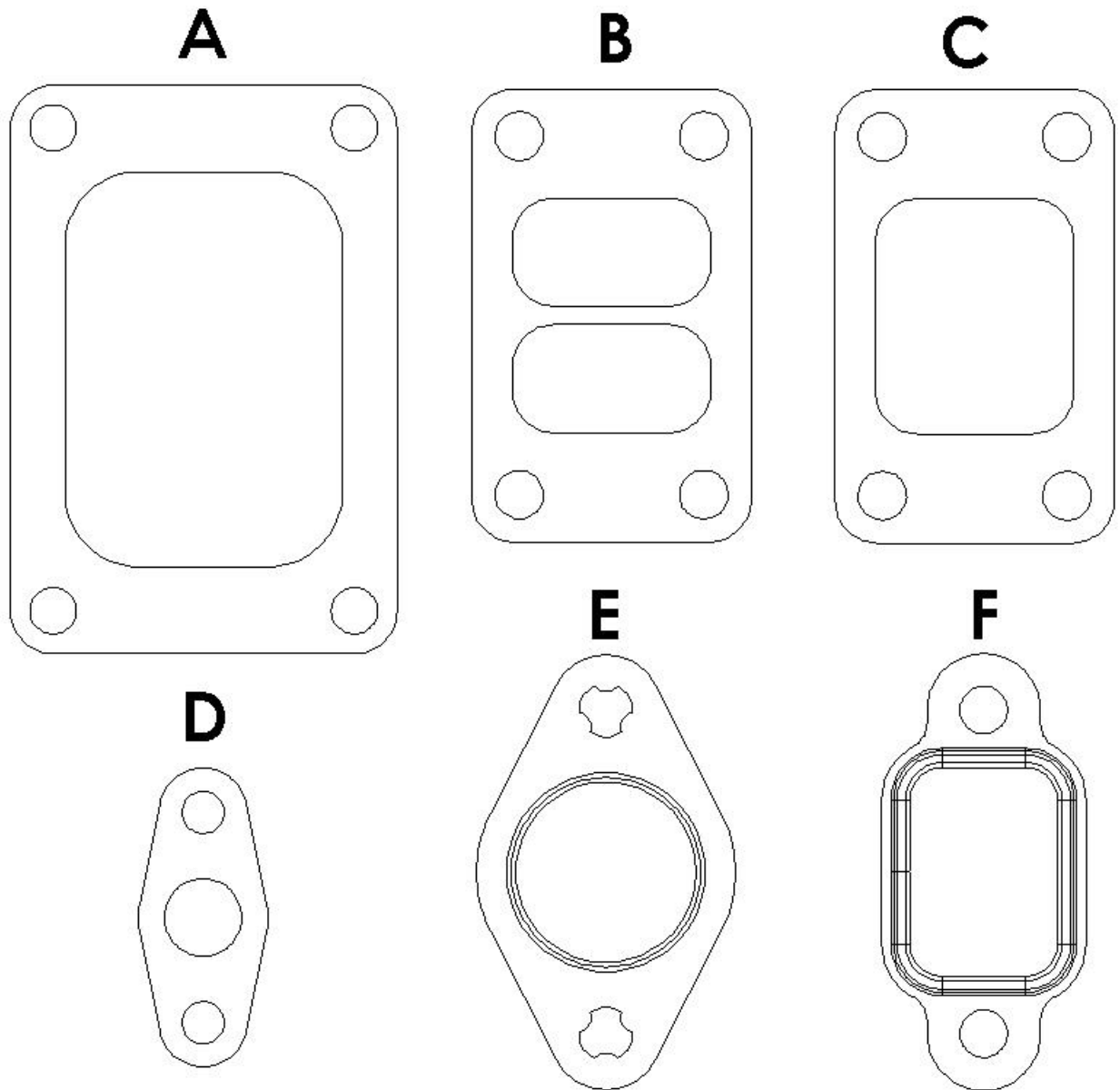


Ford Cummins Twin Turbo Kit

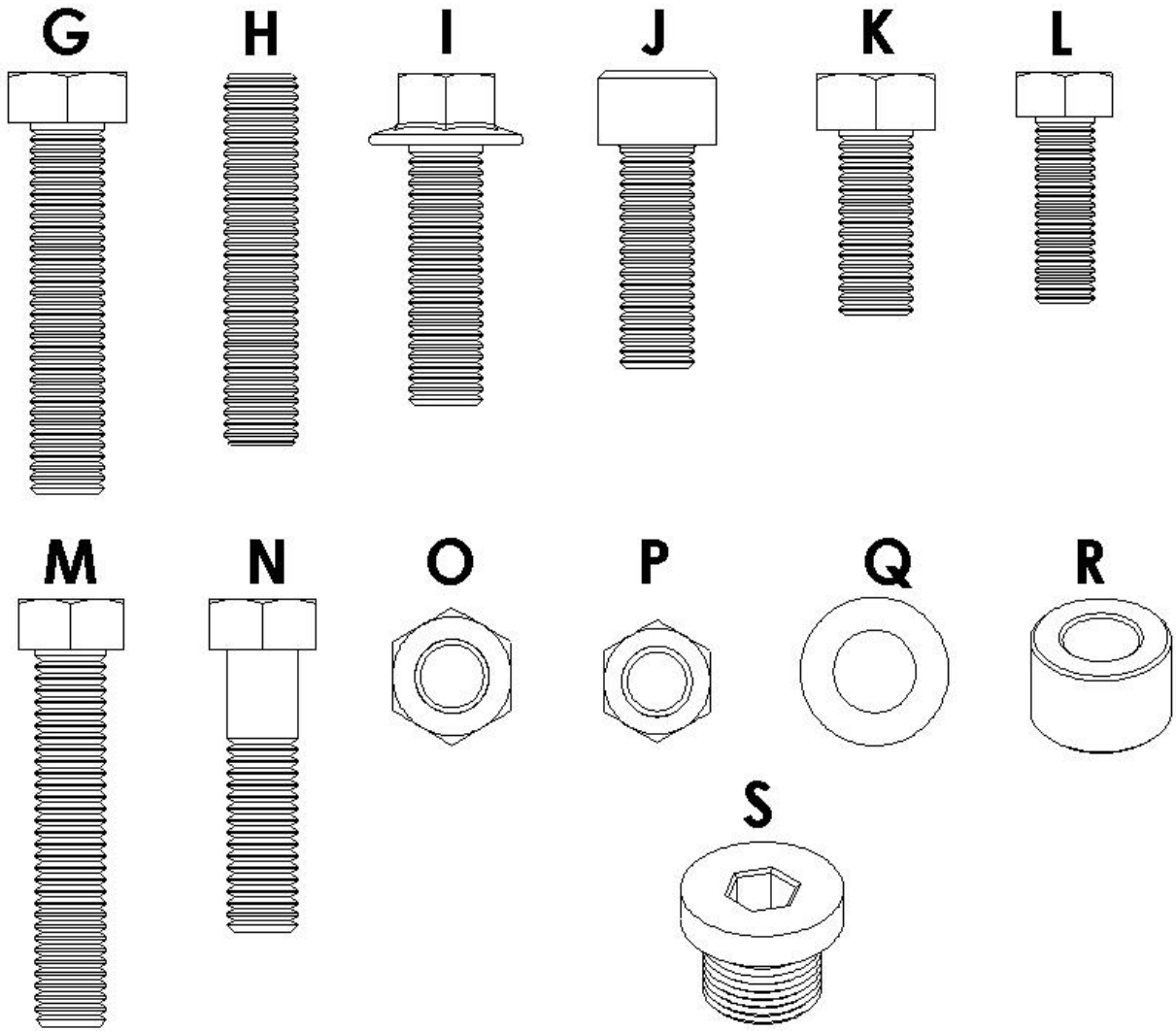
Very important:

**Prior to installation,
blow out all oil lines
and air tubes to make
sure debris is not
inside any of the lines
or tubes**

Ford Cummins Twin Gaskets and Hardware



Images Are Not to Scale



Images Are Not to Scale

Hardware Letter	Hardware Specification		Quantities	
			S300 Non-VGT Twin Kit	S300 VGT Twin Kit
A	T6 Non-Divided Gasket		1	1
B	T3 Divided Gasket		1	0
C	T3 Non-Divided Gasket		0	1
D	Oil Drain Gasket		2	2
E	24V Gasket	<u>1998.5-2002 Cummins</u>	6	6
F	12V Gasket	<u>1994-1998 Cummins</u>	Or 6	Or 6
G	M10-1.5x50mm Hex Bolt		2	2
H	M10-1.5x50mm Stud		2	3
I	M10-1.5x35mm Flange Head Bolt		6	6
J	M10-1.5x30mm Socket Head Cap Screw		4	4
K	M10-1.5x25mm Hex Bolt		2	2
L	M8-1.25x25mm Hex Bolt		4	4
M	3/8"-16 x 2" Hex Bolt		5	4
N	3/8"-16 x 1.5" Hex Bolt		2	2
O	M10 Nut		2	4
P	3/8" Nut		3	2
Q	M10 Narrow Washer		12	12
R	1/2" Spacer		0	1
S	Coolant Block Off Plug	<u>2004.5-2007 Cummins</u>	1	1

Installation Instructions for Twin Turbo Kit

Please read all instructions before installation.

Note: We strongly recommend head studs and/or fire rings.

1. Prior to installation, change the engine oil and oil filter.

2. Make sure your vehicle is parked on level ground and parking brake is applied.



3. Remove air intake box and air intake tubing.

4. Remove battery box. This allows more space for installation. The battery will be reinstalled later.

5. Remove the plastic inner wheel well cover (splash guard) on the passenger side. It will be reinstalled later.

