

OWNERS MANUAL

...with installation instructions

Banks Power Systems

**PowerPack® system
Stinger® system**

**2000-2007 GM 8.1L Class-A
Workhorse W-Series Chassis
Motorhomes**

BANKS

General Installation Practices

- 1.** For ease of installation of your Banks PowerPack system, familiarize yourself with the procedure by reading the entire manual before starting work. This manual contains 12 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 (page 11) provides only general

guidance. Refer to each step and section diagram in this manual for proper instruction.

- 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.

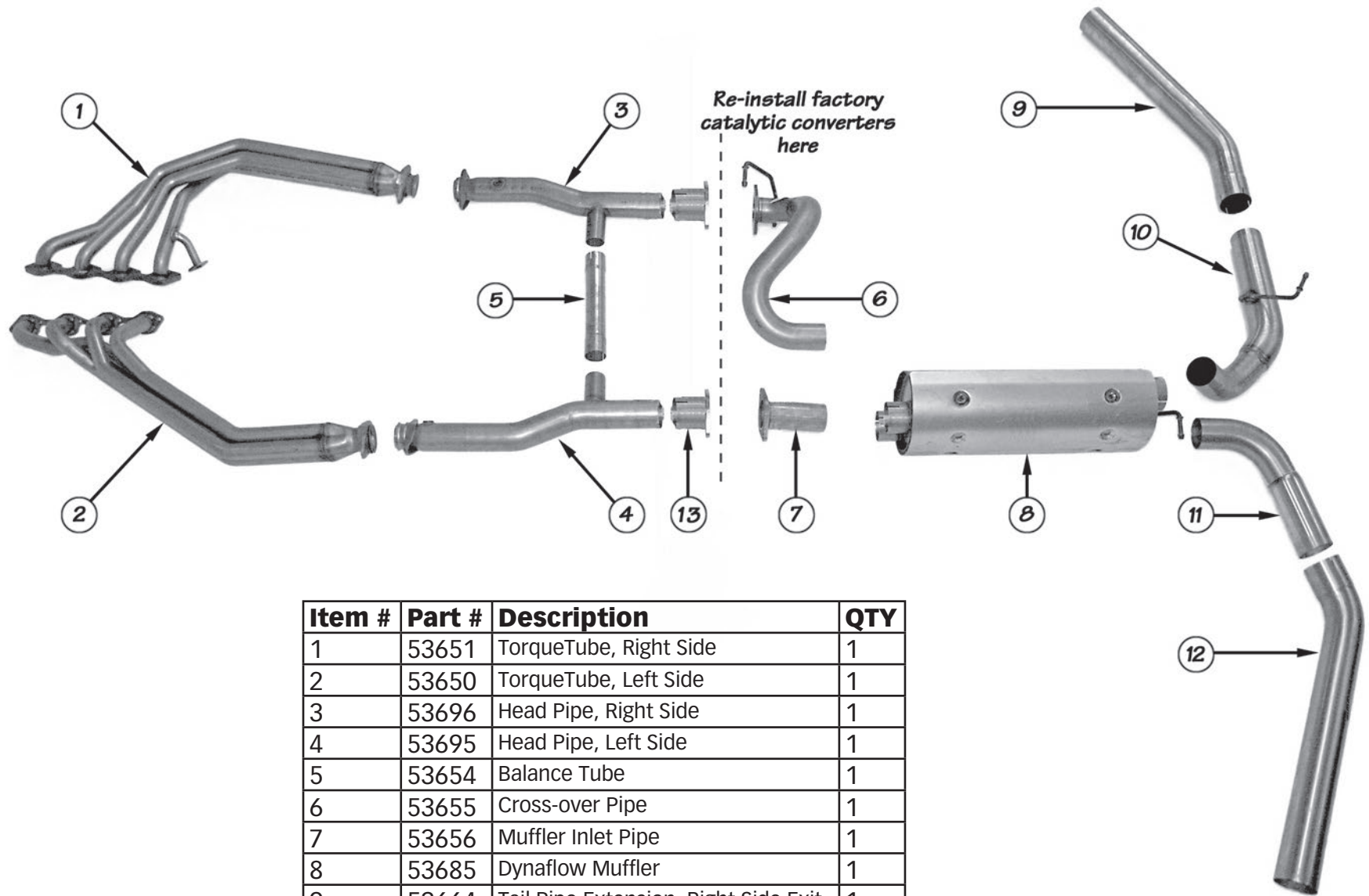
NOTE: If installing the Stinger system proceed to Step 29.

- 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.

