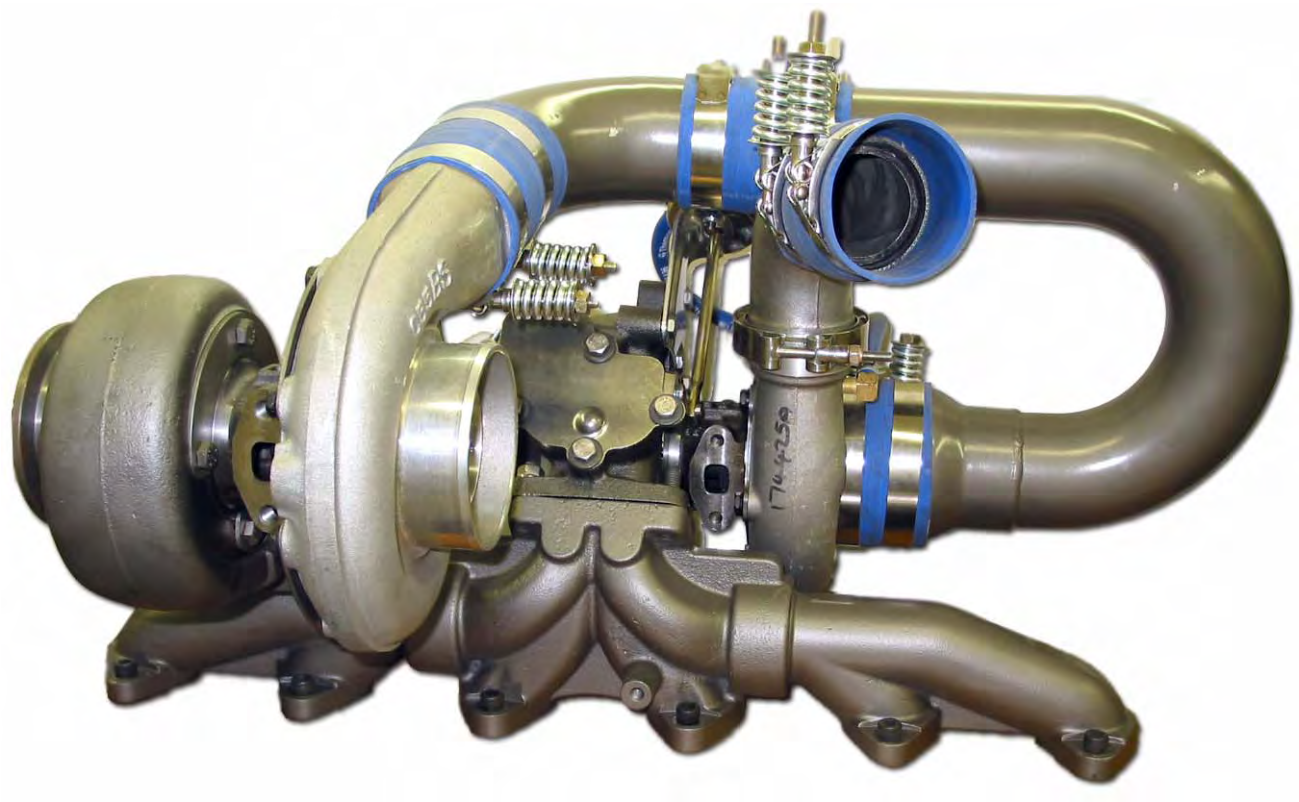

BD *Twin Turbo Kit*

1998½-2002 Dodge 24v ISB

Part# 1045320

PLEASE READ ALL INSTRUCTIONS BEFORE INSTALLATION.

** Picture as shown features recommended optional 3-piece HD Exhaust Manifold (BD P/N# 1045985)*

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Phone: 604-853-6096 Fax: 604-853-8749 Internet: www.bd-power.com

K I T C O N T E N T S :

Please check to make sure that you have all the parts listed in this kit before you start un-assembling your truck.

DODGE 24V TWIN TURBO KIT (BD# 1045320)

1405230	1405217	1453109	1452985
			
Primary Turbo (Un-wastegated)	***Secondary Turbo (Wastegated)***	***Primary Turbo Oil Drain***	***Secondary Turbo Oil Drain***
Qty: 1	**Qty: 1**	**Qty: 1**	**Qty: 1**

1453120	1453400P	1453600
		
Primary Turbo Support Bracket	***Primary Air Outlet Pipe***	***Primary Exhaust Outlet Pipe***
Qty: 1	**Qty: 1**	**Qty: 1**

1453602	1100740	1453700P	1453300P
			
Down Pipe V-Band Clamp	***4" Stainless Steel Down Pipe Clamp***	***Air Filter to Primary Turbo Pipe***	***Secondary Air Inlet Pipe***
Qty: 1	**Qty: 1**	**Qty: 1**	**Qty: 1**

1459120P	1453502	1045986	1453110
			
Intercooler Extension Pipe	***Primary to Secondary Exhaust Pipe***	***Exhaust Manifold Gasket Set***	***Primary Oil Drain***

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Qty: 1	Qty: 1	Qty: 1	Qty: 1

PRIMARY TURBO HARDWARE KIT (BD# 1453192)

1453111	1120031	1453121	1453122	1453113	1453115
					
Upper Oil Drain Bolt	***Oil Drain Washer***	***Pri. Support Bolt***	***Pri. Support Washer***	***Oil Drain Hose Clamps***	***Oil Feed Adapter***
Qty: 2	**Qty: 2**	**Qty: 1**	**Qty: 1**	**Qty: 2**	**Qty: 1**

1453503	1453504	1453505	1453983	1405926 (0406)
				
Heat Shield	**Zip Tie**	**M10x1.25x30 (FINE)**	**Washer**	***Down Pipe Clamp***
Qty: 1	**Qty: 3**	**Qty: 4**	**Qty: 4**	**Qty: 1**

SECONDARY TURBO HARDWARE KIT (BD# 1453292)

1453980	1453982	1453983	1604102	1604103	1453113	1453316
						
Turbo Mnt. Bolt	***Turbo Mnt. Nut***	***Turbo Mnt. Washer***	***Lock Washer***	***Bolt***	***Oil Drain Clamps***	***Spacer Plate***
Qty: 2	**Qty: 2**	**Qty: 4**	**Qty: 2**	**Qty: 2**	**Qty: 2**	**Qty: 1**