6. Remove oil supply line for the factory turbo.

12V Cummins Engines: Remove the fitting from oil filter housing.

24V Cummins Engines: Keep the fitting attached to the oil filter housing. Keep the oil inlet fitting attached to the factory turbo.

7. Disconnect oil drain line from the factory turbo and remove it from the block. Discard factory oil drain line. Remove the oil drain fitting in block if there is one. A slide hammer is helpful in removing the factory oil drain fitting from the block.

8. For 2004.5-2007 Engines Only: The wastegate is electronically controlled. Simply unscrew the entire sensor from the factory turbo, leave it plugged in, and zip tie it onto the shock mount.



9. Remove the factory turbo and exhaust manifold. **For 2007.5-2018 Engines Only:** Remove the factory turbo coolant lines, at the banjo fittings on the engine block. Use the two provided S plugs to plug the factory turbo coolant ports on the engine block.



10. For Trucks with Dual Oil Drain Ports Only (usually 1998 and newer engines): Locate the freeze plug. It is located underneath the oil filter (same height as the back drain port) for 2003 and newer Engines or located in the rear (same height as the front drain port) for 2002 and older Engines. Oil filter could be removed to improve accessibility to the freeze plug if needed. Gently tap on the outer rim of the freeze plug using a flat blade screwdriver and a hammer to rotate it in the block. Once rotated, use needle nose pliers to retrieve the freeze plug.