PowerPack, General Assembly



Item #	Part #	Description	QTY
1	53651	TorqueTube, Right Side	1
2	53650	TorqueTube, Left Side	1
3	53696	Head Pipe, Right Side	1
4	53695	Head Pipe, Left Side	1
5	53654	Balance Tube	1
6	53655	Cross-over Pipe	1
7	53656	Muffler Inlet Pipe	1
8	53685	Dynaflow Muffler	1
9	53664	Tail Pipe Extension, Right Side Exit	1
10	53663	Tail Pipe, Right Side Exit	1
11	53660	Tail Pipe, Left Side Exit	1
12	53661	Tail Pipe Extension, Left Side Exit	1
13	53697	Adapter, Head Pipe	2

Installation Instructions

10. With the vehicle safely raised, ground wire(s) disconnected, and other precautions in place, the factory exhaust system can be removed.

11. 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.

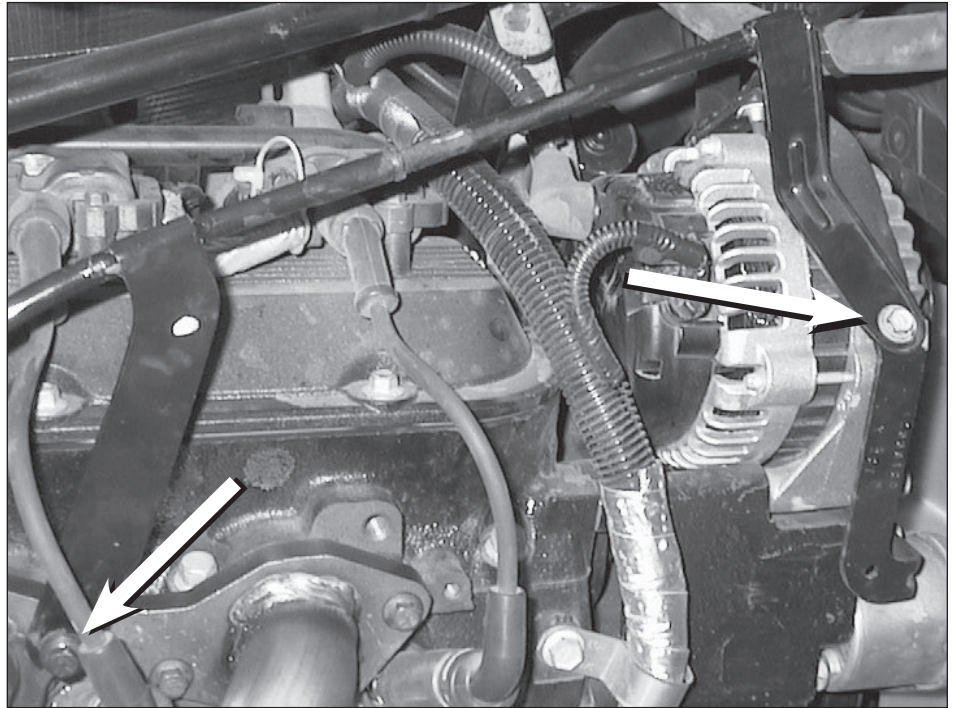
12. Disconnect from the headpipes the oval 2-bolt flange at the front of the catalytic converters. Disconnect the headpipes from the exhaust manifolds and remove the headpipe assembly.

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

13. To provide better access to the 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.

Figure 1



If the vehicle is equipped with inner front fender shields, remove them for improved access. If applicable, remove the two nuts securing the EGR tube to the rear of the right-side exhaust manifold.

14. Unbolt the brackets from the alternator support and manifold stud (see **Figure 1**). Remove the dipstick and dipstick tube by pulling and twisting upward. If the dipstick tube o-ring is stuck inside the hole in the engine block, remove it and place it back onto the dipstick tube.

15. 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.

16. Remove the nuts holding the spark-plug wire heatshields to the exhaust manifold studs. Remove the heatshields.

17. With a wrench or socket, back the exhaust manifold nuts at least one turn away from the manifolds. 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.

18. CAUTION: Make sure all ground cables are removed from vehicle's battery(s). Remove the starter wire battery cable from the starter motor. If the starter cable runs to the front

of the motor home re-route the starter cable as shown in **Figure 2**. Reinstall the cable onto the stud on the starter and tighten the retaining nut. Secure the starter cable to the other cable running through this area using the steel wire ties provided. You will not need the starter cable extension provided.

