

# JBA Cat4ward 1625 Series Header Installation Instructions for the '99 – '01 Mustang and Cobra

## **Read these instructions carefully before attempting installation.**

In addition to an adequate workspace, general mechanic's tools, and general mechanical expertise, installation of these headers requires the patience of Job, dogged determination, a box of band-aids, and at least one bottle of aspirin (or other preferred analgesic). Even auto enthusiasts with these resources and a reasonable degree of technical experience will suffer untold pain and suffering when installing these headers. Make no mistake about it: if you're not in a position to drop the motor, this WILL be the installation from Hell. You should carefully review these instructions before embarking on this automotive odyssey. If you are still determined to tackle the installation after digesting these instructions, consult a good psychiatrist or clinical psychologist for a suitable course of treatment.

If you're an average gear head working alone in your garage, it's going to take you AT LEAST twelve hours to complete this ordeal. If you're a meticulous plodder, like I am, plan on double that amount of time.

**WARNING:** These headers will not fit vehicles equipped with offset steering rack bushings. Hell, they may not even fit stock vehicles in all cases! Depends on how they were welded up at the factory. Basically, you're rolling the dice, buddy, but *JBA* will endeavor to correct any such minor faux pas.

### **JBA-supplied Parts:**

1. Driver Side Header Assembly, 1 each
2. Passenger Side Header Assembly, 1 each
3. *Mr. Gasket Ultra-Seal # 5927* Header Gaskets (Header flange to Head), 2 each
4. Passenger side collector flange gasket, 1 each
5. Dipstick tube spacer (3/8" hex nut), 1 each
6. 8mm x 1" Header bolts w/ lock washers (torque to 190 in-lbs), 16 sets
7. 3/8" x 2¼" collector bolts, 2 each
8. 3/8" x 2" collector bolts, 2 each
9. 3/8" x 1½" collector bolts, 2 each
10. 3/8" collector bolt washer sets - (1 flat washer and 1 lock washer per set), 4 sets

## **JBA Header Kit Part Numbers:**

Be certain that you have the correct headers for your car. *JBA Cat4ward™* part numbers for the 99-01 *Ford Mustang* and *Cobra* with 4.6L V-8 engines are as follows:

Part # 1625-1	'99-'01 Mustang 4.6L SOHC V-8, 1-1/2"
Part # 1625-4	'99-'01 Cobra 4.6L DOHC V-8, 1-1/2"
Part # 1625-7JB	'99-'01 Cobra 4.6L DOHC V-8, 1-5/8"

These headers are certified for use on all Emission Controlled Vehicles, and carry a **C.A.R.B. Exemption # D-216-20**.

## **Recommended Additional Parts and Supplies:**

1. Stage 8 locking header bolts, 1 set, part # 8906
2. New oil filter, 1 each
3. Fresh motor oil, 6 quarts
4. Aforementioned band-aids and aspirin

## Installation Procedure:

1. Apply a small amount of **anti-seize** to all bolts.
2. Locate the vehicle in a solid, flat work area with adequate lighting, and allow the engine to cool for at least an hour.

**Note:** Do not attempt to work on a hot engine. Heat causes metal to expand and makes removal of fasteners difficult at best.

3. Disconnect the negative cable from the battery.
4. Set the emergency brake and block the rear tires.
5. Drain the crankcase oil.
6. Disconnect the PCV hose and electrical connector from the air cleaner outlet pipe, and loosen the clamp rings at the ends of the pipe. Then, remove the pipe from the throttle body and MAF sensor housing.
7. Disconnect the electrical plug from the MAF sensor assembly. Then, release the clip ring on the air cleaner canister and remove the assembly.
8. Remove the 8mm bolt securing the air filter canister to the fender, and lift the canister and air silencer out of the car. This will make the top passenger side exhaust manifold bolts accessible from above.
9. Slightly loosen the lug nuts on both front wheels.
10. Raise the front of the car enough to provide adequate access to the bottom exhaust manifold flanges, and support the vehicle with wide-base jack stands.
11. Remove both front wheels.
12. Spray **WD-40** or some other penetrating oil on all accessible bolts and fittings, especially the EGR fitting, and allow the oil to soak in before attempting to remove them.
13. Unplug the four O<sub>2</sub> sensors on the H-pipe's catalytic converters by pressing down on the locking tabs on their square wiring harness connectors and pulling the plugs out.  
**Note:** The plugs for the two front sensors are mounted between the bell housing and the firewall. Reaching the driver side connector is a PITA, but it can be done if the Force is with you.
14. Support the H-pipe assembly. Then, disconnect the assembly from the catback assembly by removing the four 14mm nuts at the rear of the H-pipe.
15. Using a **15mm deep socket** & wrenches, remove the two nuts securing the H-pipe to the studs on each stock exhaust manifold.

