

# OWNER'S MANUAL

...with installation instructions

## Banks Brake<sup>®</sup>

### EXHAUST BRAKE SYSTEM

2003-Early 2004 Dodge 5.9L  
Cummins ISB Pickup Trucks

THIS MANUAL IS FOR USE WITH SYSTEMS 55222, 55223 & 55224

Gale Banks Engineering  
546 Duggan Avenue • Azusa, CA 91702  
(626) 969-9600 • Fax (626) 334-1743

Product Information & Sales: (888) 635-4565  
Customer Support: (888) 839-5600  
Installation Support: (888) 839-2700



# Also Available from Banks Power

03-07 Dodge 5.9L



## **Banks iQ System (P/N 61148-61149)**

- 5" touchscreen interface that can control the Banks Diesel Tuner on the fly.
- Interchangeable gauge display, read and clear codes, monitor engine diagnostics, log data, time your vehicles runs and much more.

## **Banks Monster® Exhaust System**

**Single (P/N 48640-48643, 48700, 48701, 48708)**

**Duals (P/N 48702-48707, 48709)**

**Sport (P/N 48777-48780)**

- Increases exhaust flow, cuts backpressure, lowers exhaust gas temperatures (EGTs) and increases power.

## **Banks Monster-Ram (P/N 42765-42766)**

- Increased flow from intercooler
- Raises boost without increasing backpressure at the turbine

## **Big Hoss Intake Manifold System (P/N 42747)**

- Increases flow and provides more uniform air distribution to the engine for more available power at a given boost level.

## **Banks Ram-Air Intake System (P/N 42145)**

- Increases your airflow over stock.
- Adds power, improves fuel economy, lowers EGTs and reduces smoke.

## **Banks Ram-Air Intake Super-Scoop (P/N 42190-42191)**

- Adds cooler denser air to the Ram-Air Intake housing, further increasing fuel economy, reducing smoke and lowers EGTs.

## **Boost and Pyro Gauges (P/N 64507)**

- Keep your engine safe by monitoring vital engine parameters.

## **Banks Techni-Cooler® System (P/N 25980-25981)**

- Provides increased air flow to the engine by increasing air density for more increased power, lower EGTs and improved fuel economy.

## **Banks SmartLock (P/N 55270)**

- Reduces wear on transmission
- Locks Torque Converter and raises trans-line pressure
- Works with Banks Exhaust Brake

## **Banks Billet Torque Converter (P/N 72515)**

- Higher torque capacity over stock
- Lockup clutch is slip-resistant so transmission fluids stay cooler and transmission life is prolonged.

**Banks Bullet  
(P/N 66522-66523)**

- Adds power safely to your vehicle
- Displays critical engine functions
- Engine safeguards
- Change power levels on-the-fly

**Banks Diesel Tuner  
EconoMind w/switch (P/N 63725, 63793, 63795, 64507)  
EconoMind w/iQ (P/N 63807, 63808, 63817, 63818)  
Six-Gun w/switch (P/N 61022, 63797)  
Six-Gun w/iQ (P/N 63809, 63819)**

- Adds power safely to your vehicle
- Engine and transmission safeguards
- Change power levels on-the-fly

**Thermocouple**

- Add a temperature limiting function to your Diesel Tuner .

**Banks Speed-Loader  
(P/N 62981)**

- Furthers the power output of the Banks Six-Gun and provides EGT limiting safety.

**Banks BigHead® Actuator  
(P/N 24331)**

- Achieves a higher peak boost over stock and gives you precise boost control that gives you crisp acceleration and more mid-range pulling power.

**Banks Stinger Systems  
(P/N 49692-49699, 49708-49711, 49716-49721)**

**Contains:**

- Ram-Air Intake system
- Monster Exhaust (single or dual)
- EconoMind Tuner w/ Banks iQ
- Big Head Wastegate Actuator

**Banks PowerPack Systems  
(P/N 49700-49707, 49712-49715, 49722-49727)**

**Contains:**

- Ram-Air Intake system
- Monster Exhaust (single or dual)
- EconoMind Tuner w/ Banks iQ
- Big Head Wastegate Actuator
- Monster-Ram
- Techni-Cooler System

**Banks Six-Gun Bundle  
(P/N 49728-49735, 49744-49747, 49752-49757)**

**Contains:**

- Ram-Air Intake system
- Monster Exhaust (single or dual)
- Six-Gun Tuner w/ Banks iQ
- Big Head Wastegate Actuator

**Banks Big Hoss Bundle  
(P/N 49736-49743, 49748-49751, 49758-49763)**

**Contains:**

- Ram-Air Intake system
- Monster Exhaust (single or dual)
- Six-Gun Tuner w/ Banks iQ
- Big Head Wastegate Actuator
- Monster-Ram
- Techni-Cooler System

**For More Information please call (888) 635-4565  
or Visit us online @ [www.bankspower.com](http://www.bankspower.com)**

## General Installation Practices

Dear Customer,

Your new Banks Brake is a uniquely designed exhaust brake with electronic controls, designed to achieve the optimum level of braking from your vehicle's engine.

If you have any questions concerning the installation of your Banks Exhaust Brake, 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.

1. For ease of installation of your Banks Brake, please read this 24-page Owner's Manual before starting any work. Become thoroughly familiar with all components and phases of the installation before beginning any work.

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

3. 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.

4. Pay particular attention to the routing of wires. Keep them away from exhaust heat, moving parts and sharp edges that may cause 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.

**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.

## WARNING!

For trucks with automatic transmissions, it is highly recommended that the Banks Brake be used with the Banks SmartLock for optimal braking performance.

**DO NOT** install the Banks SmartLock if either one of the following applies:

- 1) The Powertrain Control Module (PCM) is not located on the passenger side firewall behind the battery.
- 2) The engine is a high-output (325-hp rated) engine.

## Tools Required:

- ½" and ¾" drive ratchets with inch and metric sockets and ½" and ¾" drive extension
- Inch and metric combination or open-end wrenches
- Standard screwdriver
- Clean shop towels or rags
- Reciprocating saw
- Utility knife
- Electric drill
- Wire clipper



# Air Compressor Panel and Wire Harness Installation

## WARNING!

For trucks with automatic transmissions, it is highly recommended that the Banks Brake be used with the Banks SmartLock for optimal braking performance

DO NOT install the Banks SmartLock if either one of the following applies:

- 1) The PCM is not located on the passenger side firewall behind the battery.
- 2) The engine is a high-output (325-hp rated) engines.

**1.** As a precaution, disconnect the ground of the battery (if there is more than one battery, disconnect both grounds).

**2.** Raise the front of the vehicle and support it with properly weight rated safety stands, ramps or a commercial hoist. Follow the manufacturer's safety precautions. Take care to support the vehicle to prevent it from slipping or falling. When using ramps, be sure the front wheels are centered squarely on the topsides; place transmission in park; set the parking brake and place blocks behind the rear wheels.

**3.** Remove the front tire on the driver side. Remove the front wheelhouse splash shield on the driver side by removing eight (8) screws (8mm head). Detach the ABS wire that is clipped on the

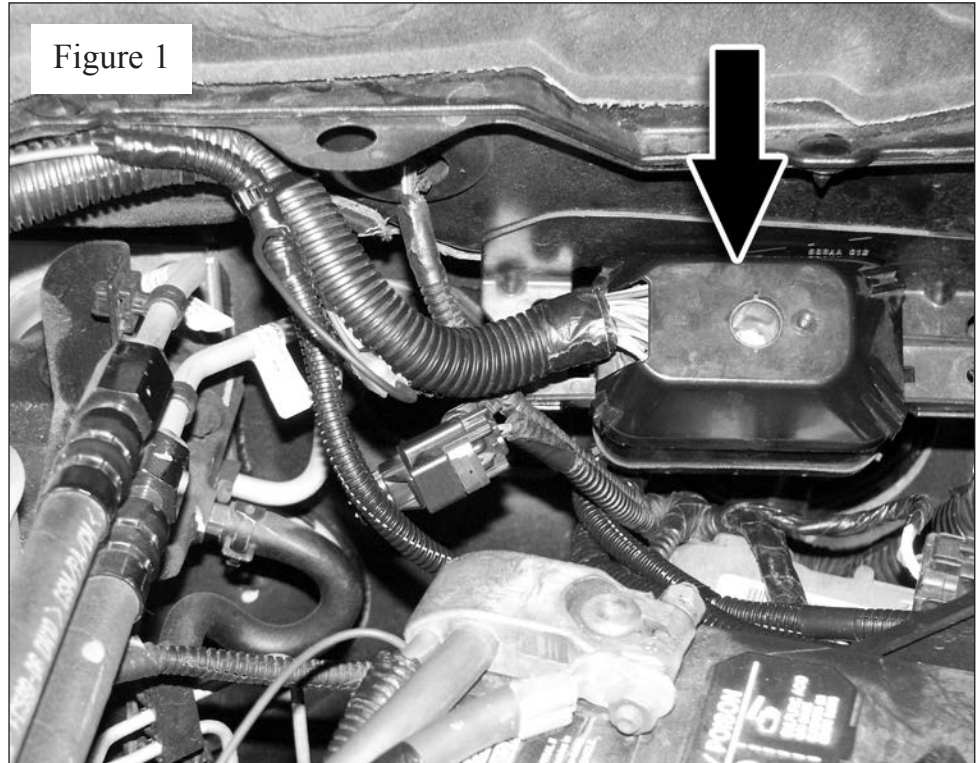
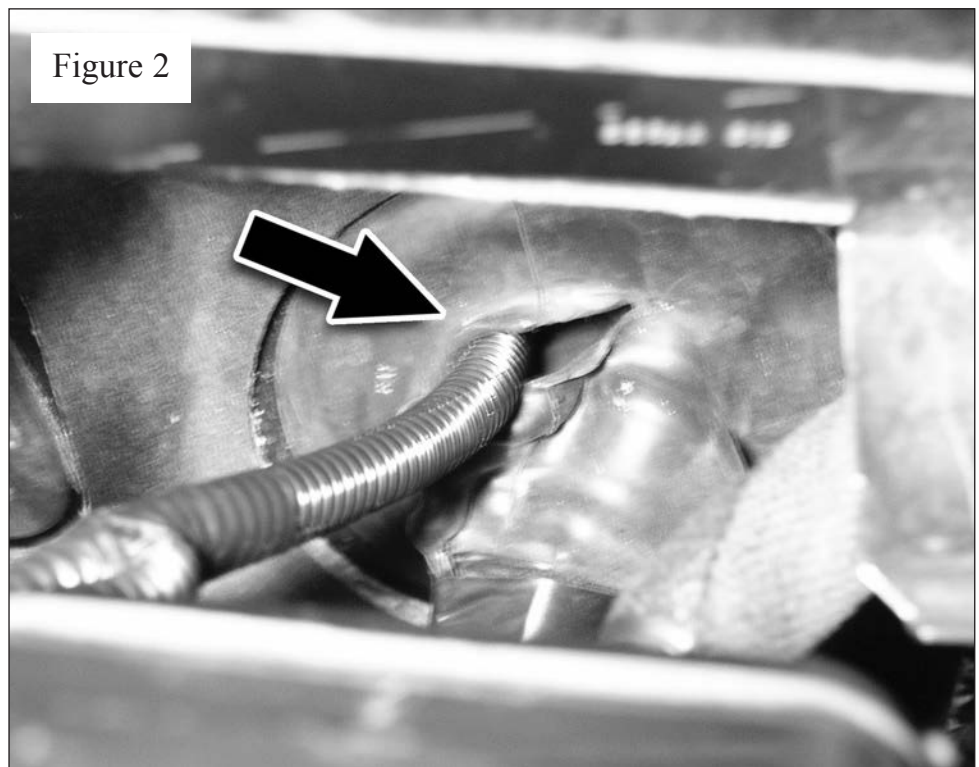


Figure 1



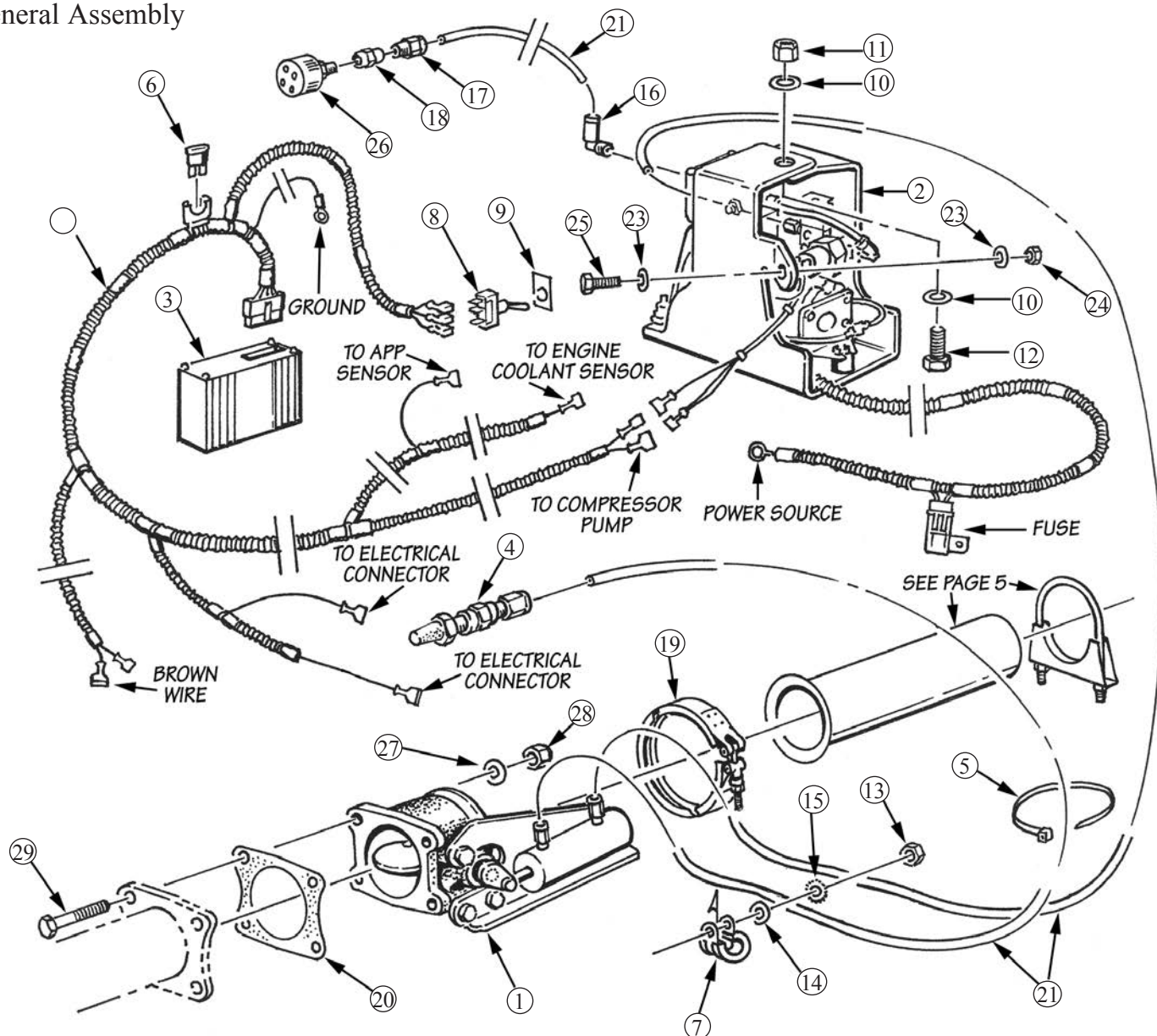
splash shield before completely removing the shield to avoid damage to the wire.