NOTE: Be sure to clean around the freeze plug and remove all debris from the cup of the freeze plug to make sure nothing drops into the oil pan. **Be very careful not to push the plug into the oil pan, or you will have to drop the oil pan to retrieve it.**

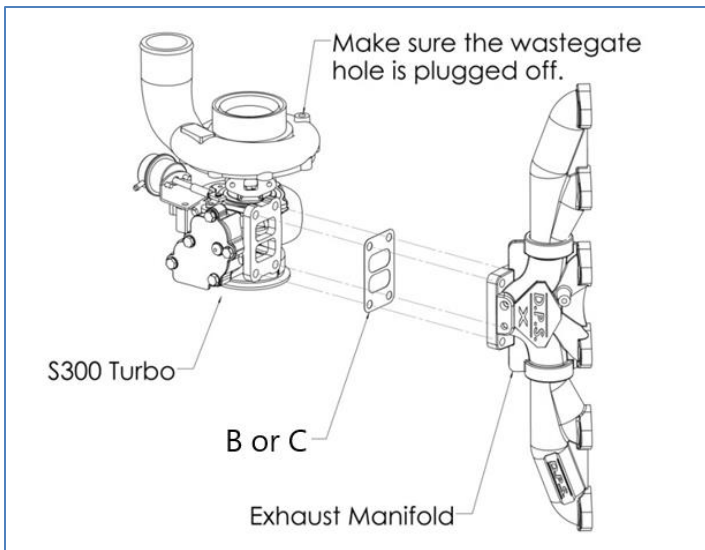
11. Insert the new oil drain lines into the drain ports.

Engines with Single Oil Drain Port (1997 and older):

These trucks only have one oil drain port and require the oil drain adapter to drain both turbos into the front oil drain port. Push the aluminum adapter with the two O-rings into the block. Insert the two 19" oil drain lines into the aluminum adapter. Make sure they are pushed completely into the holes. Both O-rings should be inside the hole. Use a small amount of grease on the O-rings.



Trucks with Dual Oil Drain Ports: Keeping the drain hose straight, insert the provided long oil drain line into the front drain port and the short oil drain line into the rear drain port. Make sure they are pushed completely into the hole. Both O-rings should be inside the hole. Later, the long oil drain line will be connected to the top turbo, and the short oil drain line will be connected to the lower turbo.



12. Install the small turbo on the exhaust manifold as shown using the following hardware depending on your kit.

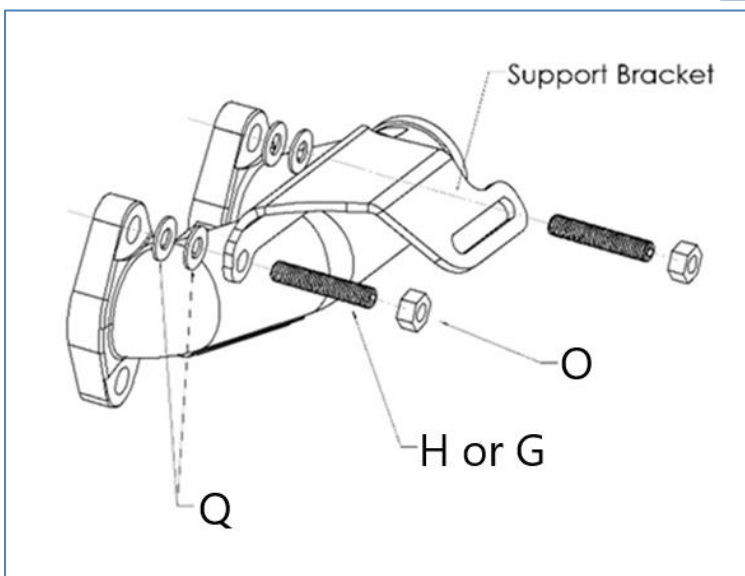
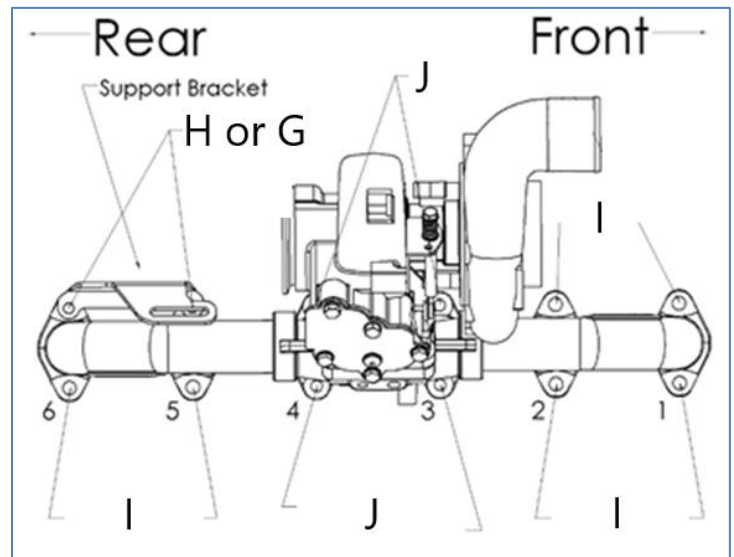
Non-VGT	VGT
1 x B gasket	1 x C gasket
2 x M bolts	1 x M bolt
2 x K bolts	1 x H stud
2 x P nuts	2 x K bolts
	2 x O nuts
	1 x P nut

Remember to place gasket **B** or **C** in between the turbo and exhaust manifold. **Tighten in an 'X' pattern, first to 5 ft-lbs, then to 15 ft-lbs, then finally to 35 ft-lbs.**

13. Install the small turbo and manifold assembly by holding it in place while putting the bolts into the head. Don't forget to install the six manifold gaskets in between the block and the manifold.

1998.5-2002 Trucks	6 x E gaskets
1994-1998 Trucks	6 x F gaskets

Attach the center manifold gaskets and bolts first (cylinders 3 & 4) using the four **J** bolts included in your kit.

