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BD Cobra Compound Turbo

2003-2018 Dodge Cummins

Cobra 76	400 - 800hp
Cobra 80	450 - 1000hp
Cobra 86	550 - 1100hp
Cobra 88	675 - 1200hp

Pre-machined BD turbocharger compressor covers and turbine housings are required for easy assembly.

2003-2012 trucks: If you have a stock intercooler with a 3.0" inlet, you must purchase a 3.0" to 3.5" boot and clamp (PN 1453221 & 1405211).

BD Engine Brake Inc.

Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

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

Order Guide

BD Cobra Kit

Kit PN	Years	Secondary Turbo		Primary Turbo
		Turbo	Turbine	
1045780	03-07	361 SXE	76mm - 1.0AR	476 SXE
1045781	08-09	361 SXE	80mm - 0.9AR	476 SXE
1045782	10-12	361 SXE	80mm - 0.9AR	476 SXE
1045795	13-18	361 SXE	80mm - 0.9AR	476 SXE
1045783	03-07	364.5 SXE	80mm - 0.9AR	480 SXE
1045784	08-09	364.5 SXE	80mm - 1.0AR	480 SXE
1045785	10-12	364.5 SXE	80mm - 1.0AR	480 SXE
1045796	13-18	364.5 SXE	80mm - 1.0AR	480 SXE
1045794	03-07	366 SXE	80mm - 1.0AR	BD 486
1045786	08-09	366 SXE	80mm - 1.0AR	BD 486
1045787	10-12	366 SXE	80mm - 1.0AR	BD 486
1045797	13-18	366 SXE	80mm - 1.0AR	BD 486
1045793	03-07	S467	83mm - 1.0AR	488 SXE
1045791	08-09	S467	83mm - 1.1AR	488 SXE
1045792	10-12	S467	83mm - 1.1AR	488 SXE
1045798	13-18	S467	83mm - 1.1AR	488 SXE

Name	Inducer Size	Potential Crank Horsepower			Max Flow (Lb/min)	*RPM to Spool	**Transien t Response
		Min	Rated	Peak			

BD Single Turbo Kit Guide

Super B Single	58mm	200	400	450	57	1250	0
Super B Killer SXE	61mm	250	500	525	77	1800	15
Super B Special SXE	63mm	300	550	600	79	1750	32
Super B 600 SXE	64.5mm	375	600	650	82	1750	35
Super B 650 SXE	66mm	450	650	675	87	1925	39
Super B 700 SXE	69mm	575	675	700	98	2125	44
Rumble B 369 SXE	69mm	575	675	725	98	2125	44
Rumble B 467	67mm	575	675	700	92	2225	43
Rumble B 472 SXE	72mm	600	775	800	110	2375	57
S476 SXE	76mm	700	825	850	121	2550	63
S480 SXE	80mm	800	925	950	134	3050	75
BD 486	86mm	900	1000	1050	144	3050	80
S488 SXE	88mm	900	1075	1125	160	3325	79
S588 SXE	88mm	900	1100	1150	162	3450	85
S594 SXE	94mm	1100	1275	1325	187	3850	87
K44	107mm	1300	1400	1500	197	4950	95

BD Compound Turbo Kit Guide

Tow Twin	58mm/66mm	250	600	625	78	1150	5
RT700	58mm/71mm	300	675	700	98	1250	10
RT850	64.5mm/74mm	400	800	850	103	1675	39
Cobra 76	61mm/76mm	400	800	900	124	1650	27
Cobra 80	64.5mm/80mm	450	1000	1050	134	1700	36
Cobra 86	66mm/86mm	550	1100	1200	144	1800	46
Cobra 88	67mm/88mm	675	1225	1400	160	2100	49
BD Triple	74mm/2x74mm	800	1525	1600	204	2200	64

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Introduction

Built for both a mild 400hp truck to an all-out 1400hp monster, the BD Cobra kit is designed to offer the turbocharger solution that can grow alongside your horsepower aspirations. The BD Cobra kit offers a bolt-on kit that includes everything needed to keep your air-conditioning, stock battery location, stock shock tower, and comes with a wastegate ready manifold to blow past the competition.

Every turbo kit comes with a pair of BD matched turbos which are designed to maximize turbo response and top-end airflow.

Recommended Fueling

	Injector Size (% Over)	HP Fuel Pump	Max Primary Turbo Speed
Cobra 76	43	R900 12mm CP3	115,500
Cobra 80	53-93	Dual fuel stock CP3	105,000
Cobra 86	103	One stock CP3 + One R900 12mm CP3	93,000
Cobra 88	103+	Dual fuel R900 CP3	105,000

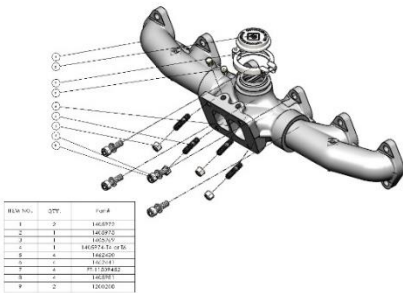
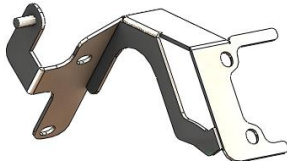
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Kit Contents

1045996-T4		1045986-T4		1405445			
							
Manifold; 20deg T4		Gasket Set; Exhaust Manifold		Bracket; LP Turbo			
Qty: 1		Qty: 1		Qty: 1			
1405438		1405442-1		1453522		2405021	
							
Battery Box		Air Box		Blanket; T4 Turbine		Gasket; T6 Dual	
Qty: 1		Qty: 1		Qty: 1		Qty: 1	
2925		1453105		1453106		1405434	
							
5" Air Filter		Oil Drain-Primary		Oil Drain-Secondary		Coolant Tube – 5/8"	
Qty: 1		Qty: 1		Qty: 1		Qty: 1	
1453130-B		1453820		1405453		1453514	
							
Turbo Oil Feed (-6JIC 90° x -6JIC)		Air Intake Seal		Bracket; Front Mount		Heat Wrap; 2"	
Qty: 2		Qty: 20" & 27"		Qty: 1		Qty:	

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1453504	1453724	1453725	1405441
			
Zip Tie; Stainless	Tube; 6.7l PCV	Bracket; Dipstick	Coolant Line
Qty: 4	Qty: 1	Qty: 1	Qty: 1
1405440	1405432	1405435	
			
Cobra Downpipe	Mid Pipe; Primary Outlet	Mid Pipe; Secondary Inlet	
Qty: 1	Qty: 1	Qty: 1	
1405431-ASSY	1405447		
			
Pipe; 5" Intake	Downpipe; 5" Exhaust		
Qty: 1	Qty: 1		

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Mounting Hardware

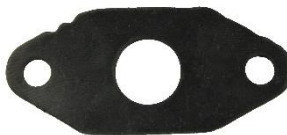
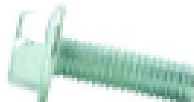
11864	1100111	1120124	1120126
			
U-Nut; M6	Washer; Flat 1/4"	Bolt; M8x20	Gear Clamp; 11/16" – 1.5"
Qty: 5	Qty: 4	Qty: 9	Qty: 2
1130058	1130182	1302108	1302198
			
Nut; Nylock M6	Bolt; M6x16	Bolt; Flange M10x25	Clamp; Spring 26mm
Qty: 5	Qty: 1	Qty: 4	Qty: 6
1401553	1401589	1402608	1453113
			
Nut; Manifold M8	Plug; M16	Washer; M6 Fender	Clamp; 1.25" gear
Qty: 1	Qty: 1	Qty: 2	Qty: 2
1453117	1453126	1453127	1453135
			
Fitting; 1/8NPT x -6JIC	Bolt; M10x20	Washer; 10mm	Fitting; ORB x -6JIC
Qty: 1	Qty: 2	Qty: 2	Qty: 1
1453137	1453162	1453735	1462441
			
O-Ring; #010 Buna-N	Fitting; -4NPT x -6JIC	Fitting; 1/2 NPT x 5/8" Barb	Nut; M10
Qty: 1	Qty: 2	Qty: 1	Qty: 2

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1900037	3008468	1453723-3	1453726-1
			
Bolt; M6x12	Plug; 1/2" NPT	Fitting; 3/4NPT x 1-1/8 Barb	Gasket; MAF
Qty: 8	Qty: 2	Qty: 1	Qty: 1
1453726-2	FT-0173590	FT-0413922	FT-0424690
			
Gasket; IAT	Bolt; 8-32x 9/16"	O-Ring; #152	O-Ring; #244
Qty: 1	Qty: 4	Qty: 1	Qty: 1
FT-11116245	FT-11127064	HS-96	
			
Bolt; Flange M8x25	Bolt; 3/8x1-1/4	Clamp; Gear 5-7"	
Qty: 2	Qty: 2	Qty: 3	
1120125		1453155	
			
Clamp; 1" Insulated		O-Ring; #216 Nitrile	
Qty: 2		Qty: 1	

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Boots and Clamps

1401563	1405211	1405212	1405625
			
Boot; 3.5" x 3.5"	Clamp; 3.0-3.38"	Clamp; 3.56-3.91"	V-Band; 4.72" OD
Qty: 1	Qty: 1	Qty: 2	Qty: 1
90368B	99502-0588	99800-0450	P103516-1
			