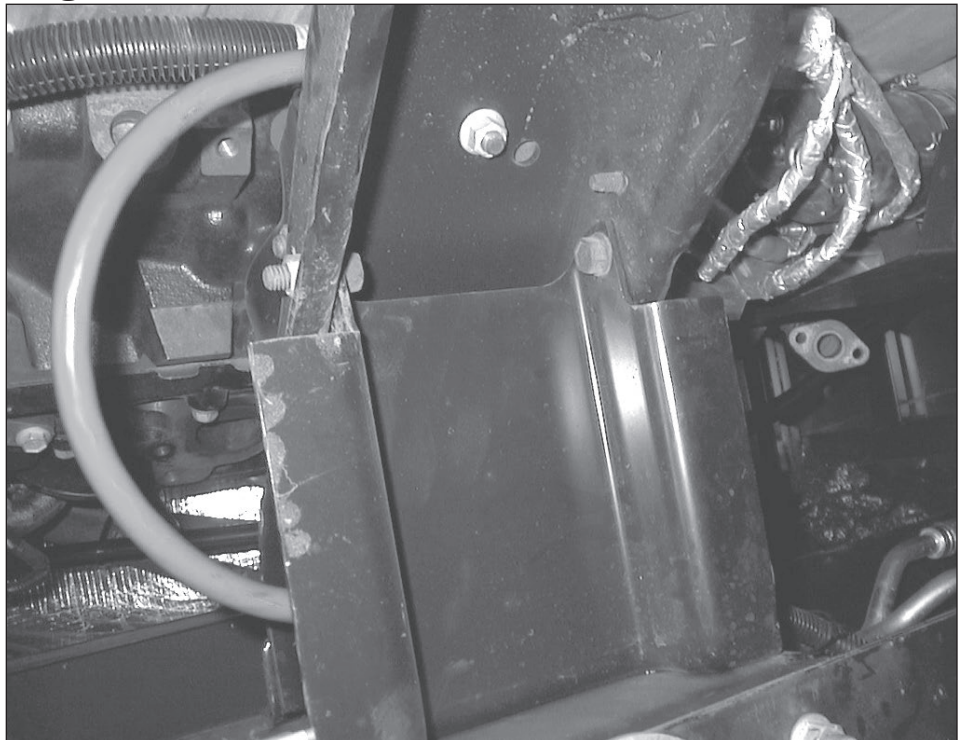
19. If the starter cable runs from the back of the motor home install the 90-degree terminal end of the supplied starter cable extension onto the starter motor and tighten the retaining nut. Route the starter cable extension forward through the frame rail under the cross member then back over the cross member to the starter motor and at least 6" away from all heat sources as shown in **Figure 3**. 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, and (1) $\frac{5}{16}$ SAE. Slide the heat shrink over the connection and heat with a heat gun until the heat shrink tightly conforms to the connection. Make sure the connection is completely covered.

20. Inspect the exhaust mounting surfaces of the cylinder heads and remove any rust or carbon, which would prevent the

Figure 2



Figure 3



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.

21. Apply a small amount of anti-seize on the threads of the 8 mm manifold bolts supplied. Lift the right side TorqueTube manifold into place and install one 8 mm x 25 mm bolt at the front of the manifold and one at the rear to hold the TorqueTube in place. 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 (see **Figure 1**). Torque all manifold bolts to 26 ft-lbs.*

22. Reinstall the dipstick tube and o-ring. Using the one 8 mm x 30 mm manifold bolt and spacer provided, attach the bracket to the flange as shown in **Figure 5**. Torque this bolt to 26 ft-lbs. Re-secure the bracket to the alternator support using the bolt previously removed. Re-install the spark plug wires in their original locations.

23. If applicable, bolt the EGR tube to the TorqueTube manifold using the gasket and $\frac{5}{16}$ -18 x 1.0" bolts, crimplock nuts, and washers provided (see **Figure 6**). It may be necessary to rotate the flange on the EGR tube to align with the flange on the TorqueTube manifold.

24. Attach the supplied heat wrap insulation to the starter cable extension, if installed, using the steel wire ties provided. Locate the insulation to shield the cable from the heat source.

