

# OWNERS MANUAL

...with installation instructions

## Banks Power Systems

PowerPack® system  
Stinger® system

2001-2004 GM 8.1L Class-A  
Workhorse P-Series Chassis  
Motorhomes

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

Product Information & Sales: (800) 438-7693  
Customer Support: (888) 839-5600  
Installation Support: (888) 839-2700

**bankspower.com**



Dear Customer,

If you have any questions concerning the installation of your Banks Power System, 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 power system, familiarize yourself with the procedure by reading the entire manual before starting work. This manual contains 16 pages of copy, illustrations and parts listing. If any pages are missing from this manual please call Gale Banks Engineering immediately for a replacement.

**2.** The exploded view of the PowerPack assembly (pages 4-5) provides only general guidance. Refer to each step and section diagram in this manual for proper instruction.

## General Installation Practices

**3.** Throughout this manual, the left-side of the vehicle refers to the driver's side, and the right-side to the passenger's side.

**4.** Banks Power systems are designed to fit Chevy 8.1L Workhorse Class-A motorhome chassis. Due to differences in coach layouts, it may be necessary to relocate or modify some coach or Banks system components to accommodate installation of the Banks Power system.

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

**6.** 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.

**7.** During installation, keep the work area clean. If foreign debris is transferred to any Banks system component, clean it thoroughly before installing.

**8.** The front of your motorhome should be raised a minimum of 5-6 inches to allow the installation of Banks TorqueTube® exhaust manifolds. If you have access to a hoist, the vehicle can be

elevated and the front wheels removed for easiest access.

**9.** 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 motorhome 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.

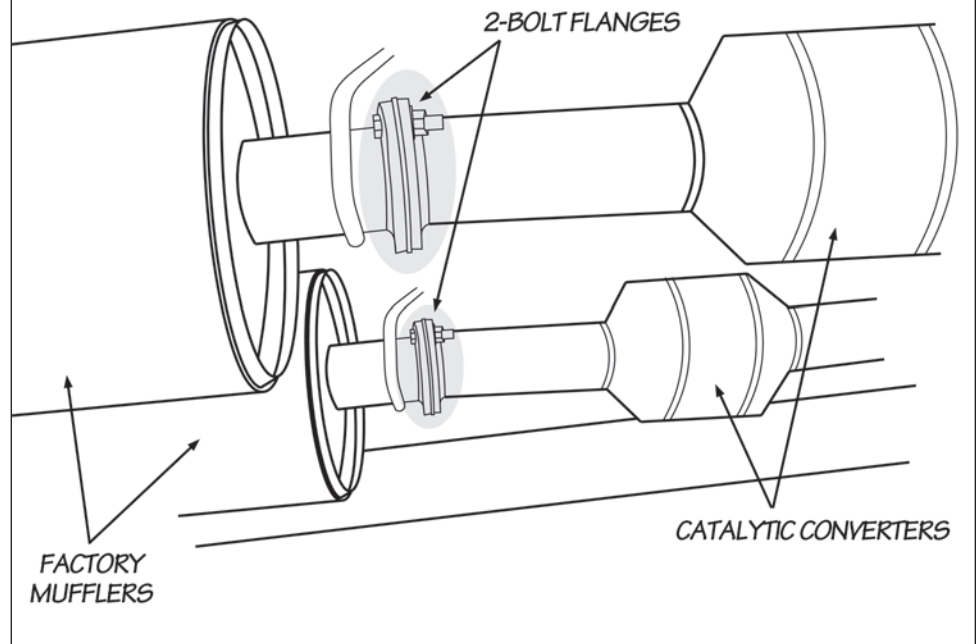
**Caution! Do not use floor jacks to support the vehicle while working under it. Do not raise the vehicle onto concrete blocks, masonry or any other item not intended specifically for this use.**

**Notification**  
**The Banks Ram-Air Filter comes pre-oiled and no oiling is necessary for initial installation. Service the filter as specified in the Cleaning and Oiling the Banks Ram-Air Filter Section of this manual.**

# Installation Instructions

- 1.** With the vehicle safely raised, ground wire(s) disconnected, and other precautions in place, the factory exhaust system can be removed.
- 2.** Locate the oxygen sensors in the exhaust headpipes on each side of the engine, forward of the catalytic converters. Unplug the connectors and unscrew the oxygen sensors, keeping track of the left and right sensors.
- 3.** Remove the hardware from each of the rear catalytic converter's 2-bolt flanges and disconnect the catalytic converters from the two mufflers (see Figure 1).
- 4.** Remove the hardware from each of the forward 3-bolt head pipe flanges and disconnect the left and right head pipes from the exhaust manifolds. Be sure to mark the right and left catalytic converters for reinstallation.
- 5.** To provide better access to the exhaust manifolds, remove the front wheels from the vehicle. Note: Before removing the lug nuts, make sure a capable torque wrench is available to tighten the lug nuts to the manufacturer's torque specifications. If the vehicle is equipped with inner front fender shields, remove them for improved access.

