OWNERS MANUAL

WITH INSTALLATION INSTRUCTIONS

BANKS® STINGER™ SYSTEM

CHEVROLET/GM 6.5L DIESEL PICKUPS
WITH FACTORY TURBO OPTION

1993 & EARLY 1994 NON-CATALYTIC CONVERTER

THIS MANUAL IS FOR USE WITH SYSTEM **49025 & 49046**

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GENERAL INSTALLATION PRACTICES

1. For ease of installation of your Banks Stinger™ System, PLEASE READ THIS ENTIRE INSTRUCTION PACKAGE BEFORE STARTING ANY WORK. (This package contains 10 pages of copy, illustrations, & parts listing. If any pages are missing from this package, please call GALE BANKS ENGINEERING immediately for a replacement.) Become thoroughly familiar with all components & phases of the installation before starting any work.

2. Inspect all components supplied for any foreign material that may have entered during shipping and handling.

3. **WARNING! NEVER work under any vehicle supported only by a jack of any kind. DO NOT USE concrete blocks or other masonry items that may collapse under the vehicle weight.**

4. Pay particular attention to the routing of wires and hoses. Keep them away from exhaust heat, moving parts and sharp edges that may cause cuts or other damage. Route or tie away from critical areas as required. Keep all wires a minimum of 6" from hot exhaust parts, 8" or more is recommended whenever possible.

5. Right-hand and left-hand designations refer to the driver's right or left, as seated in the vehicle (i.e.: Right-hand refers to the passenger side of the vehicle), unless noted otherwise.

INSTALLATION PROCEDURE

1. Disconnect both batteries.

2. Pull crankcase vent hose out of turbocharger air inlet hose, then loosen air intake hose clamp at turbo compressor. Remove two bolts through inner fender panel above right front tire, then remove air cleaner assembly from vehicle.

3. Remove decorative cover from top of engine. Unbolt and remove heat shield from turbocharger. On models with support brace between turbocharger and intake manifold, pull CDR valve out of valve cover and unbolt support brace, then remove heat shield.

4. Remove "E" clip from pin on end of wastegate control rod where pin attaches to wastegate lever on turbo outlet elbow casting. Use care not to lose "E" clip. See Figure 1.

5. Unbolt wastegate control bracket from turbo compressor cover, remove wastegate control assembly.

6. Install high boost lever, provided in kit, over pin on wastegate control rod (see Fig. 2). Install "E" clip on pin.

7. Attach high boost lever with wastegate control assembly to original wastegate lever on turbo outlet elbow. Use a 5/16–24 x 3/4 hex bolt, 5/16 AN washer, 3/16 long spacer, and 5/16–24 lock nut as shown in Figure 2. Make sure end of bolt and lock nut do not rub on outlet elbow when lever is rotated.

8. Reattach the wastegate control bracket to the turbocharger compressor. Move the wastegate control rod and lever through their rotation and check that binding does not occur. Correct as necessary. *NOTE: Some resistance is always present from the wastegate control.*

9. Loosen compressor discharge hose clamp at turbocharger. Remove connecting strap between turbocharger and air inlet casting.

10. Unbolt and remove air inlet casting from top of intake manifold. Cover intake manifold opening to prevent foreign objects form falling into engine. **WARNING! Any foreign object that falls into the intake manifold can cause serious engine and/or turbocharger damage upon engine start up.**

11. Measure and mark the air inlet casting as shown in Figure 3. Centerpunch this location and drill through the casting wall with a letter "R" drill (.399 dia.), then tap the hole with a 1/8 NPT tap. Clean all chips from inside the casting.

12. Reinstall air inlet casting on intake manifold. Use new gasket provided in kit. Tighten loose clamps, reinstall brace. Install boost gauge hose fitting into hole tapped in air inlet casting. *Boost gauge hose fitting is supplied in boost gauge kit.* Use a pipe thread sealer (such as Teflon tape) on fitting pipe thread.

13. Loosen the clamp attaching the exhaust pipe to the turbocharger outlet elbow. Remove the complete exhaust system from the vehicle. Leave the exhaust clamp on the turbo outlet elbow.

14. Install the Banks Stinger exhaust system as shown in Figure 4. Adjust the turbo outlet pipe and exhaust system to provide maximum clearance to frame and other components. Check alignment of muffler and tailpipe to hangers and vehicle. When alignment and clearances look good, tighten all clamps, including clamp at turbocharger outlet elbow.

NOTE: Tie all wiring and other heat-sensitive components away from exhaust piping. A minimum of 6 inches is recommended.

15. Install the pyrometer gauge probe (supplied in pyrometer gauge kit) in the bung on the turbo exhaust outlet pipe. We suggest using an anti-sieze compound on the probe threads to make removal easier for any future service.

16. Reinstall turbocharger heat shield, decorative engine cover and support brace (if equipped).

17. Install instrument gauge panel in a location providing easy viewing for the driver. *NOTE: An optional two gauge console is available from Banks for mounting gauges on top of the dash.*

18. Wire and plumb gauges as shown in instructions included with gauges. Route and tie wiring and nylon hose away from moving parts and hot exhaust components with cable ties provided.