TURBO HEAT SHIELD KIT (BD# 1459110)

1459111	1459112	1459113
		
Heater Wrap	***Inner Wrap***	***S/S Wire***
Qty: 1	**Qty: 1**	**Qty: 48”**

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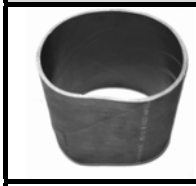
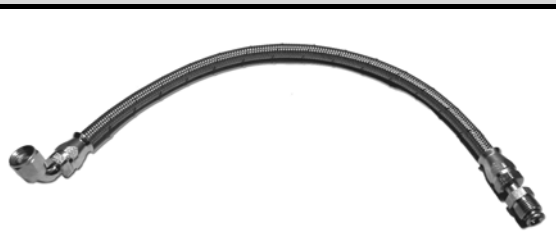
HOSE & CLAMP KIT (BD# 1453492)

1405222	1405221	1405213	1405211	1453701
				
4"i.d. Hose (4" each)	*3"i.d. Hose (4"/each)*	*Clamp (4.11")*	*Clamp (3.25")*	*Clamp (4")*
Qty: 2	**Qty: 2**	**Qty: 2**	**Qty: 4**	**Qty: 2**

1453130	1453112
	
Oil Feed Hose	*7/8" Upper Oil Drain Hose (4")*
Qty: 1	**Qty: 2**

HEATER TUBE RETRO-FIT KIT (BD# 1453922)

1459130	1459140	1300131
		
Heater Tube Coupler	*Heater Tube Clamp*	*Zap Strap*
Qty: 1	**Qty: 1**	**Qty: 2**

AIR BOX KIT (BD# 1453892)

1453800	72-90009	1453803	1453802	1453801
				
Air Box	**Air Box Filter**	***Bolt***	***Washer***	***Spacer***
Qty: 1	**Qty: 1**	**Qty: 3**	**Qty: 3**	**Qty: 1**

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Pre-Installation

A turbocharger is driven solely on exhaust energy. Therefore, if the vehicles current exhaust manifold is cracked or is leaking, it is recommend that new exhaust gaskets and a heavy-duty exhaust manifold be used.

For the purpose of the instruction manual, the term “primary turbo” refers to the larger un-wastegated turbo and the term “secondary turbo” refers to the smaller wastegated turbo

Installation should occur on a cold vehicle, as turbo and exhaust components become very hot with use.

The BD twin turbo system is recommended for trucks with 400-500 RWHP with a maximum efficient boost pressure of 52psi. Note that even a well maintained Cummins head gasket might blow around 60-65psi. This number varies depending on injection timing and engine compression.

Also note that a stock transmission will not handle this power and torque, transmission modifications are a must.

Options

Description	Part #
BD ‘X’ Torque Converter	1070215X
BD Transmission	CALL
BD High Flow Injectors	CALL
BD Auxiliary Lift Pump Kit	1050226
BD High Flow Banjo Bolts	CALL
Heavy Duty Exhaust Manifold	1045985
BD X-Monitor	1085210
Head Studs	247-4202
BD High Pressure Intercooler Boots	1405220

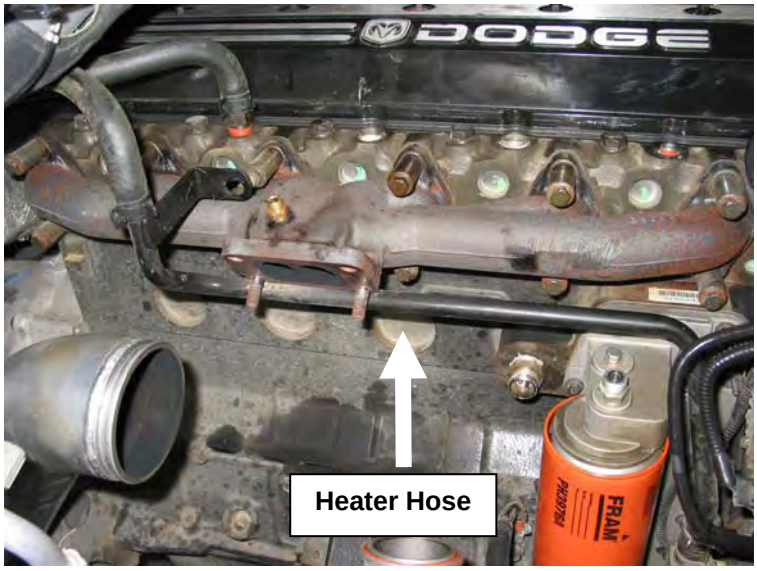
When upgrading from the Super ‘B’ Single, you must ensure that the wastegate spacer is installed correctly on the inside of wastegate, as well as the outer set hole on the wastegate arm be used to actuate the lever arm. Failure to do so will result in very high boost pressure. This needs to be done with the turbocharger off the vehicle, see the last section for assistance.

Battery Disconnect

Disconnect the negative terminals on both of the vehicle's batteries, and then disconnect the positive terminals.

Installation

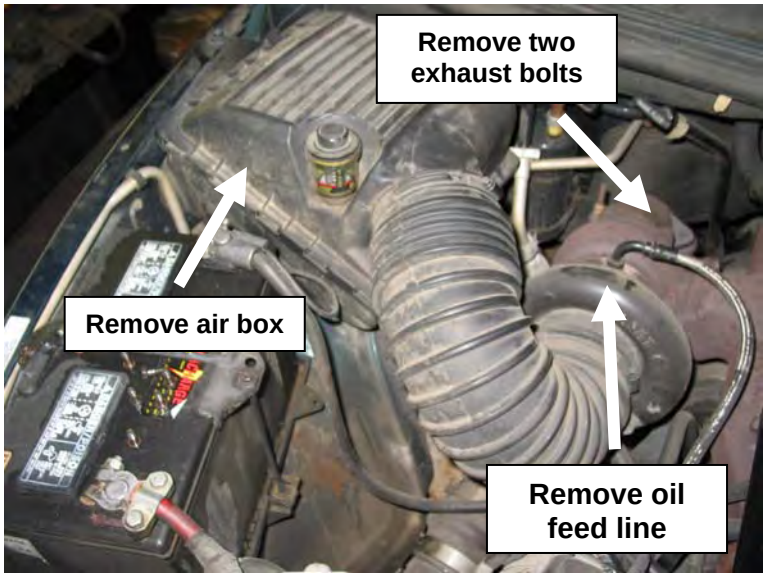
1. Record radio settings and disconnect both battery terminals on both batteries.