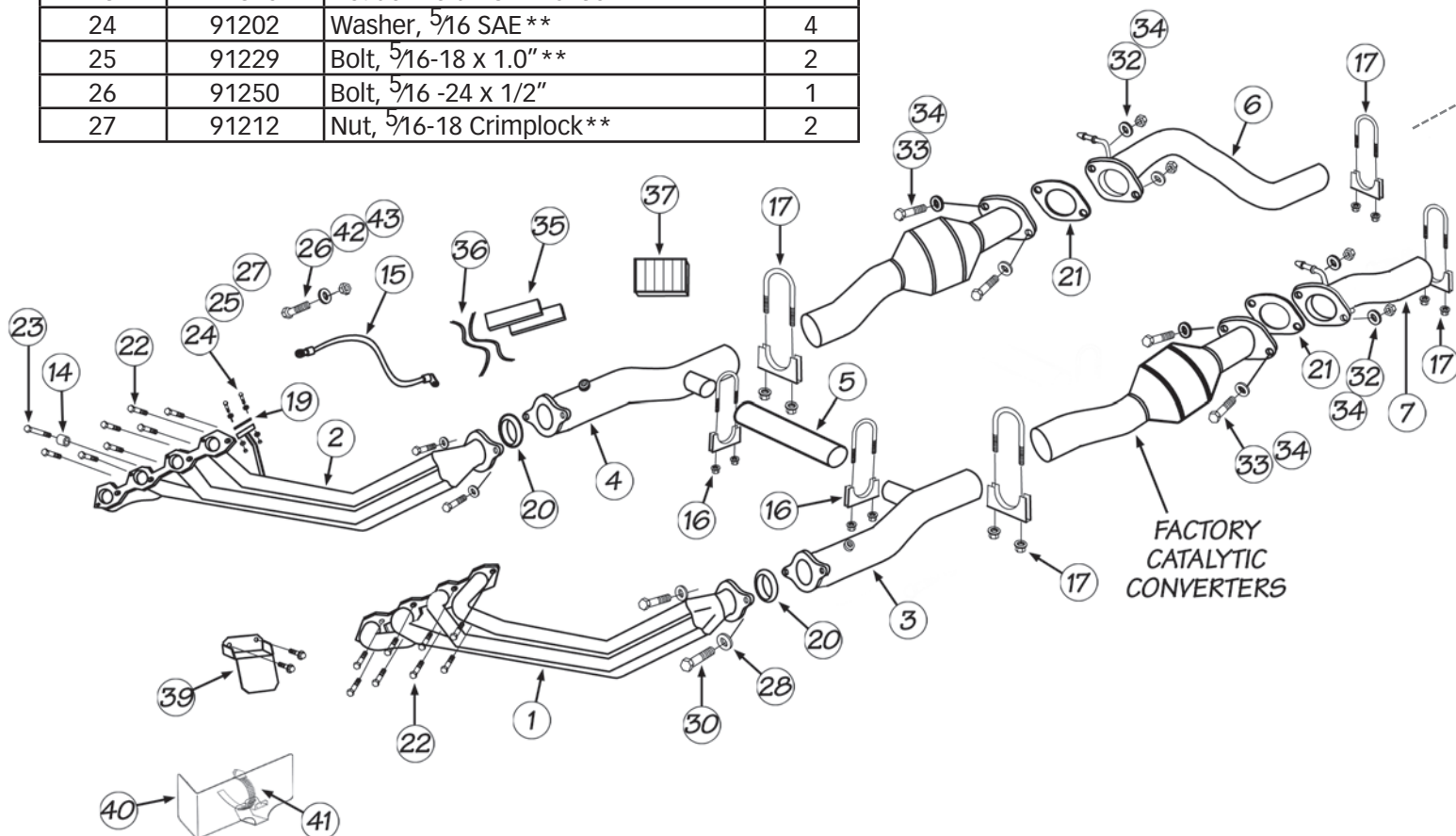
**Figure 1**

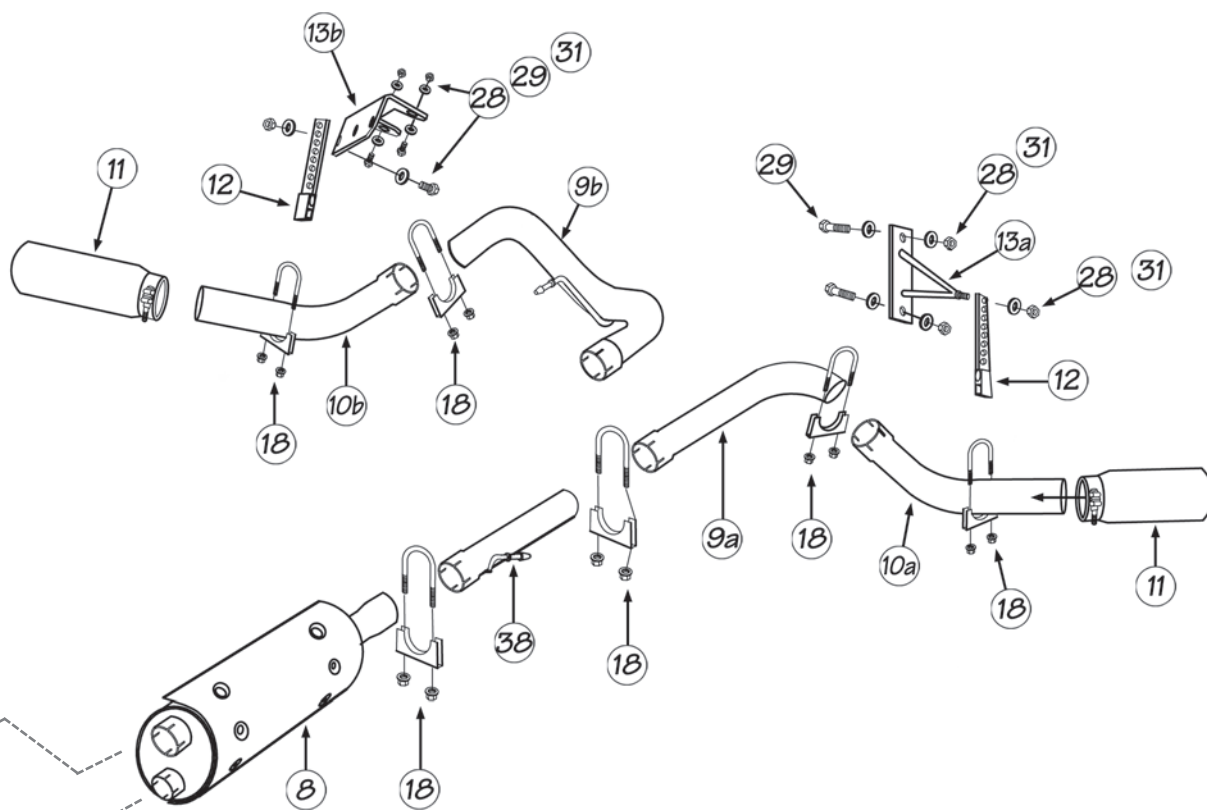


- 6.** If applicable, remove the two nuts securing the EGR tube to the rear of the right-side exhaust manifold.
- 7.** Unbolt the brackets from the alternator support and manifold stud. Remove the dipstick and dipstick tube by pulling and twisting upward. If the dipstick tube o-ring is stuck inside the port in the engine block, remove the O-ring and place it back onto the dipstick tube.
- 8.** Remove the spark-plug wires and the spark plugs from both sides of the engine. Note their original locations so they can be properly reinstalled.
- 9.** Disconnect the nuts holding the exhaust manifold heatshields to the exhaust manifold studs and remove the heatshields.
- 10.** With a wrench or socket, break loose the exhaust manifold nuts at least one turn away from the manifolds (penetrating oil may assist in manifold bolt removal). Use a #7 female torx socket to unscrew each stud from the head. If this tool is not available use a  $\frac{7}{32}$  socket. Take out the studs so the exhaust manifolds can be removed.
- 11.** If the starter cable is routed to the front of the motorhome, you will not need the supplied starter cable extension. The starter cable may need to be removed from the starter and rerouted to obtain access for the TorqueTubes. Once the starter cable is rerouted, using the supplied wire ties, secure the

# GM 8.1L P-series Motorhome Parts List

ITEM #	PART #	DESCRIPTION	QTY
1	53665	Torque Tube, Left Side	1
2	53666	Torque Tube, Right Side*	1
3	53667	Head Pipe, Left Side	1
4	53668	Head Pipe, Right Side	1
5	53671	Balance Tube	1
6	53669	Cross-over Pipe	1
7	53670	Inlet Tube	1
8	52436	Muffler	1
9A	53674	Tail Pipe, Front, Left Exit	1
9B	53684	Tail Pipe, Front, Right Exit	1
10A	53678	Tail Pipe, Rear, Left Exit	1
10B	53679	Tail Pipe, Rear, Right Exit	1
11	52384	Assembly, Tailpipe Tip	1
12	52193	Exhaust Hanger, Universal Style	1
13A	53672	Hanger, Tail Pipe, Frame, Left Exit	1
13B	53680	Hanger, Tail Pipe, Frame, Right Exit	1
14	24376	Spacer, Dipstick	1
15	62180	Assembly, Starter Cable Extension	1
16	52460	Clamp, 2.25"	2
17	52465	Clamp, 3.00"	2
18	52470	Clamp, 4.00"	3
19	93704	Gasket, EGR**	1
20	93161	2.5" Conical Seal	2
21	93702	Gasket, Intermediate Pipe	2
22	91809	Header Bolt M8x1.25x25mm	15
23	91810	Header Bolt M8x1.25x30mm	1
24	91202	Washer, 5/16 SAE**	4
25	91229	Bolt, 5/16-18 x 1.0"***	2
26	91250	Bolt, 5/16 -24 x 1/2"	1
27	91212	Nut, 5/16-18 Crimplock**	2