19. If the vehicle has a plastic elbow inside the plastic adapter on the inner fender panel (between the inner and outer fender panels), remove this elbow by the following procedure. This elbow may not be present in '95 and newer vehicles, however the Banks Ram-Air inlet duct can be installed as described in the following step.

First remove the plastic tapered adapter that connects the air silencer to the inner fender panel. Squeeze the sides of the adapter together to free it from the panel. Use pliers to pull out the center button on the plastic retainer pin inside the elbow, then remove the pin.

Next, remove the two upper screws holding the underhood light assembly to the inner fender panel. Also loosen the battery hold-down clamps and remove one sheet-metal screw in the inner fender panel near the front of the battery, see Figure 5. Now remove the plastic elbow from within the fender by pulling and wiggling it rearward and toward the engine. This elbow is part of a silencer about 16" long, and will require quite a bit of effort to pull it free from the fender. If it will not move at all, check to make sure all sheet-metal screws noted were removed. The forwardmost screw near the battery attaches directly to this duct inside the fender and *must* be removed.

20. Install the new Banks Ram-Air duct into the inner fender opening to replace the factory silencer elbow. Once the new duct has been squeezed into place inside the fender, reinstall the factory plastic retainer pin or new pin, provided, through the 3/8" hole in the duct and inner fender bracket. Push in on the center button of the retainer pin to lock the pin in place. Reinstall the underhood light assembly screws. Reinstall battery. Reinstall the plastic tapered adapter to the inner fender panel by squeezing the sides together and engaging it into the edge of the inner fender panel opening.

21. Reinstall air cleaner assembly on right inner fender panel. Reinstall CDR valve, tighten hose clamps.

22. Install new air filter supplied. See air filter cleaning and maintenance instructions elsewhere in this booklet.

23. Reconnect batteries. Start engine, allow engine to warm up. Drive vehicle, listen for exhaust leaks or rattles. Reposition or tighten exhaust components as required.