16. Remove the H-pipe assembly by dropping its front end (you may have to remove the studs from the exhaust manifolds to gain sufficient clearance to drop the front of the assembly). Then, slide the H-pipe forward off the catback pipes, and set the H-pipe aside.
17. Using a **21mm socket on a ½-inch drive breaker bar**, break loose the two lower motor mount nuts securing the motor to the K-member, and remove them.
18. Remove the **oil filter** to provide easier access to the driver side exhaust manifold.  
**Note:** Shield the steering boot against the oil that will spill out when you remove the filter.
19. Unbolt the starter assembly from the passenger side bellhousing (3 13mm bolts). The bottom bolt is easily accessible from below, but the top bolts are best removed using a **long extension** and **universal swivel** from near the front of the engine. On the starter solenoid, pull off the plastic terminal cover and disconnect the two wires. Then, set the starter assembly aside.
20. On the driver side, COMPLETELY remove the single pinch bolt securing the steering shaft mount to the steering rack mount. Then collapse the shaft, and swing it aside.  
**Note:** The steering shaft will not detach from the mount if the pinch bolt has not been completely removed.
21. Using a **1-1/16 wrench**, unscrew the slip nut from the EGR fitting at the rear of the driver side manifold, and slide the nut up the EGR tube, away from the manifold.
22. Remove the two brass nuts securing the wiring harness to the oil pan, and pull the harness away from the underside of the pan.
23. Raise the engine by placing a **2x4 wood block** under the oil pan and jacking the motor up approximately 1".  
**Note:** Be careful not to damage the oil pan or any other components when raising the motor. Go slowly, and make frequent checks to ensure that nothing is being damaged.
24. With the engine raised, unbolt the passenger side manifold, beginning at the front and working toward the back. This step sounds straightforward, doesn't it? Just wait 'til you actually tackle it. Attack the top nuts from above.  
**Note:** Some nuts will unscrew from their studs; others will be seized to their studs, and the studs will unscrew from the head.
25. Using a **5mm socket**, remove all the studs remaining in the head.
26. After you have removed all the original studs, slide the stock manifold down and out past the back of the motor, and then remove the stock gasket. (**Be sure the gasket area of the head is clean. If not, clean the head surface.**)



Figure 1 Passenger side of engine ready for header installation

27. Remove the center lock pin from the 2-piece plastic fastener securing the A/C line along the passenger side manifold. Then, bend the soft aluminum A/C line slightly upward, and reattach it with the original bracket and fastener into the alternate hole located approximately 2" above and 4" behind (toward the rear of the car). **DO NOT INVERT THE BRACKET!** If you do, the line will not be adequately relocated. Refer to the illustration below.