28	91402	Washer, $\frac{3}{8}$ SAE	5
29	91427	Bolt, $\frac{3}{8}$ - 16 x 1.0"	2
30	91429	Bolt, $\frac{3}{8}$ - 16 x 1.75"	4
31	91416	Nut, $\frac{3}{8}$ - 16 Crimplock	3
32	91602	Washer, $\frac{1}{16}$ SAE	8
33	91629	Bolt, $\frac{1}{16}$ - 20 x 1.5"	4
34	91619	Nut, $\frac{1}{16}$ - 20 Crimplock	4
35	26004	3" x 16" heat wrap	2
36	26013	Steel Wire Ties	6
37	41022	Air filter element	1
38	53675- 53677	Extension pipe	1
39	26125	Heatshield, Knock Sensor	1
40	26126	Heatshield, Brake Reservoir	1
41	92836	Hose Clamp, #36	1
42	91201	Washer, $\frac{5}{16}$ , S.S.	4
43	91217	Nut, Flexlock, $\frac{5}{16}$ - 24	1

\* 2004-2005 models use p/n 53687

\*\* 2004 and newer models do not have EGR fittings or hardware



starter cable to other cables in the area and reinstalled the cable and retaining nut to the starter.

**12.** If the starter cable runs from the rear of the motor home install the 90-degree terminal end of the supplied starter cable extension onto the starter motor and tighten the retaining nut. Route the starter cable extension forward through the frame rail under the cross member then back over the cross member to the starter motor and at least 6" away from all heat sources as shown in Figure 2. Slide the 4-inch length of heat shrink over the extension.

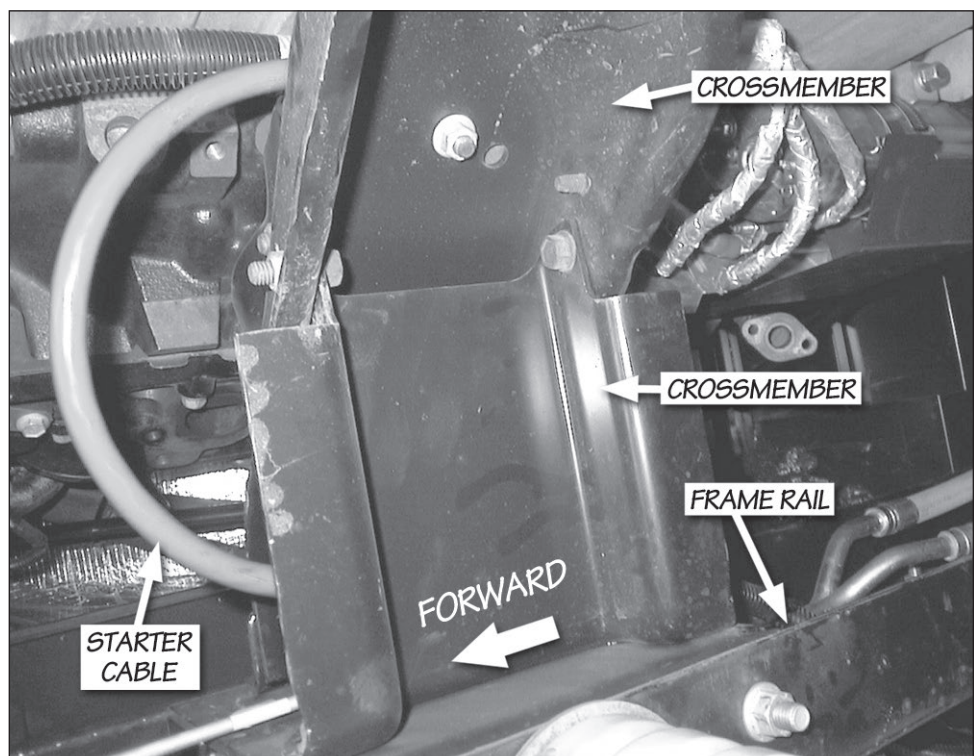
Attach the extension to the factory starter cable using:

- (1)  $\frac{5}{16}$ -18 x  $\frac{1}{2}$ " bolt
- (1)  $\frac{5}{16}$ -18 crimplock nut
- (1)  $\frac{5}{16}$  SAE washer

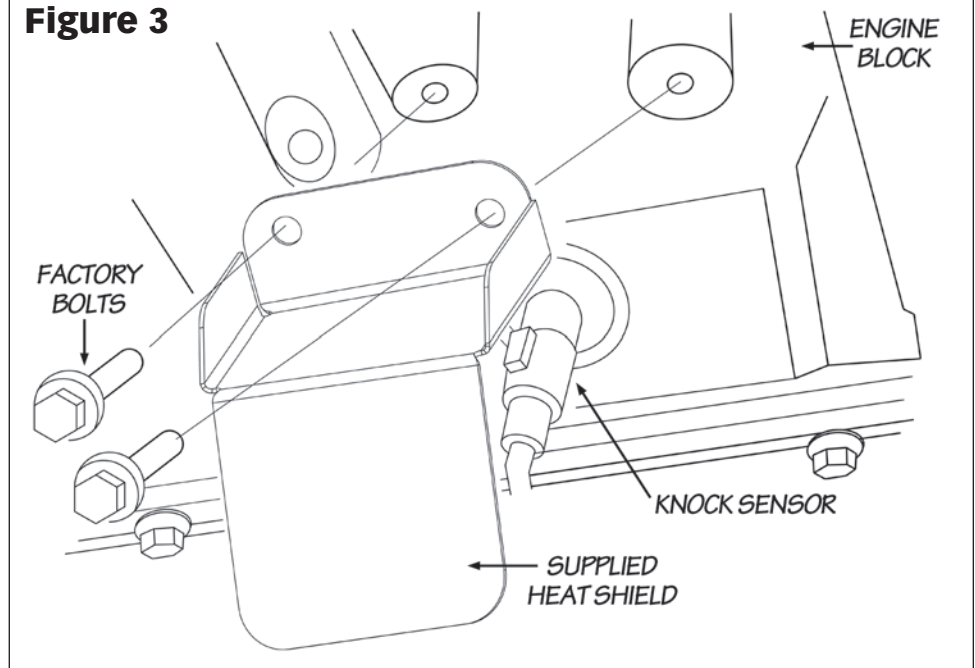
Slide the heat shrink over the bolted starter cable connection and heat with a heat gun until the heat shrink tightly conforms to the connection. Make sure the connection is completely covered.