FIGURE 1

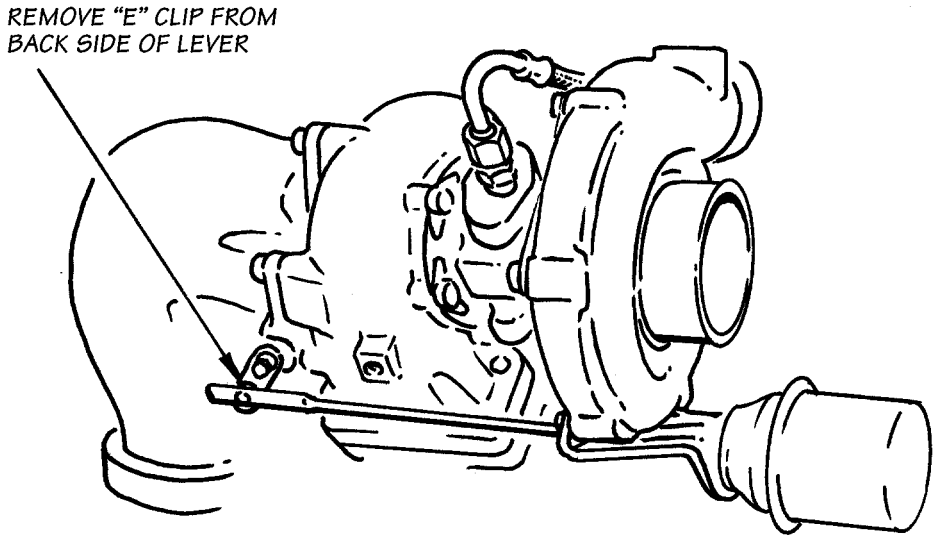


FIGURE 2

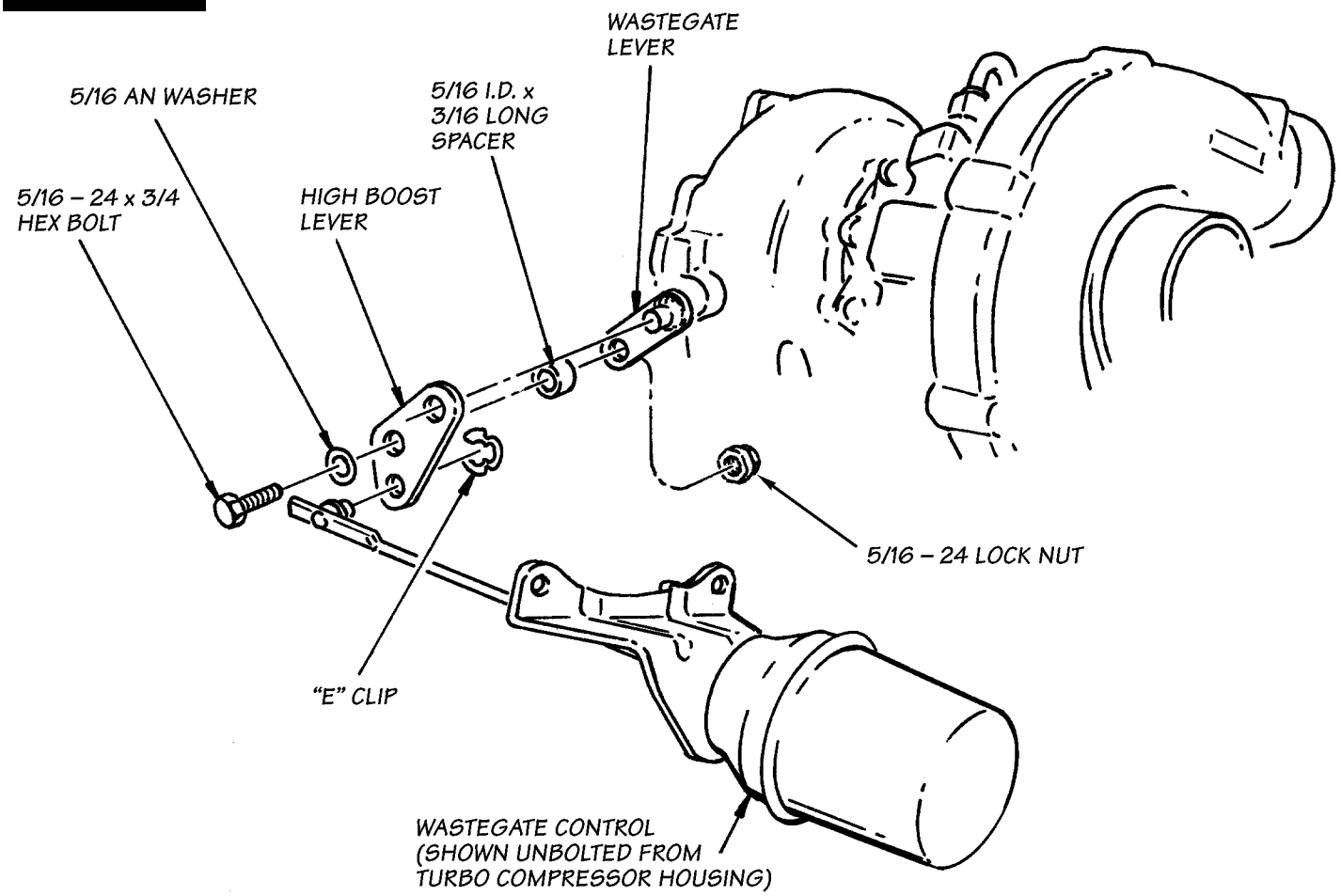


FIGURE 3

