

banks

with Installation Instructions
Owner's Manual

**Banks Six-Gun®
Diesel Tuner**
WITH OPTIONAL SPEED-LOADER™ MODULE

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

THIS MANUAL IS FOR USE WITH SYSTEMS 62957, 62958 & 62959

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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.

DISCLAIMER OF LIABILITY

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.

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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.

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The Warranty is Limited to two (2) years from the date of sale and is limited solely to the parts contained within the product’s

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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.

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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 7:00 am and 5:00 pm (PT). If you have any questions relating to shipping or billing, please contact our Customer Service Department at (888) 839-5600.

Thank you.

The Banks Six-Gun Diesel Tuner has 6-power levels adjustable by the supplied Six-Gun switch.

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 the Speed-Loader installed. Each additional higher level adds approximately 20% of the available power increase.

To prevent factory torque converter damage, Banks recommends that automatic vehicles do not exceed Level 4 (Level 3 with Speed-Loader) 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 3 (Level 2 with Speed-Loader) if the vehicle is loaded.

To use the higher levels of the Six-Gun Diesel Tuner 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 of this manual.

General Installation Practices

1. For ease of installation of your Banks Six-Gun, familiarize yourself with the procedure by reading the entire manual before starting work. This instruction manual contains 28 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. Banks recommends that a Pyrometer (EGT) gauge and a Boost gauge be installed with the Six-Gun Diesel Tuner to help monitor

performance and Engine Gas Temperatures (EGT) of the vehicle (see part numbers below). To further increase engine life by lower EGT's, Banks also recommends installing the following airflow improvements:

Airflow Improvements

1. Banks Monster® Exhaust
 - 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
 - '02-04 Std.Cab Long Bed w/cat 48632
 - '02-04 Ext./Crew Short Bed w/cat 48633
 - '02-04 Ext./Crew Long Bed w/cat 48634
2. Banks BigHead® Actuator 24396
3. Banks Ram-Air®
 - Filter 41518
 - Service Kit 90094

Gauges

1. Boost and Pyro Assembly* 64507
 2. Thermocouple** 63055
- * also available separately
** included with Speed-Loader

Tools Required:

- 1/4" and 3/8" drive ratchets with metric sockets, including 10mm
- Metric combination or open-end wrenches
- Standard and Phillips head screwdrivers
- Standard and needle-nose pliers
- Pocket or X-Acto knife
- Clean shop towels or rags
- Wire crimping/stripping tool
- 1/8" drill bit
- 3/8" drill bit
- Drill motor

Tools Required for Optional Speed-Loader Installation:

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

Highly recommended tools and supplies:

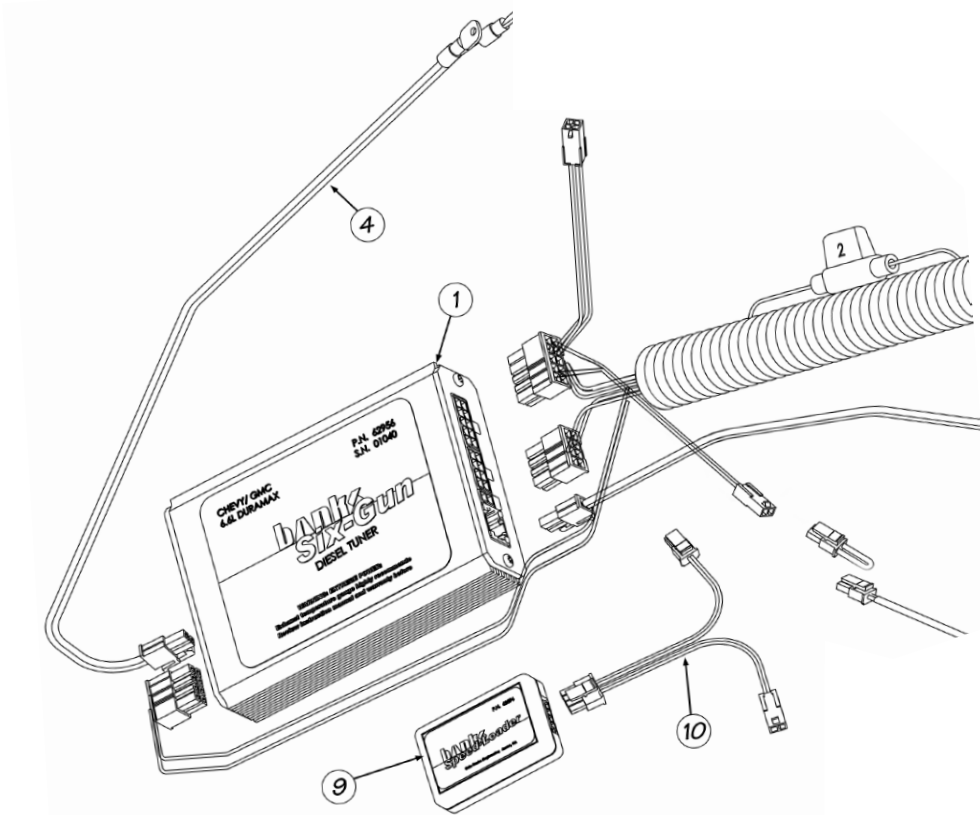
- Multimeter or 12-volt test light
- Heat gun