**13.** On the driver-side of the engine block, remove the knock sensor heat shield located just below the exhaust ports next to the oil filter. Install the supplied heat shield onto the factory location using the factory hardware (see Figure 3).

**Figure 2**



**Figure 3**



**14.** Inspect the exhaust mounting surfaces of the cylinder heads and remove any rust or carbon, which would prevent the TorqueTube manifolds from

sealing. Tie cables away from left-side Torque Tube as shown in Figure 4.

Note: Do not use the factory exhaust manifold gaskets upon reinstallation. Banks

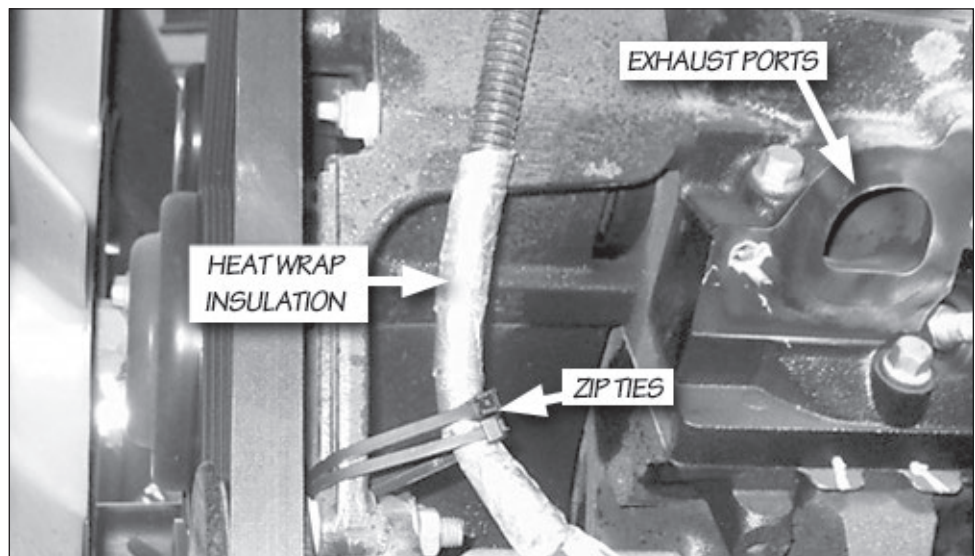
TorqueTube manifolds are a machined surface and are designed to seal without gaskets.

**15.** On the passenger side of the vehicle, bend the lower right corner of the driver-side starter heat-shield downward for TorqueTube clearance (see Figure 5). Connect the supplied heat-shield and #36 hose clamp to the brake reservoir on the vehicle's driver side (see Figure 6). Route the hose clamp to the inside of the brake reservoir and tighten the hose clamp with a standard screwdriver until the heat-shield is securely supported.

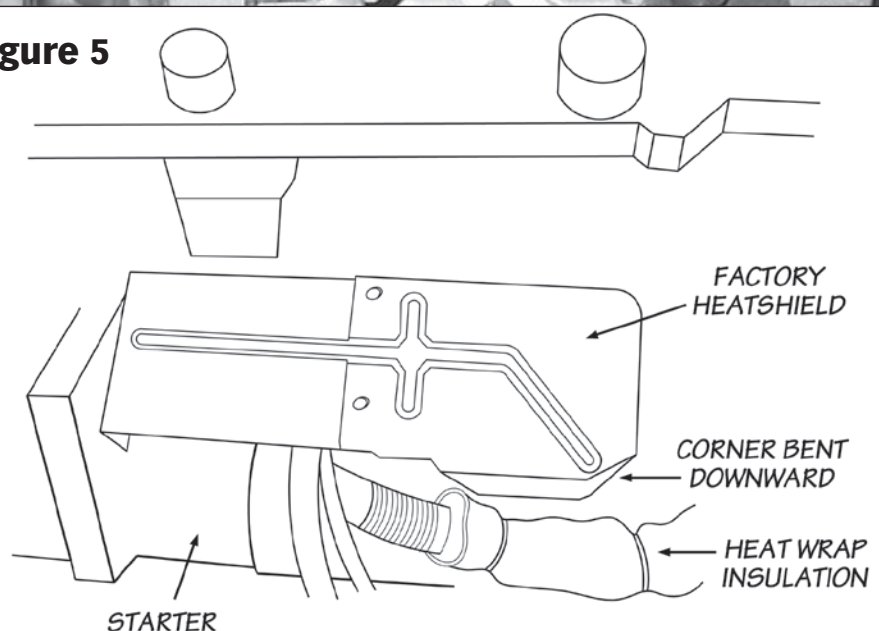
**16.** Apply a small amount of anti-seize onto the threads of the supplied 8 mm manifold bolts. Lift the right side TorqueTube manifold into place and install an 8 mm x 25 mm bolt at the front and rear of the TorqueTube to hold it in place. Set the (slightly longer) single 8mm x 30 mm bolt aside and install the remaining 8 mm x 25 mm manifold bolts to secure the TorqueTube. Repeat this step for the left side TorqueTube.

*Note: Do not install a manifold bolt in the bolt hole used to mount the dipstick tube bracket. Torque all manifold bolts to 26 ft-lbs.*

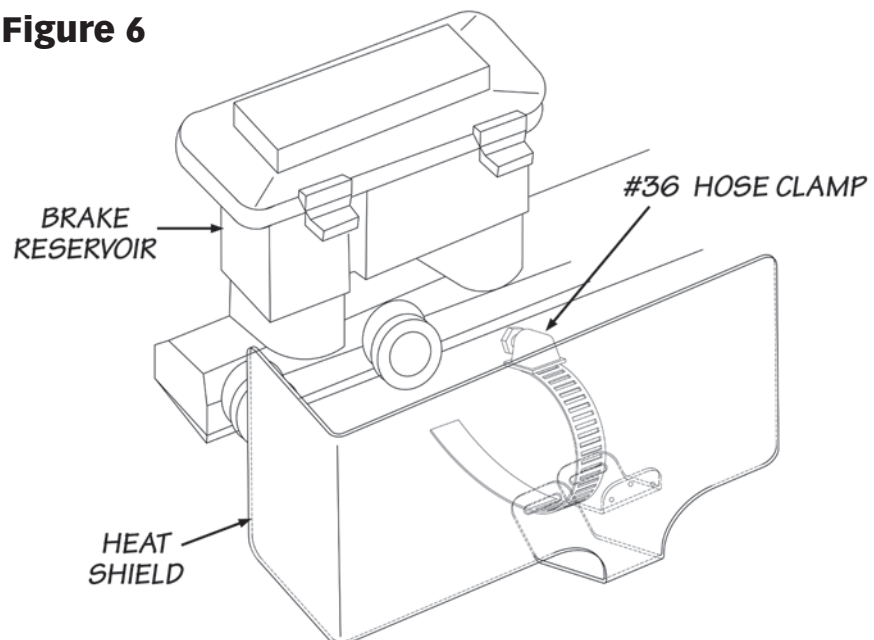
**Figure 4**



**Figure 5**



**Figure 6**





**17.** Reinstall the dipstick tube and o-ring. Using the single 8 mm x 30 mm manifold bolt and spacer provided, attach the bracket to the flange as shown in Figure 7. Torque the 8 mm x 30 mm bolt to 26 ft-lbs. Re-secure the bracket to the alternator support using the bolt previously removed. Re-install the spark plugs and spark plug wires in their original locations.