Lap Clamp; 5"	V-Band 5.75" OD	V-Band; 4.21" OD	Boot; 5.5-5"
Qty: 1	Qty: 1	Qty: 1	Qty: 1

S400 Secondary Mounting Hardware

1405439	1462431	1462429	1462441	RG-VT10481
				
S400-T6 Hot Pipe	Stud M10-1.5 x 25	Stud M10-1.5 x 35	Nut M10-1.5mm	4.81" V-Band Clamp
Qty: 1	Qty: 2	Qty: 4	Qty: 6	Qty: 1

S300 Secondary Mounting Hardware

1405454	FT-32826	1452429	1120033	1462441	RG-10216-1
					
SXE-T6 Hot Pipe	Stud 3/8" - 16	Stud M10-1.5 x 35	Nut 3/8" NC	Nut M10-1.5mm	4.2" V-Band Clamp
Qty: 1	Qty: 2	Qty: 4	Qty: 2	Qty: 4	Qty: 1

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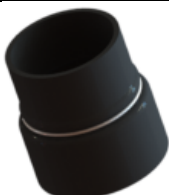
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Additional Year Dependant Parts

2003-2009

1401532	1453221-1	1401563	1405212
S300 Only	S400 Only		
			
Boot; 2.75" x 3.5"	Boot; 3" x 3.5"	Boot; 3.5" x 3.5"	Clamp; 3.56-3.91"
Qty: 1	Qty: 1	Qty: 4	Qty: 3
1405437	1405446	1456740	
			
Tube; 3.5" CAC 03-09	Coolant Line; TCC	Plate; MAF	
Qty: 1	Qty: 1	Qty: 1	
1604056	1405442-2	FT-69884	
			
Heater Hose; 5/8"	Bracket; Air box	Fitting; 3/4" NPT 90	
Qty: 8"	Qty: 1	Qty: 1	

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2010-2012

1401532	1453221-1	1302425	1400113
S300 Only	S400 Only		
			
Boot; 2.75" x 3.5"	Boot; 3" x 3.5"	Boot; 3.25" x 3.5"	Clamp; 1" Insulated
Qty: 1	Qty: 1	Qty: 1	Qty: 1
1405212	1405426	1405427	1405428
			
Clamp; 3.56-3.91"	Tank; Coolant	Hose; 1" Black	Plug; 1" Coolant
Qty: 2	Qty: 1	Qty: 4"	Qty: 1
1405433	1405446	1407030	1505001
			
Tube; 3.5" CAC 10-12	Coolant Line; TCC	Clamp; 3.28-3.63"	Clamp; Gear 5/8"
Qty: 1	Qty: 1	Qty: 1	Qty: 1
1604056	1405442-2	1453723-1	1453723-2
			
Heater Hose; 5/8"	Bracket; Air box	Fitting; Coolant x Barb 90	Fitting; Coolant Clamp
Qty: 8"	Qty: 1	Qty: 1	Qty: 1

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2013-2018

1401530	1405305	1405209	1405211
S300 Only	S400 Only	S300 Only	
			
Boot; 2.75" x 3.5"	Boot; 3" x 3.5"	Clamp; 2.75-3.09"	Clamp; 3.0-3.38"
Qty: 1	Qty: 1	Qty: 1	S300 Qty: 1 S400 Qty: 2
47082	1040142	1400113	1405465
			
Fitting; 1/2" to 3/8"	Heat Shield	Clamp; 1.25" Insulated	Tank; Coolant w/ Sensor
Qty: 1	Qty: 1	Qty: 1	Qty: 1
1405456	1405457	1405458	1405459
			
Tube; 3.5" CAC 13-18	Bracket; Air Box	Coolant Line; 13-18	Bracket; Trans Oil Front
Qty: 1	Qty: 1	Qty: 1	Qty: 1
1405462	1405463	1405464	
			
Bracket; Trans Oil Rear	Plug; 3/8"	Sensor; Coolant (Inserted into 1405465)	
Qty: 1	Qty: 1	Qty: 1	

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1406107	1407030	1505001
		
Boot; 2.75" x 3" 45	Clamp; 3.28-3.63"	Clamp; Gear 5/8"
Qty: 1	Qty: 1	Qty: 5
1604053	1453723-1	1453723-2
		
Hose; 3/8"	Fitting; Coolant x Barb 90	Fitting; Coolant Clamp
Qty: 21"	Qty: 1	Qty: 1

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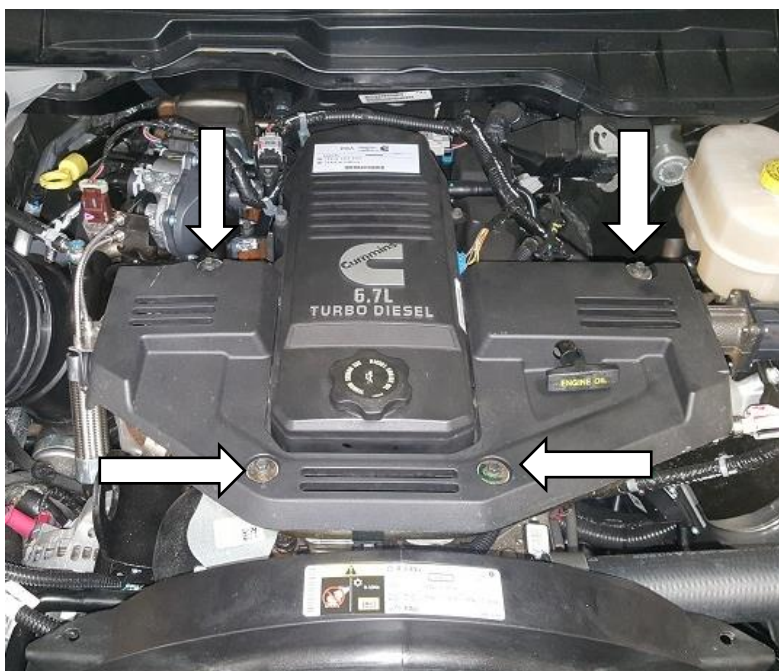
Instructions

Removal



VEHICLE SHOULD BE SAFELY SECURED BEFORE INSTALLATION.

1. Drain Coolant. Disconnect batteries and raise vehicle.
2. Remove passenger side front fender and wheel.
3. Remove engine cover (4 bolts).



4. Disconnect sensors and remove the air box and intake hose. Remove the air filter inlet hose from the turbo inlet.



5. Remove the EGR cross over tube by removing the two clamps.



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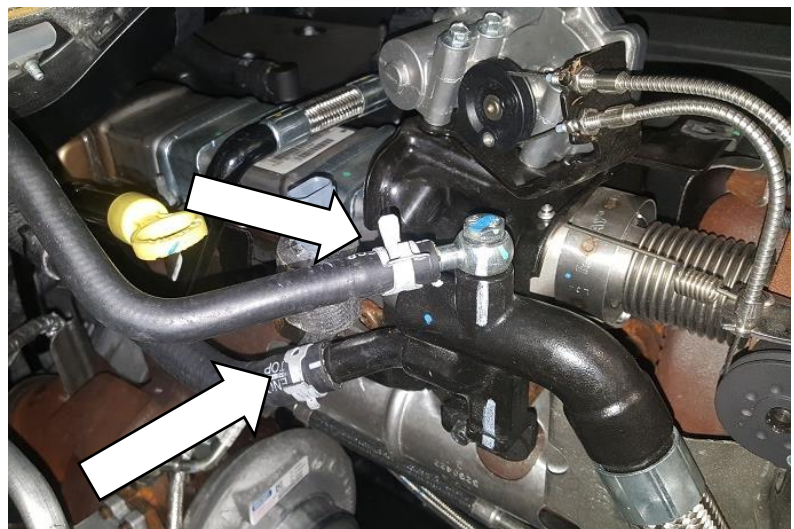
6. Disconnect the two sensors.
Note: 2013+ Truck shown.



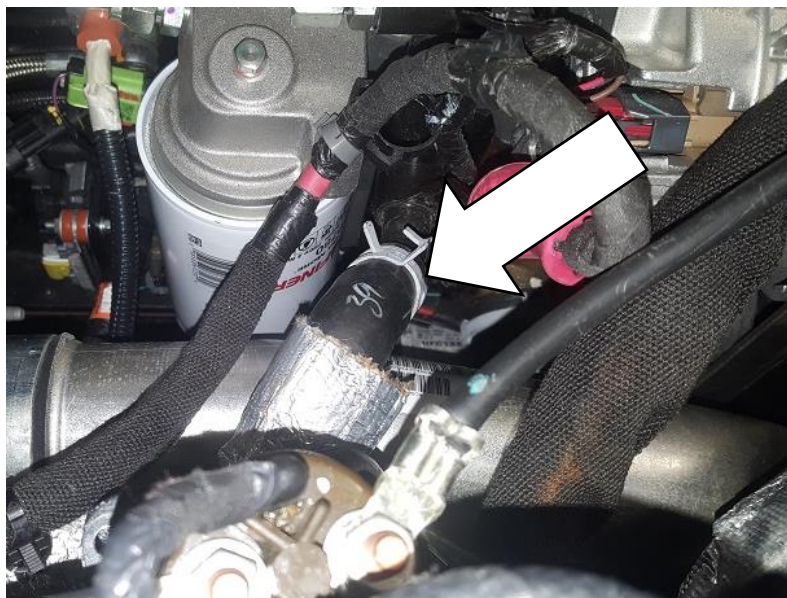
7. Disconnect the hose clamp and remove PCV hose assembly.