25. Place a conical seal in the flare on the right side headpipe. Attach the headpipe to the right-side TorqueTube manifold using (2) $\frac{3}{8}$ -16 x 1 $\frac{3}{4}$ -inch bolts and (2) $\frac{3}{8}$ SAE

Figure 4

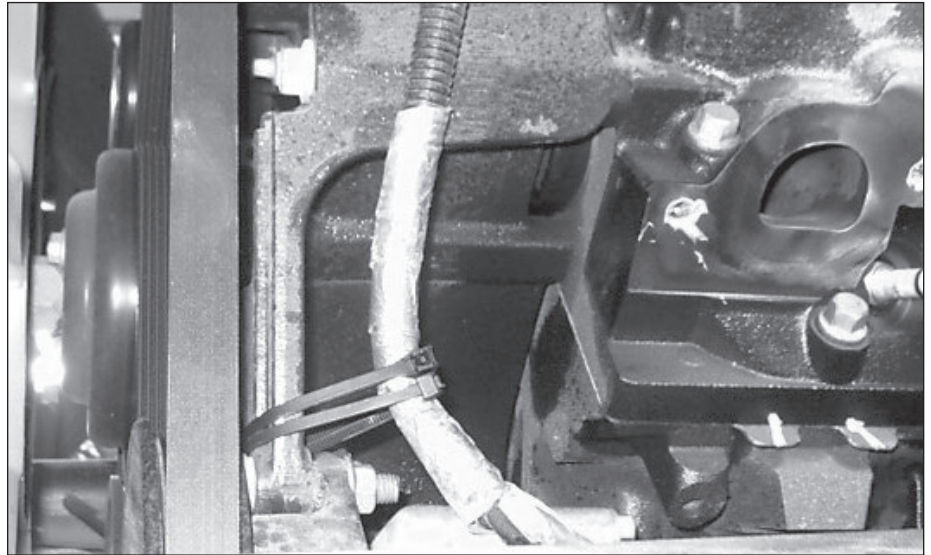
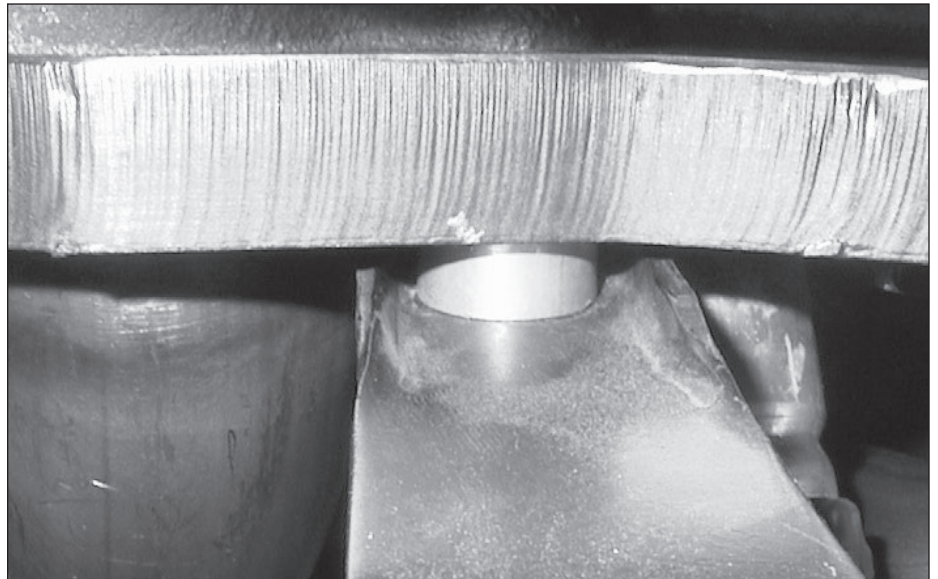


Figure 5



washers provided. Tighten the bolts just enough to hold the headpipe in place. Insert the balance tube onto the 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.

26. Apply a small amount of anti-seize to the first couple threads of the (8) $\frac{7}{16}$ -20 x 1 $\frac{1}{2}$ "

bolts provides. Insert the (2) 3" clamps onto the left and right head pipes and insert the head pipe adapters onto each head pipe. Using the (1) 2-bolt gasket and (2) $\frac{7}{16}$ -20 x 1 $\frac{1}{2}$ " bolts, (2) crimplock nuts, and (4) $\frac{7}{16}$ SAE washers for each head pipe adapter, attach the adapters to the catalytic converter inlets.

27. Position the 3" clamps over the slip joint. Align the adapters so that the holes

on the adapter line up with the cat-converter. Tighten the bolts and the clamps on the adapters, then tighten the front of the head pipes. Position the 2¼-inch clamps over the slip joint with the threaded studs pointing to the rear of the vehicle. See **Figure 7**. Tighten the clamps.

28. 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. Zip ties may need to be removed and new zip ties added to properly position the oxygen sensor cables.

29. Remove the factory tailpipes. If the slip joint at the rear of the muffler will not come apart, heat the joint until it can be separated. Unbolt the 2-bolt flange at the front of each muffler and remove the mufflers.