**18.** If applicable, bolt the EGR tube to the TorqueTube manifold using the supplied:

- (1) EGR gasket
- (2)  $\frac{5}{16}$ -18 x 1.0" bolts
- (2)  $\frac{5}{16}$ -18 crimplock nuts
- (4)  $\frac{5}{16}$  washers

It may be necessary to rotate the flange on the EGR tube to align with the flange on the TorqueTube manifold. Torque the EGR hardware to 25 ft-lbs.

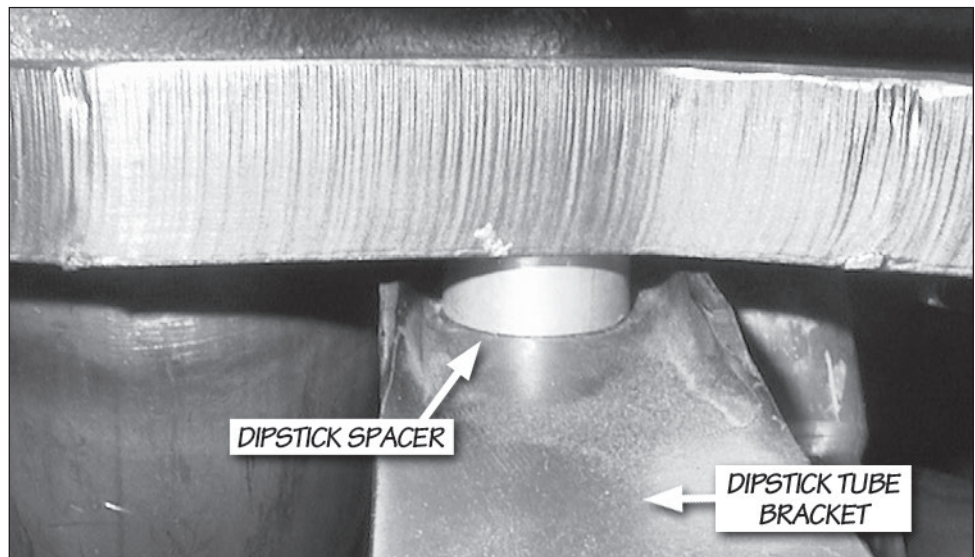
**19.** Attach the supplied heat wrap insulation to the starter cable extension, if installed, using the steel wire ties provided. Relocate and insulate wires to shield the cable from the heat source (see Figure 8).

**20.** Place a conical seal in the flare on the right side headpipe. Attach the headpipe and conical seal to the right-side TorqueTube manifold using

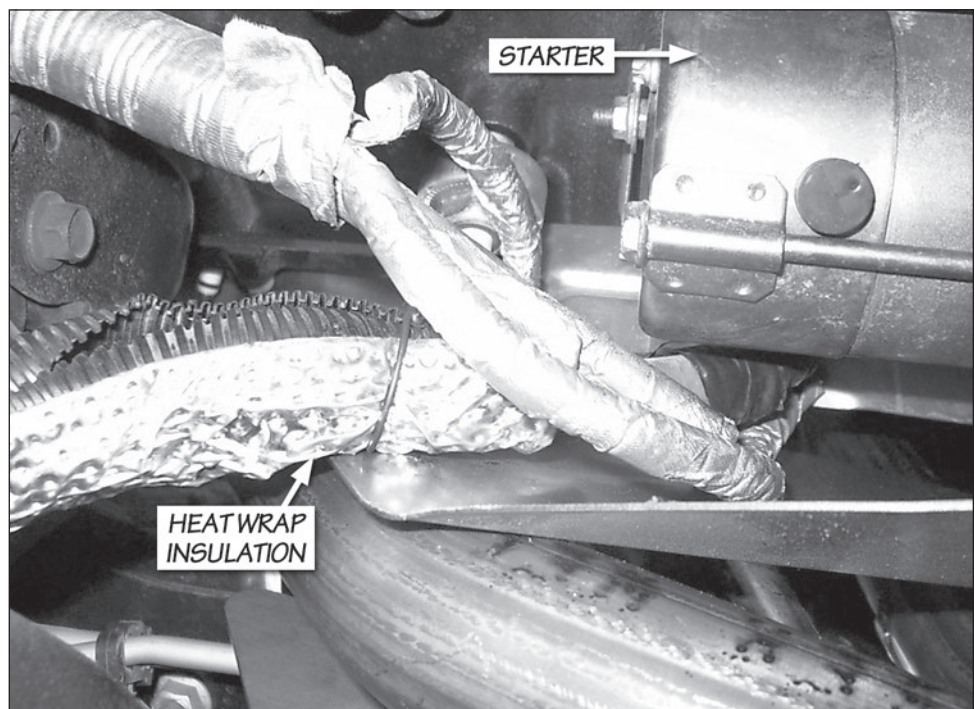
- (2)  $\frac{3}{8}$ -16 x 1  $\frac{3}{4}$ " bolts
- (2)  $\frac{3}{8}$  SAE washers

Tighten the bolts just enough

**Figure 7**



**Figure 8**



to hold the headpipe in place.

**21.** Insert the balance tube onto the installed right side headpipe. Slide (2) 2  $\frac{1}{4}$ " clamps over the balance tube. Place a conical seal in the flare on the left side headpipe. Attach the headpipe to the left-side TorqueTube manifold and balance tube. Insert the end of the balance tube

into the headpipe. Loosely assemble the left headpipe to the TorqueTube using:

- (2)  $\frac{3}{8}$ -16 x 1  $\frac{3}{4}$ -inch bolts
- (2)  $\frac{3}{8}$  SAE washers

Using the supplied zip ties, secure any wire harnesses away from the H-pipe (see Figure 9).



**CAUTION:** The following step involves cutting the catalytic converter tubing, proper safety attire including safety glasses and gloves should be worn.

**22.** With the catalytic converters removed from the vehicle, measure 16" in front of the front weld (approximately 2-½" in front of the 2nd bend) and vertically cut tubing (see Figure 10).