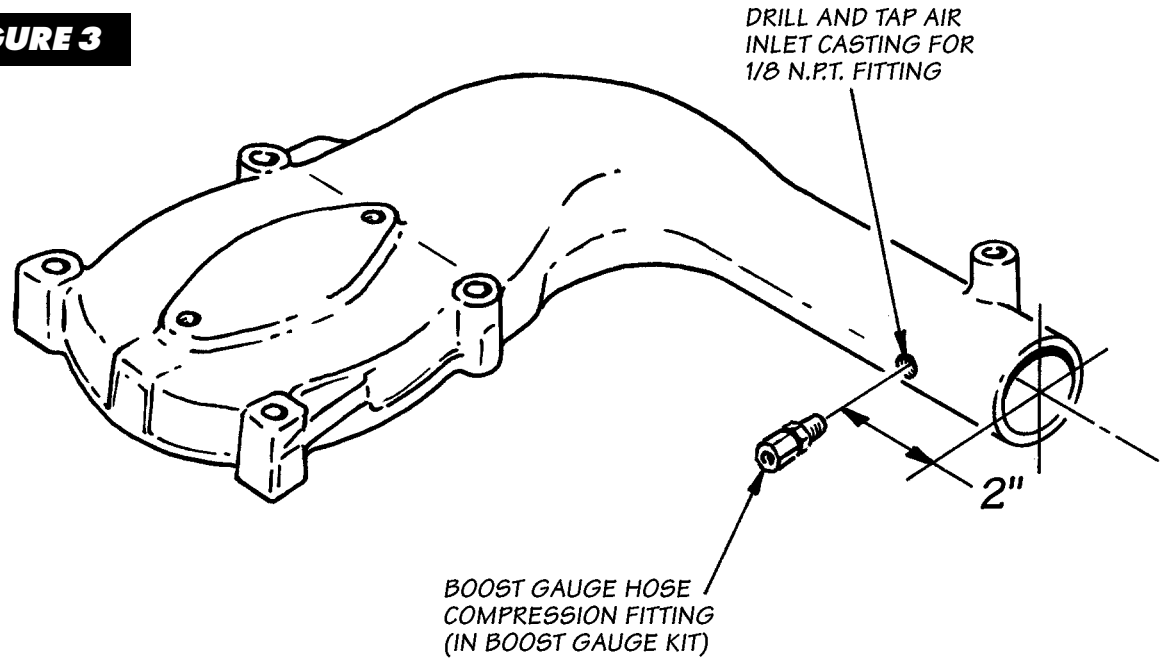


FIGURE 4

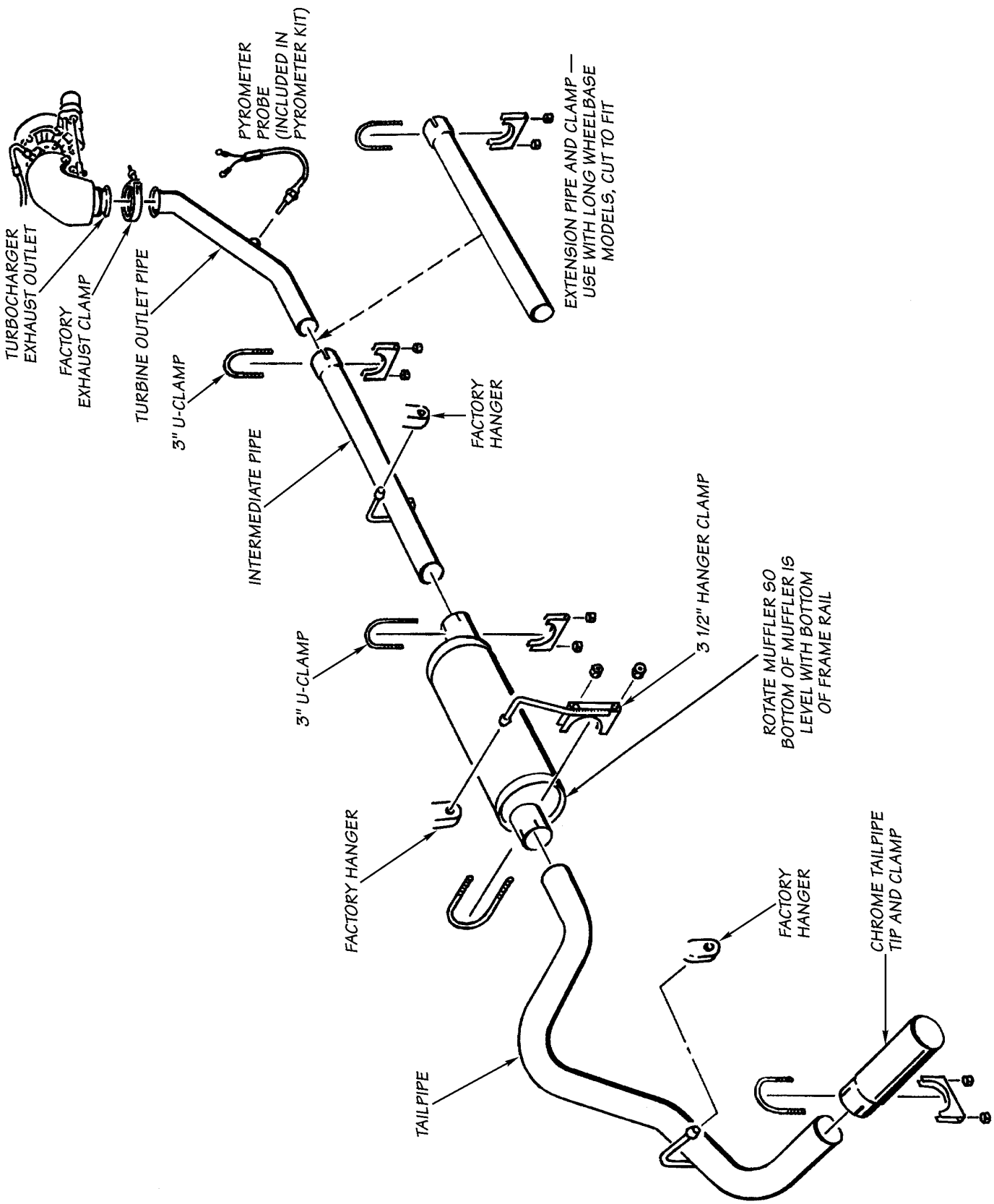
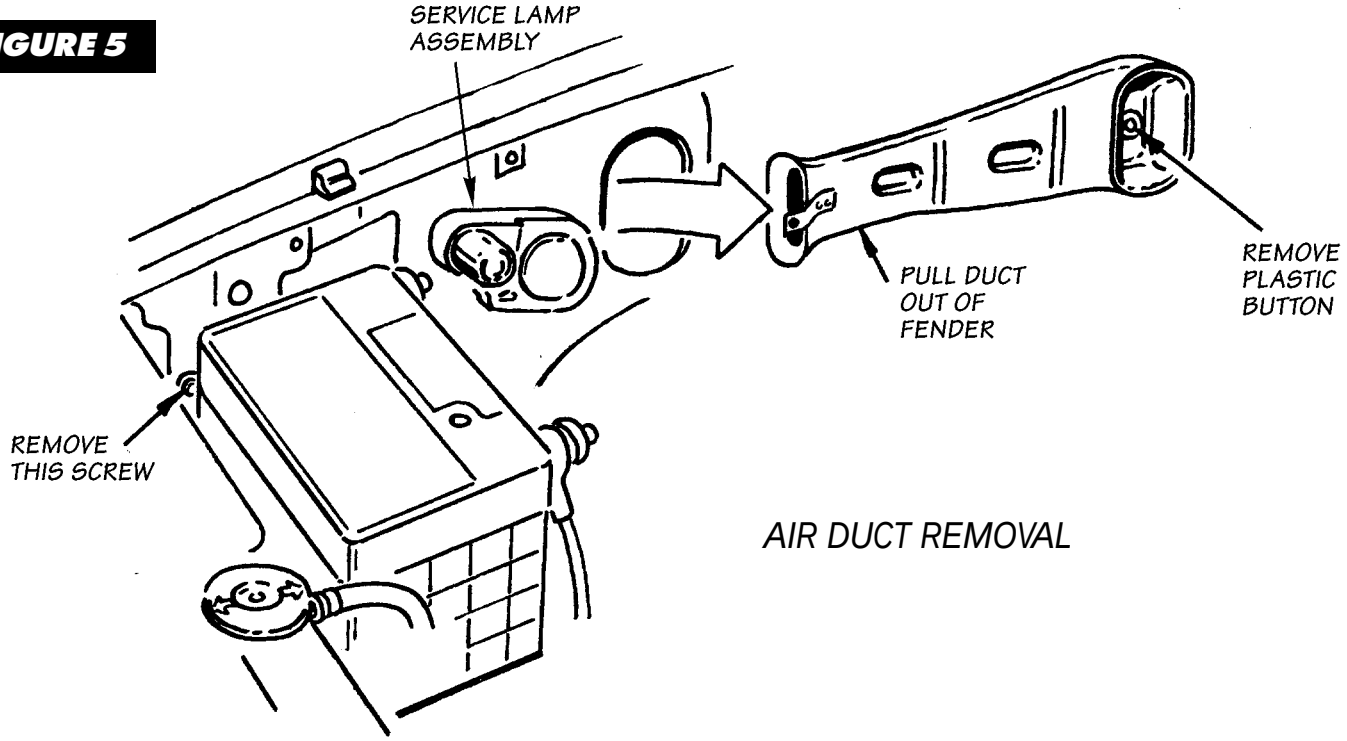