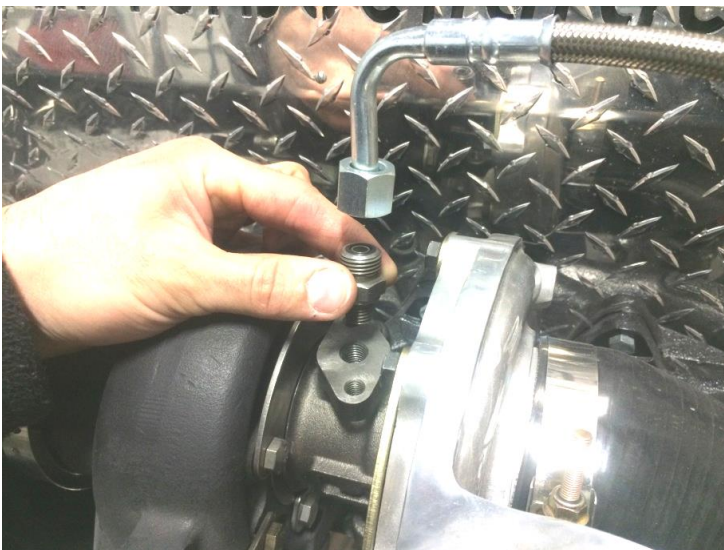


Once the center manifold bolts are in place, install the six **I** bolts on cylinders 1, 2, and the bottom holes of cylinders 5 and 6. Install the support bracket on the top two rear bolts (cylinders 5 & 6) using either two **H** studs and two **O** nuts or the two **G** bolts provided depending on your installation. Position four of the **Q** washers between the manifold and the bracket as shown in the picture.



14. Connect the longer oil drain line to the small turbo using two **L** bolts and one **D** gaskets provided in the kit.

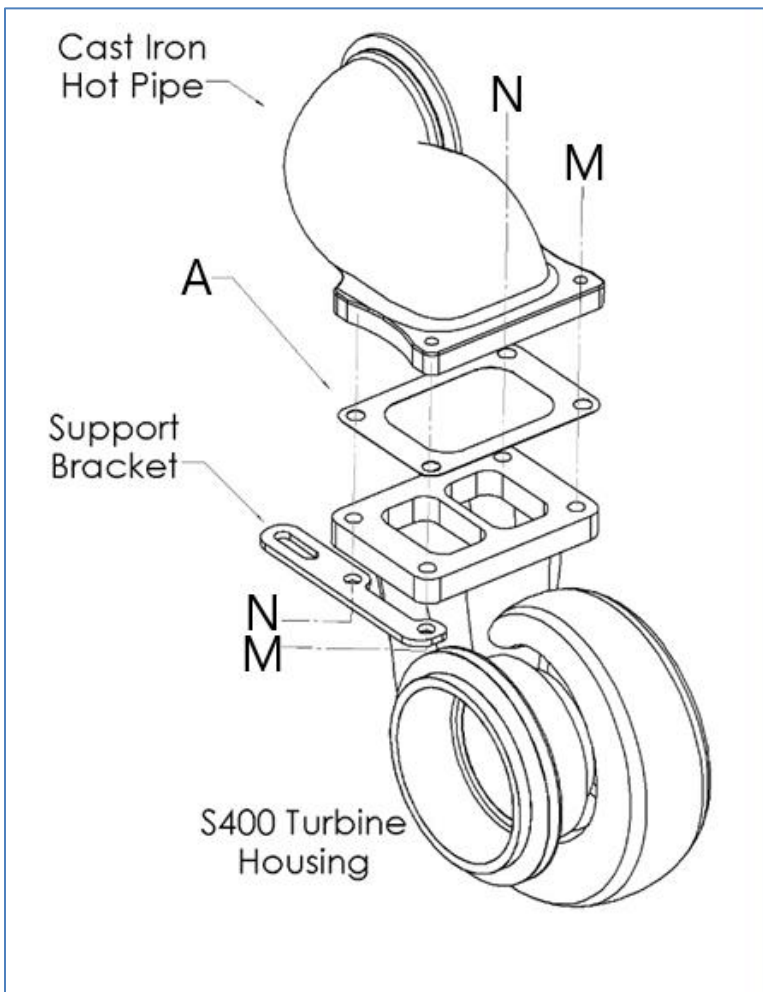
15. Install the new oil supply line for small turbo (steel braided hose with elbow ends) provided in the kit. Start by attaching the oil fitting from your factory turbo to the oil inlet port of small turbo (fitting is provided for 12V trucks). Then couple it with the longer elbow end of the steel braided hose. **DO NOT OVERTIGHTEN HOSE, 1/4 TURN PAST SNUG IS SUFFICIENT.** Lastly, attach the other end of the steel braided hose to the factory oil feed from the truck (fitting is provided for 12V trucks).



16. Separate the turbine housing from the large turbo assembly by removing the v-band clamp that secures the bearing housing to the turbine housing. **Slide the bearing housing straight out. Be careful not to damage the turbine fins when separating them.**



17. Wrap the cast iron hot pipe with the heat wrap provided in the kit. Use the provided hose clamp to keep the wrap in place.