2. If your vehicle heater feed tube runs below your exhaust manifold, you will need to drain the engine coolant into a clean container to be re-used later.

3. Lay a protective cover over the passenger side fender to eliminate any scratches.

4. Remove the air box assembly and intake tube from the inlet of the turbocharger.



5. Remove the two 13 mm bolts connecting the exhaust down pipe to the turbo flange.

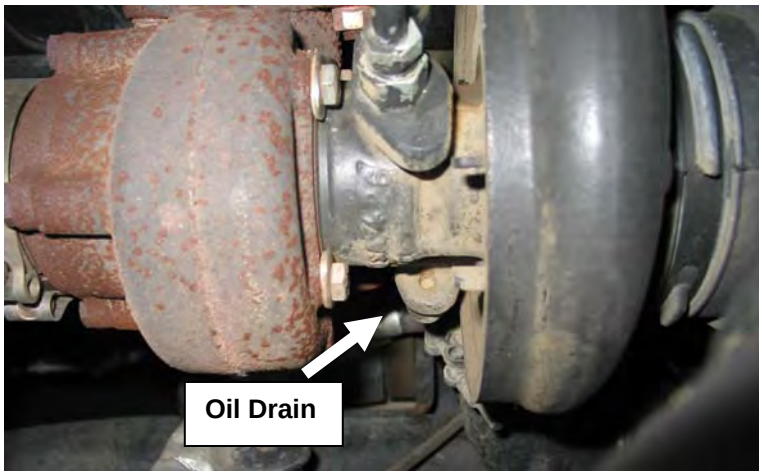
6. Remove the cast aluminum elbow attached to the turbo compressor housing outlet. You will need to loosen the 'V' band clamp and the band clamp with a 7/16" deep socket. Be sure not to lose the orange o-ring from the aluminum elbow, as you will re-use the aluminum elbow assembly later.

7. Remove the black steel intercooler tube. You will need to loosen the band clamp on the intercooler using a 7/16" deep socket.

8. Remove the turbo oil feed line

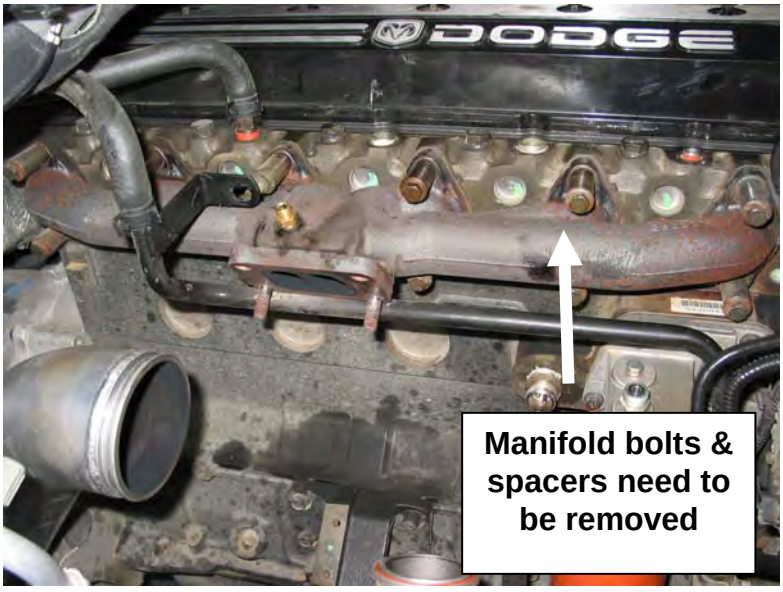
(top of turbo) from the turbo by holding the 19mm turbo fitting with a wrench and remove the 13/16" line fitting – place line to the side. As well you may now remove the 19mm oil feed fitting.

9. Unbolt the turbo oil drain tube (bottom of turbo) by removing the two 10mm bolts.



10. Remove the lower hose clamp on the turbo oil drain boot and remove the oil drain tube and hose as an assembly - you will need the hose later.

11. Remove the four nuts holding the turbo to the exhaust manifold with a 15mm wrench– remove the stock turbo and set it aside.



12. Remove the stock down pipe and intermediate pipe from the exhaust system.

13. Remove the nut holding the heater core line to the exhaust manifold stud using a 15mm socket, remove the spring clamps at each end of the steel line and remove the line.

14. Remove the exhaust manifold bolt retainer straps if equipped, and then remove the bolts with a 13mm socket. Remove the spacers and finally the manifold at this time. Be sure not to loose the spacers.

15. Discard all exhaust manifolds gaskets and clean then engine block and exhaust manifold mating surface.

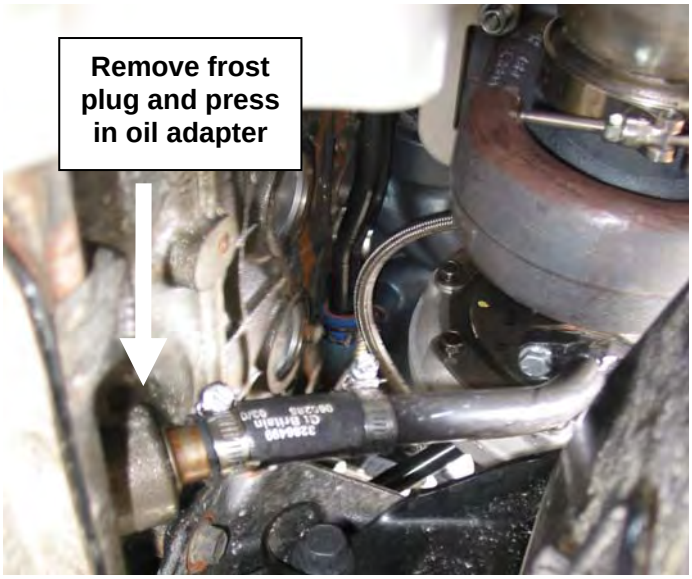
** *Critical Step* **

16. On the lower right side of engine, 6" from the rear of the engine block (just above the oil pan), there is a frost plug that caps an oil drain port that leads to the engine crankcase. This frost plug needs to be removed to serve as the oil drain for the *primary turbo*.