TURBOCHARGER EXHAUST OUTLET
FACTORY EXHAUST CLAMP
TURBINE OUTLET PIPE
PYROMETER PROBE (INCLUDED IN PYROMETER KIT)
EXTENSION PIPE AND CLAMP — USE WITH LONG WHEELBASE MODELS, CUT TO FIT
3" U-CLAMP
INTERMEDIATE PIPE
FACTORY HANGER
3" U-CLAMP
3 1/2" HANGER CLAMP
ROTATE MUFFLER SO BOTTOM OF MUFFLER IS LEVEL WITH BOTTOM OF FRAME RAIL
FACTORY HANGER
FACTORY HANGER
CHROME TAILPIPE TIP AND CLAMP
TAILPIPE

FIGURE 5



AIR DUCT REMOVAL

OPERATING CHARACTERISTICS

Your Banks Stinger will allow your GM 6.5L factory turbocharged engine to produce more power and respond quicker well within the safe operating range of the engine as long as the following guidelines are adhered to.

Use your pyrometer (exhaust temperature gauge) and boost gauge to monitor your engine's operation. At idle, EGT (exhaust gas temperature) will be very low, perhaps only 150°F. As the throttle is opened for higher speeds and 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. Use caution if your EGT approaches **1000°F**, with **1050°F** being the **SAFE MAXIMUM!**

If the vehicle approaches these EGT levels under these conditions, downshift the vehicle to reduce the load, or back off the throttle. If frequent high EGT levels are encountered, the fuel delivery of the injection pump will have to be reduced by backing out the Allen head screw in the injection pump as indicated in the PUMP ADJUSTMENT section.

Exhaust gas temperature in this system is measured "after" the turbocharger in the turbine outlet pipe, as is commonly done on long-haul diesel trucks.

Your boost gauge monitors the air pressure the turbo compressor is delivering to the intake manifold. The Banks Stinger is designed to provide a maximum boost pressure of approximately 12 PSI. This is an average maximum figure which will vary from engine to engine. This maximum figure will be reached only under hard acceleration/heavy load conditions. Light cruise conditions may show little or no boost.

INJECTION PUMP ADJUSTMENT

If your exhaust gas temperature is consistently well below the 1050°F safe maximum under full load conditions (steep uphill towing with maximum load), you may obtain additional performance through an adjustment of the fuel injection pump to provide greater fuel delivery. If the EGT wants to exceed 1050°F, the fuel delivery must be reduced.

The pump adjustment is made by turning an internal Allen screw, found within the pump. Be sure to adjust the pump with the engine and pump cold. In most cases, turning the screw 30° (one half flat of the Allen wrench) clockwise will bring the EGT into the proper range if the EGT is low. Keep in mind that increasing the fuel delivery will also increase the smoke output of the engine. Some states, such as California, have a 40% maximum smoke opacity limit during a snap throttle test. Check the emissions regulations in your state before altering the injection pump setting.

The pump adjustment can easily be set with the pump on the vehicle. If the condition of the pump is in question, or if the pump is to be removed from the vehicle, GALE BANKS ENGINEERING can provide the addresses and phone numbers of qualified Association of Diesel Specialists (ADS) pump service shops.

PUMP ADJUSTMENT PROCEDURE

NOTE: The engine must be COLD before starting this procedure.

NOTE: Utmost cleanliness should be exercised. Do NOT use any rags during the adjustment procedure. The lint from the rag can clog an injector. Lay all parts on clean newspaper during the adjustment procedure.

1. Make sure both battery ground cables are disconnected. Disconnect the wiring from the top of the fuel injection pump cover. Note their location for reassembly.

2. Place a drip pan under the rear of the engine to catch fuel. Clean the upper portion of the pump with diesel fuel or a parts cleaning solvent. See Figures 6 and 7. Do NOT clean the pump while the engine is hot, as doing so may damage the pump.