8. Disconnect the two coolant lines at the coolant stand pipe.



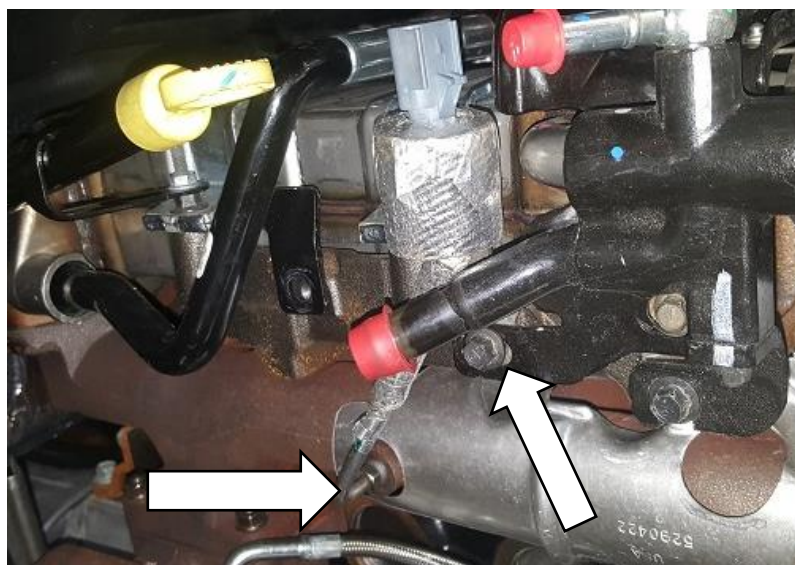
9. Remove the bottom coolant bottle hose from bottom of coolant stand tube.



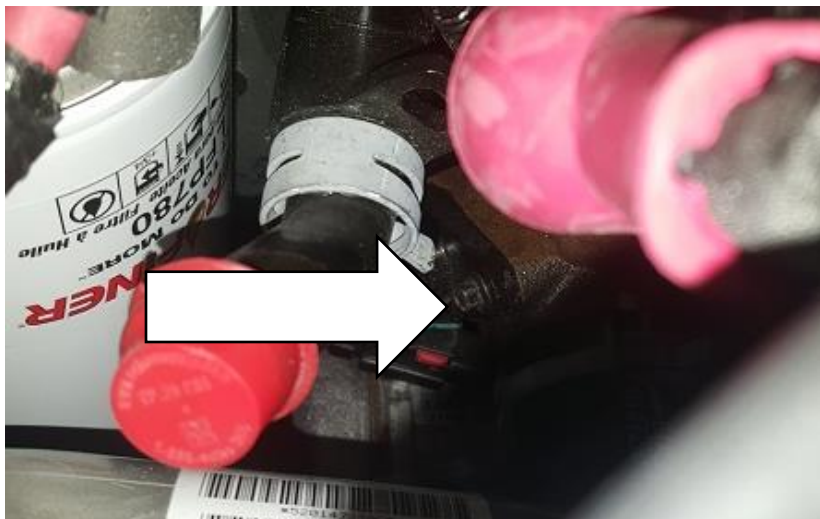
10. Remove the upper turbo coolant line from turbo and engine.



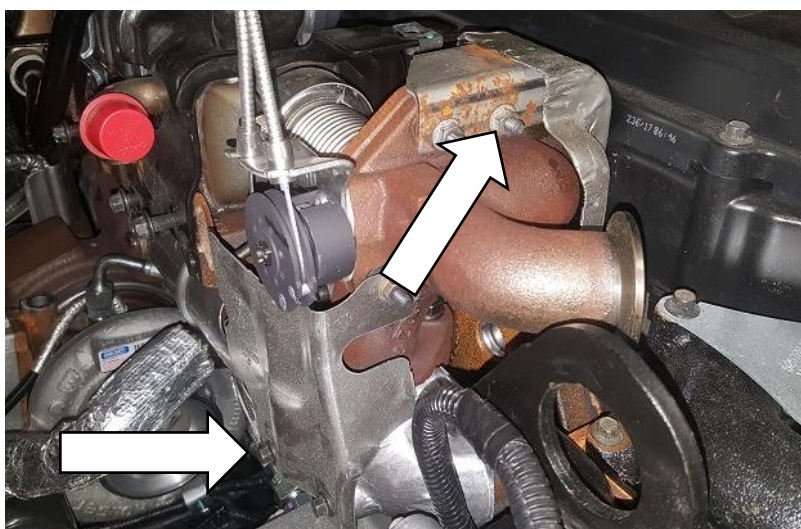
11. Remove and unplug the EBP sensor and tube.
Note: 2013+ truck shown. 2008-2012 trucks will have the sensor in the thermostat housing.



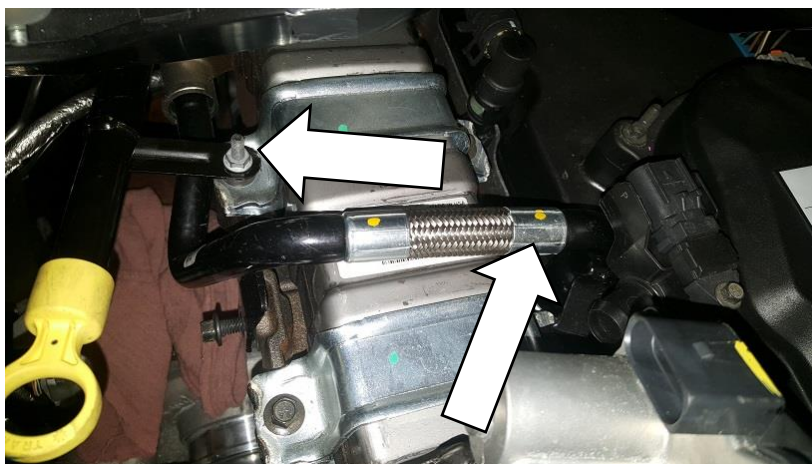
12. Remove the two remaining bolts on the coolant stand. One on the top and one bolt at the bottom and remove the coolant stand tube.



13. Remove the upper and lower EGR heat shields by removing the two nuts on the upper heat shield and 3 bolts on the lower heat shield.



14. Remove the transmission tube bracket and the coolant hose.



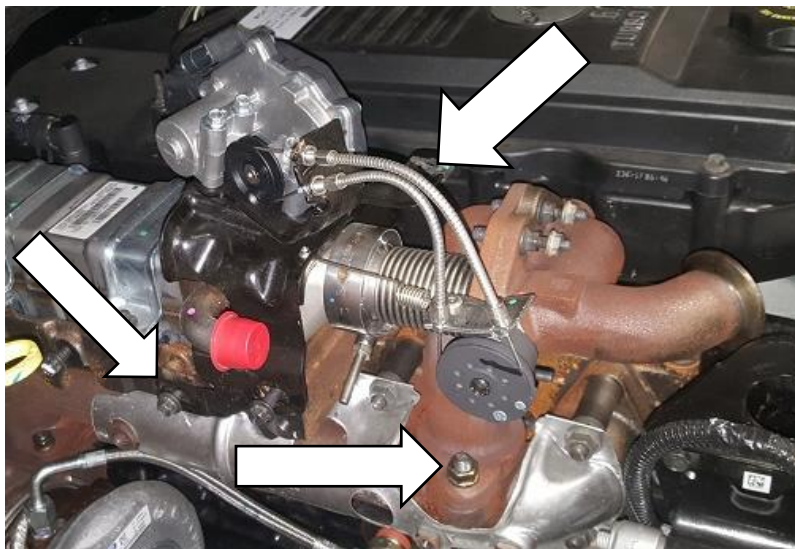
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15. Remove the EGR valve assembly by removing the two bolts on side of EGR cooler, two on top and two nuts on the manifold flange.