Great care needs to be taken when removing the frost plug so that it isn't forced into the oil pan.

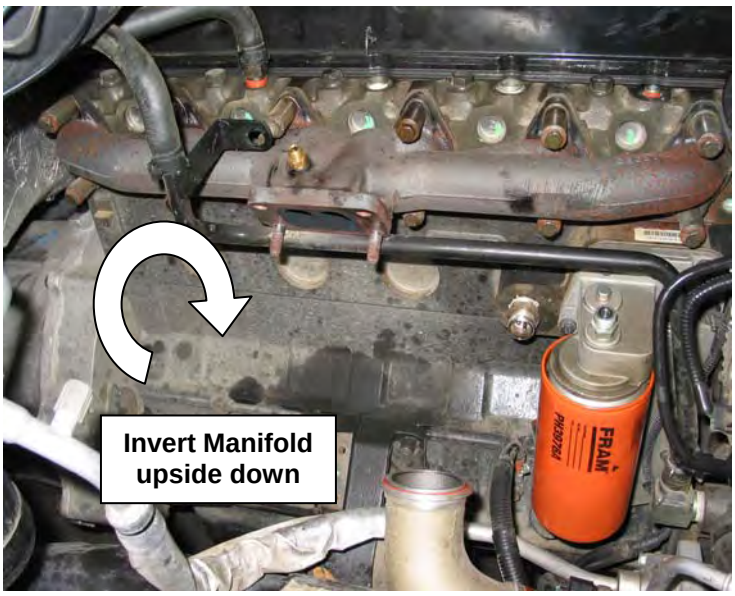
The frost plug can be removed by coating a drill bit with grease (to catch any metal shavings) and by drilling a small hole in the center of the frost plug. Insert a sheet metal screw into the hole and pry the frost plug out with a pair of pliers.

Coat the lower portion of the supplied oil drain block adapter with Loctite or Anaerobic sealer and gently tap the spout into the block.



17. Reinstall the exhaust manifold in an **inverted manner** so the turbo flange faces upward. Use the provided manifold gaskets and the factory bolts, spacers and retainers and torque to 32 ft lbs with a 13mm socket.

Note: If you have purchased a heavy-duty aftermarket manifold, you will need to install it in the same inverted manner. Please consult the manifold's instructions for the rest of the installation.



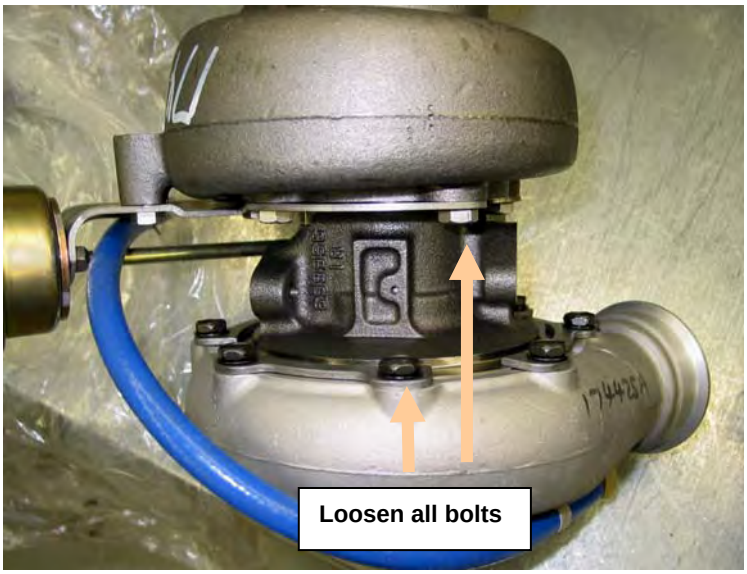
Turbo Preparation & Installation

To alleviate any fit problems, all turbocharger support bolts, housing bolts and clamps must be loose. Once everything has fit together, then tighten all bolts.

18. Remove the primary and secondary turbos from their boxes and remove any paper that may be in the inlets or outlets. It is critical that nothing is left inside of the turbos.

19. On both turbos, loosen the 4 bolts that secure the exhaust turbine housing to the turbo body with a 13mm wrench.

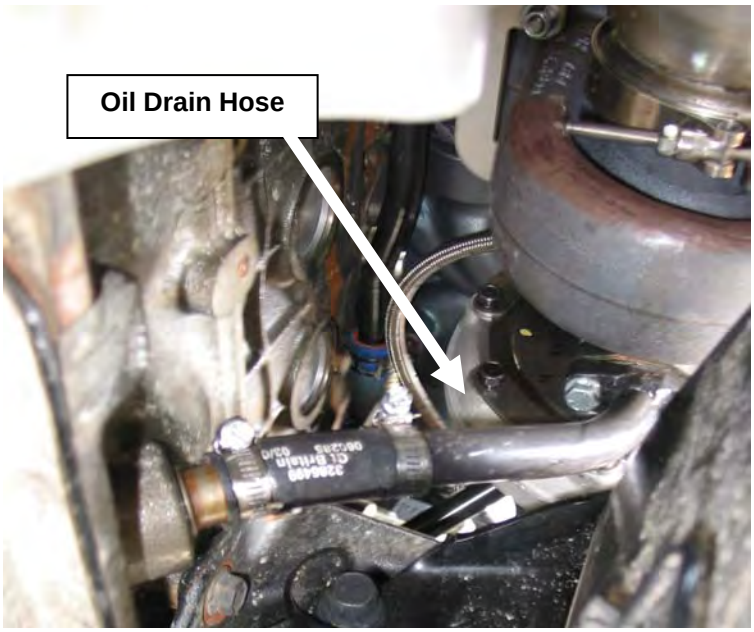
    Then, loosen the 8 bolts that are securing the turbo compressor housing to the CHRA with a 13mm wrench. This will allow the two housings to rotate freely. Be careful not to loosen the housings off too much as they will fall off and possibly damage the turbo wheels. The clamps should only be loose enough to clock the housings.



20. Thread the previously uninstalled OEM 19mm oil feed adapter into the *secondary turbo*. This is the adapter that you remove from the factory turbo.

21. Install the long oil drain adapter onto the bottom of the *secondary turbo* with the supplied gasket and two 8mm X 25mm bolts and lock washers with a 13 mm socket.

22. Install the 90° degree brass oil feed adapter in the *primary turbo*, making sure that it points towards the engine with the compressor housing facing forward.