3. Remove the fuel return line from the pump cover. Remove the top attaching bolt and loosen the lower attaching bolts on the fast idle solenoid and place the solenoid aside. Remove the pump cover bolts and remove the cover. IMPORTANT: Utmost care must be used to prevent damage.

4. Using a syringe or similar means, remove as much diesel fuel as possible from the injector pump housing. This will make it easier to view the Allen-head adjustment screw through the slot in the bottom of the pump housing when it is rotated into position.

5. Rotate the engine slowly by hand, IN A CLOCKWISE DIRECTION ONLY, using a breaker bar, a short extension and a $^{15}/_{16}$" socket on the vibration damper bolt to bring the Allen screw into view in the inspection slot in the bottom of the pump bowl (see Figure 6). *It may be necessary to remove the front crankshaft pulley to gain access to the vibration damper bolt to turn the engine over.* DO NOT ATTEMPT TO ROTATE THE ENGINE WITH THE STARTER. The Allen head screw may be hard to see — a flashlight or shop light may help. The screw will have to be adjusted at an angle from under the guide stud/spring assembly.

6. Using a $^{5}/_{32}$" ball-end style Allen wrench, rotate the Allen screw as indicated earlier. Clockwise increases fuel, counterclockwise decreases fuel.

NOTE: The Allen-screw turns fairly tightly, and is self-locking. Turning the screw clockwise adds fuel. Keep track of your adjustments.

7. Inspect the pump cover to make sure the seal is seated in the cover. Replace if questionable. Fill the pump bowl with clean diesel fuel. Hold the throttle in the idle position. With the bolts removed from the pump cover, position the cover about $^{1}/_{4}$" forward, toward the shaft end, and about $^{1}/_{8}$" above the pump. Guide the cover downward and rearward into position, being careful not to damage the cover seal. Reinstall the bolts with the flat washers against the pump cover.

8. Reconnect battery cables. Turn the ignition switch to the "ON" position, and touch the pink solenoid wire to the solenoid terminal. A clicking noise should be heard. If clicking is heard, proceed to next step. If not heard, the linkage may be jammed in the wide-open position. DO NOT START THE ENGINE!! Remove the pump cover. Ground the solenoid lead (opposite hot terminal on the cover) and connect the pink wire to the cover terminal. With the ignition switch on, the solenoid in the cover should move the linkage. If not, free the linkage or replace the solenoid. Reinstall the cover.

9. Make sure battery cables are disconnected after solenoid test.

10. Reinstall the fuel return line and fast idle solenoid.

11. Purge the air from the system as follows: Remove and fill all filters with clean diesel and reinstall the filters. Detach all fuel supply hoses between the lift pump (fuel pump in the side of the engine) and the injection pump at their highest ends, and fill them with clean diesel fuel using a small funnel. Reattach the hoses.

12. Reconnect batteries. Turn ignition on and, after the glow plug light goes out, crank the engine, again in intervals of 20 to 30 seconds followed by one minute of cooling, until the engine starts. It may not start immediately, due to fuel lost when adjusting the injector pump. It also may be necessary to depress the accelerator pedal somewhat.

13. Run engine at idle for a few minutes, to allow it to warm. Check oil feed lines for leaks. Engine may idle erratically or surge until air is fully purged from fuel system.

14. Drive vehicle. Several short bursts of acceleration are required to completely purge the fuel system of air. The engine may run slightly rough until the purge is complete, but will not in any way cause damage to the engine.

15. If possible, drive vehicle under heavy load conditions and monitor EGT levels. If vehicle wants to exceed 1050°F under heavy load, the pump adjustment must be reduced (Allen screw turned counter-clockwise). Keep track of your adjustments.