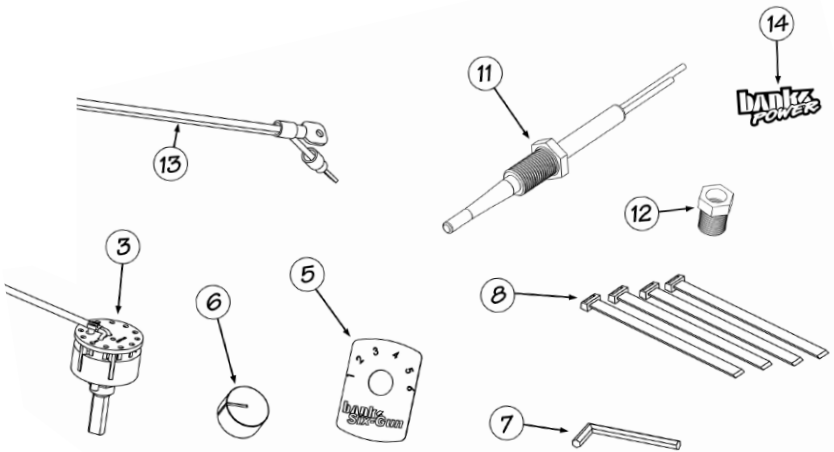
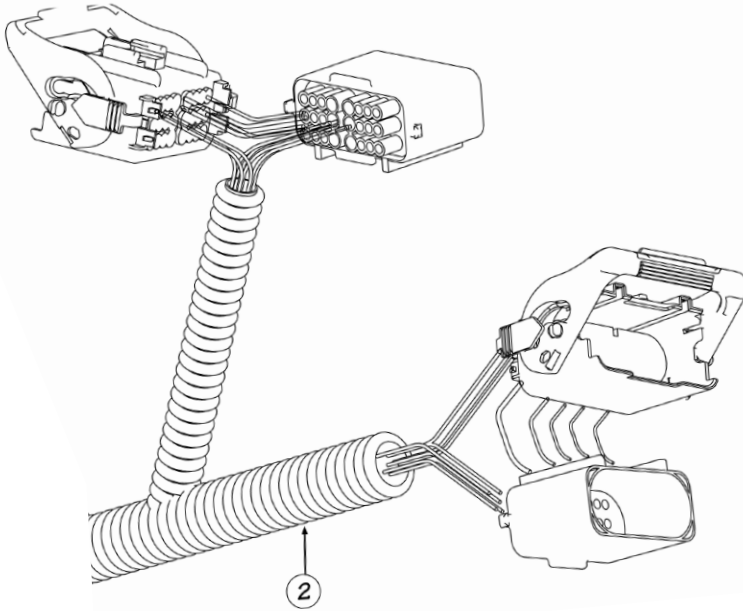
Section 1

BANKS SIX-GUN, GENERAL ASSEMBLY

Item #	Description	Part #	Item #	Description	Part #
1	Banks Six-Gun Diesel Tuner . . . . .	.62956	8	Cable Ties, 7" (10) . . . . .	.62010
2	Wire Harness, Six-Gun . . . . .	.62593	9	Banks Speed-Loader™ Module (Optional) . . . . .	.62596
3	Banks Six-Gun Selection Switch . . . . .	.62594	10	Wire Harness, Banks Speed-Loader™ (Optional) . . .	.62598
4	Wire Harness, TCC . . . . .	.62940	11	Thermocouple (Optional) . . .	.63042
5	Banks Six-Gun Switch Label . . .	.62138	12	Thermocouple insert (Optional)	
6	Banks Six-Gun Switch Knob . . .	.62595	13	Thermocouple lead wire (Optional) . . . . .	.63061
7	Hex Key Wrench, .050" . . . . .	.92983	14	BanksPower Decals (2) . . . . .	.96009

-END, SECTION 1-





Section 2

SIX-GUN DIESEL TUNER INSTALLATION

- 1.** From the engine compartment, locate the rubber grommet high on the driver's side of the vehicle firewall. The grommet is about 3" in diameter. Make a 1" x 1" cross-shaped incision in the grommet (see **Figure 1**).
- 2.** From the engine compartment, feed the two white 8-pin and the white 10-pin connectors through the grommet into the cab. From inside the cab, remove the lower dash panel under steering column to allow access to the wire harness.
- 3.** Locate the two black wire harness locking connectors between the brake fluid reservoir and the air conditioning compressor. Lift the gray connector lock and disconnect the 38-pin connector pair and the 24-pin connector pair (see **Figure 2**).
- 4.** Insert the male 38-pin connector on the Six-Gun harness into the female 38-pin connector on the factory