16. Remove the EGR cooler by removing 2 bolts shown and 2 nuts at the rear securing the cooler to the manifold.



17. Remove the battery, battery box, and grid heater relay.



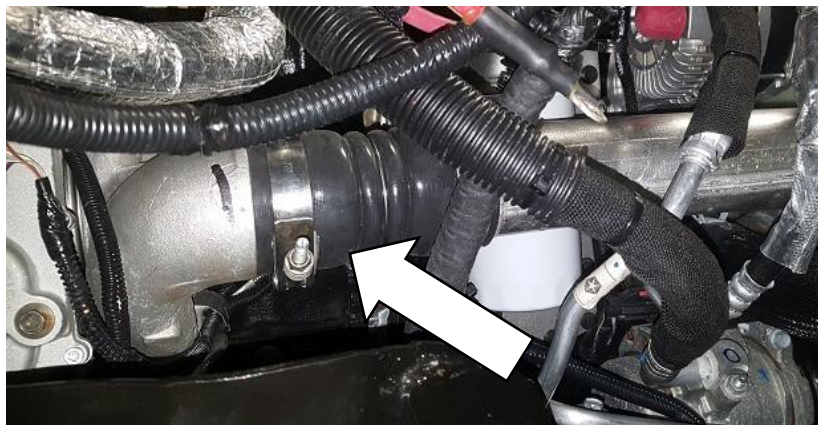
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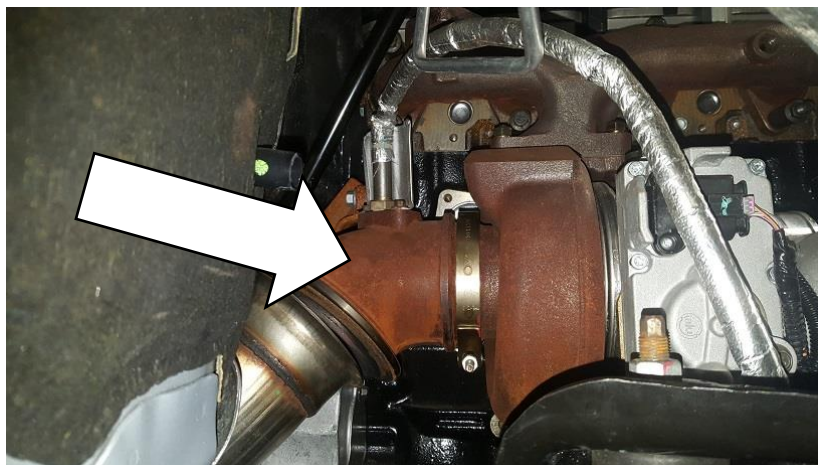
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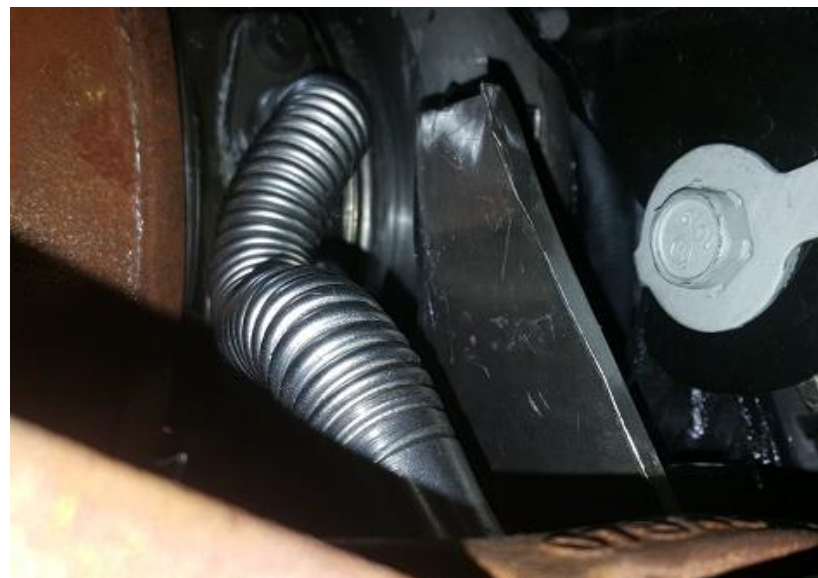
18.Remove the CAC pipe from turbo outlet.



19.Remove downpipe and exhaust outlet casting. The sensor electronics will need to be unbolted from the motor. 2013 model shown. Some models may not have electronics.



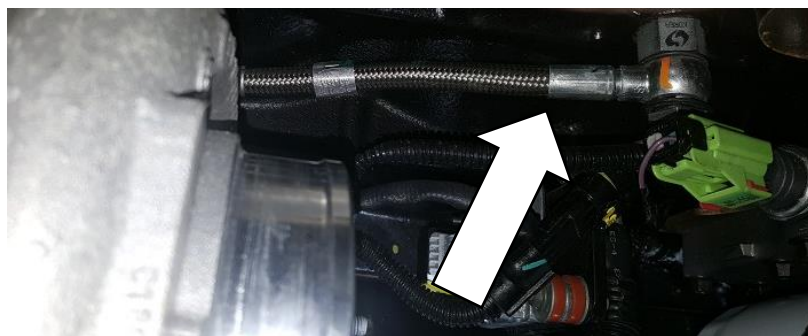
20.Remove the oil drain from the bottom of the turbocharger.



21.Remove the oil feed line



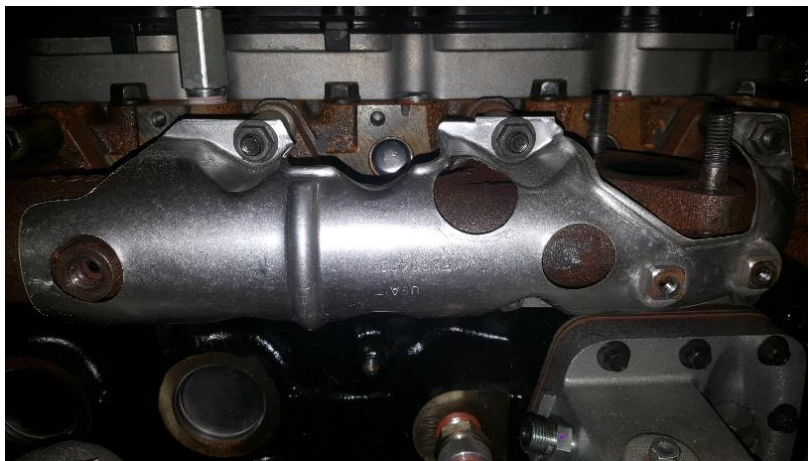
22.Remove the lower turbo coolant return hose assembly.



23.Remove the four nuts securing the turbocharger to the manifold and remove the turbocharger.



24.Remove the heat shield from the exhaust manifold.



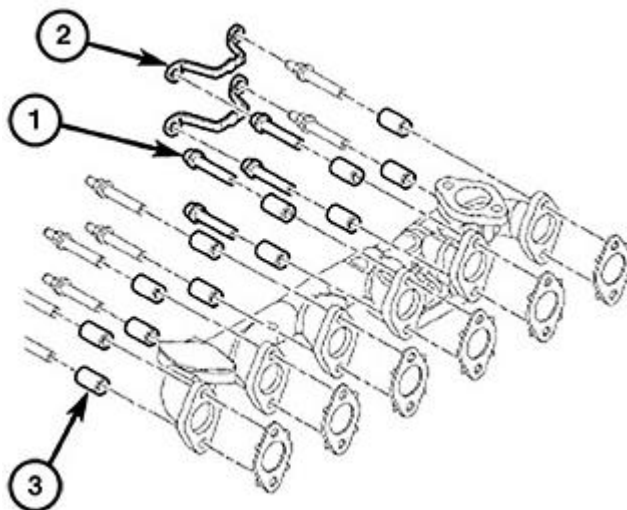
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25. Remove the rear two exhaust manifold bolt lock plates (2). Remove bolts and spacer to remove exhaust manifold.



26. Remove the engine grounding wire



27. Remove the coolant bottle and attached hoses



28. Remove the oil drain frost plug.

Drill out the frost plug with a drill bit (put grease on the drill bit to catch shavings) and thread in self-tapping screw. Use vise grip and pry bar to remove plug.



29. Remove the inlet air box tube from inside the fender

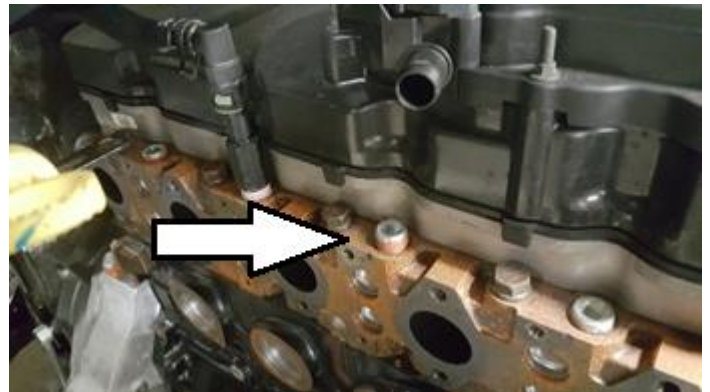


2003-2009 trucks will need to remove the passenger side shock tower.

Installation

1. Install both the NPT (3008468) and ORB (1401589) plugs into the coolant ports.

2003 – 2007 5.9L trucks will not need this step.

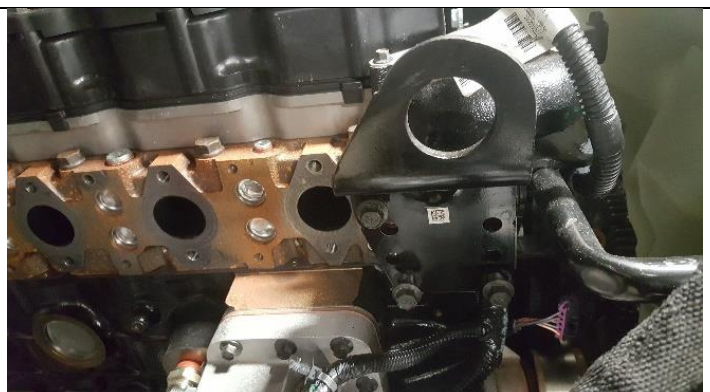


2. Install the NPT plugs into the manifold or install any EGT probes first. Centre the manifold on the ports using the locating holes. Install a new gasket for each cylinder.