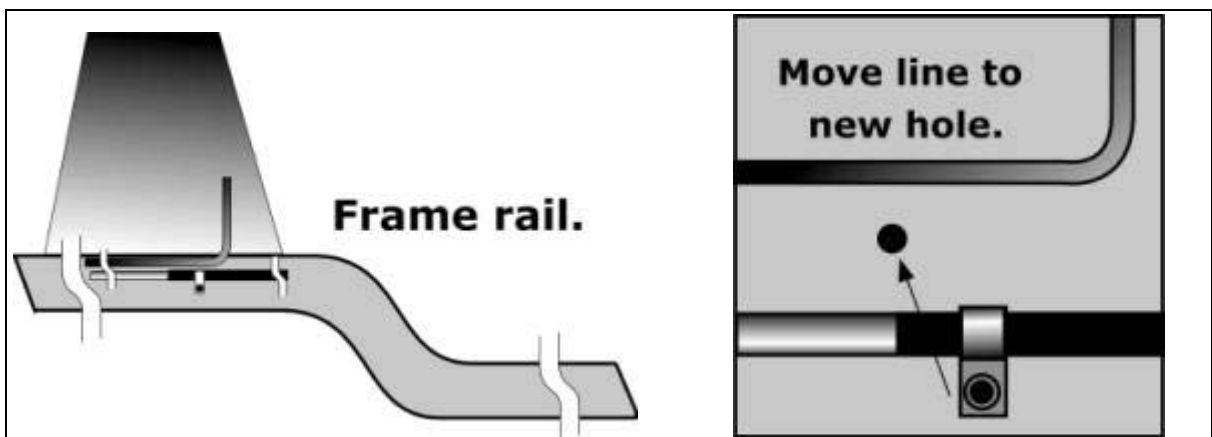


Figure 2 A/C line relocation

28. Screw all the **Stage 8** locking bolts up into the head's bolt holes to avoid problems starting them when installing the header. Then, remove the bolts and reapply a little **anti-seize** to each.
29. Slide the header up into position from the rear bottom and slip a new **JBA-supplied Mr. Gasket Ultra-Seal gasket** between the header flange and the head. Next, while holding the header and gasket over their mounting holes, install the **Stage 8** locking bolts. This step is a real BITCH, but you can do it. Just don't give in to the Dark Side.
30. Beginning with the front two bolts and working back, tighten all the header bolts to approximately **190 in-lbs (16 ft-lbs, 21 Nm)**. Repeat the entire sequence after torquing all bolts. This step is no less of a bitch. Remember, don't give in to the Dark Side.  
  
**Note:** A couple bolts can be accessed with sockets, but most, including all on top, will require tightening with wrenches. All the top bolts are most easily tightened while working from above. The most difficult bolts are the back two bolts on top. Reaching them with a wrench is very difficult, and you will be able to rotate them less than a quarter turn at a time in the limited working space available. Be patient and persistent, and take pride in every fraction of a turn that you can complete over the next few hours.
31. After torquing all the bolts, install the **Stage 8** lock tabs and e-clips on the bolts. Use the small lock tabs for the top bolts and the large tabs for the bottom bolts.
32. Take a break. You deserve one.
33. Okay, break time's over. Move to the driver side and remove the two nuts securing the two ground straps to the driver side motor mount. Then, swing the straps out of the way to expose the two studs securing the front motor mount to the block, and back each stud out between  $\frac{1}{2}$  and  $\frac{3}{4}$  inch.
34. Remove the bolt between the rear of the motor mount and the block. The back of the motor mount will drop down against the K-member, allowing easy removal of the dipstick tube from the pan (and, more importantly, easy reinsertion later).
35. Before you begin loosening the driver side manifold nuts, remove the single 8mm bolt that secures the tube in place above the manifold, and observe the route that the dipstick tube takes from its mounting bracket to the oil pan. Then, gently pull the tube out of its mounting hole above the oil pan.
36. Beginning at the front and working back, unbolt the driver side exhaust manifold, (All manifold nuts are accessible from below the car.) Then, remove the stock manifold from the car by sliding it down and out past the back of the motor. Gee, this side seems almost easy compared to the passenger side, doesn't it? Almost.
37. Remove the stock gasket. Then, remove all of the original manifold studs from the head.

38. Slide the dipstick tube up through the motor mount bracket and set it aside.
39. Screw all the **Stage 8** locking bolts up into the head's bolt holes to avoid problems starting them when installing the header. Then, remove the bolts and reapply a little **anti-seize** to each.