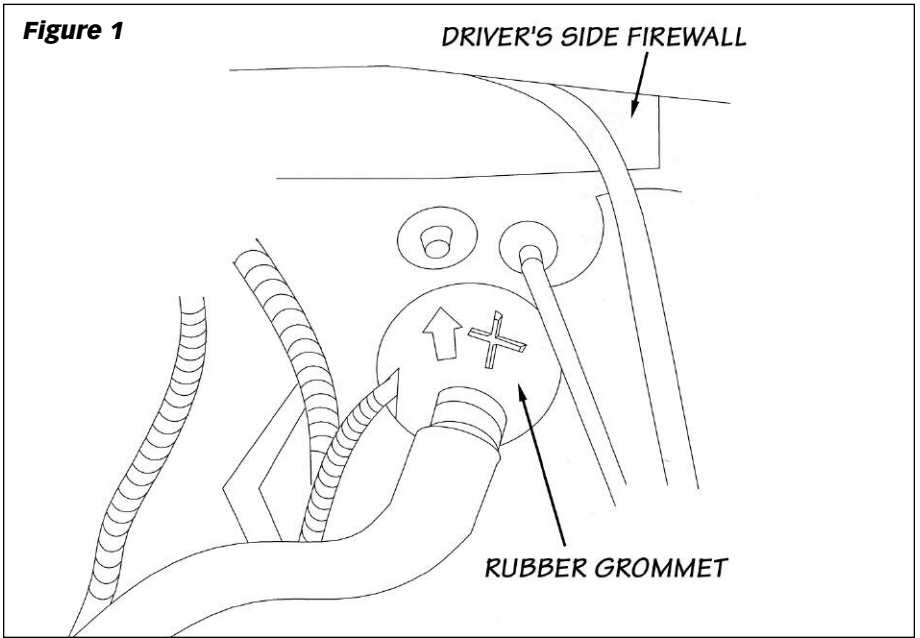
harness. Insert the female 38-pin connector on the Six-Gun harness onto the male 38-pin connector of the factory harness. Repeat this process with the 24-pin connectors (see **Figure 2**).

*For vehicles with manual transmissions proceed to **Step 8**. The TCC harness will not be used.*

5. Locate the Transmission Control Module (TCM) mounted on the driver side of the radiator fan shroud behind a black plastic housing. Remove the two (2) 6mm bolts holding the plastic TCM housing to the radiator and remove the housing.

6. Attach a red T-tap to the BROWN wire on pin 29 of the top connector. Attach another red T-Tap to the GREEN wire with a WHITE stripe on pin 32 of the top connector. The GRAY connector wire cover is split in the middle and can be separated with a small screw driver to allow access to

Figure 1



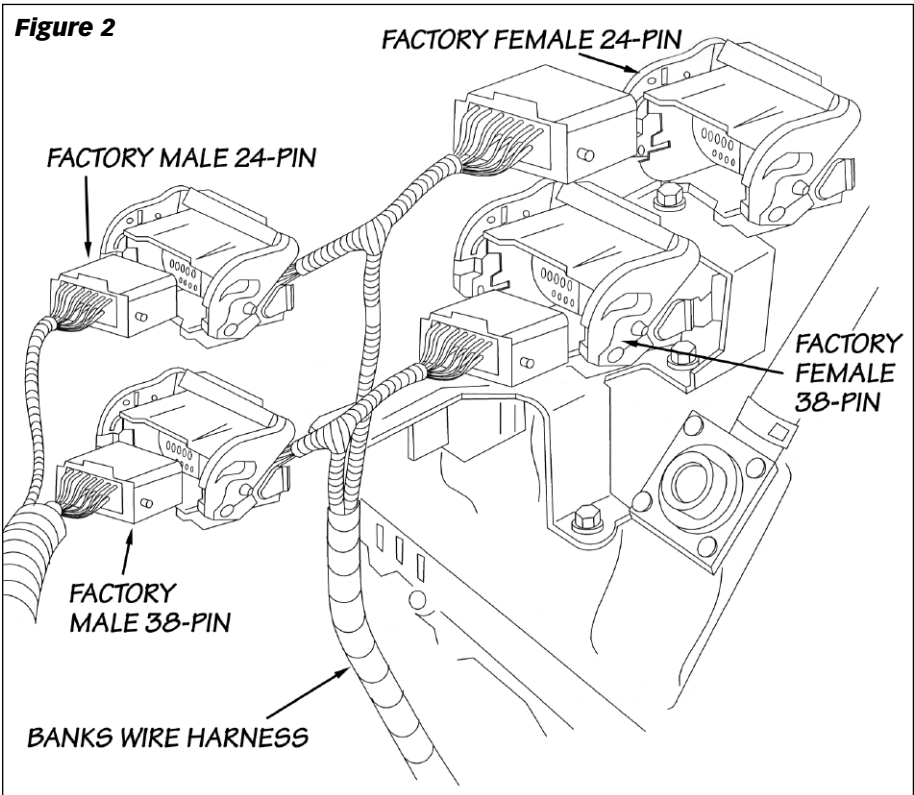
the back of the connector so the pin numbers are viewable.