Use the supplied socket head cap bolts and washers for the center section only. Torque the bolts to **35 lbs-ft.**



3. **6.7L only.** Release the tension on the accessories belt and remove the upper alternator mounting bolt. Remove the 6 bolts holding the engine hoist bracket and replace with the supplied early model bracket (1405453). Re-install the alternator bracket and accessories



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belt.

2003 - 2007 trucks will already have this bracket installed.



4. Install the transmission dipstick relocation support bracket (1453725) to the valve cover using the OEM hardware; attach dipstick tube to the bracket using the supplied bolt (1130182)

Note: you will need to reshape the dip stick tube to align with the bracket. Take care not to damage or kink the tube.



5. Loosely bolt the primary turbo bracket (1405445) in place using the supplied washers and M10 bolts (1453126/ 1453127).

2003-2009 Trucks with a TCC cooler will use this bracket to hold the 5/8" silicone coolant tube.



6. Trim the engine mount heat shield as shown to fit the relocated transmission oil lines.

This step is required to clear the larger primary turbocharger.

2003-2012 trucks will not need this step.



7. Install the transmission oil line brackets using the supplied M8 bolts. This allows room for the large frame turbo to fit. Make sure the lines do not rub on the frame after tightening bolts. (1405459/1405460).



8. Bend the engine mount heat shield downward toward the transmission lines to be ¼" away from the oil lines and frame bracket.



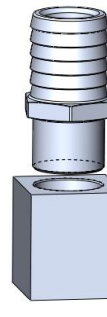
9. The coolant adapter block should be connected to the coolant port on the front of the engine block.

Use the 1453155 O-ring, 1453723-1, 1453723-2, 1453723-3 parts to accomplish this. Use the OEM fastener to secure the 1453723-2 "C" clamp to the coolant port.

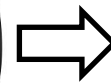
2003-2007 trucks will need to thread the ¾" NPT 90deg fitting (FT-69884) using thread sealant.
2008-2010 trucks will use the factory 1-1/8" barb.



Connect to BD
Silicone Coolant
Hose



- Lubricate O-ring
- Apply thread sealant on NPT Thread



Insert into Block
(Coolant Port)



10. Install the hard coolant line (1405434) using the supplied M8 bolts (1120124) to the engine block. Insert the 5/8" silicone coolant hoses (1405441 and 1405458) and clamps to the front (1453113) and rear (1302198) of the tube prior to install.

Use the provided P-clamp (1120125) and ¼" washer to secure the rear coolant hose to the firewall.



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2003-2009 trucks equipped with a torque converter cooler (TCC) will use a formed 5/8" silicone tube (1405446). The silicone hose will wrap around the engine using two P-clamps (1120125). One P-clamp will attach to the primary turbo bracket. The second will be threaded into the block. 6.7L trucks with a TCC installed will need to remove the bellhousing to engine bracket. If no TCC cooler is installed, use the supplied 5/8" straight hose (1604056) going directly from the heater core to the water pump hard line. See coolant lines layout, page 42.

11. Double nut and thread the four M10 studs (1462429) into the hot-pipe. Mount the primary turbine housing to the hot-pipe using a T6 gasket (2405021) and **only two** M10 nuts on the forward most studs (1462441) as shown.

The remaining nuts will be installed after being mounted in the truck.



We recommend wrapping the hot pipe with the included 2" wide heat wrap (1453514). The secondary turbine housing will also need to be covered using the included heat blanket (1453522) to protect any wiring running along the top of the firewall.

12. Mount the primary turbine housing and hot-pipe on the bracket using the two empty M10 studs. Thread the two M10 nuts hand tight to hold the turbo in place.

The turbo bracket is designed to be flexible to allow thermal cycling.



13. Install and double nut the four M10x30mm studs (1462430) into the manifold.



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14. Install and tighten the secondary turbine housing using a T4 gasket and four M10 nuts (1462441). Clamp the hot-pipe to the secondary turbine housing using supplied clamps.

S300 (RG-010650)

S400 (RG-VT10481)



15. Tighten all four primary turbine housing nuts (14mm socket/ wrench).



16. Tighten the primary turbo bracket bolts (17mm socket).



17. Install the primary oil feed fitting (1453162) using a slight amount of thread sealant on the NPT threads only.

Oil drain bolts:

S476/ S486 use M8 (1120124)

S480/ S488 use M10 (1302108)



18. Carefully install the primary turbo CHRA and compressor cover into the turbine housing. Orient the V-band clamp as shown. The CHRA must be mounted vertically with the oil feed facing straight upright.

PHYSICAL DAMAGE TO THE TURBINE WHEEL WILL VOID ANY WARRANTY AND CAUSE PREMATURE FAILURE.

Make sure the turbo wheel spins freely and is not binding before tightening the turbine V-band.



19. Pre-bend the primary oil drain as shown (1453105). Remove the two O-rings (FT-99604856) on the corrugated drain to test fit and form into place. Grease the O-rings for final fitment to prevent them from tearing. Use the supplied oil drain gasket (148062) on the turbo.



20. Remove the OEM oil feed fitting near the oil filter. Install the supplied O-ring to JIC fitting (1453135). Pre-lube the primary turbo and install the oil feed line. Make sure the line does not rub on any adjacent parts.

Failure to pre-lube your turbo will damage the bearings on startup.



21. Install the secondary oil feed fitting (1453162) using a slight amount of thread sealant on the NPT only.

Oil drain bolts:

S300 use 3/8-16 (FT-1127064)

S467 use M10 (1302108)



22. Carefully install the secondary turbo CHRA. Physical damage to the turbo will void any warranty and cause premature failure. Make sure the turbo wheel spins freely and is not binding before tightening the turbine bolts. Clock the CHRA so the oil feed is upright. Tighten turbine bolts to **186 INCH-lbs**



23. Clock the compressor cover as shown. Use new thread sealant on the compressor cover to prevent boost leaks. Torque the bolts to **120 INCH-lbs.** Make sure the turbo wheel can freely spin and is not binding before tightening bolts.



24. Pre-bend the secondary oil drain as shown (1453106). The oil drain will need to clear the 5" intake tube.

Remove the two O-rings on the corrugated drain to form in place. Grease the O-rings for final fitment to prevent tearing. Use the supplied oil drain gasket on the turbo.

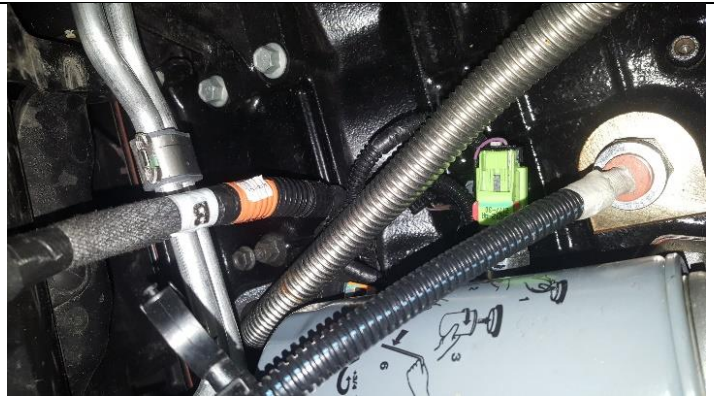
Make sure both oil drains are fully seated in the engine block.



25. Remove the OEM NPT plug above the oil filter and install the supplied NPT to JIC 45deg fitting (1453117). Pre-lube the secondary turbo and install the secondary oil feed line (1453130-B). Failure to pre-lube your turbo will damage the bearings on startup



26. Re-connect the engine block grounding wire and block heater wiring.



27. Rotate the coolant spring clamp to clear the 5" intake.

The clamp is lightly glued in place, break the glue.



28. The AC and transmission cooler lines will need to be strategically massaged.

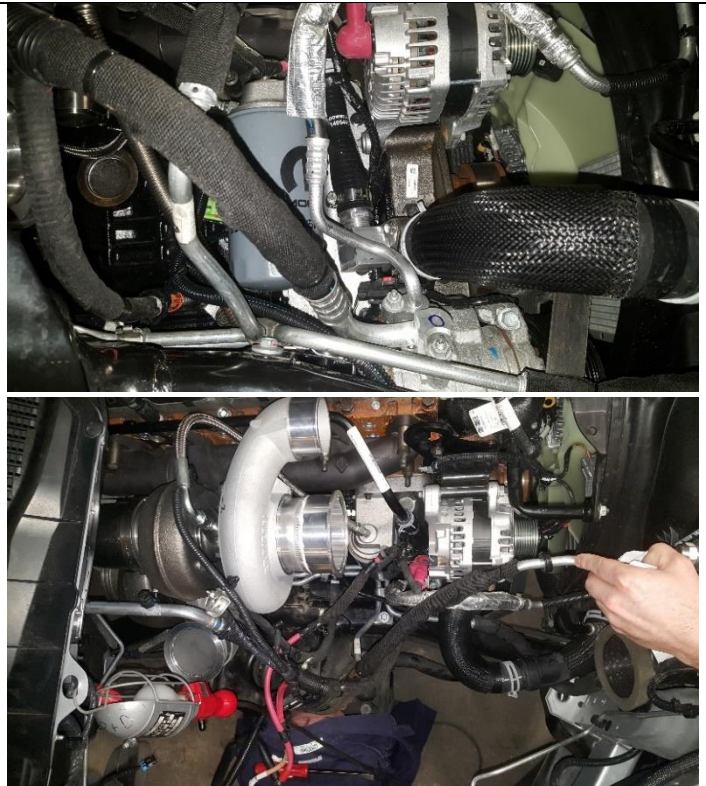
The AC line will need to be bent towards the motor/ alternator. Use blocking/ strategic pry bars to keep the lines from over bending.