30. Insert the crossover pipe hanger into the rubber hanger previously used for the front hanger on the right-side muffler. Bolt the 2-bolt flange of the crossover pipe to the 2-bolt flange on the intermediate pipe. Install the 2-bolt flange of the

Figure 6

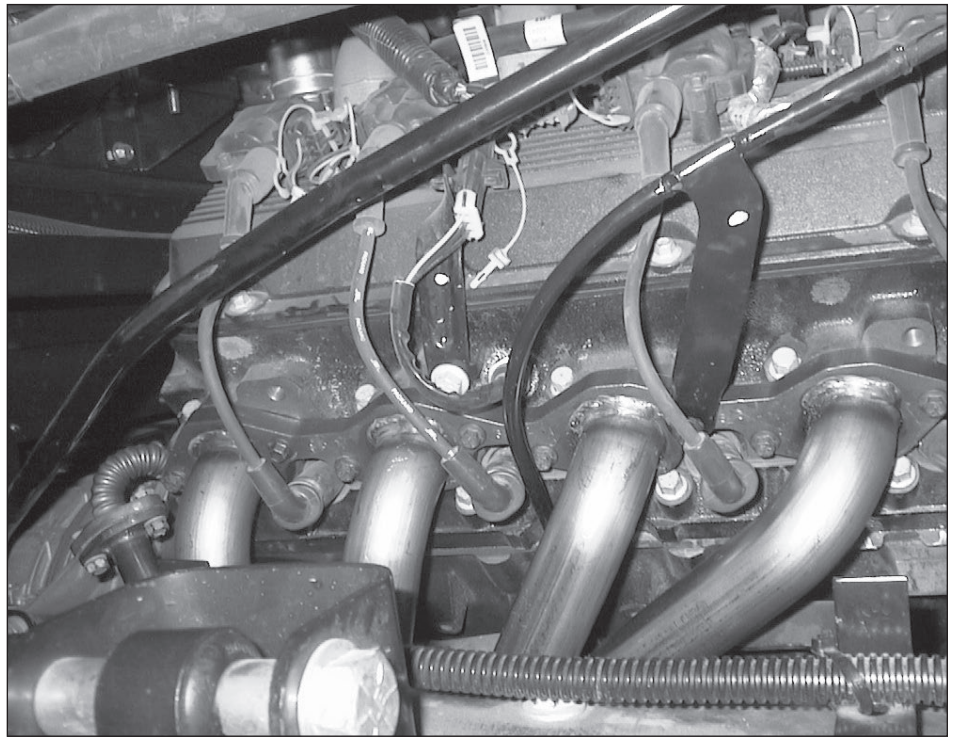
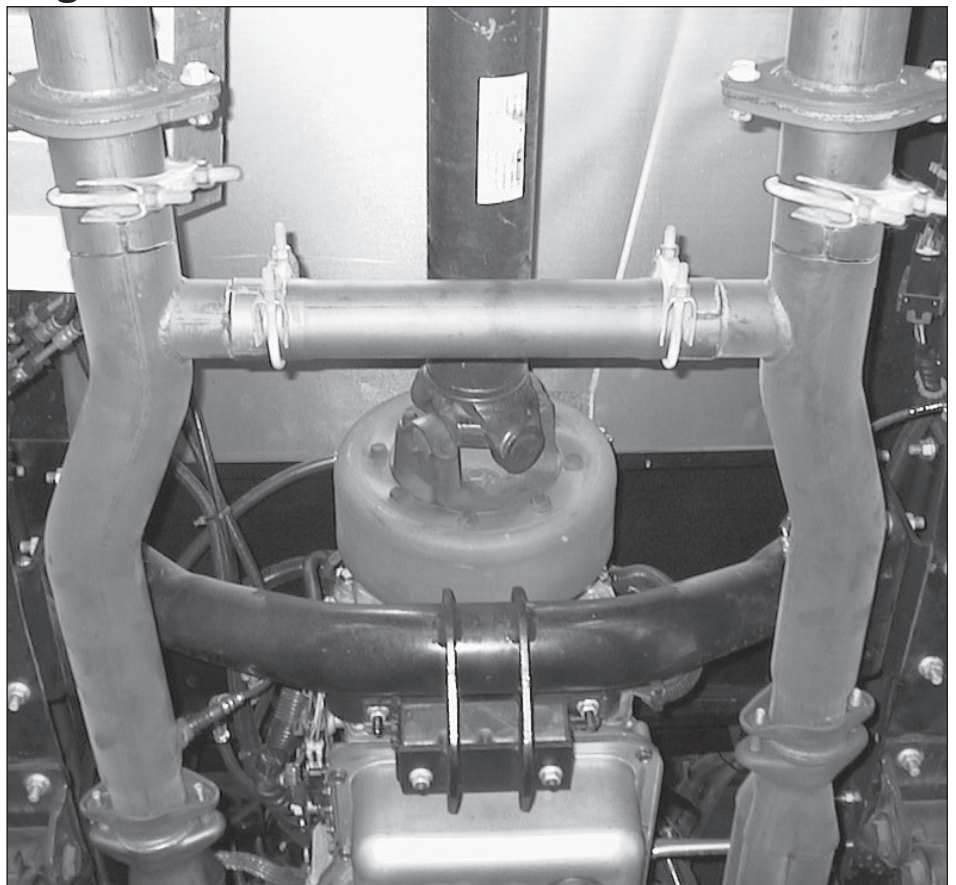