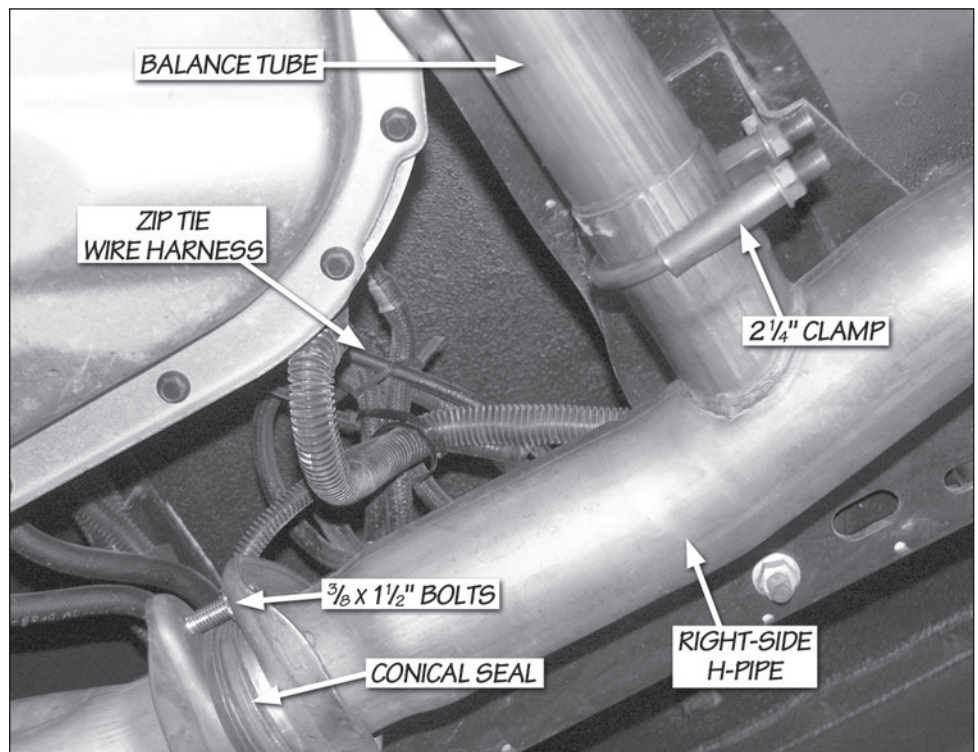
*NOTE: Whenever possible, it is recommended that the catalytic converters be inspected. Restricted or damaged catalytic converters can impede performance of your Banks PowerPack.*

**23.** Install a 3" clamp onto each outlet of the Banks H-pipe. Install the previously cut inlets of the right and left catalytic converters into the corresponding sides of the H-pipe.

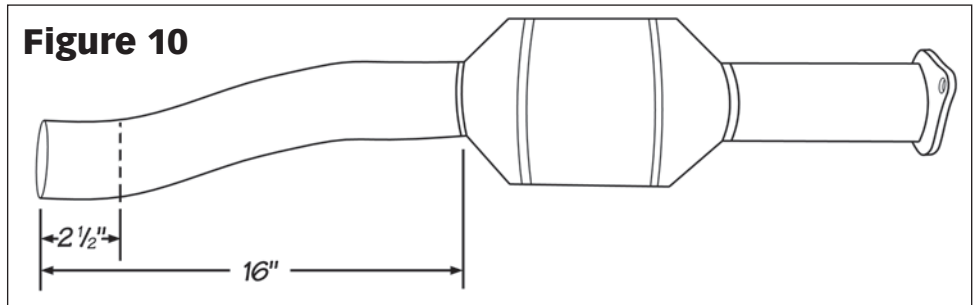
**24.** Remove the factory mufflers, extension pipes (if applicable) and tailpipes from the motorhome. Using a large screwdriver or pry bar, remove the muffler and tailpipe hangers pins from there corresponding rubber insulators.

Lubricating the rubber hangers with WD-40 or similar lubricant will ease removal of the hanger pins.

**Figure 9**



**Figure 10**



**25.** Install the crossover pipe hanger pin into the rubber insulator previously used for the front right muffler hanger.

**26.** Install the shorter inlet tube hanger pin into the driver-side rubber insulator previously used for the front left muffler hanger.

**27.** Place a small amount of anti-seize on the (4) 7/16-20x1-½" bolts. Attach the Banks crossover tube and inlet tube to each of the catalytic converter flanges using:

- (1) 2-bolt flange gasket
  - (2) 7/16-20 x 1-½" bolts
  - (2) 7/16-20 crimplock nuts
  - (4) 7/16 SAE washers
- Loosely tighten 7/16" hardware (see Figure 11).

*Note: If you have a 178" wheel-base chassis, proceed to Step 31.*

**28.** For 190, 208 and 228" wheelbases, the factory driver-side rear muffler hanger will need to be relocated. On the outside of the frame, remove the two (2) ¾" nuts

from the driver-side front muffler hanger (see Figure 12).

**29.** Measure 11- $\frac{1}{8}$ " from the previously removed front muffler hanger location, to the rear of the coach (see Figure 12). Drill (2)  $\frac{1}{2}$ " holes through the frame rail. The holes are spread 5- $\frac{1}{2}$ " apart. CAUTION: before drilling, be sure all wire harnesses, fuel lines, etc. are relocated away from the drilling location.

**30.** Install the previously removed muffler hanger and rubber insulator assembly onto the inside frame rail using the holes drilled through the frame. Torque the hanger nuts to 30 ft-lbs.

**31.** Install a 3" clamp on the outlet end of the crossover tube and inlet tube. Install the Banks Monster muffler's dual inlet tubes over the crossover tube and inlet tube. Install the rear Monster muffler hanger pin into the corresponding rubber insulator.

**32.** For 190", 208" and 228" wheelbases, install a 4" clamp onto the inlet end of the extension pipe. Install the extension pipe onto the Monster muffler outlet and snug the 4" clamp.

**33.** For motorhomes with left-side exit exhaust systems:

A) Place the supplied frame mounted hanger pin on the rear of the left outside frame next to the rear stabilizer

