION OF WARRANTY statement** located on page **2-3** of this manual.

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General Installation Practices

1. For ease of installation of your Banks Speed-Loader, familiarize yourself with the procedure by reading the entire manual before starting work. This instruction manual contains 14 pages of text, illustrations and parts listing.

2. Disconnect the ground cable from the battery before beginning work. If there are two batteries, disconnect both.

3. Route and tie wires and hoses a minimum of 6 inches away from exhaust heat, moving parts and sharp edges. Clearance of 8 inches or more is recommended where possible.

4. 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; put the transmission in park; set the hand brake; and place blocks behind the rear wheels.

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.

5. The installation should be performed at a time when the vehicle has been allowed to completely cool. This installation requires the installer to work near surfaces that may remain hot after the vehicle has been run. Failure to allow the vehicle to cool may result in personal injury.

6. During installation, keep your work area and components clean to avoid possible dirt entry into the engine.

7. Save this Owner's Manual as a reference for system maintenance and service.

8. Banks recommends that a Pyrometer (EGT) gauge (Banks part# 63401) and a Boost gauge (Banks part# 63405) be installed with the Six-Gun Diesel Tuner and Speed-Loader to help monitor performance and exhaust gas temperature of the vehicle—both gauges are also available together in one kit (Banks part# 64507). Banks also recommends the following:

Tools Required:

- 7/16" drill bit
- Tap Handle
- 1/4" NPT tap
- 12 mm, 12-point socket & wrench

Highly recommended tools and supplies:

- Heat gun

Table 1: Recommended Airflow Improvements

Banks Monster® Exhaust System LB7 (01-04)	Std. Cab Long Bed, w/o Cat	48628
	Ext. Crew Short Bed w/o Cat	48629
	Ext. Crew Long Bed w/o Cat	48630
	Header pipe kit w/o cat	48631
	2002-05 Std. Cab Long Bed w/Cat	48632
	2002-05 Ext/Crew Cab Short Bed w/Cat	48633
	2002-05 Ext/Crew Cab Long Bed w/Cat	48634
Banks BigHead® Actuator (LB7)	BigHead Actuator	24396
	Spacer	24376
	Actuator	24375
Banks Ram-Air®	Filter	41518
	Service Kit	90094
Gauges	Boost	63405
	Pyro	63401
	Boost and Pyro Assembly	64507

Section 1:

THERMOCOUPLE INSTALLATION

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 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.

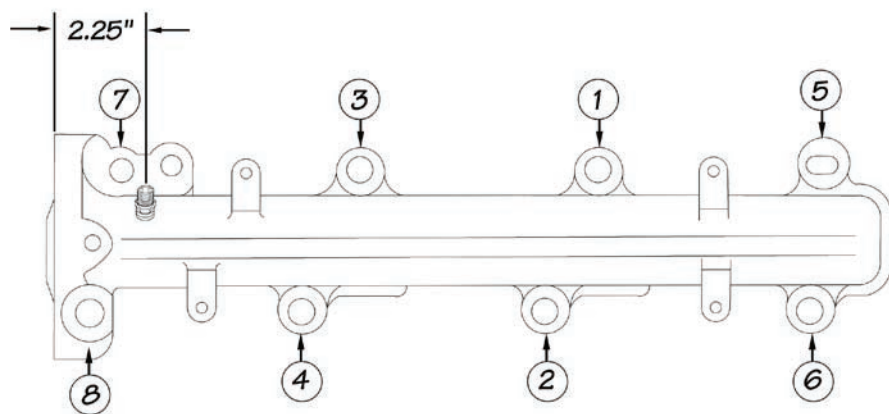
2. To access the exhaust manifold, remove front passenger wheel well by removal of plastic retainers.

3. On the passenger side, remove the hardware retaining the turbine inlet exhaust pipe to the exhaust manifold using a 12mm, 12pt socket along with a 12mm, 12pt wrench, 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 (see Figure 1). Use a 7/16" drill, keeping the drill perpendicular to the manifold surface.

5. Tap the drilled hole with a 1/4" NPT pipe tap. Check the thread depth as you tap by periodically removing the tap and screwing the thermocouple insert into the tapped hole.

Figure 1



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 ft-lb in the sequence shown (see **Figure 1**).

8. Attach the thermocouple to the supplied thermocouple leadwire extension with the supplied nuts and bolts. Cover this joint with the supplied heat shrink tubing and heat until the tubing conforms to the joint. Make sure the entire joint is insulated.

9. Route the thermocouple leadwire along the factory harness near the firewall to the driver's side and through the rubber grommet in the firewall next to the Six-Gun harness.

10. From inside the cab, remove the lower dash panel to access the Banks Six-Gun Diesel Tuner.

11. Route the thermocouple leadwire on the left side of the support bracket to the Six-Gun Diesel Tuner. Connect the 2-pin thermocouple connector to the corresponding 2-pin connector on the front of the Six-Gun Diesel Tuner.

CAUTION: When a Speed-Loader is installed, Level 6 is re-calibrated for maximum possible power output—this includes a raised EGT limit (to 1500°F) and a reduced the 5th gear

power de-rate from 50% to 0% for LB7 vehicles. 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.

12. Install the 4-pin connector of the Speed-Loader harness to the 4-pin connector on the Speed-Loader module.

13. Verify the Banks wire harness, Six-Gun Diesel Tuner and Six-Gun switch are installed as specified in the Owners Manual. Disconnect the Six-Gun switch from the Six-Gun harness.

14. Connect the Six-Gun switch's 2-pin receptacle to the Speed-Loader's 2-pin plug. Connect the Speed-Loader's 2-pin receptacle to the Banks Wire harness.