FIGURE 6

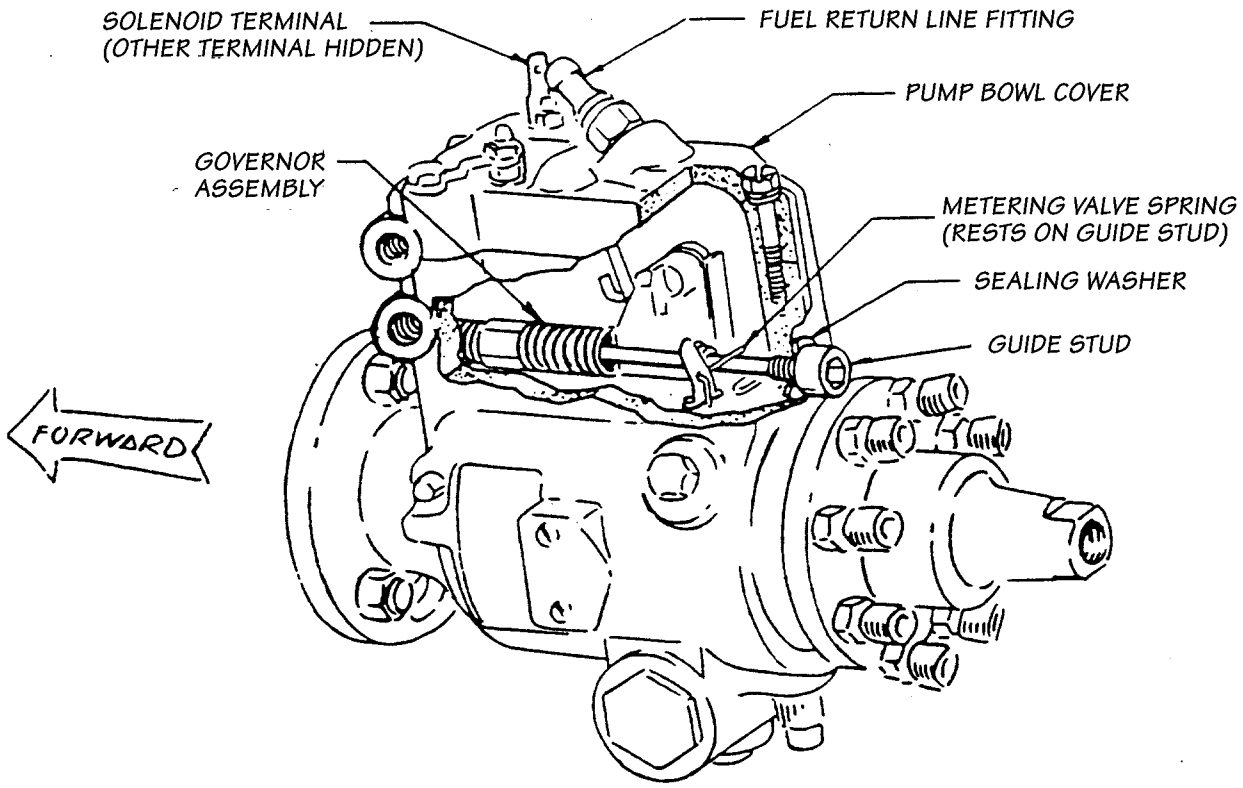
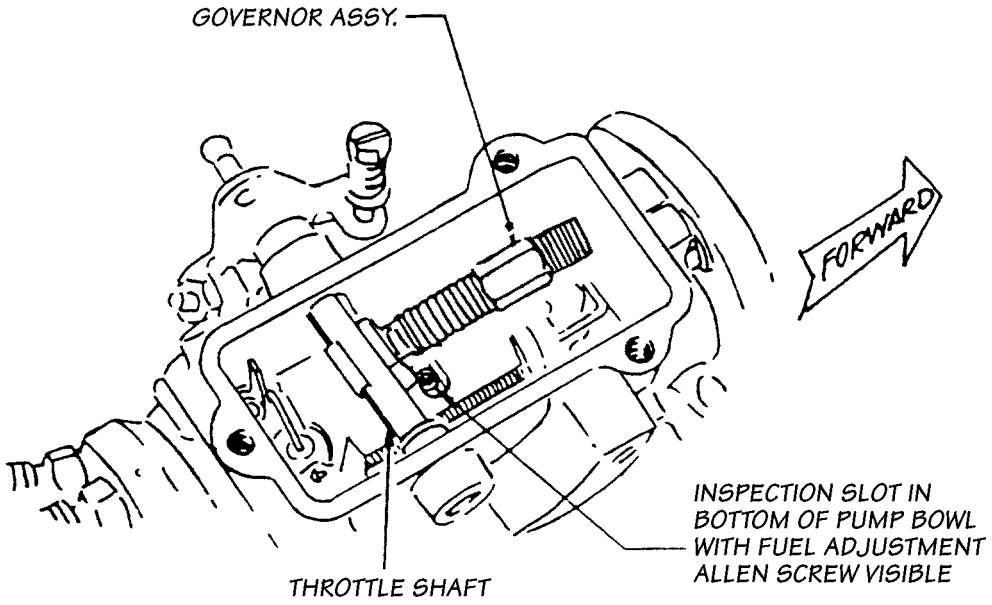
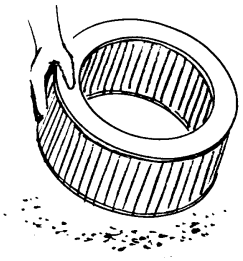


FIGURE 7



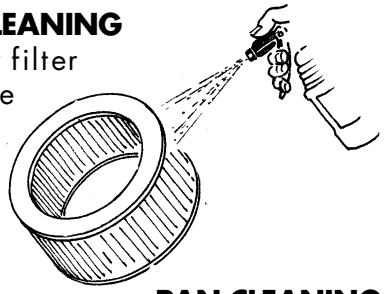
CLEANING AND OILING THE K&N FILTER

1. PRE-CLEANING

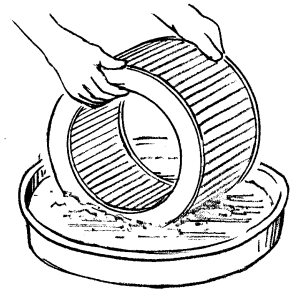


Tap the element to dislodge any large embedded dirt, then gently brush with a soft bristle brush. *NOTE: If complete cleaning is not practical at this time, re-oil the element and re-install in your vehicle.*

2. SPRAY-ON CLEANING



Spray K&N air filter cleaner liberally onto the entire element and let soak for 10 minutes.