**4.** For 2003 vehicles only: Locate

the large black electrical connector on the driver's side between the battery and the firewall. See

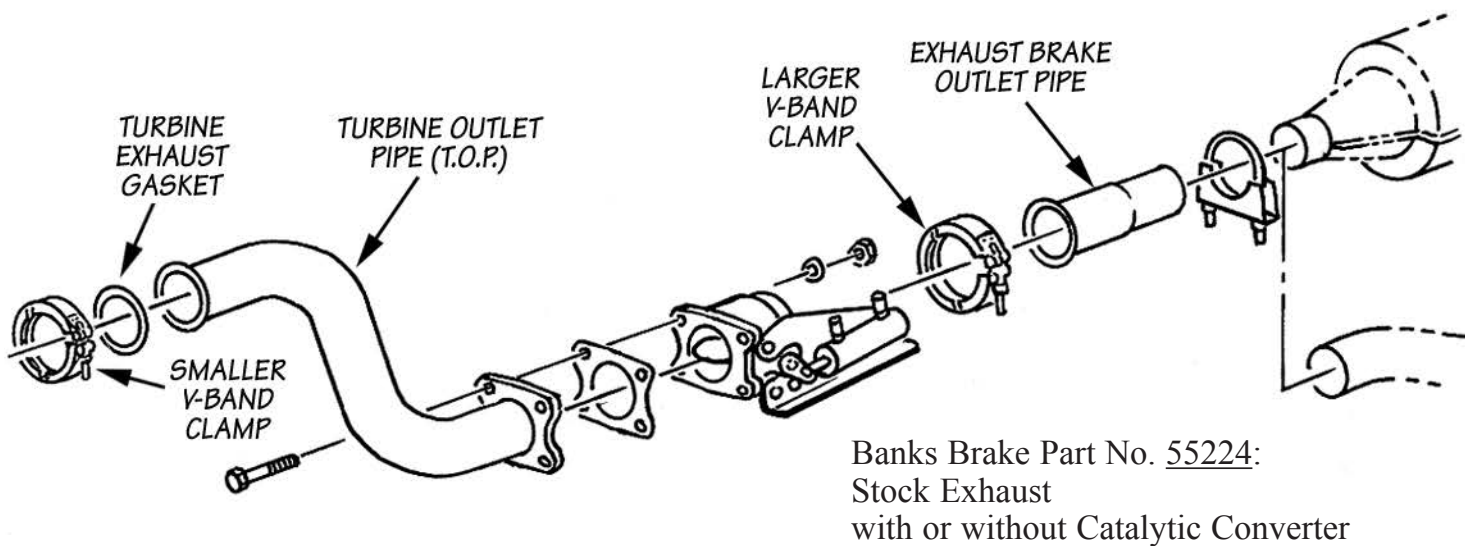
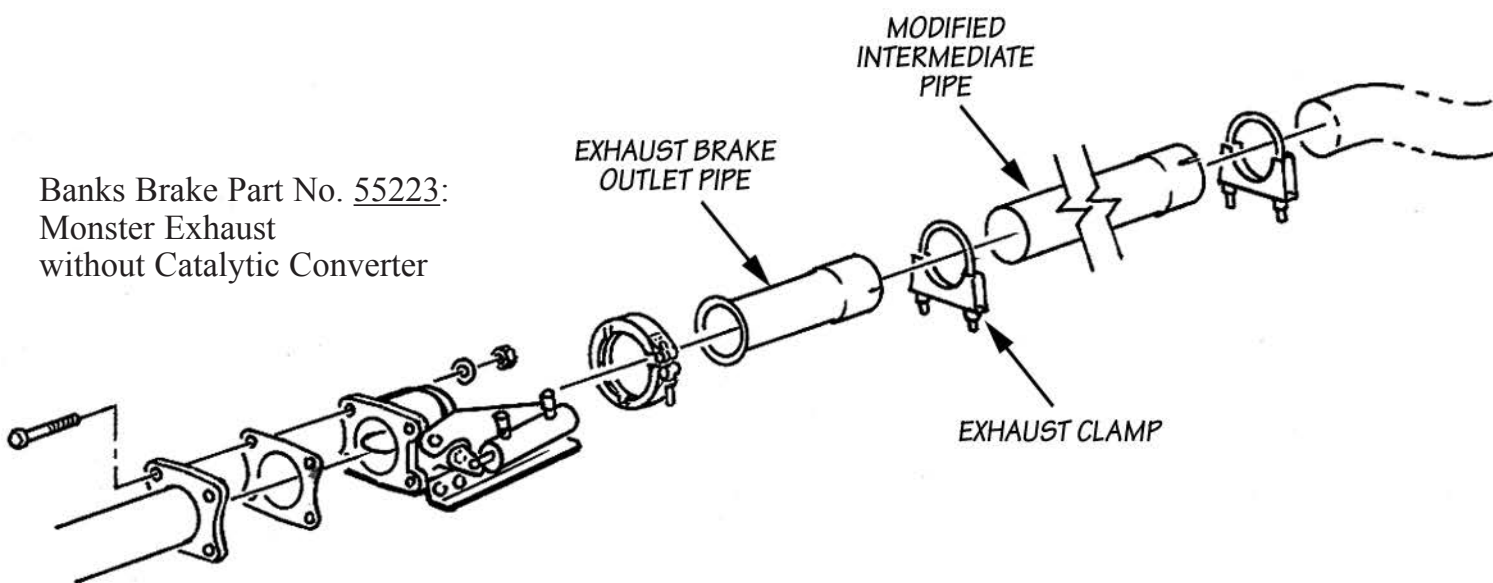
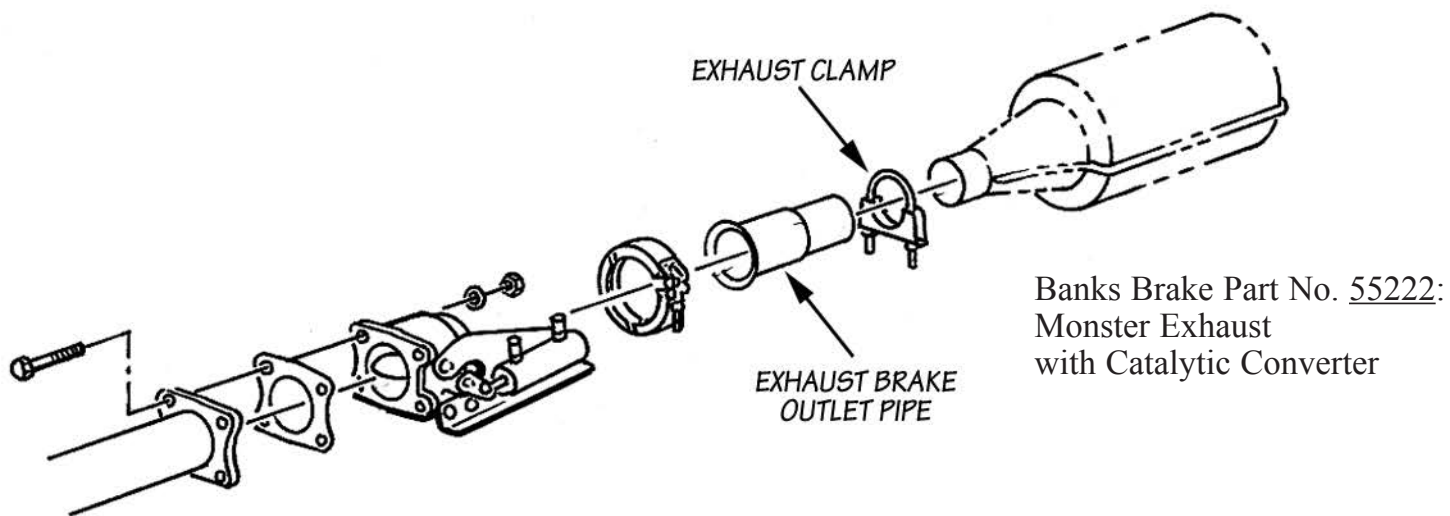
**Figure 1.** Remove the two (2)

## General Assembly



No	Description	16	Fitting, Push Lock, 90 degree	Not Shown:	
1	Assembly, Brake Housing	17	Fitting, Push Lock, straight	30	Connector, Female Spade (2)
2	Compressor Panel			31	Connector, Male Spade
3	Computerized Brake Control	18	Coupler, 1/8" x 1/8" Female	32	Wire Extension
		19	Clamp, V-Band*	33	Connector, Bypass, CBC
4	Breather assembly	20	Gasket, Exhaust Flange	34	Connector, Tee-tap, red (4)
5	Cable Ties, 7" (19)	21	Hose, Pressure	35	Urocals, Banks Power (2)
6	Fuse, 2 amp	22	Wire Harness	36	Product Registration Card
7	Cable Clamp, 1/4" x 1/4" (15)	23	Washer, 5/16" SAE(2)	37	Warranty Statement
		24	Nut, Crimplock 5/16" -18	38	Owner's Manual
8	Switch, Power	25	Hex Bolt, 5/16" -18 x 3/4"		
9	Plate, Power Switch	26	Filter, Compressor Pump		
10	Washer, 1/2" AN (2)	27	Washer, 7/16" AN		
11	Nylock Nut, 1/2" -20		(for 55224 only)		
12	Hex Bolt, 1/2" -20 x 1"	28	Crimplock Nut, 7/16" - 20		
13	Nut, 6mm x 1mm (3)		(for 55224 only)		*Kit 55224 contains (2) clamps
14	Washer, 1/4" AN (3)	29	Hex Bolt, 7/16" - 20 x 1 1/2"		
15	Ext. Tooth Lock, 1/4" (3)		(for 55224 only)		

\* Kit 55224 contains (2) clamps





plastic screws on the sides of the connector and move the connector aside. Retain the two (2) screws and the two (2) retainers for re-installation.

**5.** Locate the rubber grommet on the driver's side firewall below the connector that was just removed. Using a utility knife, make a 1½"-long slit in the grommet above the wire harness. Be careful not to cut or damage the harness. See **Figure 2** for the proper location of the required cut. Insert a screw driver from the engine compartment into the cut hole and push it through the grommet such that the internal insulation is pierced.

**6.** Inside the vehicle, remove the lower dash panel by removing the two (2) screws along the sides of the panel. Retain the screws for re-installation.

NOTE: There are also two (2) clips located at the top corners of the panel, which hold the panel in place. These clips can be released by gently pulling on the corners of the panel. Use caution to avoid damaging the panel during removal.

**7.** Remove the electric connector bracket on the left hand side of the support below the steering column in front of the firewall by removing the two (2) bolts. This will gain access to the inner grommet. See **Figure 3A**.