7. Install the male spade connector on the end of the GRAY wire of the supplied Torque Converter Clutch (TCC) harness to the red T-Tap installed on the BROWN wire in **Step 6**. Attach the BLUE wire of the TCC harness to the RED T-Tap on the GREEN wire with white tracer. Route the TCC harness through the grommet on the firewall to the Six-Gun. Re-install the TCM housing onto the radiator fan shroud. Make sure the tabs on the bottom of the housing are inserted into the slots on the tab of the shroud.

8. From inside the cab, with the lower dash panel removed, route the main

10-pin and 8-pin connectors and the TCC harness (if applicable) on the left side of the support bracket. Connect the coupled 10-pin and 8-pin connectors into the corresponding Six-Gun Diesel Tuner connections. Connect the single 8-pin connector into the bottom of the Six-Gun. For automatic transmission only, connect the 4-pin male connector of the TCC harness into the 4-pin female connector on the Six-Gun Diesel Tuner.

9. Insert the Six-Gun Diesel Tuner on the outside of the left steering column support bracket between the left dash panel and the steering column. Orient the Six-Gun such that the pair of 8-



and 10-pin connector are upright and the TCC and single 8-pin connector are facing downward.

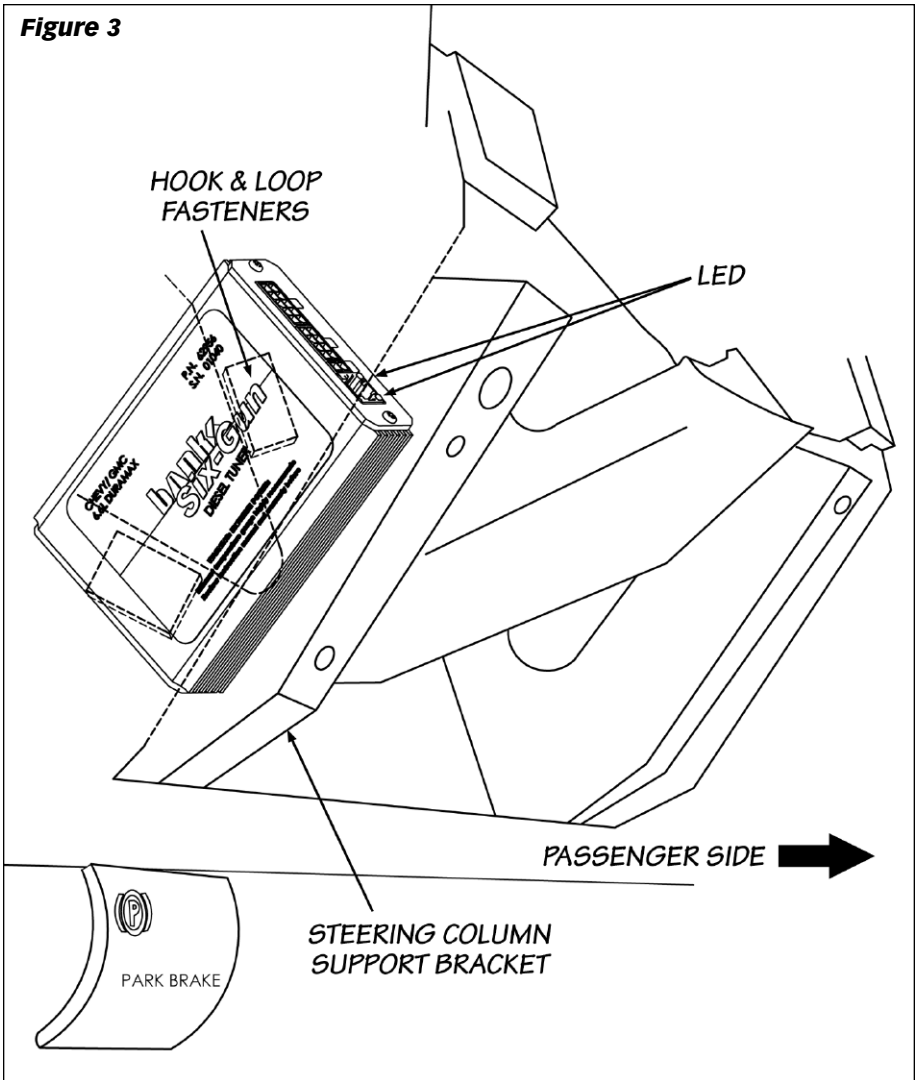
10. The Six-Gun is to be installed on the outside of the left steering column support bracket (see **Figure 3**). Make sure the outside of the column support bracket is free of oil, grease and dirt.