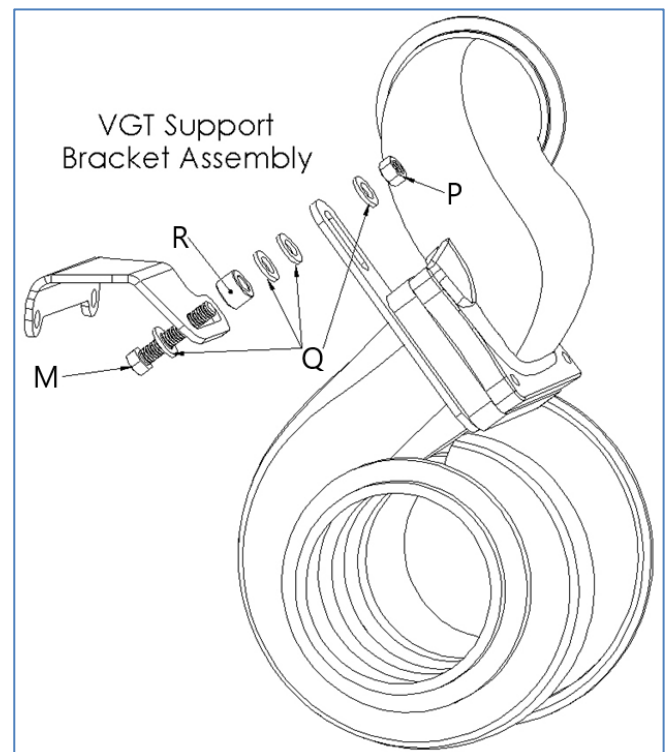
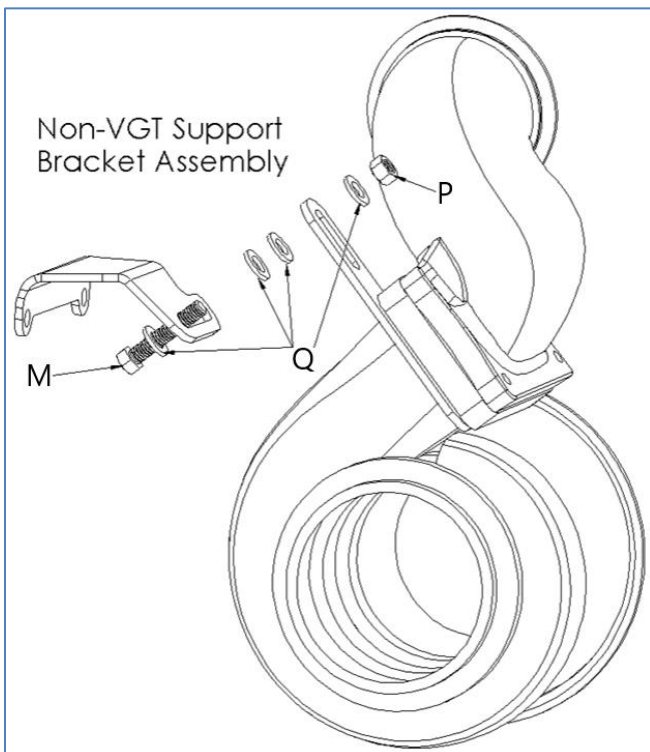
18. Assemble the hot pipe, gasket **A**, support bracket, and large turbine housing as shown using the two **M** bolts and two **N** bolts provided in the kit. Do not forget to place the **A** gasket in between the turbine flange and the hot pipe flange. Two **Q** washers should be used on the support bracket bolts going into the turbo. **Only finger tighten the bolts to allow for movement when aligning the turbine housing assembly in the next steps.**

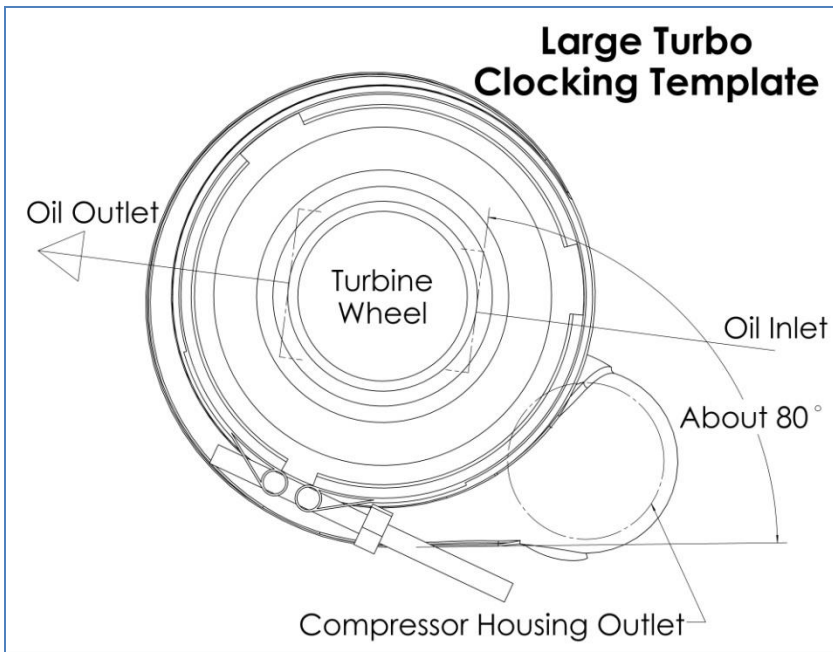
19. If your down pipe flange is 4.4 inches, attach the exhaust reducer on the back of the large turbine housing using the provided v-band clamp. Down pipe can later be attached using the factory v-band clamp.



20. Install the large turbine housing assembly to small turbo by attaching the hot pipe flange to the turbo flange using v-band clamp as shown. Make sure the hot pipe flange and turbo flange are concentric. Pass one of the provided **M** bolts with one **Q** washer through the backside of the support bracket. For non-VGT twin kits stack 2-6 **Q** washers between the two support bracket pieces. For VGT twin kits place the included **R** spacer between the two support bracket pieces. If more space is needed between these two brackets place a

few **Q** washers to increase the distance. See pictures bellow for more details. **These spacers control how far the twin kit swings out away from the engine block and my need to be adjusted later if the air intake tube is too close to the oil filter.** Once the necessary distance is obtained use one **Q** washer and **P** nut to secure the bracket together. Finish by gradually tightening the bolts simultaneously **starting with the v-band clamp first**, then the support bracket bolt and four bolts holding the hot pipe to the T6 turbine housing. Once snug go through a few times tightening the previous bolts simultaneously in the same order until the bolts are secured properly.