The transmission oil line will need to be bent at both ends to clear the 5" intake. The lower line is bent towards the fender. Remove the upper line connected to the radiator via a spring clip and straighten both bends. The upper section will need to clear the CAC tube.

2003-2007 trucks may have a steel AC receiver/ dryer. We recommend replacing it with an



aluminum one to help persuade the lines into place. The AC receiver dryer is not supplied.



29. Install the NPT barb (1456735) and OEM MAP and barometric sensor into the 5" intake tube. Gaskets 1453726-1/-2 are included if the OEM O-rings are worn.

Make sure there is no loose debris/ shavings inside the tube.

2003-2007 trucks will need to plug the 1/2" NPT with 3008468 and MAF blocker plate 1456740.



30. Install the 5.5"-5" hump boot inlet (P103516-1). Loosely tighten the gear clamps in place (HS-96). Tighten the clamps after the air box has been installed.



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31. Install the positive crankcase vent (PCV) tube (1453724) with two spring clamps (1302198). Use one P-clamp (1400113) bolted to the valve cover to prevent the tube from vibrating.

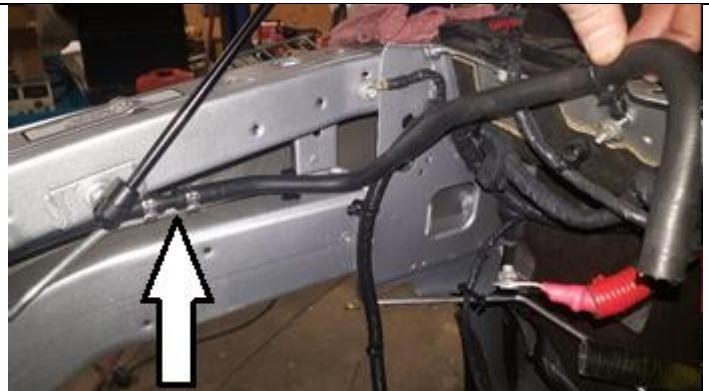
2003 - 2007 trucks will not have this step.



32. Install the supplied heat shield (1040142) on the AC line. Wrap around and use two zip ties (1453504)



33. Install the 1/2" to 3/8" (1604053) hose mender to the coolant line running to the radiator. Use two gear clamps (1505001).



34. Loosen the frame grounding bolt and rotate the wire downward to be below the coolant cap. One Christmas tree plug must be pulled out and put on a lower stud. This lets the electrical line run below the coolant cap.



35. Connect the 3/8" lines to the bottle as shown. Cut 3" of 3/8" hose to cap the second coolant port as shown. Use the provided 3/8" plug (1462122) and clamps (1505001).



36. Gently bend the AC lines near the coolant bottle and connect the 1" coolant line (1405458) and gear clamp (1453113) to the coolant bottle.

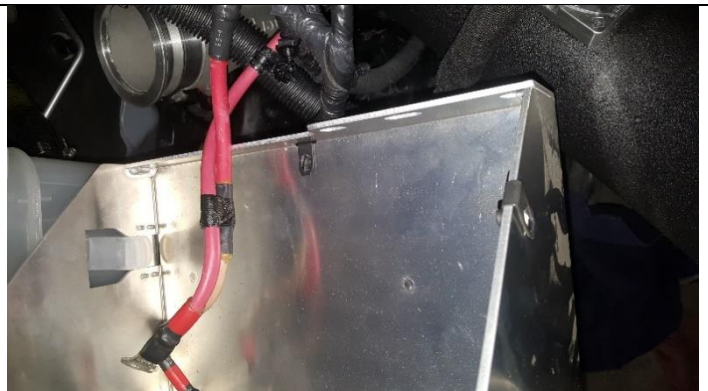


37. Install the replacement battery box (1405438). Bolt the bottom two bolts first.

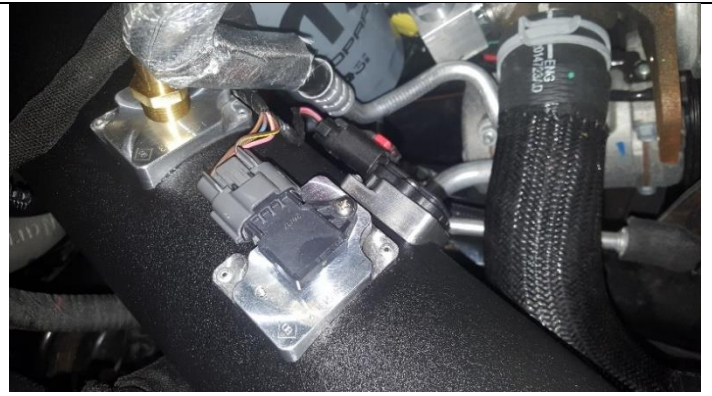
Loosely thread in all bolts before tightening the battery box bolts. Tighten all battery box bolts after installing the air box.



38. Install the 4 (or 5 for some model years with two electrical solenoids) M6 U-nuts (11864) into the battery tray. These will hold the intake air heater solenoids, air box, and battery tie down.



39. Insert the 5" intake tube (1405431-ASSY) and connect the barometric and MAF sensor. Make sure the AC and oil lines do not rub on the 5" intake. Tighten both intake boot clamps.



40. Insert both pre-cut rubber strips (1453820) 20" & 27" onto the air box (1405442-1). Install the air box using the supplied air box bracket (1405457). Use two M6 bolts (1900037) with lock nuts (1130058) and the OEM T27 torx on the radiator shroud to secure into place.

Tighten all battery box bolts.

2003-2012 trucks use 1405442-2 as the air box bracket.



Place a clean rag in the 5" intake to protect debris from falling in. Make sure there is no debris in the intake tube. Even a small object will cause severe turbo damage and will void warranty.

41. Zap Strap the ½" radiator hose to fit alongside the 5" intake air filter.



42. Remove the OEM intake grid heater solenoid from the battery box. Install the solenoid rotated 90deg onto the supplied battery box. Use two M6 bolts (1900037) and the installed U-nuts.

2003-2012 trucks will not need to rotate the solenoid 90 degrees.

Make sure the AC line does not rub on the solenoid.



43. Insert the battery and install the OEM tie down bracket and bolt.



44. Use a light coating of O-ring grease to hold the O-ring (FT-0413922) in the primary outlet tube (1405432). Install and clamp (99800-0450) to the primary compressor cover. Do not tighten yet.

The compressor cover may need to be loosened to move the outlet tube into position.



45. Connect the grid heater solenoid wiring.

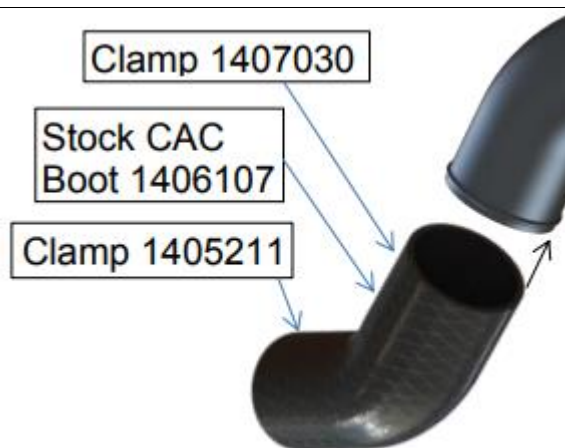


46. Install the secondary turbo inlet (1405435). Preinstall the 3.5"-3.5" boot (1401563) and associated clamps (1405212). Use a light coating of O-ring grease to hold the O-ring (FT-0424690) in the groove and tighten the V-band clamp (1405625).

Align the primary compressor cover and outlet tube. Tighten all bolts and clamps.



47. 2013 – 2018 trucks install the 2.75" to 3" charge air cooler boot (1406107) onto the CAC with the supplied clamps. (1405211 on CAC. 1407030 on 3" tube)



2003-2012 trucks: If you have a stock intercooler with a 3.0" inlet, you must purchase a 3.0" to 3.5" boot and clamp (PN 1453221 & 1405211).

Truck Years	Boot	Tube Clamp	CAC Clamp
2003-2009	1401563	1405212	1405212
2010-2012	1302425	1405212	1407030
2013-2018	1406107	1407030	1405211

48. 2013 – 2018 trucks install the 3" CAC tube to the secondary turbo.