Figure 7



muffler inlet pipe onto the 2-bolt flange on the left-side intermediate pipe. Use (1) 2-bolt gasket, (2) $\frac{7}{16}$ -20 x 1 $\frac{1}{2}$ " bolts, (2) crimplock nuts, and (4) $\frac{7}{16}$ SAE washers for each flanged joint.

31. Install the supplied frame mounted muffler hanger inboard of the frame rail using the (2) M12x1.75x40mm bolts through the two holes in the frame rail approximately 3 inches in front of the frame cross member (see **Figure 8**). If the tailpipe is to exit the left-side install the frame mounted tailpipe hanger outboard of the frame rail using the same M12 bolts. Place a $\frac{1}{2}$ " SAE washer over the end of the M12 bolt and thread a M12 nut onto the end of each bolt. Tighten the nuts and bolts. Remove the rubber hanger used by the factory for its muffler hanger and install it on the Banks frame mounted muffler hanger.

32. Slide a 3-inch clamp onto the crossover pipe and muffler inlet pipe. With the unshielded portion of the muffler facing the driveshaft insert the muffler hanger into the rubber hanger. Make sure the two inlets to the muffler are vertical. Push the muffler forward and hold. Make sure the crossover pipe and muffler inlet pipe are fully seated into the slip joints of

Figure 8

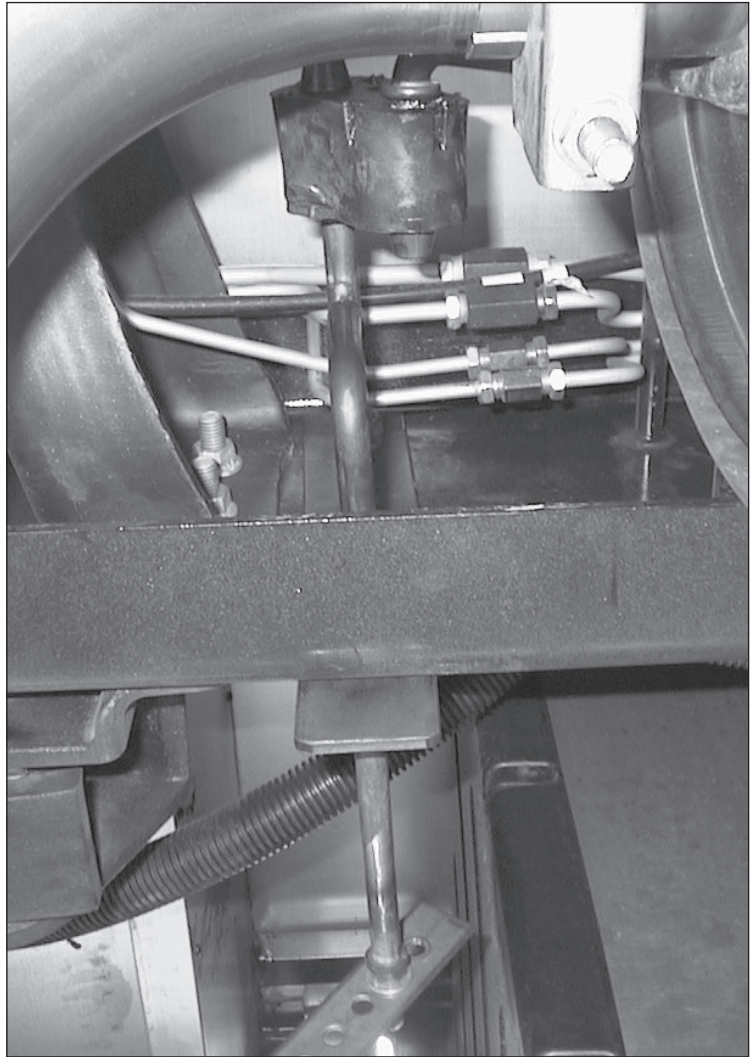
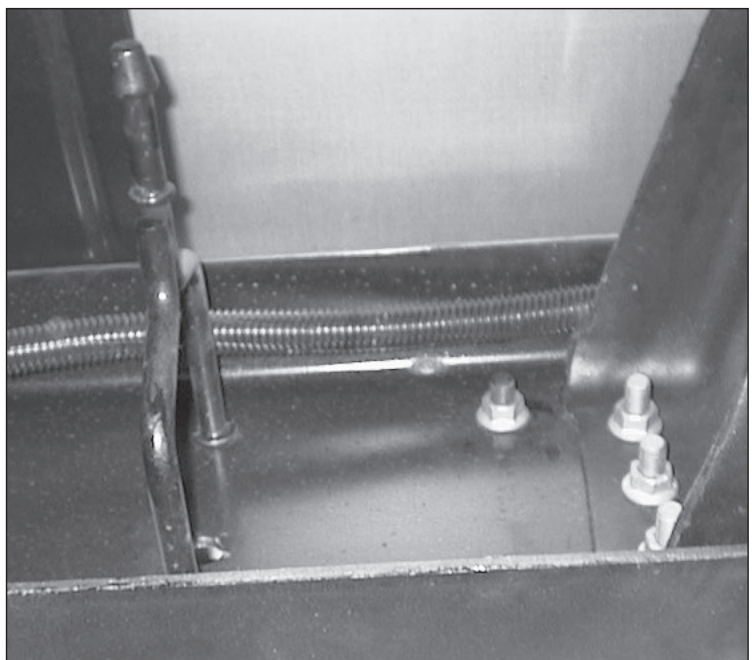