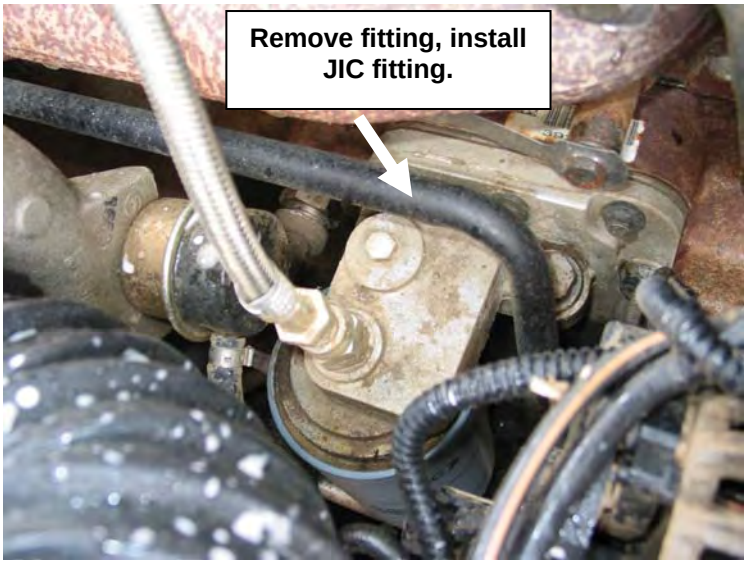
23. Install the short oil drain adapter onto the bottom of the *primary turbo* with the supplied gasket and two 3/8” X 1-1/4” NC bolts and lock washers with a 9/16” wrench.

** *Critical Step* **

24. Squirt fresh oil down the oil feed port of both turbo chargers while slowly rotating the compressor wheel.

25. Remove the 1/8 NPT plug using a 7/16” wrench from the top of the oil filter head and install the supplied oil feed adapter fitting.

26. Mount the *secondary turbo* to the exhaust manifold.



Installing with Stock Manifold

Mount the turbo to the manifold using the two factory studs and nuts, the supplied gasket, two 3/8" X 1-1/2 NF bolts, two 3/8" nuts and the four 3/8" flat washers. You will need to use two separate 9/16" wrenches.

Installing with Aftermarket Manifold

Remove the studs from your stock turbo and stock manifold for reinstallation into your aftermarket Heavy Duty Manifold. Install the turbo with the gaskets on either side of the spacer plate and reuse the factory mounting nuts.

27. Locate the caste flanged turbine adapter, and wrap the supplied heat shielding around the adapter. The heat shield has been formed in a specific pattern to completely wrap around the elbow. Use the 3 supplied stainless steel zip ties to secure the heat shield. One at the bottom, one at the middle and one at the top. Be sure that neither the heat shield or zip tie will interfere with the circular marmon flange when the band clamp is applied.

28. You can know bolt the flanged turbine adapter to the primary turbo. Use the four M10x1.25x30 FINE threaded bolts and washers to secure the two. At the same time mount the SS primary turbo support bracket to the assembly.

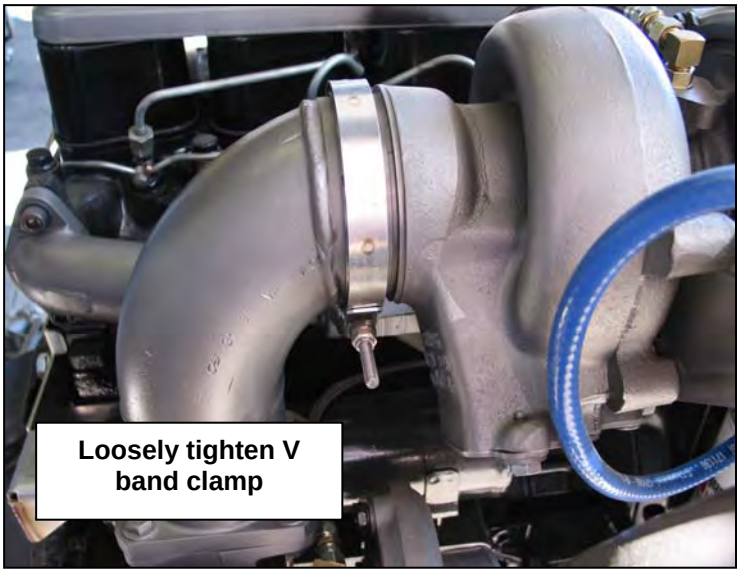
    Note that the support bracket bolts on the bottom side of the turbine housing.

29. Place the turbo and turbine adapter assembly onto the frame rail in a location close to the final install point. Be sure that it does not fall.

30. With the secondary turbo, bolt it loosely to the manifold and align the oil inlet straight up and the compressor outlet towards the bottom of the passenger battery.

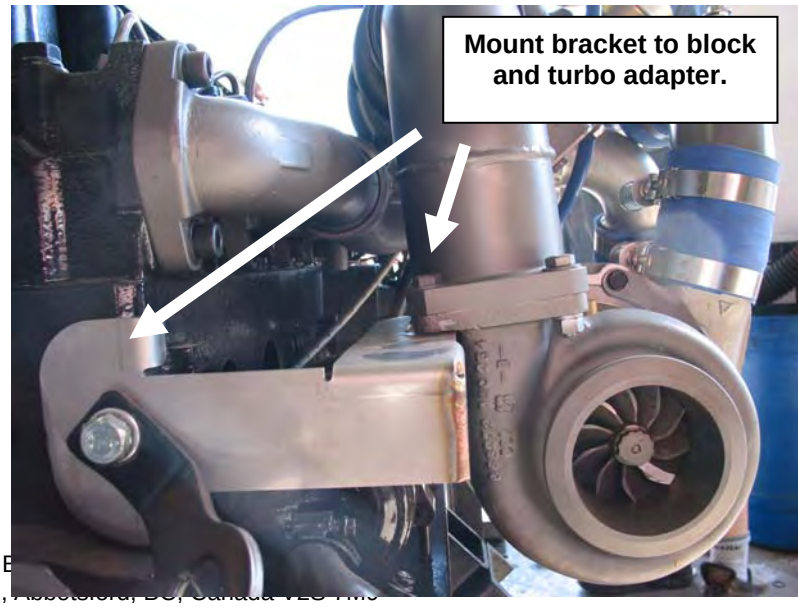
31. Using the supplied v-band clamp (clamp will be labeled 995L2-0406) tighten the secondary exhaust housing to the primary turbo-turbine adapter assembly.