Figure 11

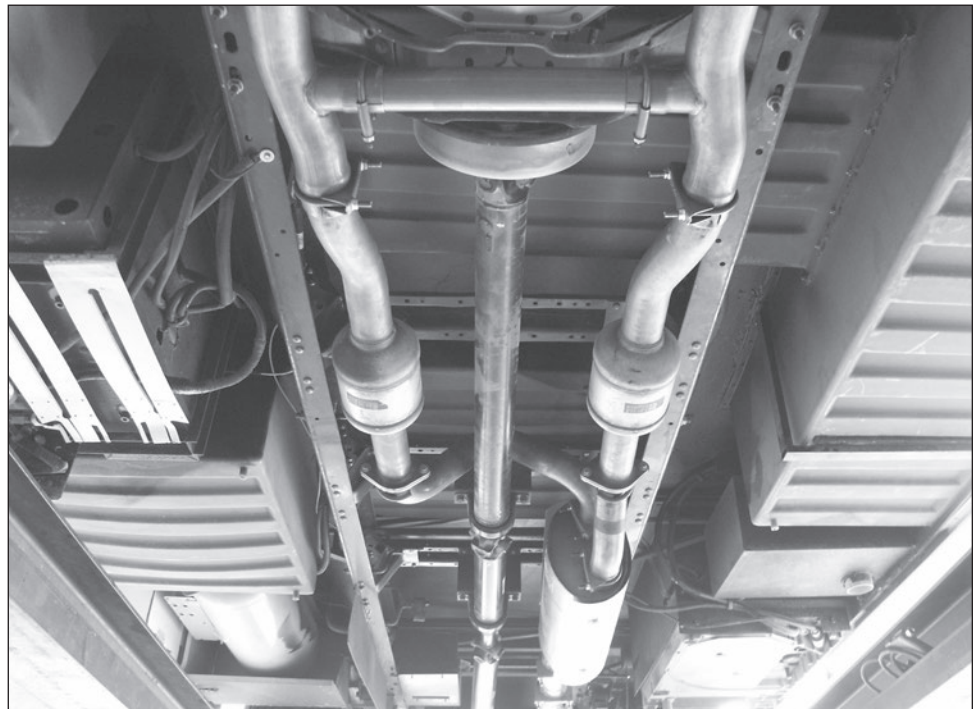
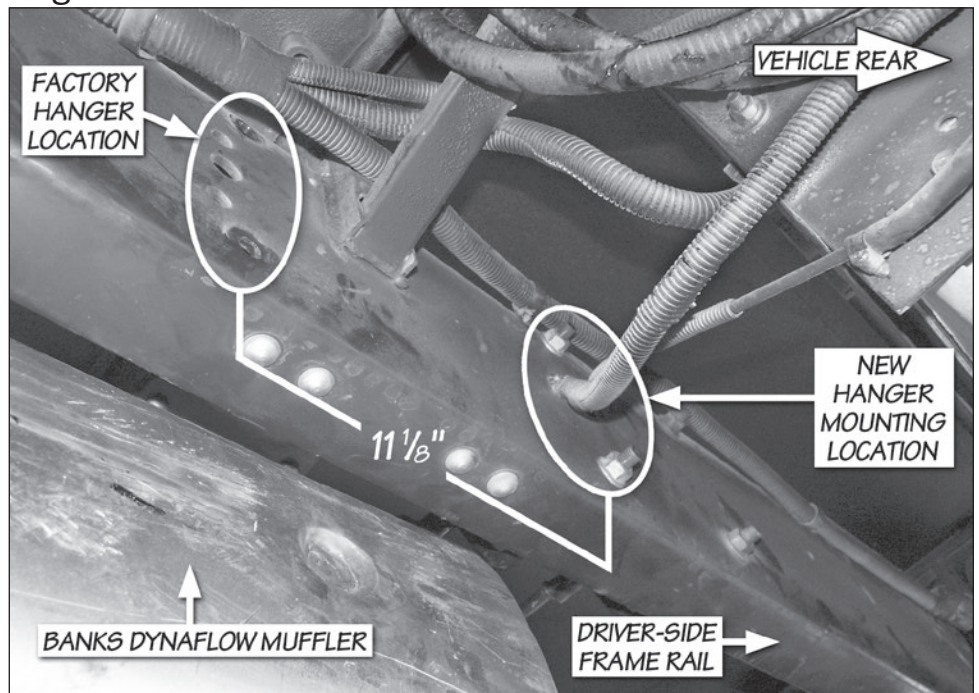


Figure 12



cross member.

B) Verify  $\frac{3}{8}$ " or larger frame holes are apparent. Some models may need the  $\frac{1}{4}$ " frame holes drilled to  $\frac{7}{16}$ " (see Figure 13).

C) Secure the supplied frame mounted hanger pin onto the

frame using:

(2)  $\frac{3}{8}$ -16 x 1" bolts

(2)  $\frac{3}{8}$ -16 crimp nuts

(4)  $\frac{3}{8}$ " SAE washers

D) Verify the hanger is straight and torque the  $\frac{3}{8}$ " hardware to 30 ft-lbs.



**34.** For motorhomes with right-side exit exhaust systems:

A) Install L-bracket onto the lower right-side frame rail near the rear stabilizer cross member. Install the bracket such that the two (2) holes are attached to the bottom of the frame rail with the three (3) holes flush to the outside frame.

B) Secure the bracket to the frame using:

- (2)  $\frac{3}{8}$ -16 x 1" bolts
- (2)  $\frac{3}{8}$ -16 crimplock nuts
- (4)  $\frac{3}{8}$ " SAE washers

C) Verify the hanger is straight and torque the  $\frac{3}{8}$ " hardware to 30 ft-lbs.

**35.** Place a 4" clamp onto the Monster muffler outlet or extension pipe. Install the front tailpipe onto the muffler outlet/extension pipe.

**36.** Install a 4" clamp onto front tailpipe outlet. Install the rear tailpipe onto the front tailpipe. Position the rear tailpipe so that it is parallel with the ground and coach.

**37.** There should be a 2-3" gap between the coach and rear tailpipe. If the gap is greater than 3", the front and rear tailpipe will need to be removed from the system and the front tailpipe outlet will need to be trimmed (see Figure 14).

**38.** With the proper height established, install a 4" clamp onto the rear tailpipe.

Figure 13

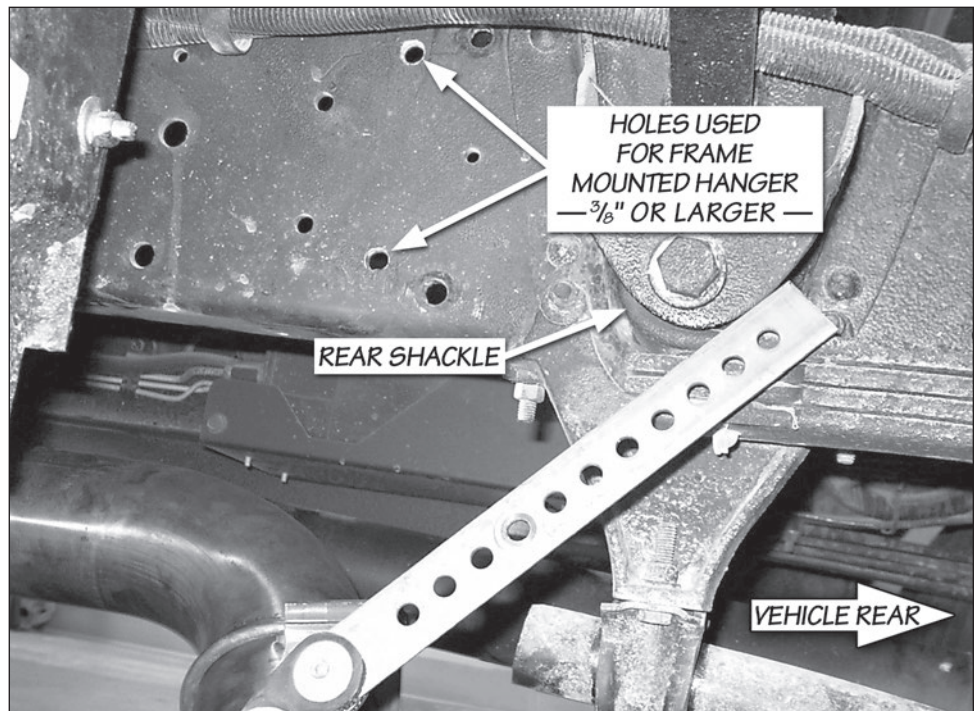
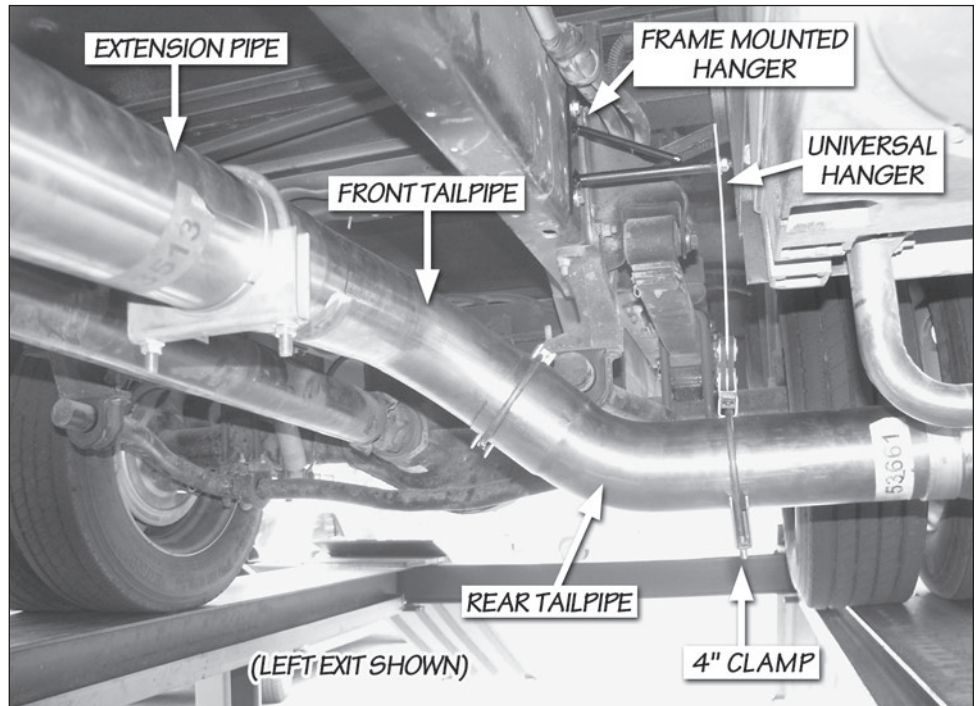