**8.** Cut the grommet on the firewall inside the vehicle along the hole created by the screw driver in **Step 5**.

Figure 3A

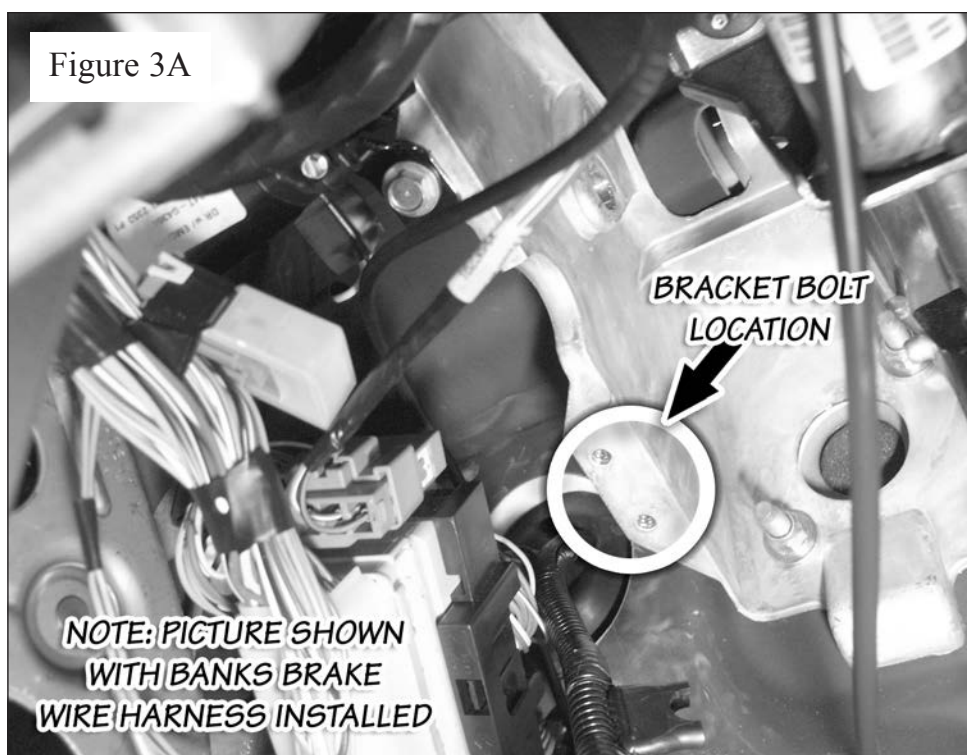
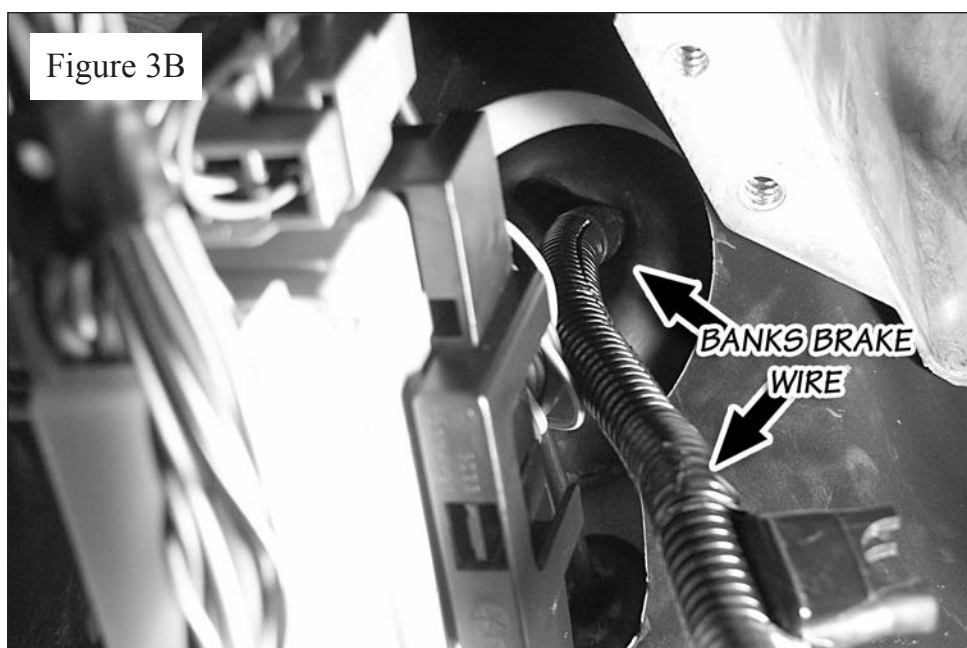


Figure 3B



**9.** Locate the 14-pin connector on Banks Brake wire harness. From the engine compartment, push it through the hole cut in the grommet through the firewall. See **Figure 3B**.

NOTE: Taping the end of the harness to a piece of stiff wire (i.e. coat hanger) may make routing the harness through the

firewall a simpler task. The stiff wire should be pushed through the slit in the grommet and then the wires can be attached to the stiff wire and pulled through the hole in the firewall.

CAUTION: Pull gently to avoid damage to the wire harness connectors. Always pull on the wire harness convolute sheath



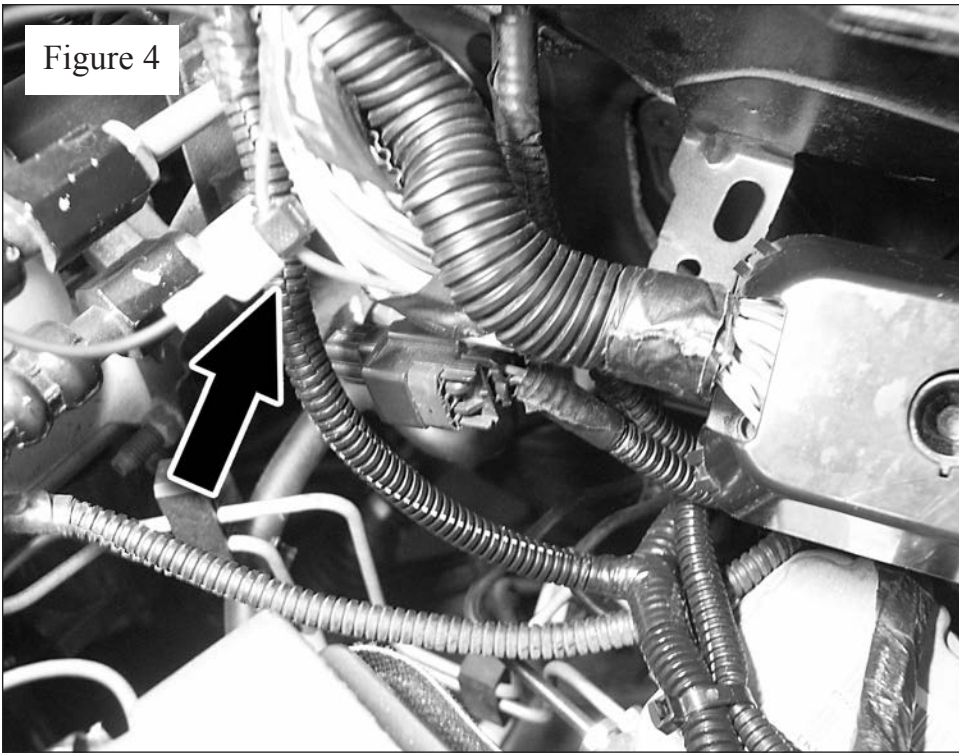


Figure 4

rather than the wires themselves.

**10.** From inside the vehicle, continue to pull the harness through the firewall until 18" of the wire harness comes through.

NOTE: The Banks Brake wire harness installations are different with different vehicle years and transmission types. Refer to **TABLE 1** at bottom of **page 7** for the specific instruction on your particular model year and transmission type. See Wire Connection Reference on **page 23** for more details.

## For 2003 Vehicles with Automatic Transmissions

**11.** Locate the WHITE wire with ORANGE stripe in the wire loom entering the large black electrical connector on the driver side. This is the same connector removed in Step 4. Install a T-tap on this WHITE wire with ORANGE stripe. Plug the Banks Brake ORANGE wire into this T-Tap. See **Figure 4**.

**12.** Locate the solid RED wire in the same wire loom that enters the large black electrical connector. Install a T-tap on the RED wire. Plug the Banks Brake BLACK wire that is in the same convolute as the ORANGE wire into this T-tap.

**13.** Use the nylon ties to tie the two (2) BROWN Banks Brake wires to the BLACK and GREEN wire pair convolute (the BROWN wires are not applicable

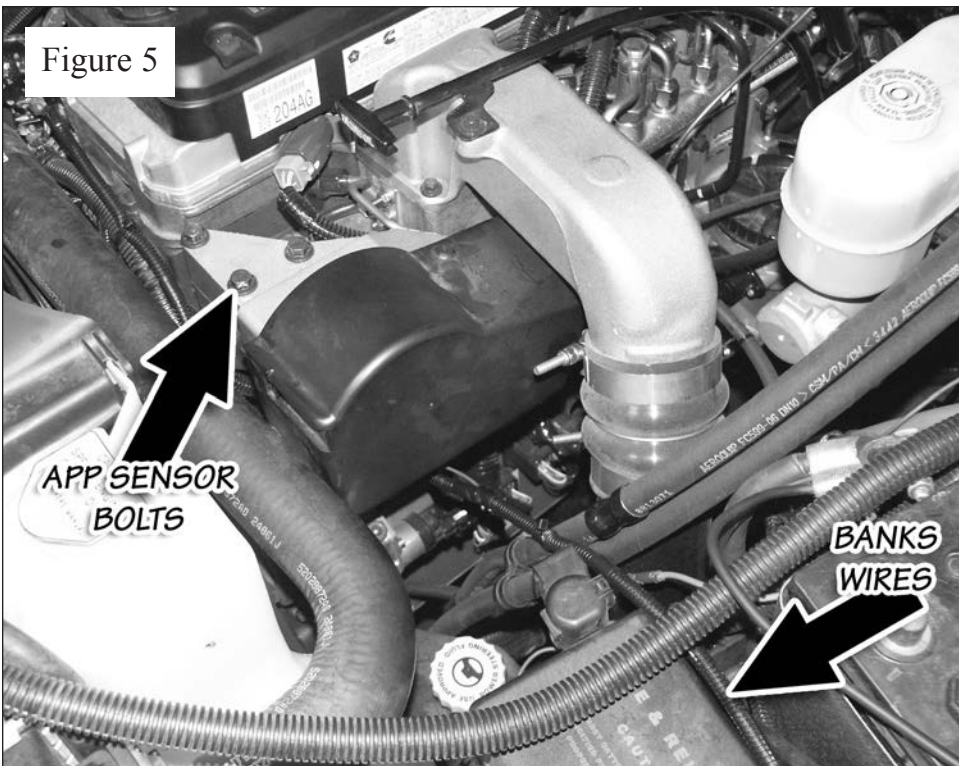


Figure 5

Table 1: Installation Procedures for Different Model Year and Transmission Type

No.	Model Year	Transmission Type	Steps
1	2003	Automatic	11 to 16
2	2003	Manual	17 to 22
3	2004	Automatic	23 to 28
4	2004	Manual	29 to 34

on vehicles with automatic transmissions).

**14.** Route the Banks Brake GRAY and BLUE wires behind the battery box on the driver side along the fender with the factory harness. They should come around between the battery and the fuse box toward the engine block. See **Figure 5**. Shorten the BLUE wire by 10" and install a male spade connector.

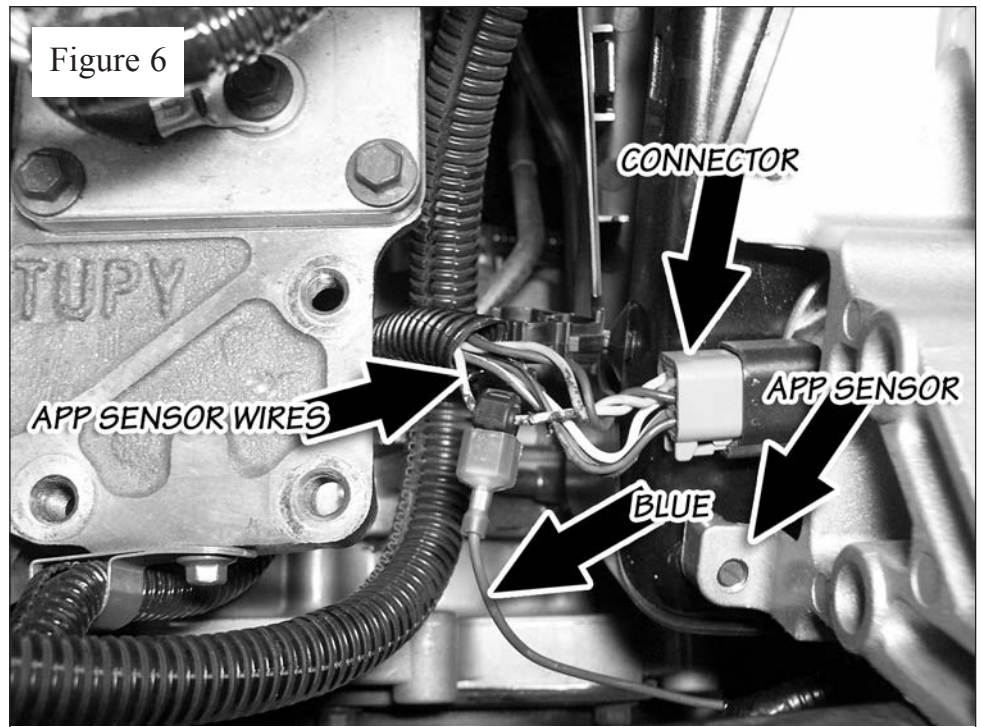
**For APP sensors mounted on the engine proceed to step 15.**

**For APP sensor located beneath the fuse box above the tire proceed to step 16.**

**15.** Remove and keep the three (3) bolts that mount the accelerator pedal position (APP) sensor to the engine. Turn the APP sensor to its side and locate the YELLOW wire on the electrical connector. Install a T-tap and plug the BLUE Banks Brake wire into it. See **Figure 6**. Re-install the APP sensor with the three (3) bolts. **Skip to Step 31.**

**16.** Route the BLUE wire toward the bottom of the fuse box. The accelerator pedal position (APP) sensor is located beneath the fuse box above the tire. Locate the WHITE wire with DARK GREEN stripe on the wire loom going into the APP sensor. Install a T-tap into this wire and plug the BLUE Banks wire into it. See **Figure 7**.