    Make sure that heat shield or stainless zip tie does not interfere with the band clamp. Tighten the v-band clamp just enough so that you can still rotate the exhaust elbow.

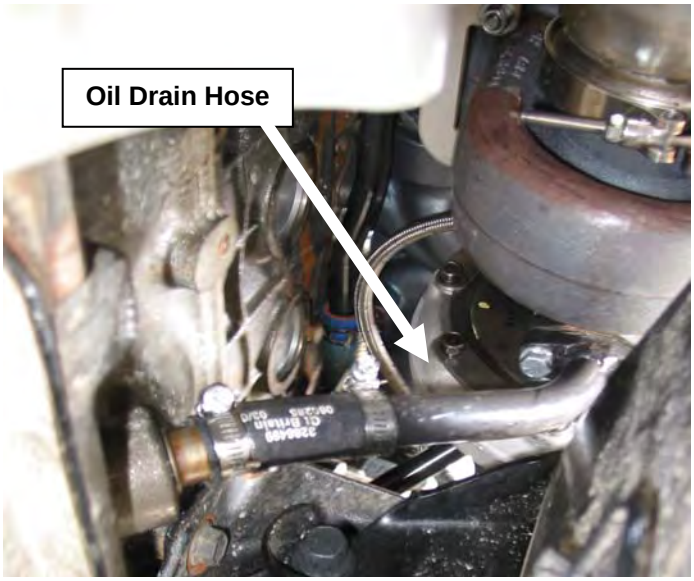


32. Install the *primary turbo* support bracket to the engine block with the supplied bolt (12mm x 1.75 x 25) and lock washer. Now tighten the bolts and V band clamp.

33. Now that the exhaust housings are in their proper locations, the turbo center sections can be twisted so that the turbo oil feeds are pointing straight up and drains are pointed at the block adapters. Tighten the exhaust housing bolts. Note that you



may adjust the factory block oil drain adapter to help align the system.



34. Install the short piece (approximately 4") of 7/8" hose that we have provided to the *primary turbo* drain tube to the block adapter. You will need to apply a little lube to the hose to fit over the adapter.

35. Discard the factory oil drain hose and use the supplied 4" section on the *secondary turbo* drain. This hose will attach to the factory drain adapter. Use the hose clamps to secure the connection. You will need to slide the oil drain adapter as far as possible away from the wastegate arm to prevent any contact. In some rare cases the wastegate arm may need to be bent.

36. If your heater feed tube runs below your exhaust manifold, remove it and cut off the support bracket in half as shown. Clean off the powder coat and loosely install the brass coupler and reinstall the line with original hose clamps. This will allow you to position the rearward end between the turbo and manifold and hook it back up to the factory rubber hoses. Once positioned, tighten the brass coupler and install the new support clamp to the oil filter housing bolt. Zap strap the two rubber heater hoses to secure them together.

37. Install the factory oil feed line into the 19mm oil feed adapter that should be installed in the *secondary turbo* (hold the fitting with a 19mm wrench and tighten the line with a 13/16" wrench), this line should run on the engine side of the turbo.

38. Install the *primary turbo* oil feed line from the JIC fitting you installed earlier in the filter housing to the inverted flare on the *primary turbo*, the line should run between the turbo and engine.

NOTE: All oil drains and feeds should be vertical.

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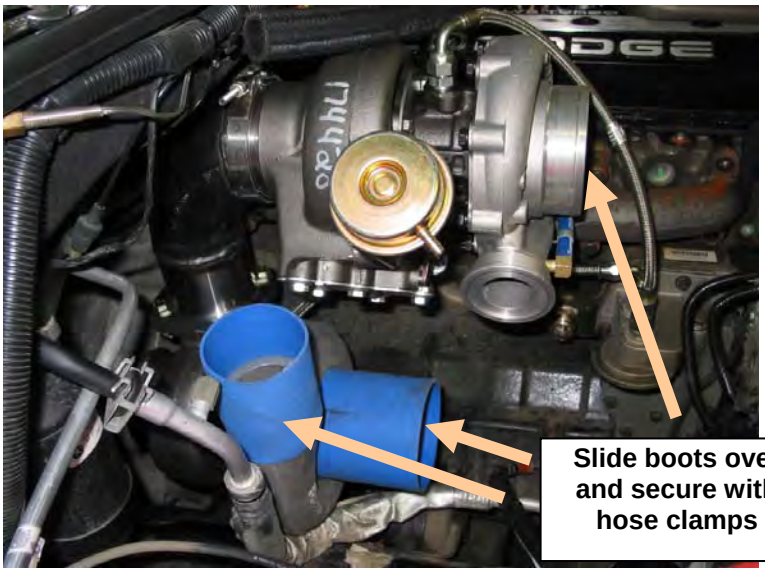
39. Remove the factory intercooler horn and boot from the factory intercooler pipe and place them on the new intercooler pipe provided.

40. Install the cast aluminum elbow and intercooler tube assembly to the compressor outlet of the *secondary turbo* and the lower intercooler boot. Secure with the factory v-band clamp and the two boot band clamps (use a 7/16" deep socket to tighten all clamps)

    Be sure not to forget the orange factory o-ring in the elbow joint from the compressor housing to the intercooler horn and tighten the compressor housing bolts.



41. The compressor housing of the *primary turbo* should still be loose and so adjustments can be made as required. Move the compressor housing around so that the fit is secure and the tubes will not hit anything when the engine torques over.

42. Install a 4 inch silicone boot on both the *primary turbo* and *secondary turbo* compressor housing inlets – also slide two Heavy Duty 4" band clamps on to each boot for easier installation later.

43. Install a 3" silicone boot on the compressor outlet of the *primary turbo* and slide two Heavy Duty 3" band clamps onto the boot.

44. Slide the 90-degree steel pipe into the compressor outlet boot on the *primary turbo* and point the pipe outlet towards the front of the vehicle.

45. Install a 3" silicone boot on the 3" 'U' 180° pipe and slide two Heavy Duty 3" band clamps onto the boot and install it between the short 90° on the primary to the secondary turbo 4" inlet.