2003 – 2012 trucks use a 3.5" CAC tube to match the large CAC. Make sure the turbo is clocked correctly to clear the hood.



Turbo Outlet Boot

Secondary Turbo	Boot	Tube Clamp	Compressor Clamp
03-12 - S300	1401532	1405212	1405211
03-12 - S400	1453221-1	1405212	1405211
13-18 - S300	1401530	1405211	1405209
13-18 - S400	1405305	1405211	1405211

A Boot Lock Kit is recommended to be installed on both sides of the CAC tube for trucks with boost levels above 75psi (1045201) or if the CAC tube is rubbing.

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49. Hold up the 5" primary intake tube whilst installing the air filter (2925). This helps the filter sit low in the air box, as well as prevent the 5" intake tube from rubbing on the fender liner.



50. Install the cast Cobra downpipe (1405440) using the v-band clamp (99502-0588). Tighten the clamp after installing and aligning the 5" tube downpipe.



51. Install the 5" exhaust tube downpipe (1405447). Leave clearance to the frame rail. The turbo kit will move with the engine. Use the 5" lap clamp (90368B). Tighten the cast downpipe and tube downpipe after lining it up with the rest of the exhaust. The downpipe may need a small tack weld if an exhaust brake is installed.



52. On 2013-2018 trucks, connect the coolant level sensor (1405464). Zap strap to the wiring harness.



53. Install the OEM fender liner. The two holes that line up with the battery box may need to be elongated to improve fitment. Use the supplied fender washers (1402608) and M6 locking nuts (1130058).

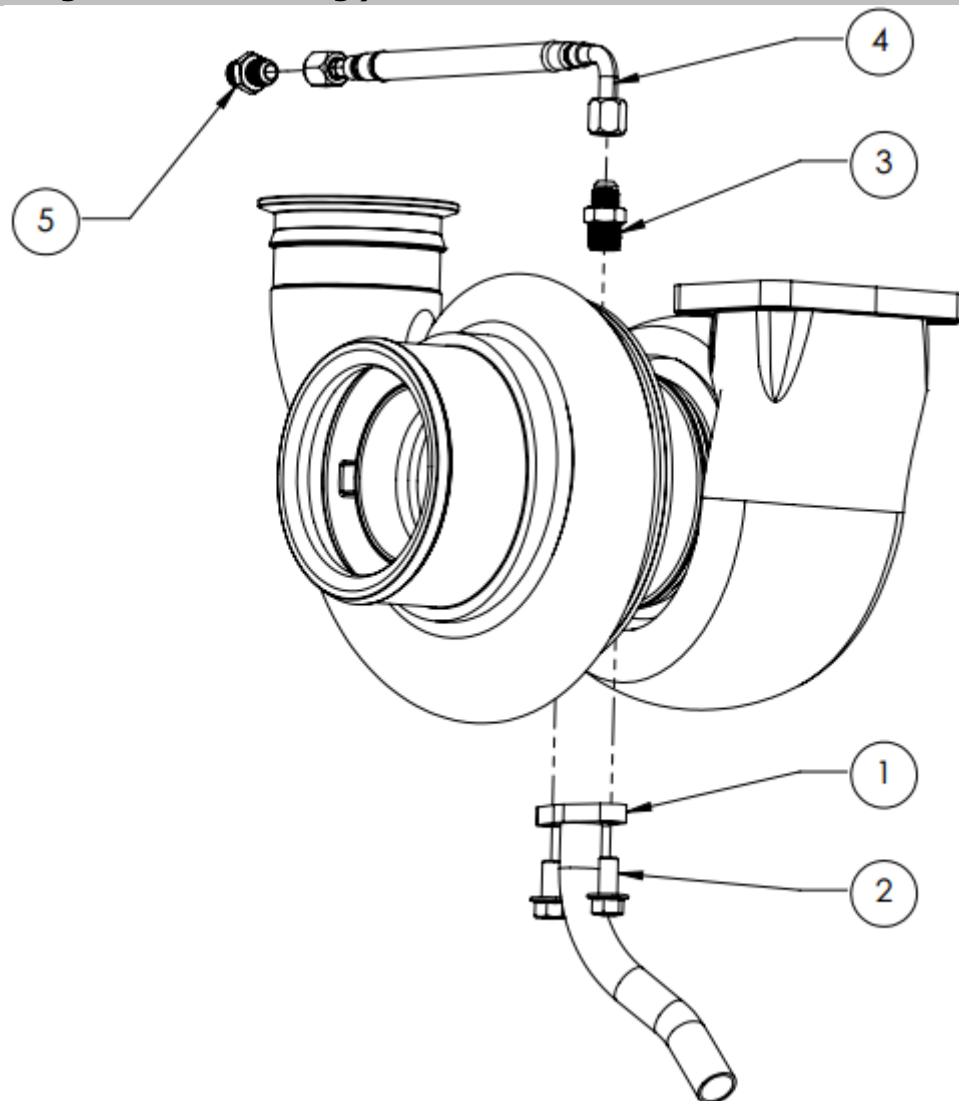


54. Refill the coolant and connect both batteries.



Installation Layouts

Turbocharger Oil Feed/ Drain Layout (Primary/ Secondary)



Item No.	Part No.	Description	Qty
1	1453105	Oil Drain; Cummins (Primary)	1
	1453106	Oil Drain; Cummins (Secondary)	1
	148062	Gasket; Oil drain	2
2	1120124	Bolt; M8 (S476, S486)	2
	1302108	Bolt; M10 (S467, S480, S488)	4
	Ft-11127064	Bolt, 3/6-16 (S300 SXE)	2
3	1453162	Turbo Oil Inlet 1/4NPT X -6JIC	2
4	1453130-B	-6JIC 90 X -6JIC HOSE	2
5	1453135	Fitting; ORB x -6 JIC (Primary)	1
	1453117	Adapter; Oil Feed 1/8NPT x -6MJIC (Secondary)	1
	1453137	10mm O-ring	1

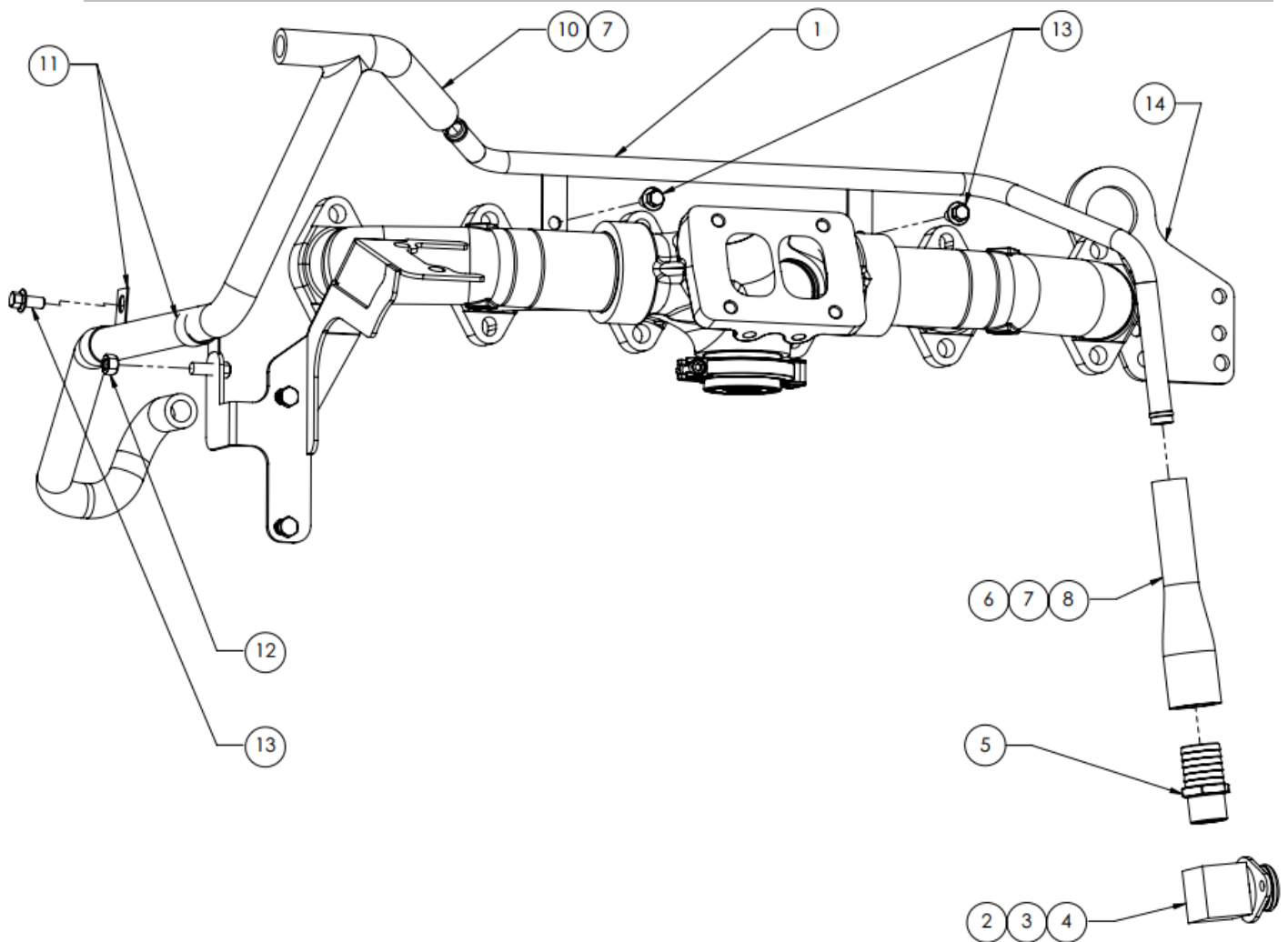
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Coolant Lines Layout