Note: On some early 2003 vehicles, the WHITE wire on the APP Sensor shall be used. **Skip to Step 31.**



## For 2003 Vehicles with Manual Transmissions

**17.** Find the WHITE wire with ORANGE stripe in the wire loom entering the large black electrical connector on the driver side. This is the same connector removed in **Step 4**. Open the convolute and remove the electrical wire tape around the wire loom. Install a T-tap on the WHITE wire with ORANGE stripe. Plug the Banks Brake ORANGE wire into it. See **Figure 4**.

**WARNING:** There are a few WHITE wires with different color stripes in close proximity and may easily be mistaken for the right lead. Be sure to pick the correct wires as described.

**18.** In the same wire loom, locate the LIGHT GREEN wire with

BLACK stripe and install a T-tap. Plug the Banks Brake BLACK wire to it.

**19.** In the same wire loom, find the YELLOW wire with RED stripe. Cut the wire and crimp a female spade connector on one end of the cut wires and a male spade connector on the other end. (It does not matter which connector goes on which wire.) Connect the two Banks BROWN wires from the harness to these spade connectors.

**20.** Route the Banks Brake GRAY and BLUE wires behind the battery box on the driver's side along the fender with the factory harness. They should come around between the battery and the fuse box toward the engine block. See **Figure 5**. Install a spade on the BLUE wire.

**For APP sensor mounted on the engine proceed to step 22.**



Figure 7

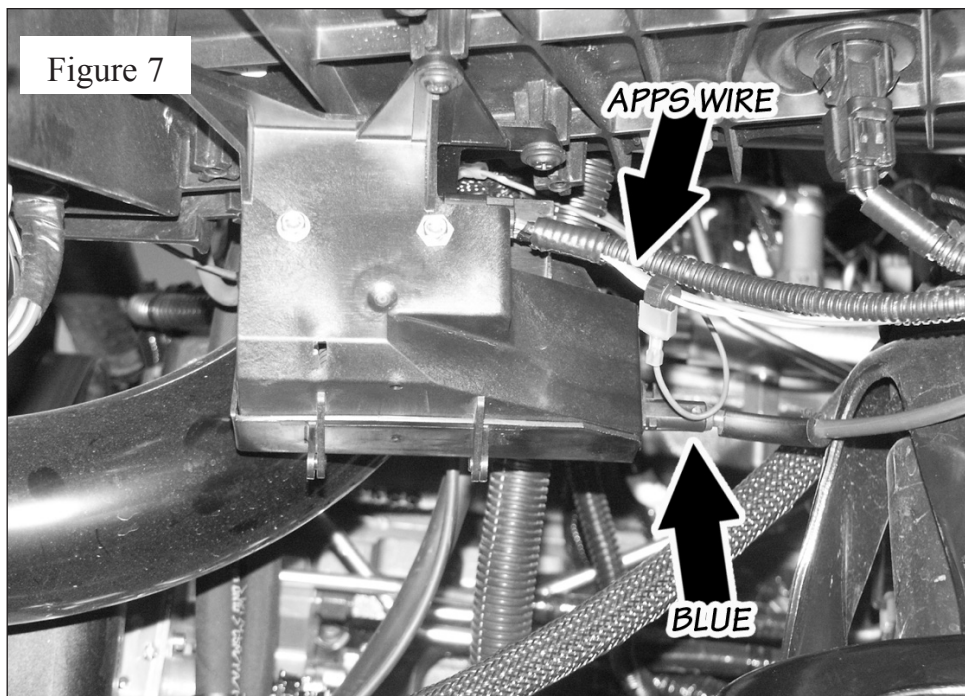
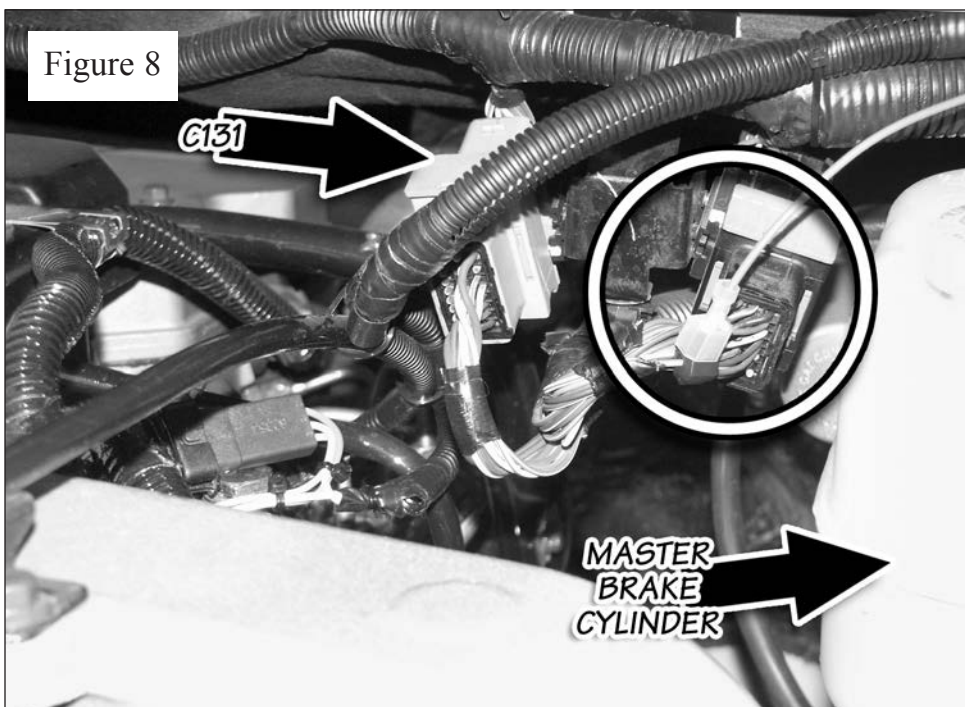


Figure 8



**For APP sensor located beneath the fuse box above the tire proceed to step 21.**

**21.** Route the BLUE wire toward the bottom of the fuse box. The accelerator pedal position (APP) sensor is located beneath the fuse box above the tire. Locate the WHITE wire with DARK GREEN stripe on the wire loom going into the APP sensor. Install a T-tap

into this wire and plug the BLUE Banks wire into it. See **Figure 7**. Note: On some early 2003 vehicles, the WHITE wire on the APP Sensor shall be used. **Skip to Step 35.**

**22.** Remove and keep the three (3) bolts that mount the accelerator pedal position (APP) sensor to the engine. Turn the APP sensor to its side and locate the YELLOW wire

on the electrical connector. Install a T-tap and plug the BLUE Banks Brake wire into it. See **Figure 6**. Re-install the APP sensor with the three (3) bolts. **Skip to Step 35.**

## For 2004 Vehicles with Automatic Transmissions

**WARNING!** For trucks with automatic transmissions, it is highly recommended that the Banks Brake be used with the Banks SmartLock. Not doing so will result in poor exhaust brake performance.

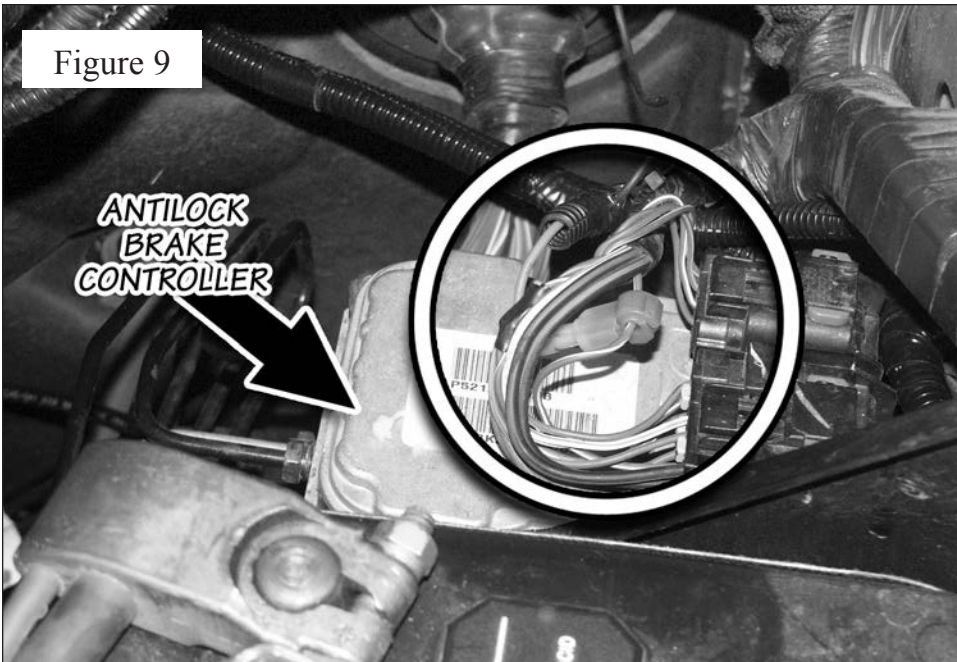
DO NOT install the Banks SmartLock if either one of the following applies:

- 1) The PCM is not located on the passenger side firewall behind the battery. The Banks SmartLock is only designed to work with PCMs that are located on the passenger side firewall behind the battery.
- 2) The engine is a high-output (325-hp rated) engines.

**23.** In the engine compartment, locate the C130 electrical connector. It is the purple and black connector closest to the main brake cylinder. See **Figure 8**. Find the YELLOW wire with ORANGE stripe and install a T-tap. Note: It may require removing the factory electrical tape. Locate the BLACK Banks Brake wire that has an ORANGE wire emerging from the bottom of its convolute. Install this Banks Brake BLACK wire into the T-tap.



Figure 9



along the fender with the factory harness.

They should come around between the battery and the fuse box toward the engine block. See **Figure 5**. Shorten the BLUE wire by 10" and install a male spade connector.

**For APP sensor mounted on the engine proceed to step 27.**

**For APP sensor located beneath the fuse box above the tire proceed to step 28.**

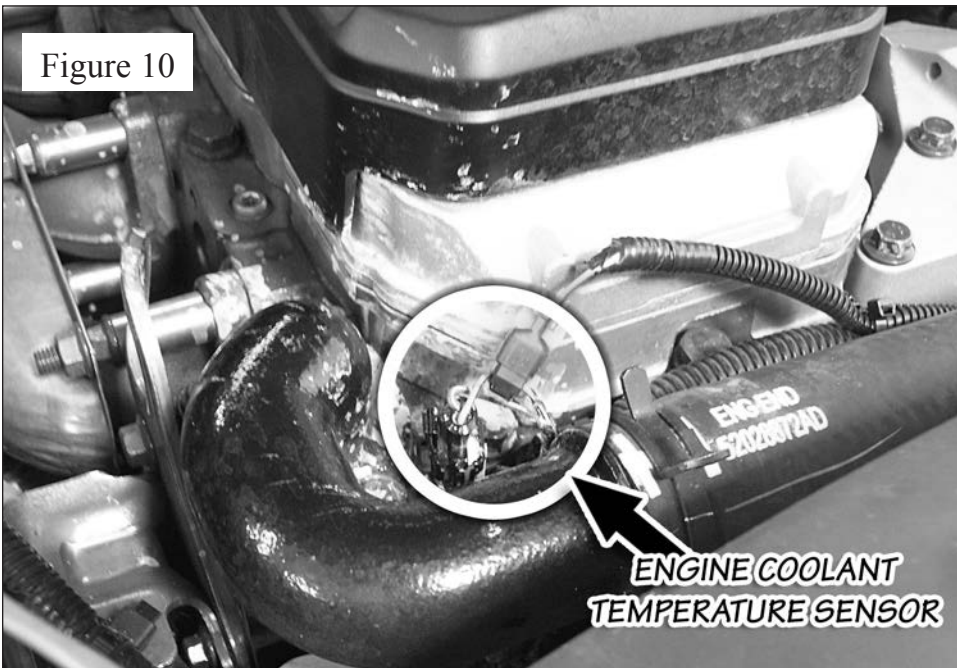
**27.** Remove and keep the three (3) bolts that mount the accelerator pedal position (APP) sensor to the engine. Turn the APP sensor to its side and locate the BROWN wire with WHITE stripe on the electrical connector. Install a T-tap and plug the Banks Brake BLUE wire into it. Refer to **Figure 6**. Re-install the APP sensor with the three bolts. **Proceed to Step 35.**

**28.** Route the BLUE wire toward the bottom of the fuse box. The accelerator pedal position (APP) sensor is located beneath the fuse box above the tire. Locate the BROWN wire with WHITE stripe on the wire loom going into the APP sensor. Install a T-tap into this wire and plug the BLUE Banks wire into it. See **Figure 7**. **Proceed to Step 35.**

## For 2004 Vehicles with Manual Transmissions

**29.** In the engine compartment, locate the C130 electrical connector. It is the purple and black connector closest to the

Figure 10



**24.** Locate the Antilock Brake Controller next to the battery on the driver side. See **Figure 9**. Find the DARK GREEN wire with YELLOW stripe entering the connector that is closest to the battery. Install a T-tap on this wire. Find the Banks Brake ORANGE wire that emerges from the BLACK wire convolute (the same one mentioned in **Step 21**). Plug the ORANGE wire into the

T-tap.

**25.** Use the nylon ties to tie the two (2) BROWN Banks Brake wires to the BLACK and GREEN wire pair convolute (the BROWN wires are not applicable on vehicles with automatic transmissions).

**26.** Route the Banks Brake GRAY and BLUE wires behind the battery box on the driver side

main brake cylinder. See **Figure 8**. Find the PINK wire with GRAY stripe and install a T-tap. Note: It may require removing the factory electrical tape. Locate the BLACK Banks brake wire that has an ORANGE wire emerging from the bottom of its convolute. Install this Banks Brake BLACK wire into this T-Tap.