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

Note: Once the Speed-Loader is installed and detected, the green LED on the Six-Gun will flash twice at power up. Refer to the following "SPEED-LOADER LEARNING SEQUENCE" section for more details.

16. Reconnect the ground cables to the vehicle batteries.

-END, SECTION 1-

Section 2:

SPEED-LOADER MODULE INSTALLATION: (For Off-Road, Short Duration Use Only)

Speed-Loader Learning Sequence

Once the Speed-Loader Module is installed or removed from the vehicle, the following learning sequence (A1-A4) will need to be performed so that the Six-Gun Diesel Tuner can correctly identify that the Speed-Loader is present or absent.

A1. Start the engine

A2. Turn the Six-Gun switch to the highest level (position 6) and stay there for five (5) seconds.

A3. Rotate the switch to the lowest level (position 1) and stay there for five (5) seconds.

A4. Rotate the switch again to the highest level (position 6) and stay there for five (5) seconds.

Note: To determine if the Banks Six-Gun Diesel Tuner 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, the Banks Six-Gun Diesel Tuner will run with the Speed-Loader programming. If the GREEN LED doesn't flash, the Banks Six-Gun Diesel Tuner will run the standard programming. If you have installed a Speed-Loader but the GREEN LED does not flash upon key-on, the Speed-Loader has not been learned properly by the Six-Gun —repeat steps A1-A4, above.

Checking Engine Performance

Note: The Six-Gun module will not add power until it detects that minimum engine operating temperatures have been reached.

Go over the entire installation as a precautionary check to ensure that all clamps are tight, wiring and hoses are properly routed, and connections are tight.

Observe the operation of the boost and pyrometer gauges (if equipped) 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 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 (LB7 models), or turbine vane actuator (LLY models), or dirty air filter. Typical maximum boost pressure settings for the GM Duramax diesel will vary considerably with manual transmission or automatic transmission options, model year of vehicle and altitude.

Use your pyrometer 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. Your pyrometer is color coded to assist in your reading of the gauge. The red zone indicates a dangerous level of temperature. Your engine should not operate in this range for more than a few seconds. The blue zone indicates when it is safe to shut the engine off. 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 with Speed-Loader is calibrated to maintain a maximum EGT of 1400 °F (1500 °F in Level 6). You may experience brief excursions slightly

above 1400 °F (1500 °F in Level 6) under acceleration. If you find that EGT remains high for any length of time, check for boost leaks or a dirty air filter.

-END, SECTION 2-

Section 3: TROUBLESHOOTING

If you feel that your Six-Gun Diesel Tuner and Speed-Loader are 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. Turn vehicle key to ON position. Observe the two LED's mounted on the end of the Six-Gun Diesel Tuner (see **Figure 2**).

If all wire connections are correct, a steady green light is illuminated. If the green light is not illuminated when key is on, check power supply hookup and the fuse on the Six-Gun main wire harness. If connection and fuse is okay, contact Banks Technical Service.

If a connection is incorrect or if there is a problem with the system, when the key is on the red LED will flash in sequence to identify a diagnostic code. 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. **Table 2** lists some common diagnostic codes.

For example, if a faulty thermocouple is detected (code "2,3") by the Six-Gun Diesel Tuner, the following red and green LED flashing sequence is observed when the key is on:

- (1) Two times flashing RED LED
- (2) One time quick flashing GREEN LED
- (3) Three times flashing RED LED
- (4) One time longer flashing GREEN LED

The above flashing sequence will repeat continuously. When the problem is corrected, the diagnostic code will be eliminated and replaced by a steady green light.

Note: If multiple codes are set, they will be displayed in a series separated by the longer flashing green LED. When reading codes, make sure to watch the entire series until you see the first code repeat.

If problem persists, contact Banks Technical Service.

If the Six-Gun Diesel Tuner should ever need to be removed from the vehicle, follow the appropriate procedure below based on your model.

LB7 models: The system includes a by-pass plug that must be connected to the white 8-pin connector (next to the 10-pin connector) on the Banks wire harness. Failure to utilize the by-pass plug will result in a Check Engine light on the dash and a Diagnostic Trouble Code being stored in the factory computer and the engine will not start.

If the Speed-Loader is removed from the vehicle without removal of the Six-Gun module, perform **Steps A1 to A4** on **page 10** again to properly re-calibrate the Six-Gun module.

Figure 2

GREEN LED INDICATOR LOCATION - LB7 SIX-GUN

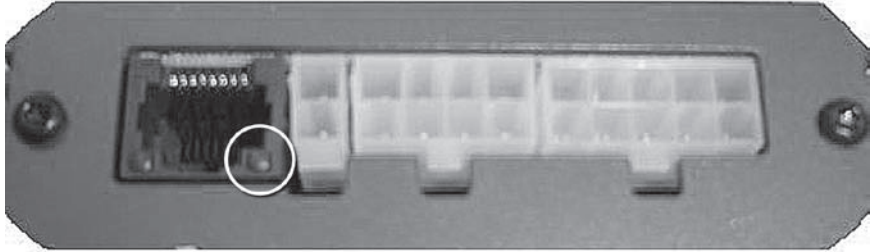


Table 2: Banks Speed-Loader Diagnostic Codes

Diagnostic Code	Code Description	Course of Action
1,3	Faulty Six-Gun signal input	Make sure the Six-Gun switch is connected to the main wire harness. Reset Six-Gun Diesel Tuner by turning key ON and OFF.
2,3	Faulty thermocouple signal	Check thermocouple connection and 2-pin Six-Gun Diesel Tuner connector.
4,2	Transmission slip detected (automatic transmission ONLY)	Six-Gun Diesel Tuner will automatically derate engine power to preserve the transmission. Contact Banks Technical Service if problem persists.

-END, SECTION 3-

NOTES

NOTES

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