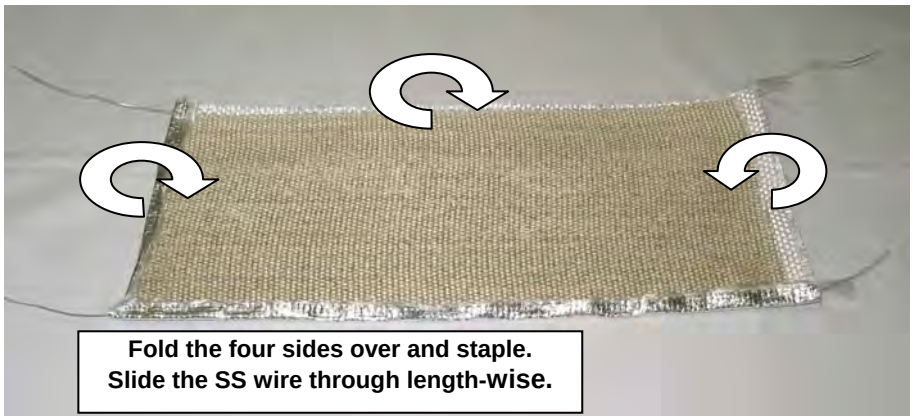
46. Once all intermediate pipes are lined up, the heavy-duty hose clamps can be tightened as well as the bolts on the *primary turbo* compressor housing.

47. Loosely secure the new down

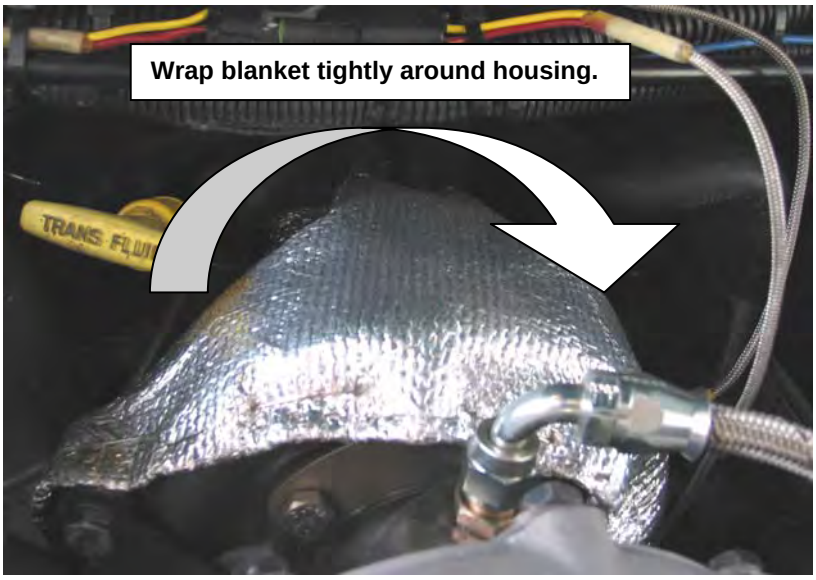
pipe to the *primary turbo* using the supplied V-band clamp.

Be sure to align all exhaust pipes, and then tighten the V band clamp on the back of the turbo. Once this is done you can finally clamp and weld the appropriate exhaust components.

48. In each kit there is a 17" section of sliver exhaust wrap, along with a 16" tan section. You will need to stack these two pieces of wrap on top of each other, so that the silver wrap can be folded over the tan wrap on all four sides. Note that the silver side should be facing out, so that the tan wrap is fixed against the white side of the wrap. You will need to staple all four folds to secure them in place. Once secure, run the 40" stainless wire through the folds length-wise. You will need to do this on both sides.



49. Install the turbo heat shield as shown over the top of the secondary turbo exhaust housing and secure with the stainless wire. Completely wrap the blanket around the turbo housing, then tighten and tie off with the stainless steel wire.



50. Install the air box spacer on the stud at the front closest to the engine. This stud is lower than the other two.

51. Insert the 4" intake tube into the air box and then into the silicone boot in the compressor-housing inlet of the *primary turbo*. Install air box onto the factory

studs using the three supplied ¼" NF nuts and the three supplied ¼" flat washers.

52. Using a 7/16 deep socket tighten the two band clamps on the silicone boots – ensure all pipes have good contact with the boots and at least 1/8" of boot sticks out past each clamp.

53. Install the supplied air filter by inserting it onto the pipe after it has passed through the air box and secure it with the supplied 4" hose clamp.

54. Re-connect the battery terminals and refill engine coolant. Double check all connections to make sure that they are all secure and free from any damage. You now may start the vehicle, once the vehicle has start and is up to temperature re-check for leaks and ensure that all the air is out of the coolant system.

Note: The exhaust housings of the turbos may smoke slightly when new, as manufacturing residue on housing must burn off.

Twin Turbo Testing

It is highly recommended that allow the turbochargers to break in, before any high power test runs. Slowly allow the turbo to come up to boost. Ideally the intake manifold pressure should not go above 52psi. You may have to adjust the waste gate with shims or a bleed orifice to ensure this boost level.

While driving listen for any odds noises such as a boost least or perhaps piping rubbing against the vehicle. Once the vehicle has gone though a number of heat cycles it is highly suggested to retighten all clamps, bolts and nuts.

Periodically retighten all clamps and check for any oil or boost leaks.