**30.** Locate the Antilock Brake Controller next to the battery on the driver side. See **Figure 9**. Find the DARK GREEN wire with YELLOW stripe entering the connector that is closest to the battery. Install a T-tap on the wire. Find the Banks Brake ORANGE wire that emerges from the BLACK wire convolute (the same one mentioned in **Step 29**). Plug the ORANGE wire into the T-Tap.

**31.** Locate the BROWN Banks Brake wires on the harness. Insert the 16" extension wires onto each terminal. Find the C131 connector in the engine compartment. It is the purple and gray connector near the master brake cylinder. See **Figure 8**. Locate the VIOLET wire with YELLOW stripe. Cut the wire and crimp a female spade connector on one end of the cut wires and a male spade connector on the other end. (It does not matter which connector goes on which wire.) Connect the two BROWN Banks wires into these spade connectors. Secure the BROWN wires with the supplied cable ties.

**32.** Route the Banks Brake GRAY and BLUE wires behind the battery box on the driver side

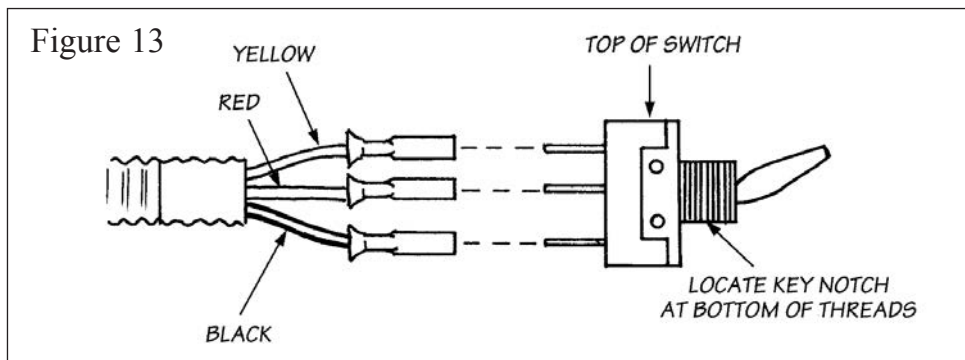
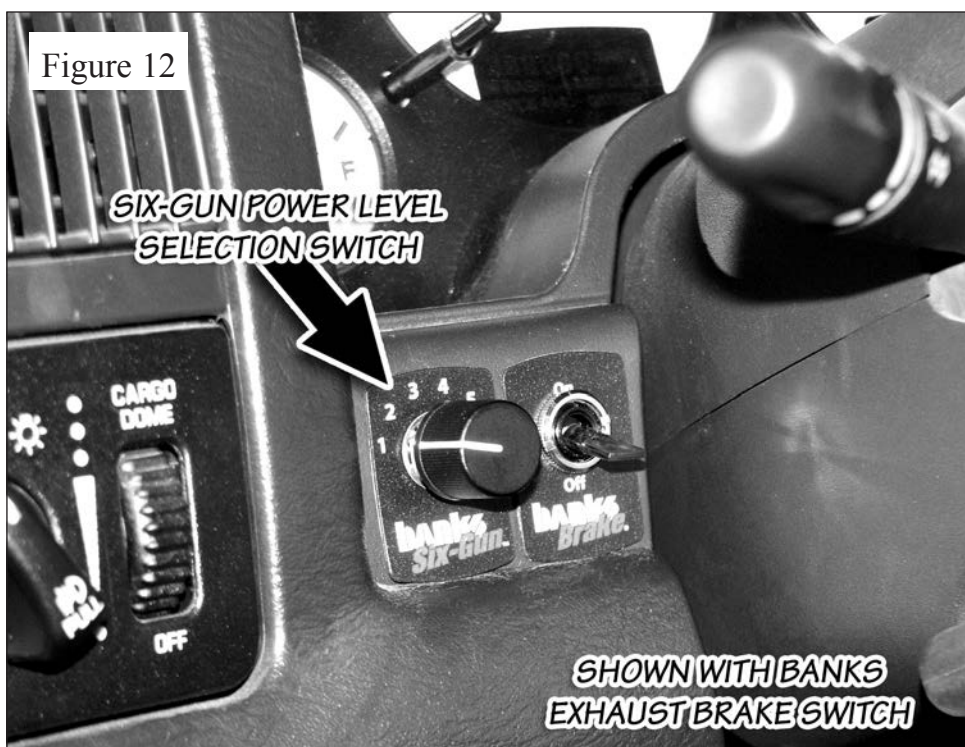
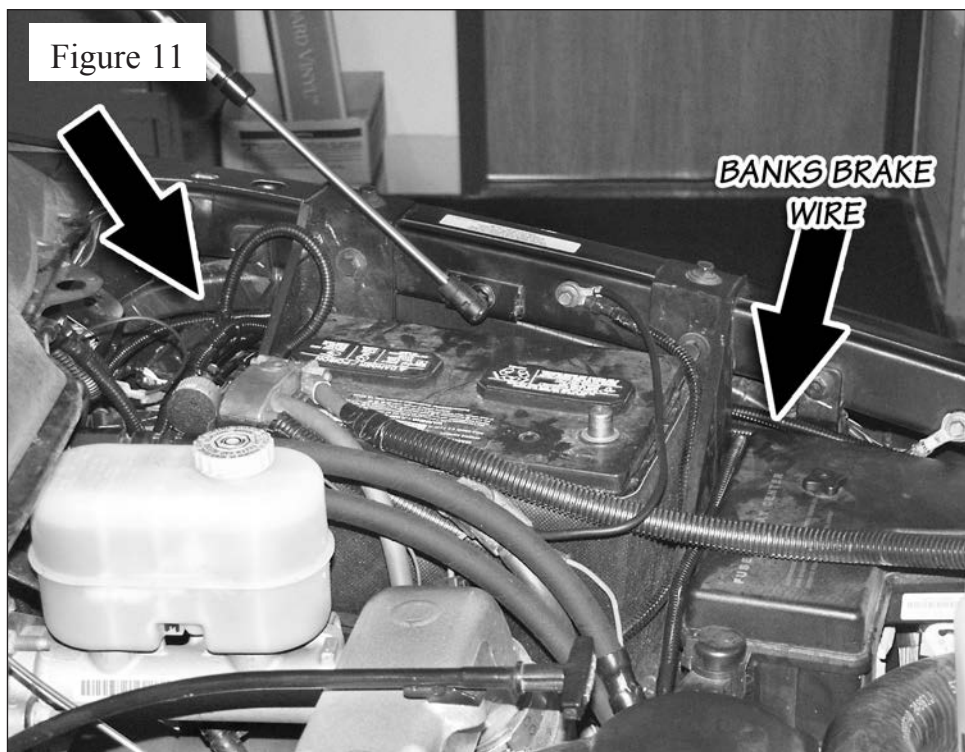




Figure 14

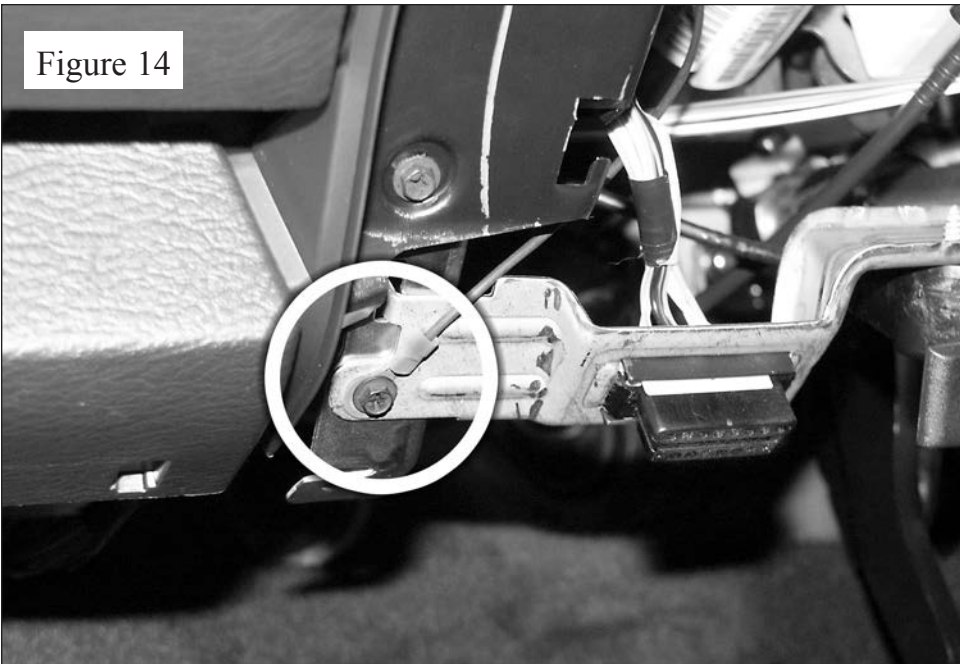


Figure 15



along the fender with the factory harness. They should come around between the battery and the fuse box toward the engine block. See **Figure 5**. Install a spade on the BLUE wire.

**For APP sensor mounted on the engine proceed to step 33.**

**For APP sensor located beneath the fuse box above the tire**

**proceed to step 34.**

**33.** Remove and keep the three (3) bolts that mount the accelerator pedal position (APP) sensor to the engine. Turn the APP sensor to its side and locate the BROWN wire with WHITE stripe on the electrical connector. Install a T-tap and plug the Banks Brake BLUE wire into it. Refer to **Figure 6**. Re-install the APP sensor with the

three bolts. Proceed to **Step 35**.

**34.** Route the BLUE wire toward the bottom of the fuse box. The accelerator pedal position (APP) sensor is located beneath the fuse box above the tire. Locate the BROWN wire with WHITE stripe on the wire loom going into the APP sensor. Install a T-tap into this wire and plug the BLUE Banks wire into it. See **Figure 7**. Proceed to **Step 35**.

**35.** On the front of the engine, find the engine coolant temperature sensor. Install a T-tap on the TAN wire with BLACK stripe or the VIOLET wire with ORANGE stripe. Route the GRAY Banks Brake wire underneath the APP sensor toward the T-tap and plug in. Secure the wire on the factory harness with a supplied cable tie. See **Figure 10**.

**36.** Route the GREEN and BLACK wire pair on the Banks Brake wire harness behind the battery box along the fender down toward the back of the bumper on the driver side. This is the approximate location where the compressor panel will be installed. See **Figure 11**. Secure the wire along the way with cable ties. **CAUTION:** Do not use force when working on plastic parts. Permanent damage to the part might result.

**37.** The Banks Brake switch will be installed on the driver's side of the instrument panel (IP) next to the steering column. See **Figure 12**. Remove the headlamp



switch bezel on the driver's side by gently pulling on it. Disconnect the electrical connector once the bezel is removed.

**38.** To remove the center bezel, open the ashtray and cup holder and remove the retaining screw. Gently pull on the center bezel to disengage all the clips that attach the bezel to the dash. Disconnect four (4) the electrical connections after the bezel is removed.

**39.** Remove the cluster bezel by first removing the top two (2) screws. Gently pull on it and disengage all the clips that attach the bezel to the dash.

**40.** Cut out the supplied template (see **Figure A** on **page 23**) and align the template onto the front of the cluster bezel by placing its left edge against the cluster rib, and its bottom edge against the cluster bottom edge. Use masking tape to securely hold down the template.

**NOTE:** Do not tape over the markings on the template.

**41.** Using a 1/2" Uni-drill, center the bit onto the 1/2" drill location on the template and slowly drill through the IP. Remove and discard the template and any plastic shavings.

**NOTE:** It is important that the hole is drilled at the recommended location. The switch may not clear the instrument panel structure if the hole is shifted to another location.

**42.** Remove the two (2) ribs on the back of the cluster next to the

1/2" hole. Test fit the brake switch through the hole to ensure that the ribs do not interfere with the switch installation. Remove all the necessary material on the cluster to fit the switch properly,

**43.** Align the Banks Brake label onto the previously drilled hole. Make sure the entire mounting surface is clean and free of dirt and oil before mounting the label. Clean and dry as required using a cloth dampened with rubbing alcohol or similar cleaning solution.

**CAUTION:** Do not spray fluid directly onto any electrical equipment, or equipment damage may result.

Mount the Banks Brake switch label onto the cluster by peeling off the protective backing off the adhesive tape on the back of the switch label. Hold the label against the panel for approximately 20 seconds while applying pressure to allow the

adhesive to properly adhere to the surface.

**44.** Attach power switch wires (RED, YELLOW, BLACK) to power switch as shown in **Figure 13**.

**45.** Remove the chrome bezel nut from the power switch shaft. Insert the switch shaft into the hole that was drilled in the dash panel. Install the provided switch plate cover and reinstall the chrome bezel nut.