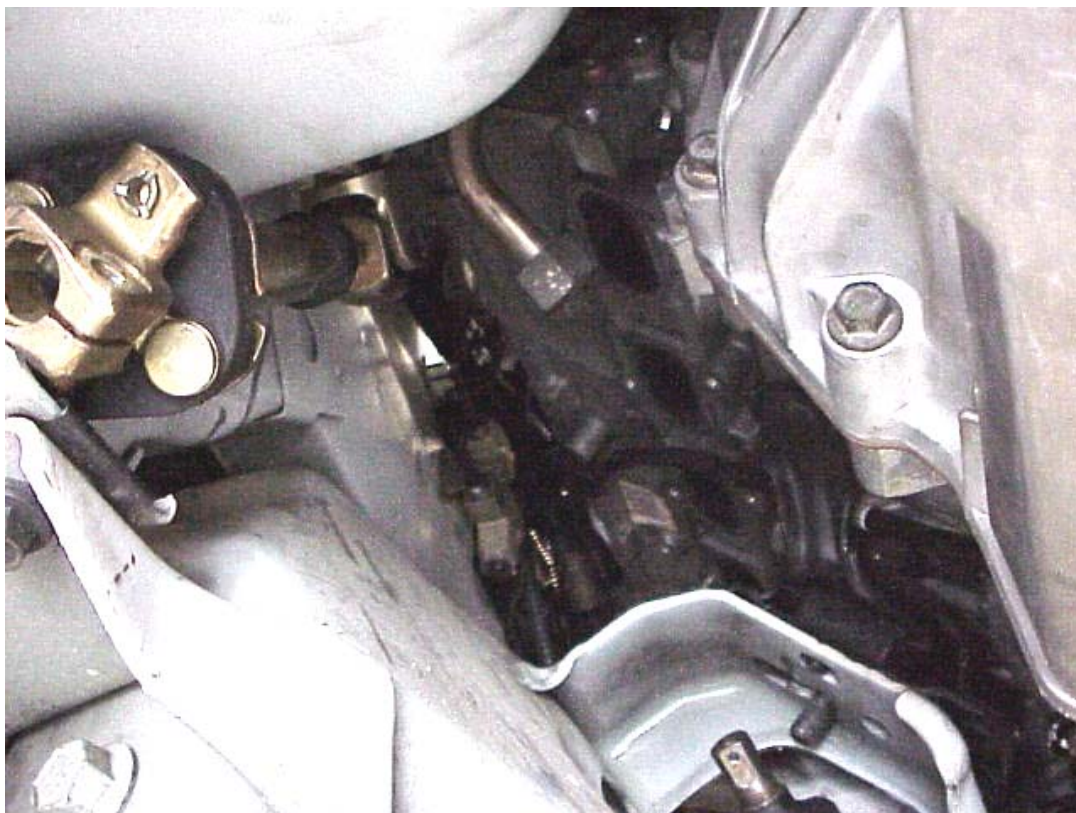


Figure 3 Driver side of engine ready for header installation

40. Slide the second new **JBA-supplied Mr. Gasket Ultra-Seal gasket** up into its position on the head. (**Be sure the gasket area of the head is clean. If not, clean the head surface.**) Thread one of the **JBA-supplied bolts and lock washers** part way into the location where the new header is slotted to slip over the bolt (bottom row, 2<sup>nd</sup> from the back).

**Note:** You DID make certain that the mouth of the slot in the flange is wide enough to allow a bolt slide in, didn't you? Shame on you! Do it now, and enlarge the mouth of the slot as required.

41. Slide the new header into its approximate position from underneath the vehicle. Then, from above, slide the dipstick tube down through the header between the second and third tube.
42. Next, guide the dipstick tube between the motor mount bracket and the block, and into its' hole above the oil pan. If necessary, gently tap the tube into place.

43. Slip the new header over the **JBA bolt** and into place.
44. **Loosely** secure the header with a couple more **Stage 8** locking bolts.
45. Swing the steering shaft back into place and check the clearance between the shaft and the collector on the header. If it looks like the collector is going to interfere with the shaft, either order a replacement and hope for the best, or mark the path of the shaft along the collector, remove the header, and peen the collector down in the area you marked.

**Note:** I first ordered a replacement, which didn't fit any better than the original, so I peened the damned thing down enough to clear the shaft.

46. Thread the slip nut on the EGR tube a few turns onto the fitting on the new header.

**Note:** Unbolting the EGR valve from the intake manifold (2 readily accessible bolts) may make it easier to attach the tube to the header.

47. Reattach the dipstick tube's mounting bracket to the head using the original bolt and the extra **JBA-supplied nut** as a spacer, tightening the bolt to **89 in-lbs (7½ ft-lbs, 10 Nm)**.

48. Reinstall the bolt between the rear of the motor mount and the block and retighten the two studs between the motor mount and block. Torque the bolt and both studs to **52 ft-lbs (70 Nm)**.

49. Swing the two ground straps back over the two studs at the front of the motor mount. Then, secure the straps to the studs with the original two nuts.

50. Secure the header with the remaining **Stage 8** locking bolts.

**Note:** It is imperative that you turn down the bolt in the slotted hole (bottom row, 2<sup>nd</sup> from the back) relatively tight before tightening any of the others. There will be insufficient clearance to rotate this bolt after the other bolts have been tightened.

51. Follow the same procedure as detailed for the passenger side to torque all of the header bolts. Then, install the lock tabs and e-clips on the **Stage 8** bolts. Use the large lock tabs for all seven of the **Stage 8** bolts on the driver side header. See, the driver side really was easier, wasn't it? Aren't you glad you didn't throw in the towel and have your car trailered to a shop for someone else to finish the install?