Figure 9



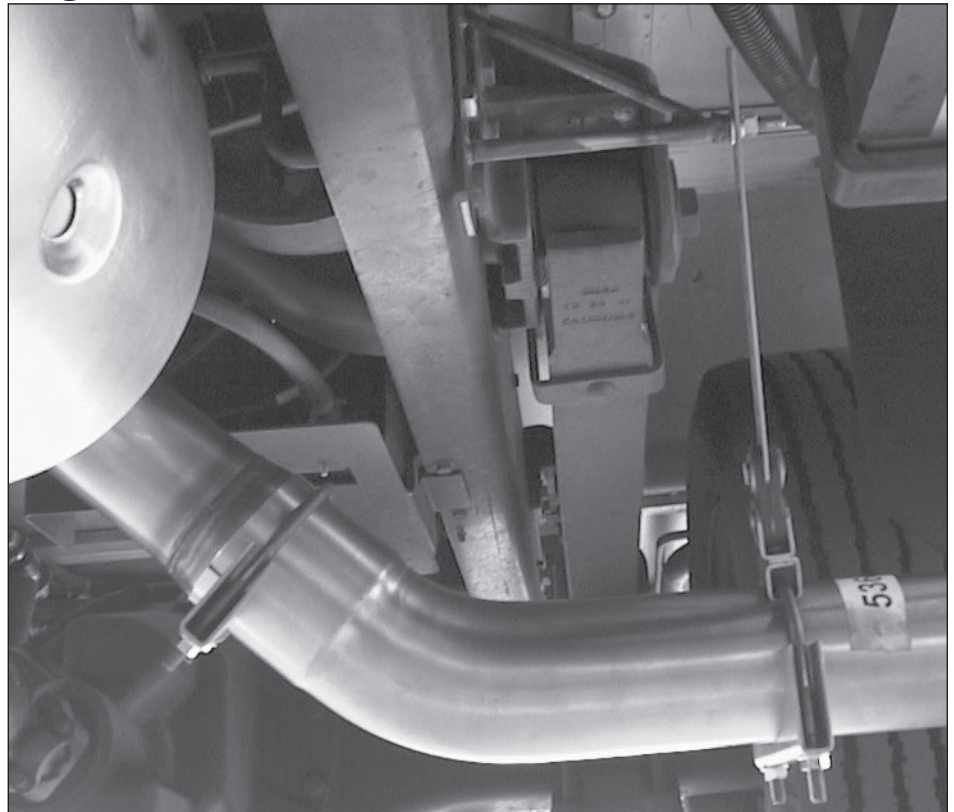
the muffler. Tighten the 3-inch clamps.