**46.** Find the 14-pin connector on Banks Brake wire harness, and plug it into the supplied Computerized Brake Controller

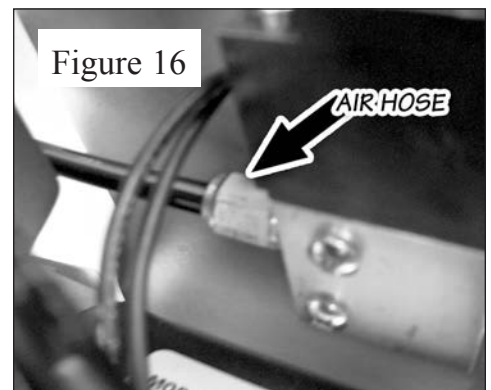


Figure 16

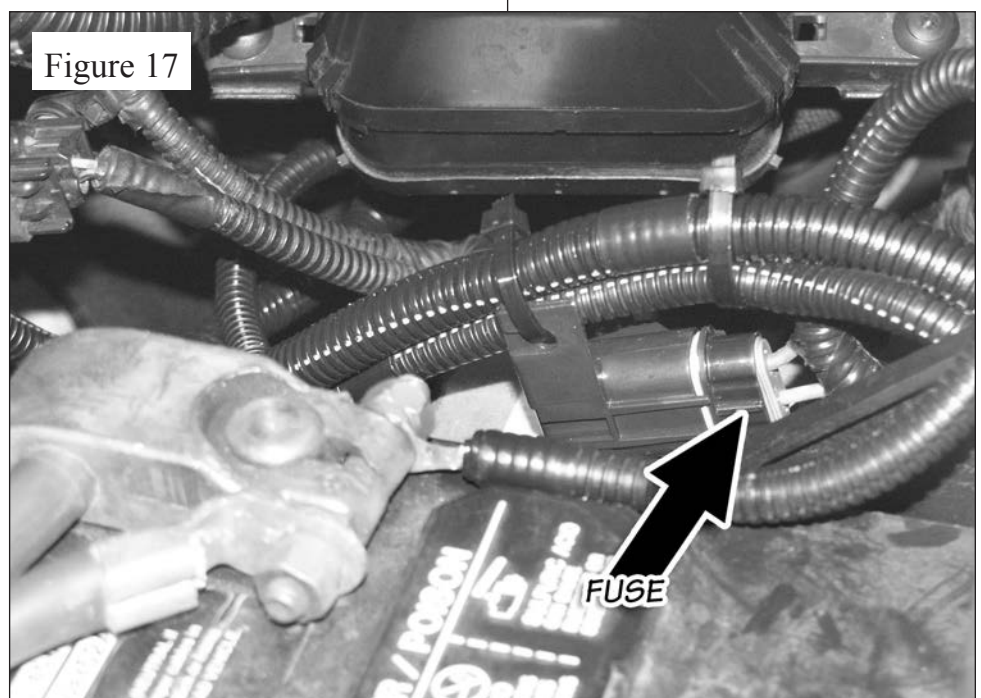


Figure 17

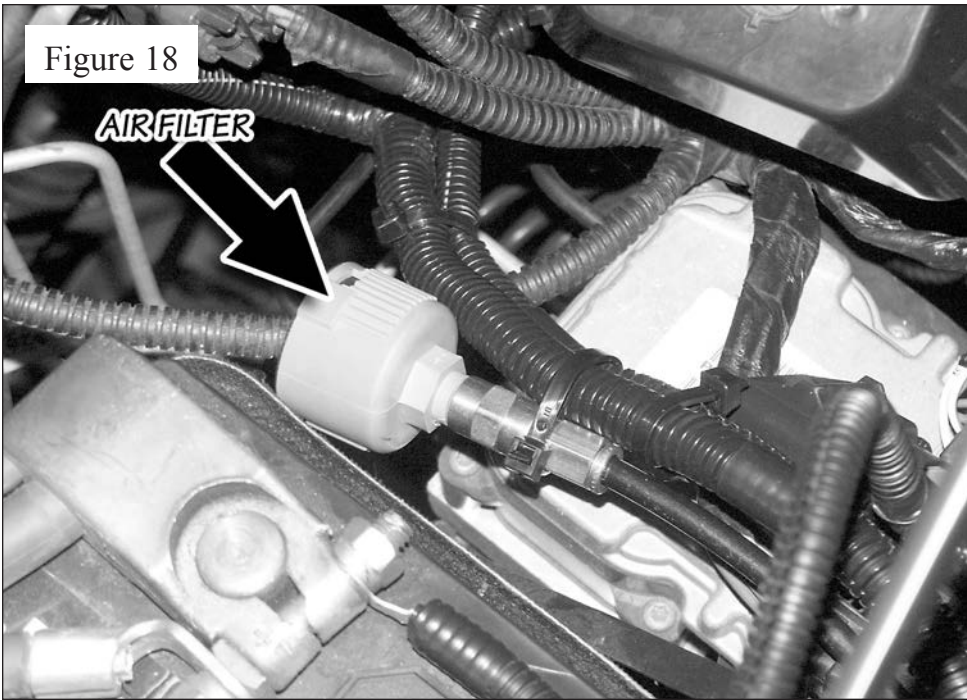


Figure 18

(CBC). Install the 2Amp fuse on the harness.

Note: Do not mount CBC to vehicle at this time. The Functional Test requires visibility of the green LED on the CBC to monitor its functionality.

**47.** Locate the screw on the cross bar underneath the steering column that is left of the data link connector. Unbolt the screw. Ground the Banks Brake black wire with the ring terminal at this location. Re-install the screw. See **Figure 14**.

**48.** Reinstall the cluster bezel by pressing on it to ensure all the clips are engaged. Secure it with the original two (2) bolts.

**49.** Reconnect the electrical

connector to the headlamp switch bezel. Reinstall this bezel by gently pushing on it until all clips are engaged. original two (2) bolts.

**50.** Reconnect the four (4) electrical connections to the center bezel. Reinstall this bezel by pushing on it to engage all the clips. Open the ashtray and cup holder and reinstall the screw.

## Banks Brake Installation

**51.** Locate a hole at the front end sheet metal bracket on the driver side (it is behind the front bumper). Slide the top of the Banks compressor panel over the bracket. Use the supplied 1/2" x 1"

bolt & nut, and two (2) washers to temporarily mount compressor panel upright at this location. Hand tighten the bolt. See **Figure 15** for the correct orientation.

**52.** Align the 5/16" hole on the side of the compressor panel so it touches the sheet metal bracket. Mark the mounting location to be drilled with a center punch. Remove the pump and drill a 3/8" hole at the mark location on the sheet metal bracket. Remove any burrs. The supplied 5/16" bolt & nut, and two (2) washers are to be used in this hole to secure the compressor panel.

**53.** Install the 90° swivel push lock fitting onto the inlet of the compressor pump. Do not over tighten.

**54.** Inspect the end of the supplied pneumatic hose and ensure that the end of the hose is free from burrs and is cut squarely. The hose can be trimmed with a sharp knife or razor blade. Avoid cutting the hose with scissors or side cutters because it will collapse the hose before it cuts and may cause a pressure leak in the future.

**55.** Cut a 4-ft section from the supplied air hose. Insert this 4-ft air hose into the compressor pump inlet (the 90 deg fitting that was just installed). To ensure the hose is installed correctly, pull on it and it should not come loose.

**56.** Attach the pneumatic hose to the air compressor panel by inserting the hose into the push-lock fitting as shown in **Figure**

Table 2: Installation Procedures for the Different Exhaust Configurations

No.	Banks Brake p/n	Exhaust System	Catalytic Converter	Steps
1	55222	Banks Monster Exhaust	Yes	58 to 64
2	55223	Banks Monster Exhaust	No	65 to 72
3	55224	Stock Exhaust	Yes or No	73 to 81



16.

**57.** Install the compressor panel onto the sheet metal bracket. Tighten the ½" and ⅝" bolts to securely mount the compressor panel in place.

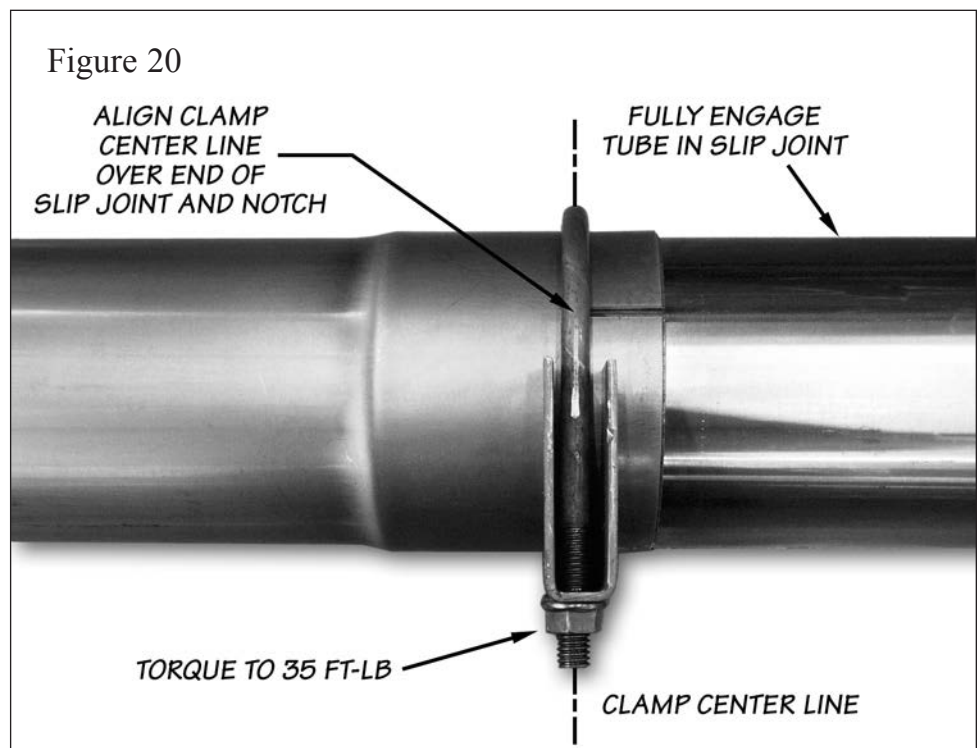
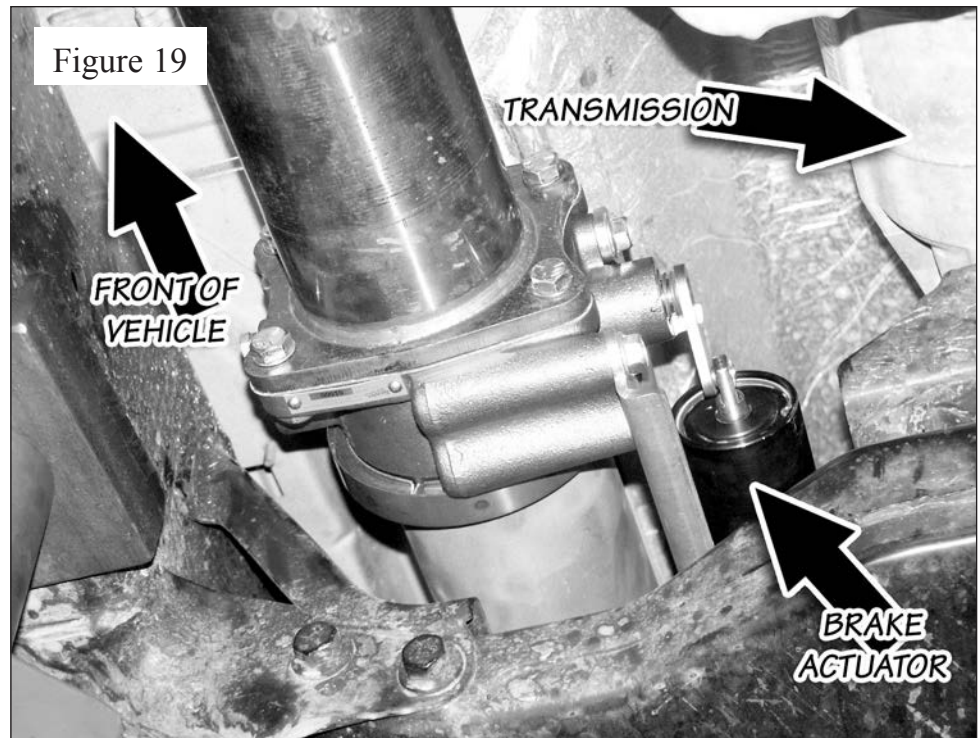
**58.** Locate the GREEN and the BLACK terminal pair on Banks brake wire harness that was previously installed. Plug the GREEN wire to the GREEN wire on the compressor pump. Plug the BLACK wire to the BLACK wire on the compressor pump.

**59.** Locate the RED wire with ring terminal on the compressor. Route this wire to the positive battery terminal on the driver side. Remove the nut from the bus bar stud and place the ring terminal over the stud. Re-install the nut on the bus bar stud.

**60.** Locate the fuse on the compressor wire harness. Use cable tie to securely mount it on the wire harness as shown in **Figure 17**. Assemble the compressor pump air filter to the straight push lock fitting using the provided coupling.

**61.** Route the 4-ft air hose toward the positive battery terminal following the brake wire harness. Use cable tie to secure the air hose along the way. The outlet of the air hose should be located at the positive battery terminal side. Install the air filter assembly to the air hose and tie it with a cable tie as shown in **Figure 18**.

**IMPORTANT:** If the vehicle is equipped with a catalytic

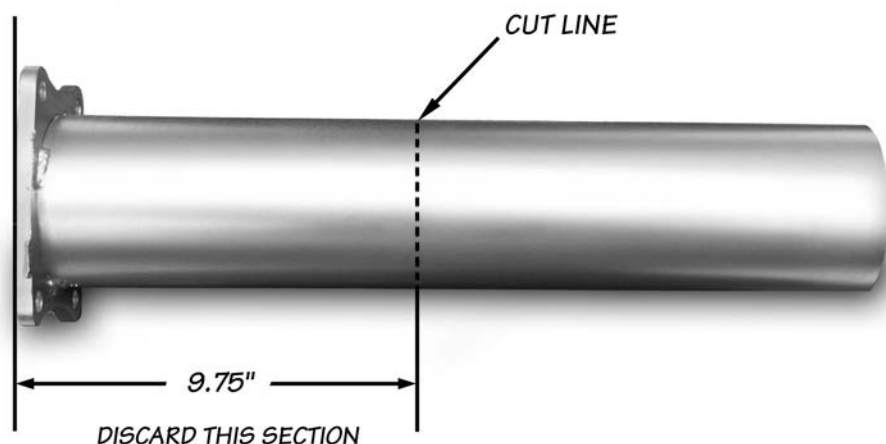


converter, it should be inspected. Diesel catalysts may become plugged with soot and can cause a restriction to exhaust flow, impeding performance. Shine a powerful flashlight into the inlet end of the converter. Observe the light through the other end

of the converter. The full circle of the flashlight should be visible without any blockage in the gridwork of the catalyst. If excessive soot is observed, the catalyst may need to be cleaned. TAKE PRECAUTIONS to avoid blowing soot toward the



Figure 21



work area or where it could be inhaled. ALWAYS use breathing protection. Also inspect the catalytic converter for damage (i.e. chips, bent corners, etc.) to the gridwork. If your catalytic converter is damaged, it may be covered under your vehicle's emissions warranty.