11. With the Six-Gun Diesel Tuner positioned under the dash, just outside the left steering column support bracket, peel the protective backing from the hook and loop interlocking fastener attached to the Six-Gun Diesel

Tuner. With the Six-Gun Diesel Tuner's long outside edge parallel to the support bracket, press the adhesive onto the outside of the support bracket (see **Figure 3**). Apply light pressure to the Six-Gun Diesel Tuner by hand for 60-seconds to create a strong bond between the bracket and hook & loop interlocking fastener. Using the supplied cable ties, secure the wire harness under the dash away from any pedals or moving components.

-END, SECTION 2-

Figure 3



Section 3

SIX-GUN POWER LEVEL SELECTION SWITCH INSTALLATION

Caution: Do not use force when working on plastic parts. Permanent damage to the part may result.

12. The Six-Gun switch will be installed on the driver's side of the instrument panel (IP) next to the steering column (see **Figure 4**). Carefully remove IP from the dashboard by slowly pulling IP, allowing the pins to pull free from the dashboard sockets. Automatic vehicles will need to set the parking brake and move the shift lever down to the lowest gear.

13. Cut out the supplied template (see **Figure 9** on page 23) and align the template onto the rear of the IP over the IP alignment pin and mounting pin (see **Figure 5**).

14. Using a $\frac{3}{8}$ " Uni-drill bit, center the bit onto the $\frac{3}{8}$ " drill location on the template and slowly drill through the IP. Using a $\frac{1}{8}$ " drill bit, center and drill through the $\frac{1}{8}$ " location on the template. Remove and discard the template and any plastic shavings.

15. On the frontside of the IP, align the Banks Six-Gun label onto the previously drilled hole (see **Figure 6**).

16. Remove the nut and internal tooth washer from the Six-Gun Switch. Rotate the shaft counter clockwise

until the shaft stops. Verify the locating washer tab is inserted into the #6 position on the switch (see **Figure 7**).

NOTE: If the washer is in any position other than the #6, your Six-Gun Diesel Tuner will not select power levels properly.

17. After confirming the locating washer is in the #6 location, install the switch through the $\frac{3}{8}$ " hole on the backside of the instrument panel. The alignment pin should rest in the $\frac{1}{8}$ " hole and with the switch fully rotated counter clockwise; the shaft's flat side should be facing the steering column. Secure switch with internal tooth washer and nut. Snug the washer; be careful not to over torque the nut and damage the plastic threads.

18. Install the knob onto the shaft facing the #1 Level on the Six-Gun label. On the knob, snug the two (2) set screws with the supplied 0.050" hex key wrench.

19. Route the Six-Gun Switch wires down to the Six-Gun Diesel Tuner and reinstall the IP to the dashboard.

20. Remove the 2-pin Jumper from the Six-Gun Diesel Tuner wire harness. Connect the Six-Gun harness to the 2-pin connector on the switch wire.