52. Tighten the EGR tube fitting, torquing the nut to **30 ft-lbs (40 Nm)**.

**Note:** If you unbolted the EGR valve from the intake manifold, reattach it now, tightening the two bolts to **89 in-lbs (7½ ft-lbs, 10 Nm)**.

53. Slip the steering shaft onto the steering rack and ensure that there is enough clearance between the header's collector and the shaft to avoid contact after the motor has been lowered.



54. After confirming sufficient clearance between the header and the steering shaft, lower the engine and reinstall the two nuts securing the motor mounts to the K-member. Torque both nuts to **111 ft-lbs (150 Nm)**.
55. Pull the wiring harness back into place on the underside of the oil pan, and secure the harness brackets to the pan with the two original brass nuts.
56. Secure the steering shaft to the steering rack mount with a fresh pinch bolt, tightening the bolt to **37 ft-lbs (50 Nm)**.
57. Install a new oil filter, making sure to first lubricate the filter's gasket with a coating of engine oil.
58. Reinstall the starter, tightening the starter bolts to **204 in-lbs (17 ft-lbs, 23 Nm)**. Then, reattach the two wires to the starter solenoid (**torque to 9 ft-lbs on the large nut and 53 in-lbs on the small one**), and replace its protective cover.
59. Slip the rear tubes of the H-pipe assembly into the catback tubes, and LOOSELY secure the H-pipe to the catback with the four original nuts.
60. Apply a small bead of **RTV blue gasket sealant** around the dome on the driver side header's collector for leak protection, and insert two **JBA-supplied collector bolts** through the holes in the collector flange.
61. Using two **JBA-supplied nuts and lock washers**, secure the driver side tube of the H-pipe to the driver side header. Tighten both nuts to **30 ft-lbs (40 Nm)**.
62. Insert two more of the **JBA-supplied collector bolts** through the holes in the passenger side collector flange.
63. Lay the **JBA-supplied collector gasket** in the opening at the end of the passenger side tube of the H-pipe, and pull the tube up into position at the passenger side collector flange.  
  
**Note:** The distance between the two JBA collector flanges may be somewhat different from that of the stock exhaust manifold collector flanges. If this is the case, use a hammer and a Gorilla Bar adjust the spacing between the forward H-pipe tubes as necessary to get the passenger side tube to align with its header's flange.
64. Using two more **JBA-supplied nuts and lock washers**, secure the passenger side H-pipe tube to the passenger side header. Tighten both nuts to **30 ft-lbs (40 Nm)**. Then, reconnect the four catalytic converter oxygen sensor cables to their harnesses.
65. Torque the four nuts securing the rear tubes of the H-pipe assembly to the catback tubes to **26 ft-lbs (35 Nm)**.
66. Inspect all parts for adequate clearance – A/C lines, steering shaft, brake lines, etc. Pay particular attention to the steering shaft and to the A/C line that you moved.

67. Reinstall the air filter canister assembly, making certain to seat the two rubber plugs on the bottom of the canister in their holes. Then, secure the assembly to the fender with the original 8mm bolt.
68. Reposition the MAF sensor assembly on the air cleaner canister, ensuring that the locating tab at its bottom is positioned in the corresponding slot on the canister. Then, secure the assembly with the clip ring and reconnect the electrical plug to the assembly.
69. Reinstall the air cleaner outlet pipe between the throttle body and MAF sensor housing and secure it with the clamp rings at the ends of the pipe. Then, reconnect the PCV hose and electrical connector to the pipe.
70. Reinstall the front wheels, and tighten all lug nuts enough to support the wheels.
71. Raise the car at its forward jacking point, remove the jack stands, lower the car, and torque the front wheel lug nuts in a star pattern to **95 ft-lbs (129 Nm)**.
72. Reinspect all parts for adequate clearance.
73. Replace the drain plug and tighten to **120 in-lbs (10 ft-lbs, 14 Nm)**. Refill the crankcase with fresh oil.
74. Reconnect the negative battery cable.
75. Start the engine, let it warm up, and check for leaks. Then, shut engine off and let it cool down.

**NOTE:** Provided you used either the *Ford* or the *Mr. Gasket Ultra Seal* gaskets and *Stage 8* locking fasteners, periodical checking and re-torquing of the header bolts should NOT be necessary.