NOTE: The Banks Brake Housing Assembly installation instructions are different with different exhaust configurations. Refer to **TABLE 2** for the specific instructions on your particular exhaust configuration.

## Banks Monster Exhaust with Catalytic Converter

**62.** If the Banks Monster Exhaust is being installed along with the Banks Brake, follow the Monster Exhaust instructions for removal of the stock exhaust and installation of the Banks Monster

Turbine Outlet Pipe before proceeding with the installation of the Banks Brake.

**63.** If the Banks Monster Exhaust has been installed on the vehicle, locate the intermediate pipe between the catalytic converter and the turbine outlet pipe. Remove it by removing the clamp in front of the converter and the four (4) bolts on the turbine outlet pipe. Discard the old gasket and the clamp. Save the bolts, washers, and nuts for later use.

NOTE: It may be necessary to heat the end of the intermediate pipe with a torch to allow it to be removed from the vehicle.

**64.** Slide the new supplied exhaust clamp on the inlet of the catalytic converter. Install the supplied outlet pipe onto the catalytic converter. Loosely clamp them together.

**65.** Install Banks Brake assembly

between the turbine outlet pipe and the brake outlet pipe. The brake actuator shall be oriented closer to the transmission. See **Figure 19**. Place the new supplied exhaust flange gasket between the brake assembly and the 4-bolt exhaust flange. Use the four (4) sets of bolts, washers and nuts that were removed previously to mount the brake housing to the turbine outlet pipe. Snug the nuts up and adjust the brake housing to align the two flange halves with each other. Evenly torque the flange nuts to 48 ft-lbs.

**66.** Engage the exhaust brake outlet pipe into the larger supplied V-band clamp. Snug the clamp and ensure that the outlet pipe is centered on the V-band flange on the brake housing. Torque the V-band clamp to 12 ft-lbs.

**67.** Position and torque the previously installed exhaust clamp (in Step 60) to 35 ft-lbs as shown in **Figure 20**.

**68.** Banks brake housing is installed and skip to **Step 82**.

## Banks Monster Exhaust without Catalytic Converter

**69.** If the Banks Monster Exhaust is being installed along with the Banks Brake, follow the Monster Exhaust instructions for removal of the stock exhaust and installation of the Banks Monster Turbine Outlet Pipe before proceeding with the installation of the Banks Brake.

**CAUTION:** The following step involves cutting a stainless steel tube. Safety glasses should be worn during any cutting operation, and care should be taken to avoid injury due to sharp edges and burrs.

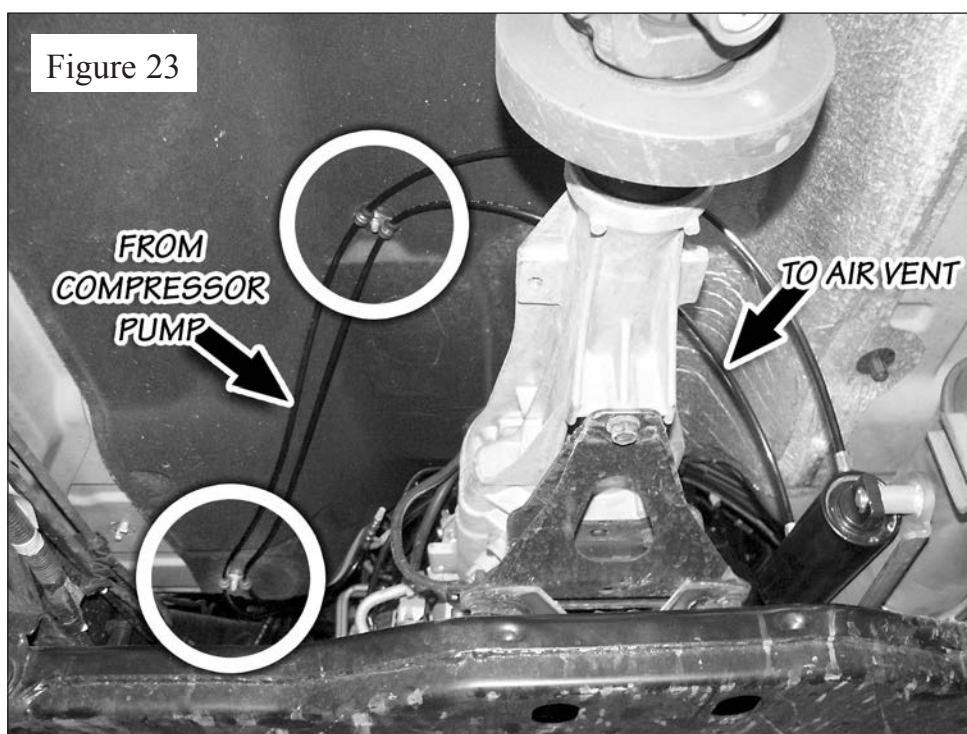
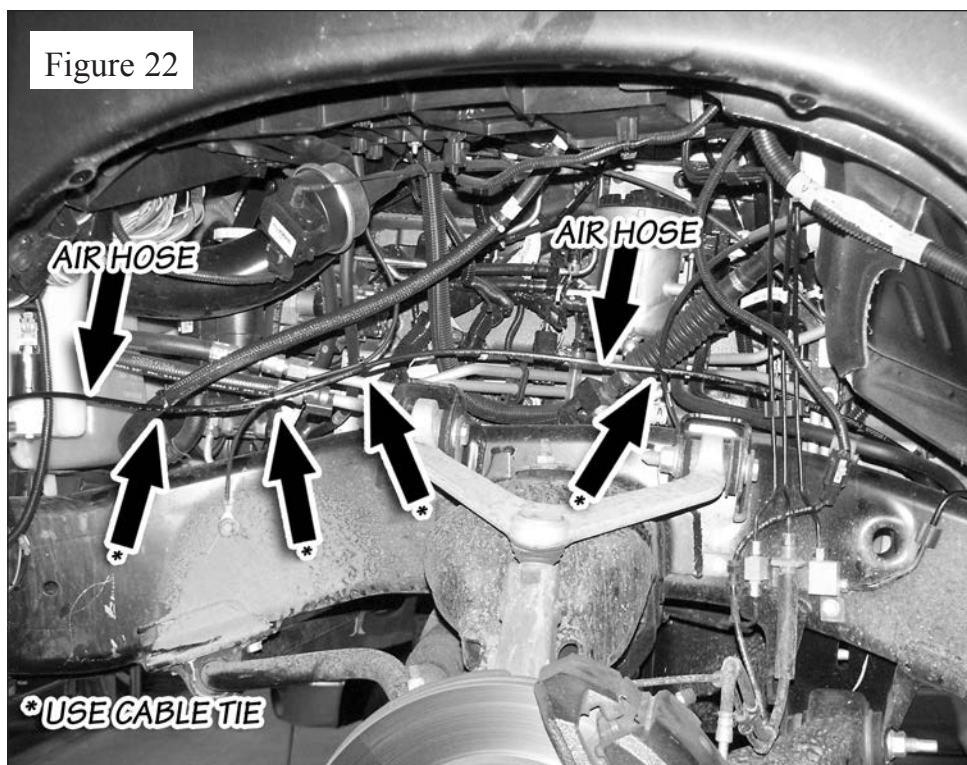
**70.** If the Banks Monster Exhaust has been installed on the vehicle, locate the intermediate pipe bolted to the turbine outlet pipe. Remove the four (4) bolts connecting it to the turbine outlet pipe. Discard the old gasket. Save the bolts, washers, and nuts for later use.

**71.** Measure and mark the intermediate pipe 9 3/4" from the end of the flange. See **Figure 21**. Make a square cut in the intermediate pipe at the marked location. De-burr the pipe to prevent injury due to sharp edges. Discard the half with the flange, and keep the straight pipe section.

Note: Dismounting the intermediate pipe might be necessary for cutting operation. It may be necessary to heat the end of the intermediate pipe with a torch to allow it to be removed from the vehicle.

**72.** Slide the exhaust clamp onto the intermediate pipe inlet. Slide the supplied outlet pipe onto the inlet of the intermediate pipe. Loosely tighten them together.

**73.** Install Banks Brake assembly between the turbine outlet pipe and the brake outlet pipe. The brake actuator shall be oriented closer to the transmission. See **Figure 19**. Place the new supplied



exhaust flange gasket between the brake assembly and the 4-bolt exhaust flange. Use the four (4) sets of bolts, washers and nuts that were removed previously to mount the housing to the turbine outlet pipe. Snug the nuts up and adjust the brake housing to align

the two flange halves with each other. Evenly torque the flange nuts to 48 ft-lbs.

**74.** Engage the exhaust brake outlet pipe in the V-band clamp. Snug the clamp and ensure that the outlet pipe is centered on the V-band flange on the brake



Figure 24



housing. Torque the V-band clamp to 12 ft-lbs.

**75.** Position and torque the previously installed exhaust clamp (in **Step 68**) to 35 ft-lbs as shown in **Figure 20**.

**76.** Banks Brake housing is installed and **skip to Step 82**.

## Stock Exhaust System with or without Catalytic Converter

**77.** Remove the original turbine outlet pipe (TOP) by removing the V-band attaching it to the turbine housing outlet along with the clamp attaching it to the catalytic converter or the intermediate pipe. It may be necessary to heat the lower end of the pipe with a torch to loosen the joint to allow the pipe to be removed.

**78.** Ensure that the surface of the new supplied turbine outlet pipe is clean and free of oil, grease, and dirt. Clean and

dry as required using a cloth dampened with rubbing alcohol or similar cleaning solution. Peel the protective backing off of the adhesive tape on the supplied turbine exhaust gasket. Firmly press it against the side of Banks turbine outlet pipe that mates to the turbine housing for at least 60 seconds.

**79.** Attach the smaller supplied V-band clamp to the turbine flange on the vehicle. Install the Banks TOP in the V-band clamp on the turbine housing side. Snug the clamp and ensure that the pipe is centered on the V-band flange on the turbine housing. Loosely tighten the V-band.

**80.** Slide the provided 3½" clamp onto the catalytic converter or the intermediate pipe and install the supplied outlet pipe. Loosely clamp them together.

**81.** Install Banks Brake assembly between the TOP and the outlet pipe. The actuator on the brake shall be oriented closer to the

transmission. See **Figure 19**. Place the supplied exhaust flange gasket between the brake assembly and the 4-bolt exhaust flange. Use the supplied four (4) sets of the 7/16" x 1½" bolts, washers and nuts to mount the housing to the turbine down pipe. Snug the nuts up and adjust the brake housing to align the two flange halves with each other. Loosely tighten the bolts.

**82.** Engage the exhaust brake outlet pipe in the larger supplied V-band clamp. Snug the clamp and ensure that the outlet pipe is centered on the V-band flange on the brake housing. Loosely tighten the V-band.

**83.** With everything positioned properly, begin to tighten the clamps starting with the ones closest to the turbo and working your way back. Torque the V-band clamp on the turbine housing outlet to 80 in-lbs (not ft-lbs). Torque the 7/16" hardware to 48 ft-lbs.

**84.** Position and torque the previously installed exhaust clamp in **Step 76** to 35 ft-lbs as shown in **Figure 20**.

**85.** Banks brake housing is installed. **Proceed to Step 82**.

**86.** Route the pneumatic hose from the compressor panel outlet along the driver's side frame rail toward the back of the vehicle. See **Figure 22**. Use cable ties as indicated.

**87.** Route the air hose across and over the transmission following the plastic body

insulation retainers. There is one plastic retainer close to the frame rail behind the wheel on the driver side, and another one is on the vehicle body above the transmission. See **Figure 23**.

**88.** Install one of the supplied tubing clamps on each of the pneumatic hose at the same locations as the two (2) plastic retainers.

**89.** Cut and install the pneumatic line into the pneumatic fitting located on the rear of the brake actuator cylinder (the one farthest away from the actuator rod and the lever). Retain the remaining hose for use on the remote vent line.

NOTE: The hose should be trimmed as required to allow the hose to follow the mounting locations and then gently arc towards the actuator.

**90.** Install one end of the remaining pneumatic line into the pneumatic fitting on the forward end of the brake actuator cylinder.

**91.** Route the vent line over the transmission along the previously installed compressed air line. Install 2 supplied tubing clamps on the pneumatic hose at the same locations as the 2 plastic mounts.

**92.** Remove the plastic retainers and install the tubing clamps onto the studs. Put a 1/4" washer, a 1/4" external tooth lockwasher, and 6mm nut (in this order) on the mounting bolts and lightly tighten them. Align the hoses on the clamp so they are parallel to one another. Tighten the nuts.

Figure 25



Re-install the plastic retainers.

NOTE: Make sure to route the plastic hose away from heat sources and moving components to prevent damage to the hose.

**93.** Continue to route the vent line forward along the frame rail and up. There is a chassis ground bolt on the vehicle body next to the transmission. See **Figure 24**. Use this to mount the vent line end. Trim the line as required to allow the vent port to be installed as high as possible. Install a cable clamp on the air hose at the same location as the mounting point. Install the breather assembly on the end of the vent line. Put a 1/4" washer, a 1/4" external tooth lockwasher, and 6mm nut (in this order) on the mounting bolt and securely tighten the nut.