-END, SECTION 3

Figure 4

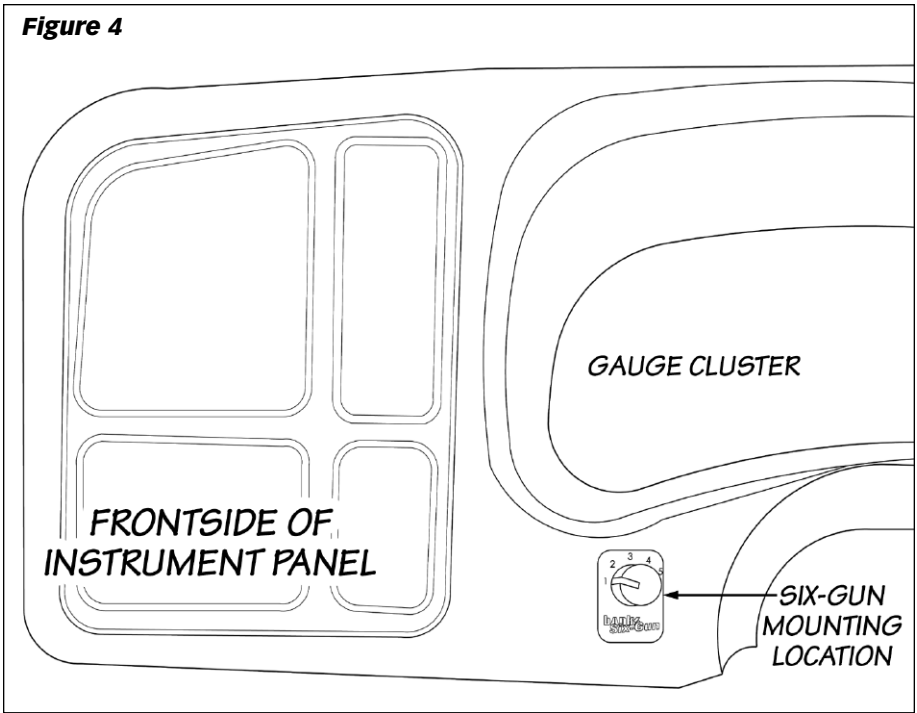


Figure 5

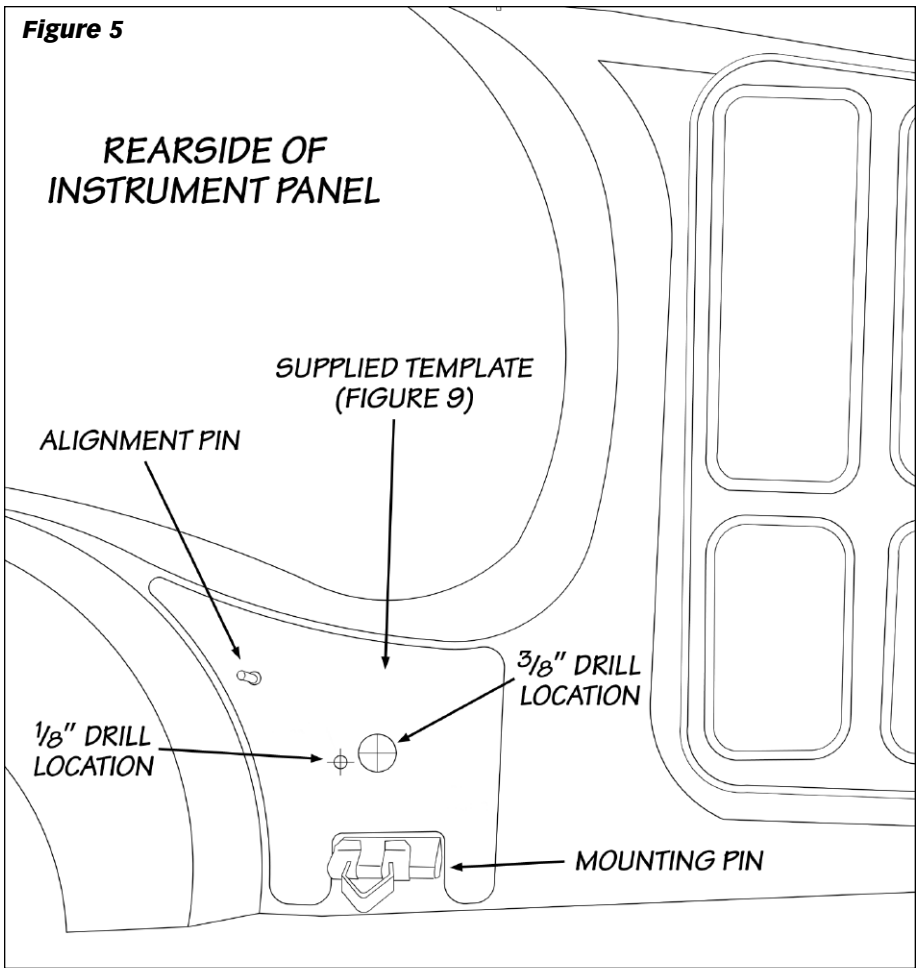


Figure 6

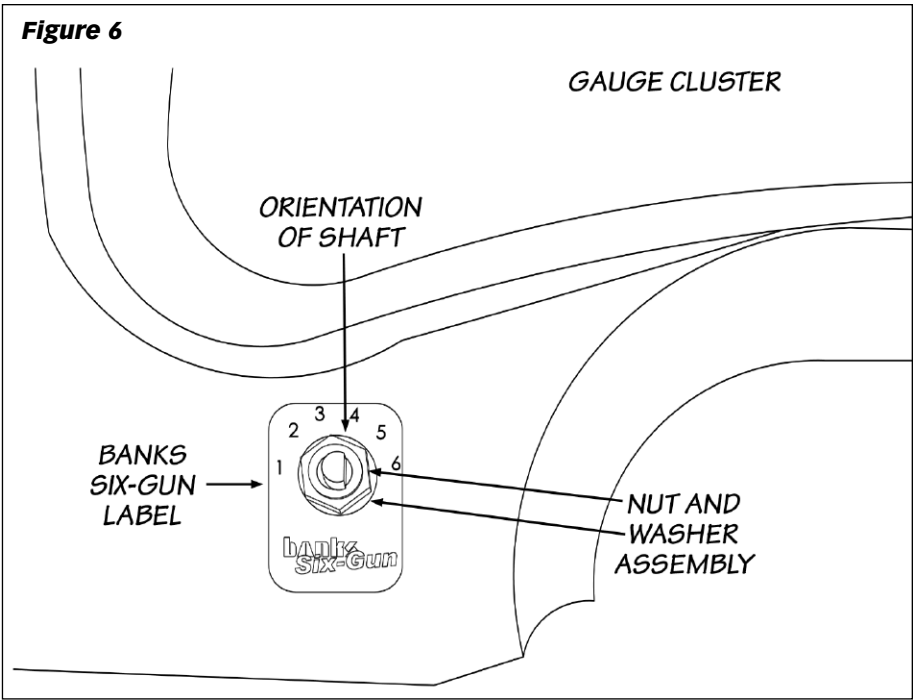
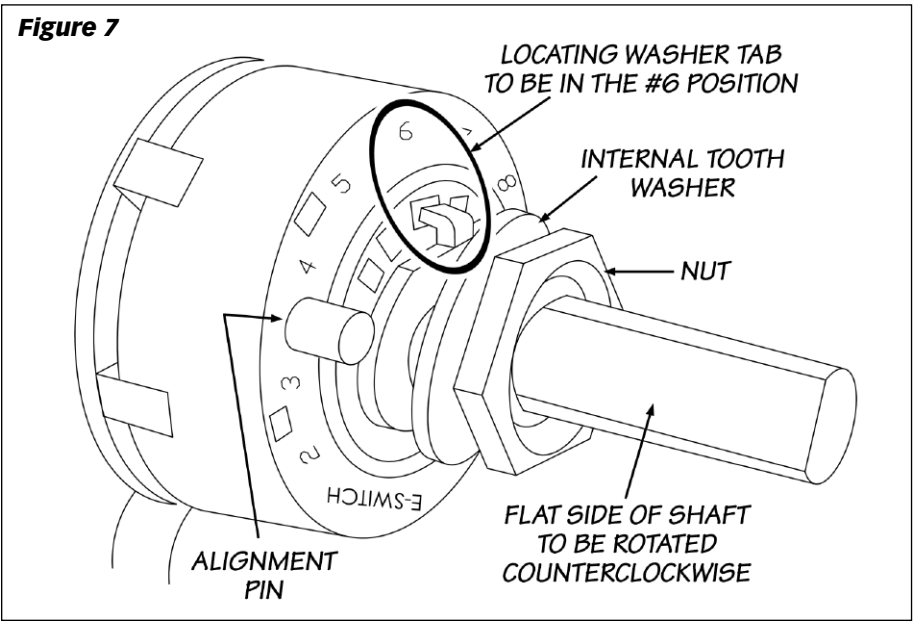


Figure 7



Section 4

OPTIONAL THERMOCOUPLE INSTALLATION (REQUIRED FOR SPEED-LOADER)

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.

21. 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.

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

23. On the passenger side, remove

the hardware retaining the turbine inlet exhaust pipe to the exhaust manifold using a 12mm, 12pt and 1/2" drive socket along with a 12mm, 12pt wrench. 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.

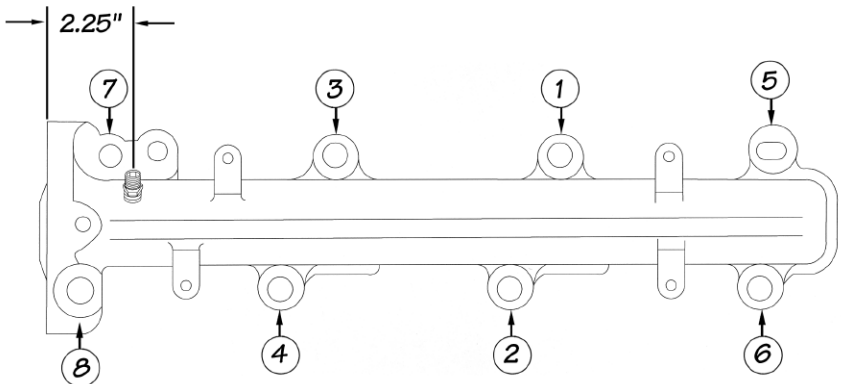
24. Center punch and drill through the passenger side exhaust manifold into the rear passage at the location shown (see **Figure 8**). Use a 7/16" drill, keeping the drill perpendicular to the manifold surface.

25. 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.

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

27. 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 8**).

Figure 8



28. Attach the thermocouple to the supplied thermocouple leadwire extension with 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.

29. Route the thermocouple leadwire along the factory harness to the driver's side and through the rubber

grommet in the firewall. From inside the cab, route the leadwire on the left side of the support bracket to the Six-Gun Diesel Tuner. Connect the 2-pin thermocouple connector to the front of the Six-Gun Diesel Tuner into corresponding 2-pin connection.