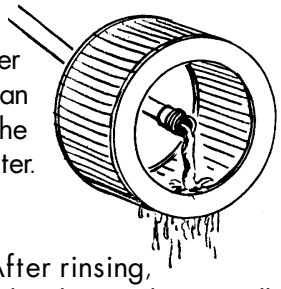
PAN CLEANING

Large K&N elements can be rolled or soaked in a shallow pan of K&N air filter cleaner. Remove immediately and let soak for approximately 10 minutes.

3. CLEANING HINTS

Use only K&N air filter cleaner. NO gasoline cleaning, NO steam cleaning, NO caustic cleaning solutions, NO strong detergents, NO high pressure car wash, NO parts cleaning solvents. Any of these NOs can cause harm to the cotton filter media plus SHRINK and HARDEN the rubber end caps.

4. RINSE OFF

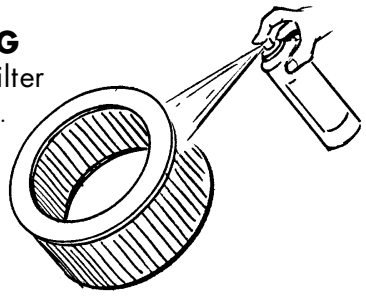


Rinse off the element with low pressure water. Tap water is okay. Always flush from the clean side to dirty side. This removes the dirt and does not drive it into the filter.

5. DRYING HINTS

Always dry naturally. After rinsing, shake off all excess water and let the element dry naturally. DO NOT USE COMPRESSED AIR – DO NOT USE OPEN FLAME – DO NOT USE HEAT DRYERS!
EXCESS HEAT WILL SHRINK THE COTTON FILTER MEDIA. COMPRESSED AIR WILL BLOW HOLES IN THE ELEMENT.

6. AEROSOL OILING



After cleaning air filter always re-oil before using. Spray K&N air filter oil down into each pleat with one pass per pleat. Wait 10 minutes and re-oil any white spots still showing.

7. OILING HINTS

Never use a K&N air filter without oil (the filter will not stop the dirt without the oil). Use only K&N formulated air filter oil. K&N air filter oil is a compound of mineral and animal oil blended with special polymers to form a very efficient tack barrier. Red dye is added to show just where you have applied the oil. Eventually the red color will fade but the oil will remain and filter the air. NEVER USE Automatic Transmission Fluid. NEVER USE Motor Oil. NEVER USE Diesel Fuel. NEVER USE WD40, LPS, or other light weight oils.

8. REINSTALL

Reinstall your K&N air filter element with proper care. Make sure the element seats properly in the filter case. Install the cover making sure it's in the right position. Tighten all the nuts, bolts, screws or clips to factory specifications.

9. DO NOT DISCARD

Affix the "Do Not Discard" sticker to the filter case (included with every K&N replacement element). Make sure you put the sticker in a highly visible place to alert your mechanic not to discard.

10. PERFORMANCE HINTS

Service every 50-100,000 miles on street driven applications. Service more often in offroad or heavy dust conditions or when air filter reaches 18" of restrictions. Let the dirt "build-up" work for you; it will not hurt the performance and actually helps filter the air.

CAUTION! Extreme fine dust – agriculture or offroad use – will pull the oil from the element. Frequent reoiling of the element's clean side might be required. Completely service when practicable. For extra protection use K&N sealing grease on rubber ends of the element. Service only with K&N air filter cleaner and K&N air filter oil.

PARTS LIST

Stinger System, GM 6.5, Standard Cab.

QTY.	DESCRIPTION	STANDARD CAB 49025 PART#	EXTENDED/ CREW CAB 49046 PART#
1	BOLT, 5/16" 24 x 3/4"	91252	91252
1	CARD, Product Registration	96392	96392
1	CLAMP, Hanger, 3 1/2"	52090	52090
2	CLAMP, Exhaust, 3" Heavy Duty	52465	52465
1	CLAMP, Exhaust, 3 1/2" Heavy Duty	52467	52467
1	DUCT, Super-Scoop Air Inlet	42590	42590
1	FASTENER, Push-In	92015	92015
1	FILTER ELEMENT, Banks Ram-Air	41022	41022
1	GASKET, Air Inlet Casting	93024	93024
1	GAUGE, Boost, 0-15 PSI	63021	63021
1	KIT, Boost Gauge Installation	63032	63032
1	KIT, Pyrometer Gauge	64001	64001
1	LEVER, High Boost, Wastegate	24375	24375
1	MOUNTING PANEL, 2-Gauge w/ Fasteners, Black	63002	63002
1	MUFFLER, 3" x 3 1/2"	52407	52407
1	NUT, 5/16" 24 Flexlock, Thin	91217	91217
1	OWNERS MANUAL	96299	96299
1	PIPE, Intermediate, Extension	•	52049
1	PIPE, 3" Intermediate	52048	52048
1	PIPE, 3 1/2" Monster Tailpipe	52072	52072
1	PIPE, Tailpipe Tip, Chrome	52281	52281
1	PIPE, Turbine Outlet, 3"	52012	52012
2	PLAQUE, Banks PowerPack	96008	96008
1	SERVICE KIT, Air Filter	90094	90094
1	SPACER, High Boost Lever	24376	24376
10	TIE, Cable, 11" Black	62002	62002
1	WARRANTY STATEMENT	96362	96362
1	WASHER, 5/16" AN, Stainless Steel	91201	91201