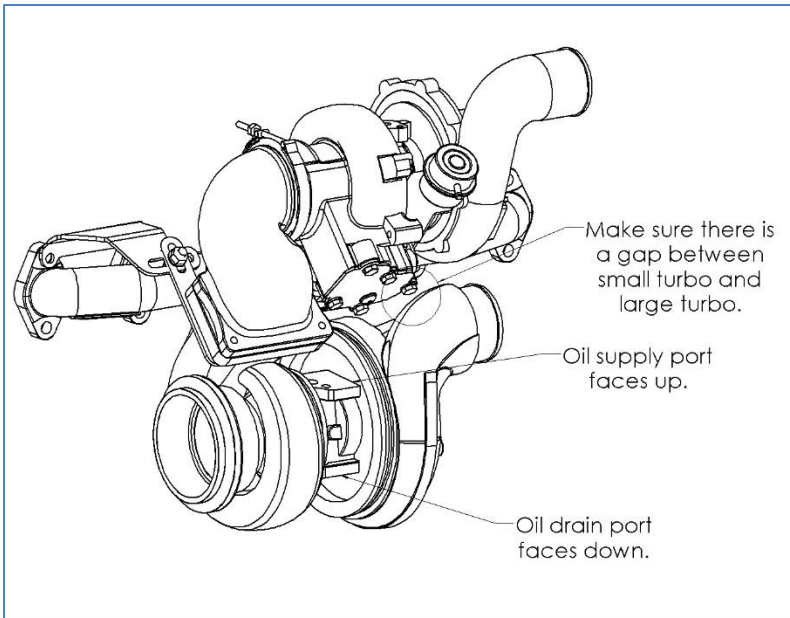
21. Clock the large turbo compressor housing and cartridge by loosening the v-band clamp, rotating them according to the template shown, and tightening the v-band clamp. V-band clamp should be placed where it is shown in the template. It will allow you to access the clamp easier if you need to adjust the clocking later.



22. Install the oil inlet elbow fitting provided in the kit. Tighten it so the fitting points toward the compressor outlet side as shown.

23. Install oil supply line (steel braided hose without elbows) to the oil inlet elbow fitting on large turbo as shown. Tighten the fitting snug, but do not over tighten.





24. Carefully lower the large turbo section to the front of the turbine housing installed in the truck and insert the turbine wheel into the turbine housing. **Do not allow the exposed turbine fins to touch anything. They can easily be damaged.** Use v-band clamp to secure in place but keep it slightly loose to allow adjustment. Orient the bearing housing so the oil supply port faces up and oil drain port points down (vertical of each other). Once aligned, tighten the v-band clamp to secure the turbo in place (Torque to 100 inch lbs.).

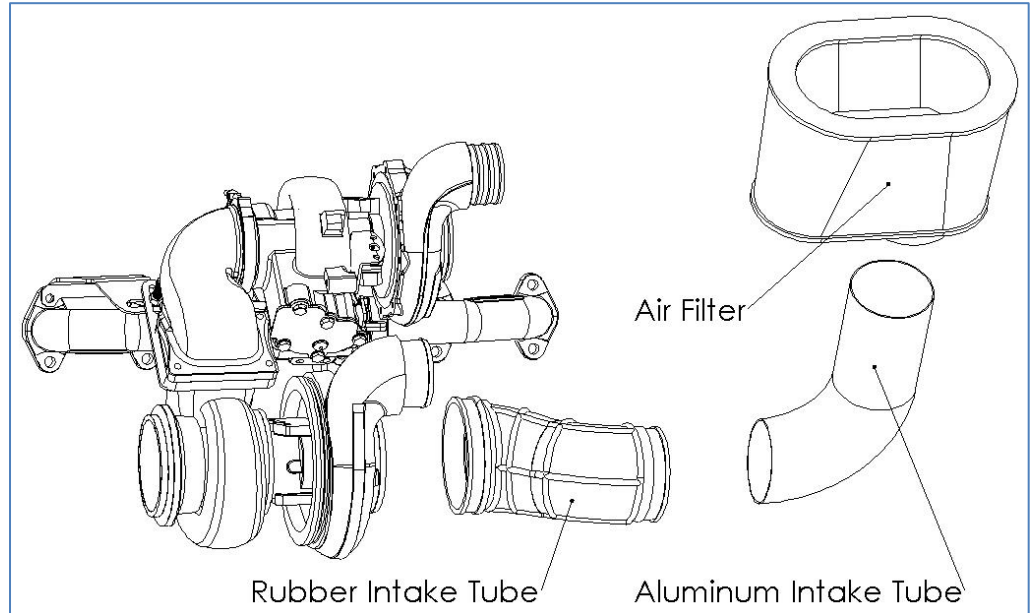
25. Every set of air conditioning, and transmission dipstick tubes are slightly different. Make sure that all tubes, cords, and lines (air conditioning tubes, heater lines, electrical cords, etc.) are not in contact with any portion of the Twin Turbo Kit, especially the hot side of the turbo. They could be damaged or melted due to high heat. If they are in contact by chance, carefully bend them to fit properly.



26. Remove one of the oil plugs from the top of the oil filter mount, and screw in the provided fitting (should be at the end of the steel braided oil line from the large turbo), then couple the oil line to that fitting.