30. Reconnect the ground cables to the vehicles batteries.

-END, SECTION 4-

Section 5

OPTIONAL SPEED-LOADER MODULE INSTALLATION (FOR OFF-ROAD, SHORT DURATION USE ONLY)

- 31.** Install the 4-pin connector of Speed-Loader harness to the 4-pin connector on the Speed-Loader module.
- 32.** 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 Banks Wire harness.
- 33.** 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.
- 34.** 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 connector will flash twice at powerup. Refer to the following "SPEED-LOADER LEARNING SEQUENCE" section for more details.

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 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 the green LED does not indicate the same status as your Six-Gun and Speed-Loader setup, repeat the above steps (A1 through A4).s

-END, SECTION 5-

Section 6

CHECKING ENGINE PERFORMANCE

When the vehicle engine is cold, the Six-Gun module initiates an internal warm up sequence that takes about 60-seconds to complete. During this 60-seconds, you will not see any performance gains to your vehicle.

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 or dirty air filter. Typical maximum boost pressure settings for the GM Duramax diesel will vary considerably with manual transmission or automatic

transmission options, year model 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° before the engine is shut down.

Your Six-Gun with Speed-Loader is calibrated to maintain a maximum EGT of 1400°F. You may experience brief excursions slightly above 1400°F 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 6-

Section 7

TROUBLESHOOTING

When the vehicle engine is cold, the Six-Gun module initiates an internal warm up sequence that takes about 60-seconds to complete. During this 60-seconds, you will not see any performance gains to your vehicle.

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. Turn vehicle key to ON position. Observe the two LEDs mounted on the upper corners of the black connector on the end of the Six-Gun Diesel Tuner. 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 are 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 1** 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.

Note: The "4,3" code comes on when the Six-Gun Diesel Tuner module is first installed on a vehicle. To eliminate this code, follow the instructions described in the "LEARNING TRANSMISSION" section.

If problem persists, contact Banks Technical Service.

If the Six-Gun Diesel Tuner should ever need to be removed from the vehicle, 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, perform **Steps A1 to A4** on page 18.

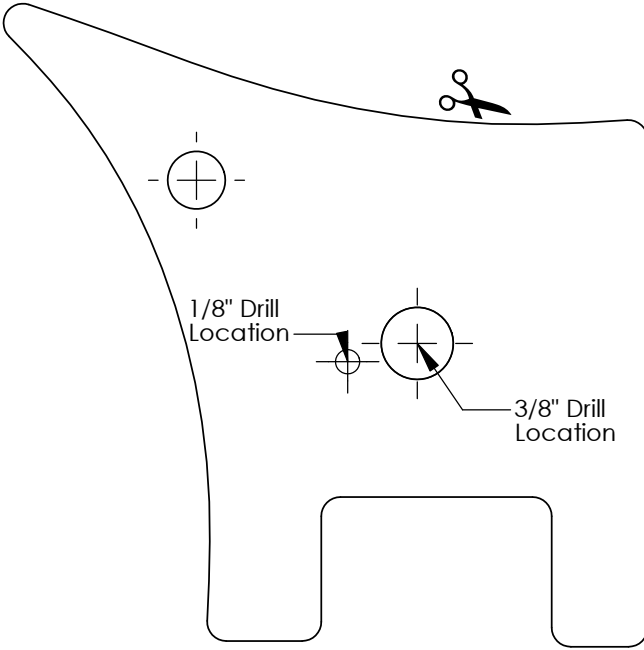
-END, SECTION 7-

Table 1: Banks Six-Gun Diagnostic Codes

Diagnostic Code	Code Description	Course of Action
1,1	Fuel Rail Pressure Input Signal Fault	Check Main Harness Connection
1,2	Boost Input Signal Fault	Check Main Harness Connection
1,3	Six-Gun Input Switch Not Connected	Check Six-Gun Switch or Speed-Loader Connection
1,4	Barometric Pressure Input Fault	Check Main Harness Connection
2,1	Fuel Rail Pressure Output Signal Fault	Check Main Harness Connection
2,2	Boost Output Signal Fault	Check Main Harness Connection
2,3	EGT Input Signal Fault	Check EGT Thermocouple, connections, extension wire, etc.
2,4	TCC Input Signal Fault	Check TCC Harness Connections
3,1	Crank Input Fault	Check Main Harness Connection
3,2	Internal Module Error	Call Gale Banks Engineering Tech Support
3,3	Internal Module Error	Call Gale Banks Engineering Tech Support
3,4	CAN Bus Problem (Data Input Timeout)	Check Main Harness Connection
4,1	Injector Input Fault	Check Main Harness Connection
4,2	Transmission Slip Detected (Auto Trans)	Transmission Is Slipping. Code Will Stop Once The Transmission Slipping Stops (repaired)

NOTES

Figure 9



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