33. For a left-side exit tailpipe insert the 3½" end of the tailpipe into the outlet of the muffler.

For a right-side exit tailpipe remove the factory frame mounted hanger used to support the rear of the right-side muffler and install it inboard of the frame rail through the holes in the frame rail approximately 3 inches in front of the frame cross member (see **Figure 9**). If a factory installed tail pipe hanger is installed in these holes remove the hanger. Install the supplied frame mounted tailpipe hanger outboard of the frame rail adjacent to the relocated frame mounted hanger using its studs and nuts. Route the tail pipe up and over the driveshaft. Insert the tailpipe hanger into the relocated rubber hanger. Slide the 3½" end of the tailpipe into the outlet of the muffler.

34. Slide the tailpipe extension onto the tailpipe, without installing the clamps. Level the tailpipe extension to the vehicle. The tailpipe extension should be 1½ to 2½ -inches below the bottom of the vehicle body. If the pipe is more than 2½-inches below the body, trim the tailpipe at the slip joint to raise the tailpipe extension. Make sure to trim the tail pipe and not

Figure 10



the extension. Also, be sure to leave at least 3.5-inches of straight on the tailpipe at the slip joint so it can be correctly inserted into the slip of the extension.

35. With the proper height established, install the 4-inch clamp over the tailpipe extension slip joint and snug up the clamp. Do not tighten completely at this time incase more adjustment is required.

36. Level the tailpipe extension with the vehicle and place the 4-inch universal hanger clamp onto the extension pipe. Determine which hole in the hanger strap should be inserted over the stud on the frame mounted tailpipe hanger and

place the strap onto the stud. Using the ¾" SAE washer and crimplock nut provided secure the hanger strap to the frame mounted hanger. Slide the 4-inch hanger clamp on the extension pipe until the hanger strap is square to the extension pipe. Lightly tighten the clamp. See **Figure 10**.

37. Check the extension pipe to ensure it is level and the gap between it and the body is correct. If not loosen the connections and adjust accordingly. Once pipe is level and at the correct height tighten all clamps. Install a 3½" clamp on the outlet of the muffler. Make sure the tailpipe is inserted fully into the slip joint of the muffler and tighten the clamp.

38. 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.

BANKS RAM-AIR® FILTER:

39. 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.

40. Re-install the inner front fender shields and wheels if removed. Make sure to torque the wheels to the manufacturer's specifications. 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

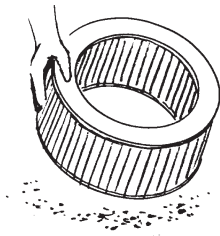
NOTIFICATION! The Banks Ram-Air Filter comes pre-oiled and no oiling is necessary for initial installation.

Use Banks Ram-Air Filter cleaning system (part# 90094), available from Gale Banks Engineering to service the Ram-Air Filter. Follow the instructions included with the cleaning system to clean and re-oil your Banks Ram-Air Filter.

1. PRE-CLEANING

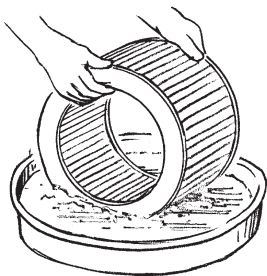
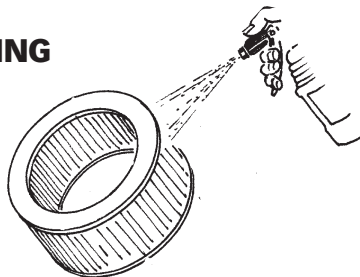
Tap the element to dislodge any large embedded dirt, then gently brush with a soft bristle brush.

NOTE: If complete cleaning is not practical at this time, re-oil 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

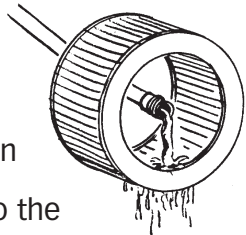
Large air-filter elements can be rolled or soaked in a shallow pan of air-filter cleaner. Remove immediately and let soak for approximately 10 minutes.

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.



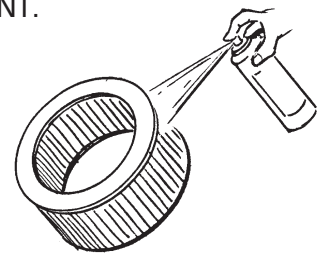
5. DRYING HINTS

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 re-oil 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 WD-40, LPS, or other light-weight oils.**

8. RE-INSTALL

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.O.

CAUTION! Extremely fine dust from agriculture or offroad use will pull the oil from the element. Frequent re-oiling 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 air-filter oil.