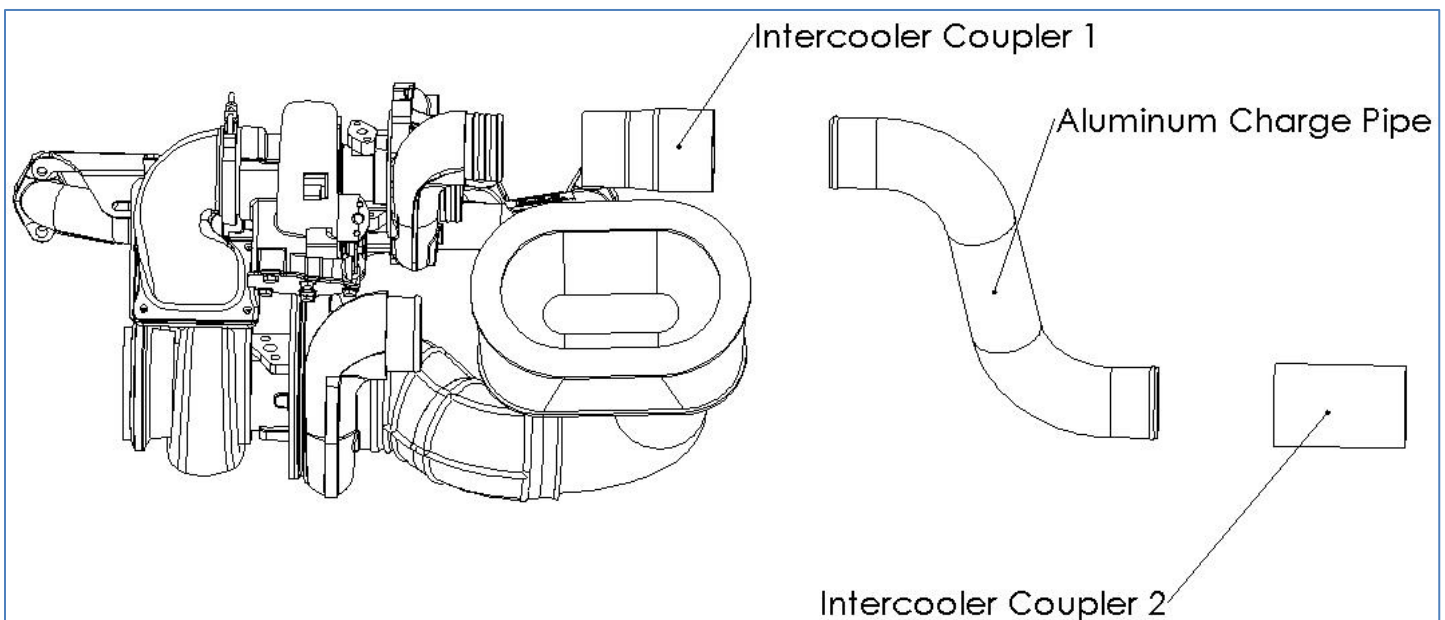
27. Connect the shorter oil drain line to the large turbo using the last two **L** bolts and the last **D** gaskets provided in the kit.

28. On the Ford Cummins conversion trucks, the air intake provided may need modified. This is because of the uniqueness of each conversion and because the engine was not the native engine to the truck, we provided an air intake system which most commonly is used. This includes our rubber intake, aluminum intake, air filter, and worm gear clamps. Some fabrication may be required on the air intake/filter system on these kits. **HINT:** If air intake does not clear oil filter, loosen the support bracket single bolt. Rotate the lower turbo outwards and use the extra **Q** washers to shim the support bracket.



Note: Oiling the filter with K&N filter oil is highly recommended, especially if being used in dusty environments. Also the K&N filter cleaning and oiling kit can be used to wash the air filter when it gets dirty.

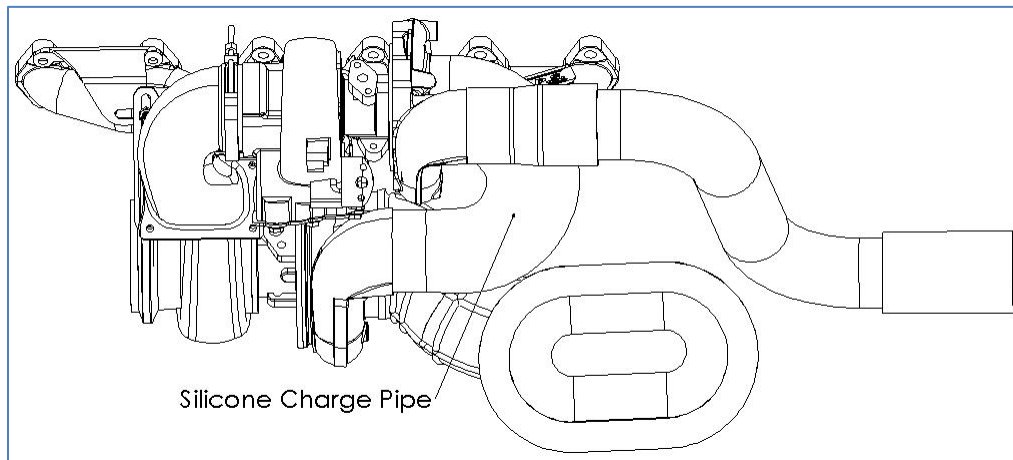
29. Install the metal intercooler charge pipe (goes from the small turbo outlet to intercooler) and silicone couplers as shown. Use appropriate T-bolt clamps to secure in place. Tighten snug, but do not over tighten (appx. 5-7 ft. lbs.).



Note: If the charge pipe does not line up with the intercooler inlet, you may need to rotate the small compressor housing slightly. To do so, loosen the 8 bolts that hold the housing just loose enough that the housing can rotate but not rattle. Rotate the housing to where it needs to be, then re-tighten all 8 bolts. Aluminum thread can be striped easily. Only tighten to appx. 10-12 ft.lbs.