**94.** Re-install the wheel house splash shield with the original 8 bolts.

**95.** Re-install the tire.

**96.** Lower the vehicle.

**97.** For 2003 vehicles only, re-install the black electrical connector on the driver side with the original screws and the plastic retainers.

**98.** Re-install the electric connector bracket on the left hand side of the support below the steering column in front of the firewall with the original two (2) bolts.

**99.** Re-connect the previously disconnected ground terminals at the battery (if there is more than one battery, re-connect both).

## Functional Testing

The following testing should be performed only after the vehicle has been allowed to COMPLETELY COOL. This test verifies the performance of the warm-up feature of the brake system and must be performed with a cold vehicle.

**100.** Verify that the Banks Brake Activation Switch is in the "OFF"



position.

**101.** Ensure that the accelerator pedal is NOT depressed. Turn the ignition key to the “ON” position. The green LED on the Computerized Brake Controller (CBC) should light up and the air compressor should run for approximately 2 seconds before turning off.

**102.** Slowly press the accelerator pedal. The green LED should turn off almost immediately (very little throttle movement) and the air compressor panel should vent the air from the brake actuator. Release the accelerator pedal and the green LED should again light up and the compressor should run for approximately 2 seconds and then shut off. Repeat this cycle a few times to verify CBC function.

**103.** Start the engine and let it idle. The brake valve will close and can be verified by the muffled sound of a restricted exhaust pipe.

**104.** Slowly press the accelerator pedal. The green LED should turn off almost immediately (very little throttle movement) and the air compressor panel should vent the air from the brake actuator and the brake valve should open. Release the accelerator pedal and the green LED should again light up and the compressor should run for approximately two (2) seconds and then shut off. Repeat this cycle a few times to verify CBC function.

NOTE: The engine speed (RPM) should not exceed 1200 rpm prior

to brake disengagement.

**105.** Allow the vehicle to reach normal operating temperature. The brake will remain active until the vehicle reaches approximately 125°F engine coolant temperature (measured with a Tech II scan tool). Once the vehicle warms up, the brake will turn off.

**106.** Obtain a vehicle speed of approximately 40-45 mph in an area where speeds of this nature are safe and traffic is light. Turn the Banks Brake activation switch to the “ON” position. Release the throttle. The brake should activate and the vehicle will begin to slow. Bring the vehicle to a safe stop (using the service brakes). As the vehicle speed drops below approximately 15 mph the brake should turn off. Turn the Banks Brake activation switch to the “OFF” position

**107.** Obtain a vehicle speed of approximately 40 mph in an area where speeds of this nature are safe and traffic is light. Set the cruise control to 40 mph. Activate the Banks Brake by placing the activation switch in the “ON” position. The cruise control should disengage and the vehicle should begin to slow.

**108.** Turn the Banks Brake activation switch to the “OFF” position. Activate the cruise control and set it for approximately 40 mph. Press on the brake pedal. The cruise control should deactivate. The functional testing is completed.

**109.** Ensure that the surface of

the left aluminum structure below the steering column is clean and free of oil, grease, and dirt. Clean and dry as required using a cloth dampened with rubbing alcohol or similar cleaning solution.

CAUTION: Do not spray fluid directly onto any electrical equipment, or damage to the equipment may result.

Peel the protective backing off of the adhesive tape on the backside of the CBC. Install the CBC onto the left aluminum structure supporting the steering column as shown in Figure 25. Hold the module against the vehicle structure for approximately one (1) minute while applying pressure to allow the adhesive to properly adhere to the surface.

**110.** Re-install the lower dash panel with the original screws.

NOTE: Once the vehicle has passed all of the tests outlined in **Steps 96-104**, the installation of the Banks Brake system is complete and ready for years of reliable service.

## SAFETY

CAUTION: Your Banks Brake is NOT a substitute for the hydraulic brakes on your truck. The device will not correct or compensate for improperly maintained hydraulic brakes. Also please be aware that your Banks Brake is not designed to be used as a parking brake or to bring your vehicle to a complete stop. Your Banks Brake is a supplementary braking system

designed to help you slow down or to assist you in maintaining a more constant speed when descending a grade. Remember that this exhaust brake is first and foremost a safety device and it is most efficient when used to prevent, rather than correct a runaway vehicle condition.

The use of a Banks Brake does not increase the load capacity of your vehicle. Gross Combined Weight Rating specifications should always be adhered to. The Banks Brake will allow you to slow your vehicle more effectively within your vehicle's weight specifications.

## OPERATION/ DRIVING TIPS

Use your Banks Brake to assist in slowing your vehicle while traveling down grades. To activate the brake, flip the switch to the "ON" position. With the switch on, the brake will be active anytime that your foot is not on the accelerator pedal. Note that cruise control will be cancelled if it is active at the time the Banks Brake is engaged.

When alternating between braking activity and acceleration, it is good practice to allow a minimum of one second to elapse after the brake has been disabled or the throttle is applied before reaching full throttle acceleration. This allows enough time for the brake valve to fully open and eliminates the possibility of excess exhaust

backpressure being introduced into the engine.

If your vehicle is equipped with a manual transmission, it should also be downshifted to maintain a high engine speed when the brake is active.

When the engine is cold (below 125°F) the exhaust brake will activate to reduce the amount of warm-up time required. Once the vehicle reaches operating temperature the brake will open. The brake will also open when the accelerator pedal is depressed at temperature below 125°F. This prevents soot build-up and keeps the shaft assembly from sticking. It eliminates the need for any additional maintenance.

If it becomes necessary to remove the CBC from the vehicle, a by-pass plug has been provided to install in its place. If the CBC is removed without being replaced by the by-pass plug, the vehicle will idle poorly and set a diagnostic code. The CBC should only be removed when the ignition switch is in the "OFF" position.



# TROUBLESHOOTING

If the Banks Brake does not pass the FUNCTIONAL TESTING or ceases to function properly, re-check all connections per the installation instructions. The following diagnostic procedures could be carried out to identify and correct the problem.

To check for proper Banks CBC connections, measure the voltages at the 14-pin connector on the CBC wiring harness. These voltages should be the same as the values shown in Table 3. Refer to **Figure 26** for the wire locations. Use **Pin #6** on the connector for ground.

NOTE: Assure the ignition key is in the on position but engine is not running. To check the gray wire, follow “SIMULATE COLD ENGINE CONDITION” procedure below.

To SIMULATE COLD ENGINE CONDITION, unplug the coolant temperature sensor connector (with the GRAY Banks wire still attached) from the sensor. The GRAY wire should read 5V; and with the throttle released, the green light should be on. If it is not, turn the ignition key to the off position and unplug the GRAY Banks wire from the sensor. Turn the key to the on position without the engine running. Wait five (5) second and key off. Plug the GRAY Banks wire back into the coolant temperature sensor cable. Re-measure the voltage and confirm it is at 5V.

If voltages are not present or different, re-check the connections. Reconnect the temperature sensor connector. If all voltages are present, repeat FUNCTIONAL TESTING. The GREEN LED will be lighted indicating the Brake will function as described. If the GREEN LED is lighted, but the compressor does not run, re-check connection of the GREEN and BLACK wires in

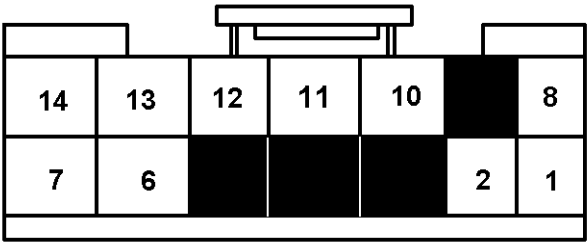
**Step 54.** If Green LED does not light or compressor does not run, call Banks Installation Support for assistance.

Table 3: Banks CBC input voltages

Engine	Banks Exhaust Brake Wire Colors	Voltages	Figures
Key On/Engine Off	BLUE (Pin # 2)	~0.5V @ no throttle > 2V @ full throttle	6 or 7
	BLACK (Pin #6)	Ground	N/A
	YELLOW (Pin #11)	11 to 15V (to fuse)	N/A
	RED (Pin #1)	11 to 15V (power switch)	N/A
	GRAY* (Pin #8)	> 2V (coolant temperature is <120 deg F)	10

\* Follow “TO SIMULATE COLD ENGINE CONDITION” procedure

Figure 26: Rear view of Banks CBC 14-pin connector. (Figure not to Scale.)



# Wire Connection Reference

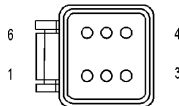
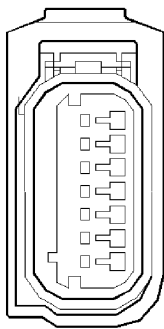
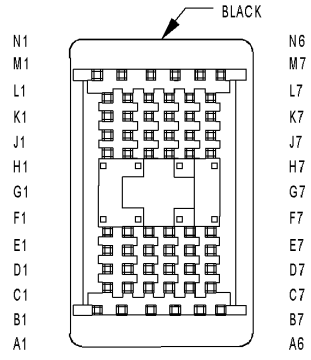
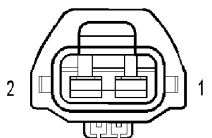
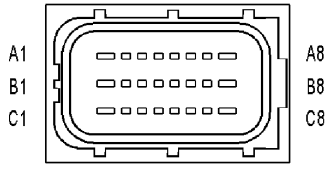
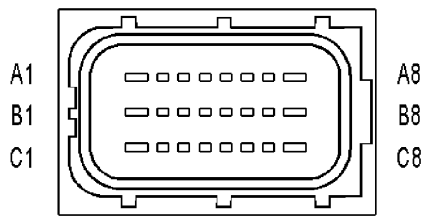
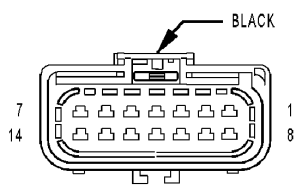
			2003		2004	
NO.	Installation Steps	Banks Brake Wire	Auto Trans (Connector - Wire Colors)	Manual Trans (Connector - Wire Colors)	Auto Trans (Connector - Wire Colors)	Manual Trans (Connector - Wire Colors)
1	15, 20, 25,30	BLUE	TPS - YL (Pin #3) Figure Z1	APPS - WT/DG or WT (Pin #5) Figure Z2	APPS - BR/WT (Pin #3) Figure Z1	APPS - BR/WT (Pin #5) Figure Z2
2	12, 17, 21, 26	BLACK	C130* - RD (Pin #N2) Figure Z3	C130* - LG/BK (Pin #J5) Figure Z3	C130** (bk) - YL/ OR (Pin #B1) Figure Z5	C130** (bk) - PK/ GY (Pin # B4) Figure Z5
3	18, 28	BROWN	N/A	C130* - YL/RD (Pin #B2) Figure Z3	N/A	C131 (gray) - VT/ YL (Pin # B4) Figure Z6
4	11, 16, 22, 27	ORANGE	C130* - WT/OR (Pin #J2) Figure Z3		CAB C1- DG/YL (Pin # 12) Figure Z7	
5	31	GRAY	CTS - TN/BK (Pin #2) Figure Z4		CTS - TN/BK or VT/OR (Pin #B) Figure Z4	

TABLE Z. Wire colors and the corresponding color codes

Wire Color	Color Code
BROWN with WHITE stripe	BR/WT
DARK GREEN with YELLOW stripe	DG/YL
LIGHT GREEN with BLACK stripe	LB/BK
PINK with GRAY stripe	PK/GY
RED	RD
TAN with BLACK stripe	TN/BK
VIOLET with ORANGE stripe	VT/OR
VIOLET with YELLOW stripe	VT/YL
WHITE	WT
WHITE with DARK GREEN stripe	WT/DG
WHITE with ORANGE stripe	WT/OR
YELLOW	YL
YELLOW with ORANGE stripe	YL/OR
YELLOW with RED stripe	YL/RD

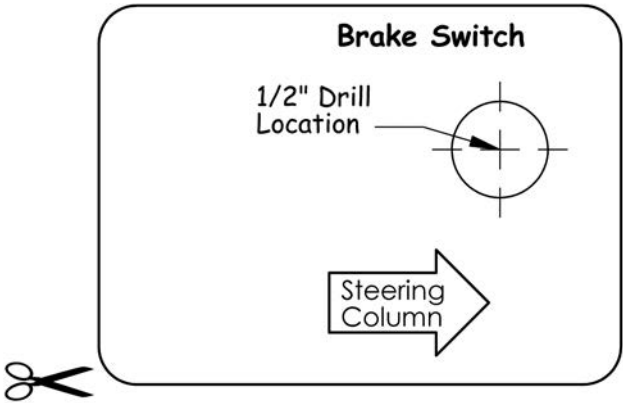


TABLE Z1 to Z7 Show the front face of connectors (Figure not to scale)

<p><b>Figure Z1 (APPs for Automatic Transmission)</b></p> 	<p><b>Figure Z2 (APPs for Manual Transmission)</b></p> 	<p><b>Figure Z3 (C130*)</b></p> 	<p><b>Figure Z4 (CTS)</b></p> 
<p><b>Figure Z5 (C130**)</b></p> 	<p><b>Figure Z6 (C131)</b></p> 	<p><b>Figure Z7 (CAB)</b></p> 	

## Brake Switch Label

Figure A



Gale Banks Engineering  
546 Duggan Avenue • Azusa, CA 91702  
(626) 969-9600 • Fax (626) 334-1743

Product Information & Sales: (888) 635-4565  
Customer Support: (888) 839-5600  
Installation Support: (888) 839-2700

[bankspower.com](http://bankspower.com)

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