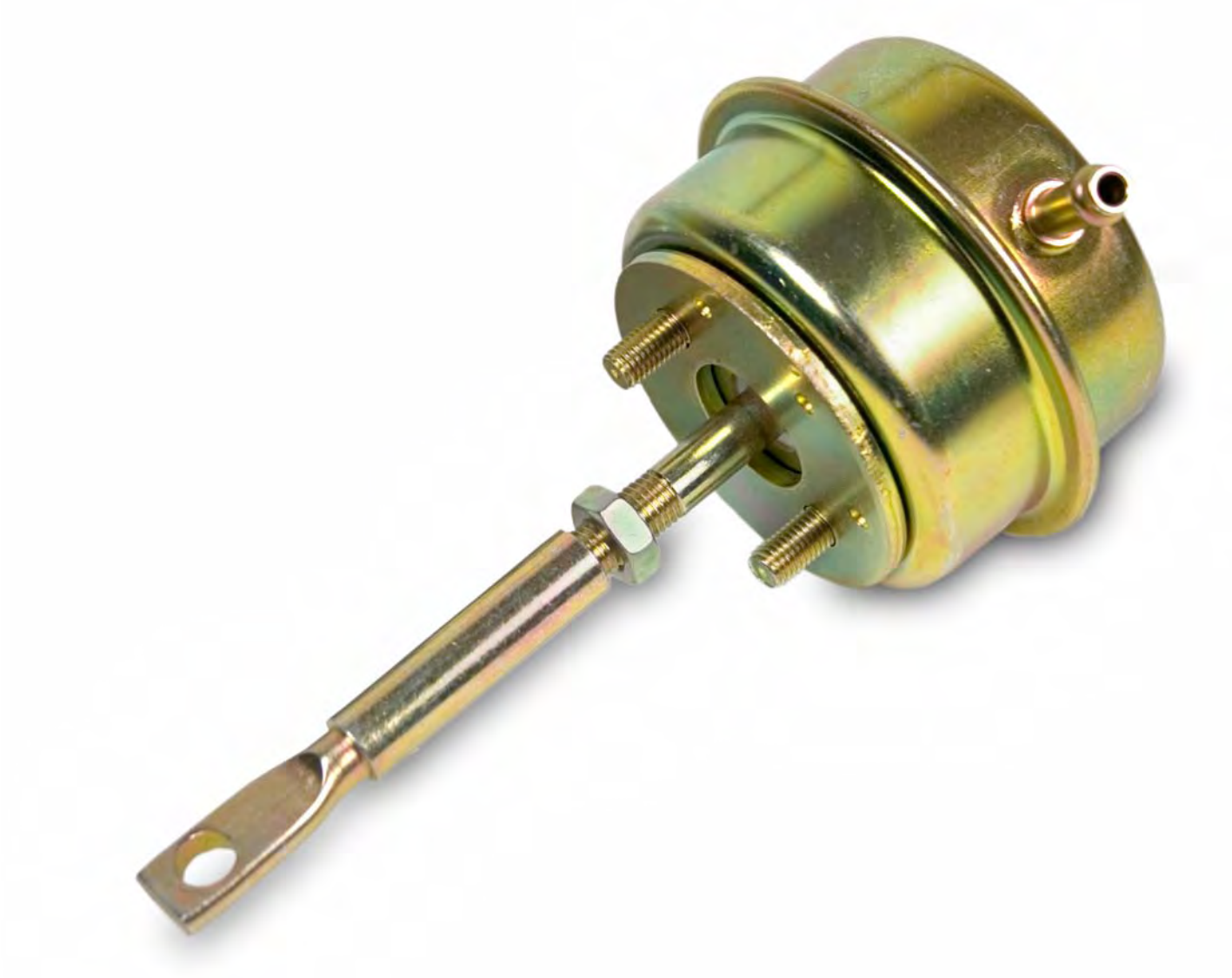
Wastegate Adjustments

To adjust the wastegate, remove the circlip and pull the rod end off the wastegate lever. Then loosen the jam nut and turn the rod end clockwise. This will shorten the overall length of the rod, which will increase the boost pressure. To lower the boost pressure, turn the rod counter clockwise to length the rod.

More Boost = Shorten Rod
Less Boost = Longer Rod

Be sure to tighten the jam nut and reinstall the circlip once you have made the adjustments.

Note: Do not turn the actuator rod to adjust the wastegate. By turning this rod you may tear or damage the diaphragm inside of the wastegate housing. All adjustments must be done on the rod end.



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LIMITED WARRANTY STATEMENT

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DISCLAIMER OF LIABILITY

BD Engine Brake Inc., its successors, distributors, jobbers, and dealers (hereafter "**BD**") shall in no way be responsible for the product's proper use and service. THE **BUYER** HEREBY WAIVES ALL LIABILITY CLAIMS.

BD disclaims any warranty and expressly disclaims any liability for personal injury or damages. **BD** also disclaims any liability for incidental or consequential damages including, but not limited to, repair labor, rental vehicles, hotel costs, or any other inconvenience costs by reason of use or sale of any such equipment. The **BUYER** acknowledges and agrees that the disclaimer of any liability for personal injury is a material term for this agreement and the **BUYER** agrees to indemnify **BD** and to hold **BD** harmless from any claim related to the item of any equipment purchased.

This warranty shall not apply to any unit that has been improperly stored or installed, or to misapplication, improper operation conditions, accidents, neglect, or which has been improperly repaired or altered or otherwise mistreated by the **BUYER** or his agent. **BD** also assumes no liability regarding the improper installation or misapplication of its products. It is the installer's responsibility to check for proper installation and if in doubt, contact the manufacturer.

LIMITATION OF WARRANTY

BD Engine Brake Inc. (hereafter "**BD**") warrants to the **BUYER** that any parts purchased shall be free from defects in material workmanship. A defect is defined as a condition within the product that would render the product inoperable. **BD** gives Limited Warranty as to description, quality, merchantability, fitness for any product's purpose, productiveness, or any other matter of **BD's** product sold herewith. **BD** shall be in no way responsible for the product's open use and service and the **BUYER** hereby waives all rights other than those expressly written herein. This Warranty shall not be extended or varied except by a written instrument signed by **BD** and the **BUYER**.

The Warranty is Limited to one (1) year from the date of sale. Until BD has approved the claim, the consumer may be responsible for these costs.

A Return Material Authorization (RMA) number, obtained in advance from **BD**, must accompany all products returned for warranty consideration. All products must be returned, shipping prepaid, to **BD** and must be accompanied by a dated proof of purchase receipt. All Warranty claims are subject to approval by **BD** and repaired or replaced product will be returned to the customer freight collect. Accepted warranty units, which have been replaced, become the sole property of **BD**.

This warranty is in lieu of all other warranties or guaranties, either expressed or implied, and shall not extend to any consumer or to any person other than the original purchaser residing within the boundaries of the continental U.S. or Canada.

IN THE EVENT THAT THE BUYER DOES NOT AGREE WITH THIS AGREEMENT, THE BUYER MAY PROMPTLY RETURN THIS PRODUCT, IN A NEW AND UNUSED CONDITION, WITH A DATED PROOF OF PURCHASE, TO THE PLACE OF PURCHASE WITHIN THIRTY (30) DAYS FROM DATE OF PURCHASE FOR A FULL REFUND.

Damaged or blown head gaskets will not be covered under warranty, it is the responsibility of the user to regulate cylinder pressures to protect the head gasket.