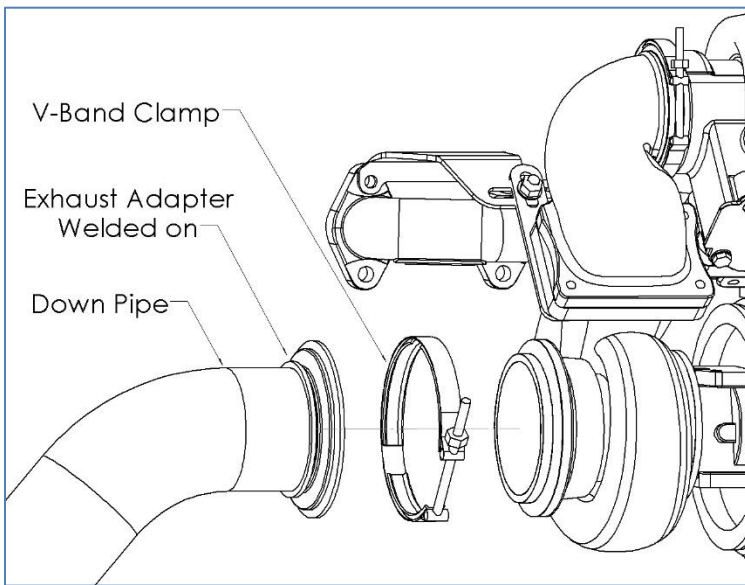
Note: If it is difficult to slide couplers on, you can use a small amount of soapy water to help the charge pipe slide into the couplers. **DO NOT USE OIL TO DO THIS** as oil will not dry and the charge pipe may slip out under pressure.

30. Install the silicone charge pipe connecting the two turbos. Tighten the clamp for the top turbo **FIRST** to **make sure** the edge of the silicone charge pipe is flush against the compressor inlet all the way around. (This will prevent blowing off or damage to the silicone charge pipe). Next, attach the other side of the pipe to the large turbo using T-bolt clamp.



31. On Ford Cummins conversions it may be necessary to move the battery to the driver side to get the intake and intercooler hoses to fit properly. Most users do this, but some do not.

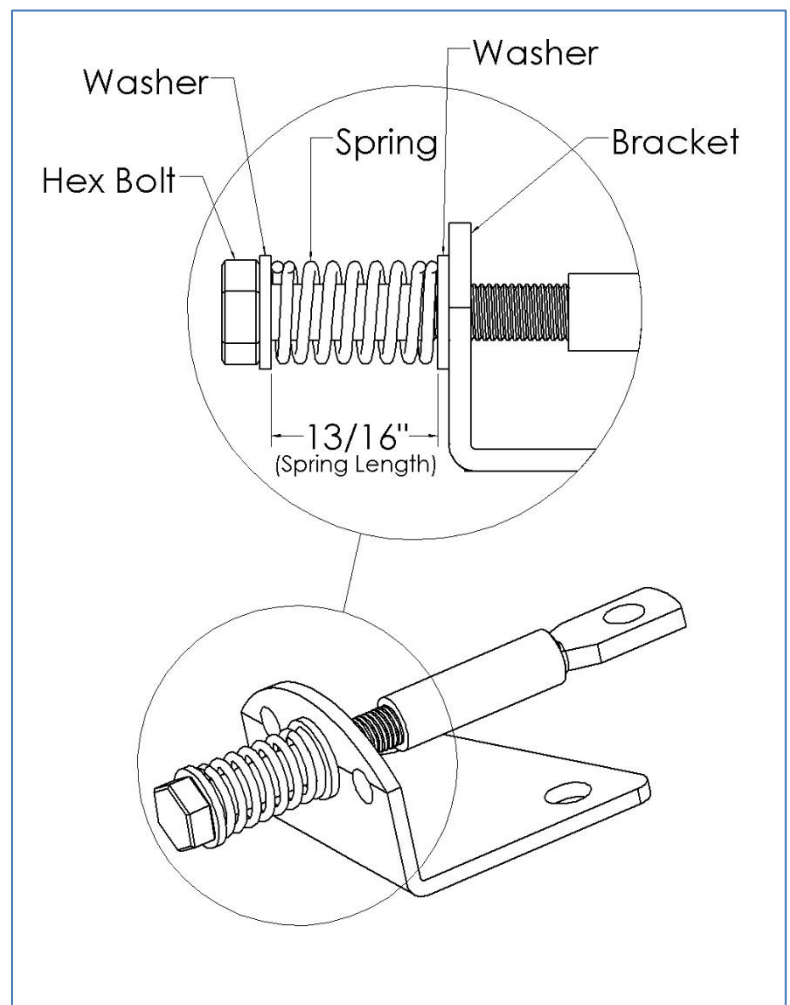
32. Once again check to make sure that all tubes, cords, and lines are not in contact with any portion of the Twin Turbo Kit.



33.If your down pipe flange is 4.4 inches, use the factory v-band clamp to connect the large turbine housing to down pipe. Otherwise, the exhaust adapter can be welded to your down pipe, then use the provided v-band clamp to connect it to the large turbine housing. If you ordered our 2G down pipe it will not be an exact match to your truck. Modifications will be needed to attach it to your existing exhaust set up.

34. Wastegate/Spring Gate: (If your kit has the spring gate only, skip to next item): Connect the wastegate actuator on the top turbo to the elbow fitting on the bottom turbo using the hose and tension spring hose clamps provided in the kit. **If equipped with spring gate, disregard this instruction, spring gate tension will already be set.**

VERY IMPORTANT: If you are using your own small turbo in this compound turbo kit, it is extremely important that you **DO NOT run the wastegate actuator off small turbo pressure, it will open too wide and damage the inside valves.** You should run our spring gate setup as shown if you are running one of our small turbos (S300 style turbos). The spring length will provide the correct wastegate opening/closing pressure. If you have a competitor's turbo, you should re-route the wastegate hose to reference the large turbo and block off the small turbo port.



35. Reinstall battery and reconnect the battery cables.

36. Start the truck and check for any oil leaks, air leaks, or vibration. If leaks are found, make sure all the clamps, bolts, or fittings are tight. Be sure that the oil pressure rises to the correct pressure. Allow it to idle for about 2-3 minutes without revving the engine. This allows the oil to reach the bearings of the new turbos. Do not allow truck to idle for long periods of time, especially on new turbos because it can cause turbo leaks.

37. Drive conservatively for about 100 miles to allow some break-in time on the turbocharger. After driving about 100 miles, while engine is hot from running, put on gloves and re-torque all exhaust bolts and all clamps. This will ensure they do not loosen in the future.