Figure 14



Attach the universal hanger to the clamp. Do not tighten completely at this time in case more adjustment is required. Position the tailpipe parallel to the ground, and arrange the hanger such that

it is perpendicular to the tailpipe and is touching the frame mounted hanger pin or bracket.

**39.** For left side exit exhaust systems, secure universal hanger to the frame mounted



hanger pin with:

(1)  $\frac{3}{8}$ " flat washer

(1)  $\frac{3}{8}$ -16 crimplock nut

**40.** For right side exit exhaust systems, on Banks frame mounted hanger bracket, select one of the three holes that most correctly aligns the universal hanger. Secure universal hanger to the bracket using with:

(1)  $\frac{3}{8}$ -16x1" bolt

(2)  $\frac{3}{8}$ " flat washer

(1)  $\frac{3}{8}$ -16 crimpnut

**41.** Apply a small amount of anti-seize to the threads of the oxygen sensors previously removed.

**Caution: Make sure no anti-seize gets on the tip of the oxygen sensor. This will damage the sensor.**

Install the oxygen sensors in the headpipe making sure they are in their original locations. Torque the oxygen sensors to 30 ft-lbs. Zip ties may need to be removed and new zip ties added to properly position the oxygen sensor cables.

**42.** Beginning with the front of the exhaust system, torque the TorqueTube and headpipe hardware to 30 ft-lbs. Torque all clamps to 30 ft-lbs. Torque the inlet muffler bolts to 48 ft-lbs.

**43.** Slide the tailpipe tip onto the tailpipe extension. Position the tip so it extends 1-inch beyond the coach body or wherever aesthetically pleasing and tighten the band-clamp to 30 ft-lbs.

## **BANKS RAM-AIR™ FILTER:**

**44.** Locate the factory air filter housing and access it from inside the right-side wheel-well. Replace the factory air filter element with Banks Ram Air element. Place the "STOP!" decal on the air filter housing so that it is clearly visible to service personnel.

**45.** Re-install the inner front fender shields and wheels if removed. Make sure to torque the wheels to the

manufacturer's specifications.

**46.** Lower the vehicle and reconnect the battery cables. Start the engine and listen for any exhaust leaks. Tighten bolts or clamps to correct any leaks or improper adjustments. Whenever possible, tack-welding slip connections to prevent disengagement is recommended.

Note: It is normal for the vehicle exhaust to smoke upon initial start-up. This indicates the lubricant applied during the tube-bending process is burning off the pipes.

# Cleaning and Oiling the Banks Ram-Air Filter

## Notification

**The Banks Ram-Air Filter comes pre-oiled and no oiling is necessary for initial installation. Use Banks Ram-Air Filter cleaning system (part# 90094), available from Gale Banks Engineering to service the Air Filter. Follow the instructions included with the cleaning system to clean and re-oil your Banks Ram-Air Filter.**

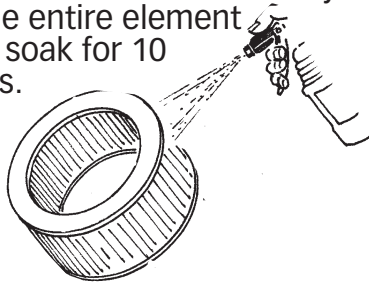
### 1. PRE-CLEANING

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, reoil the element and reinstall in your vehicle.*

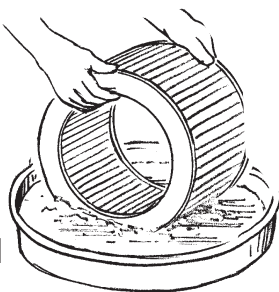
### 2. SPRAY-ON CLEANING

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



### PAN CLEANING

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



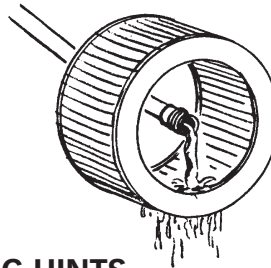
### 3. CLEANING HINTS

Use only an 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 No's

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.

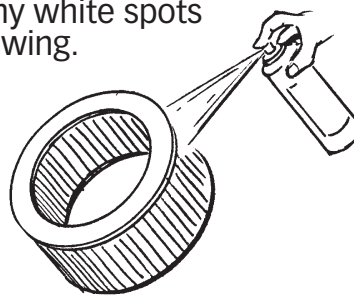


### 5. DRYING HINTS

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 reoil before using. Spray Banks Ram-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 Banks Ram-Air filter without oil (the filter will not stop the dirt without the oil). Use only an air filter oil. 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 Banks Ram-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 Banks 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. If an air-filter restriction gauge is installed, then change the element when the air-filter restriction reaches 18"-H<sub>2</sub>O.

**CAUTION! Extremely fine dust from 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 an air-filter sealing grease on rubber ends of the element. Service only with Air-filter cleaner and oil.**

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

Product Information & Sales: (800) 438-7693  
Customer Support: (888) 839-5600  
Installation Support: (888) 839-2700

**bankspower.com**