Item No.	Part Number	Description	Qty.
1	1405434	Coolant Tube; Dodge 5/8" Line	1
2	FT-69884	Fitting; 3/4 NPT x 3/4 NPT 90d (2003-07)	1
3	1453723-2	Fitting; Coolant Hose Clamp (2010-18)	1
4	1453723-1	Fitting; Coolant Hose Block (2010-18)	1
5	1453723-3	Fitting; Barb 1.125"-3/4" (2010-2018)	1
6	1405441	Coolant Line; 1-1/8x 5/8x 6.25L	1
7	1302198	Clamp; Spring CTB-26mm	4
	1453113	Clamps; 1-1/4 Gear (HS12) (2013-2018)	1
8	1453113	Clamps; 1-1/4 Gear (HS12)	1
9	1604056	Hose; Heater 5/8" ID (in) non TCC	8"
10	1405446	Coolant Line; Dodge 5/8" TCC	1
	1405458	Coolant Line; Dodge 5/8" (2013-2018)	1
11	1120125	Clamp; Insulated 1"(900729-23)	2
12	1401553	Nut, M8 Flange	1
13	1120124	Bolt, M8-1.25 Flange	3
14	1405453	Bracket; Engine Hoist Mount (2008-18)	1

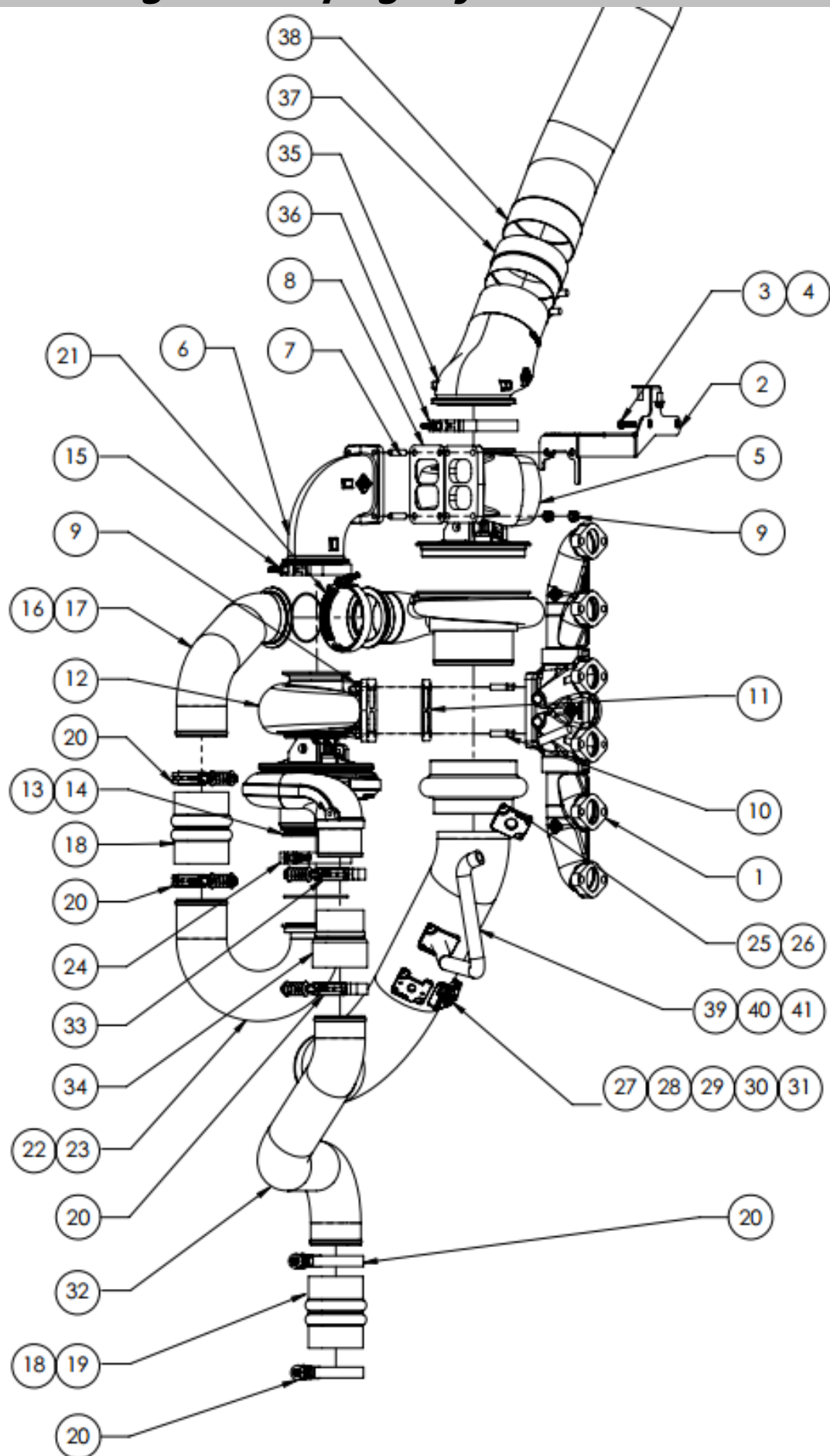
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Turbocharger and Piping Layout



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Item No.	Part No.	Description	Qty
1	1045996-T4	Manifold; T4 Waste gate	1
2	1405445	Bracket; T6 Primary Support	1
3	1453126	M10 x 1.5 - Mounting Bracket Bolts	2
4	1453127	M10 x 1.5 - Mounting Bracket Washer	2
5		Primary Turbo	1
6	1405439 ¹	Adapter; T6 – S400 HM Hot Pipe	1
	1405454 ²	Adapter; T6 – S300 SX-E HM Hot Pipe	1
7	1462429	STUD; M10 x 1.5 x 035	4
8	2405021	T6 Dual Volute Gasket	1
9	1462441	NUT; M10x1.5 Small Flange	8
10	1462431	STUD; M10 x 1.5 x 025	4
11	2475052	T4 Dual Volute Gasket	1
12		Secondary Turbo	1
13	1405430	Adapter; V-Band S400 4" (pre-welded on turbo)	1
14	1405236	Adapter; V-Band S300 3.75" (pre-welded on BD turbo)	1
15	RG-VT10481	Clamp; V-Band 4.81" (.207") (S400 Secondary)	1
	RG-010650	Clamp; V-Band 4.21" (.14") (S300 Secondary)	1
16	1405432	Pipe; Primary Outlet Tube	1
17	FT-0413922	O-ring; #152 (.139) 3.25" Viton	1
18	3.0" CAC Tube	Refer to install step 47	1
19	3.5" CAC Tube	Refer to install step 47	1
20	1405212	Clamp; 3.56-3.91	5
21	99800-0450	Clamp; V-Band 4.50"	1
22	1405435	Pipe; Secondary Inlet	1
23	FT-0424690	O-ring; #244 Viton(.139) 4.25id	1
24	1405625	Clamp; V-Band 4.72"	1
25	P103516	Reducer Sleeve; 5 1/2" x 5"	1
26	HS-96	Clamp; 5" - 7" Worm Gear	2
27	1405431	Pipe; Primary Intake	1
28	1453726-1	Gasket; Dodge MAF	1
29	1453726-2	Gasket; Dodge IAT	1
30	1456740	Plate; MAF Block Off BD Intake (2003-2007)	1
31	FT-0173590	Screw; #8-32 x 9/16 Pan Head SS	4
	3008468	Hex Plug; 1/2" (2003-2007)	1
	1456735	5/8" Hose x 1/2" Npt (2008-2018)	1
32	1405437	Pipe; CAC 3.5" (2003-2009)	1
	1405433	Pipe; CAC 3.5" (2010-2012)	1
	1405456	Pipe; CAC 3.0" (2013-2018)	1
33	Clamp	Refer to install step 48	1
34	3.0" CAC Tube	Refer to install step 48	1
	3.5" CAC Tube	Refer to install step 48	1
35	1405440	Cobra Casting; 5" Downpipe	1
36	99502-0588	Clamp; V-Band 5.88"	1
37	90368B	Clamp; SS Exhaust Lap 5"	1
38	1405447	Exhaust; Dodge S400 Twin Downpipe	1
39	3008468	Plug; Hex Head 1/2" NPT (2003-2007)	1
40	1453735	Fitting, 5/8" Barb x 1/2" NPT (2008-2018)	1
41	1453724	Tube; Crank Breather (2008-2018)	1

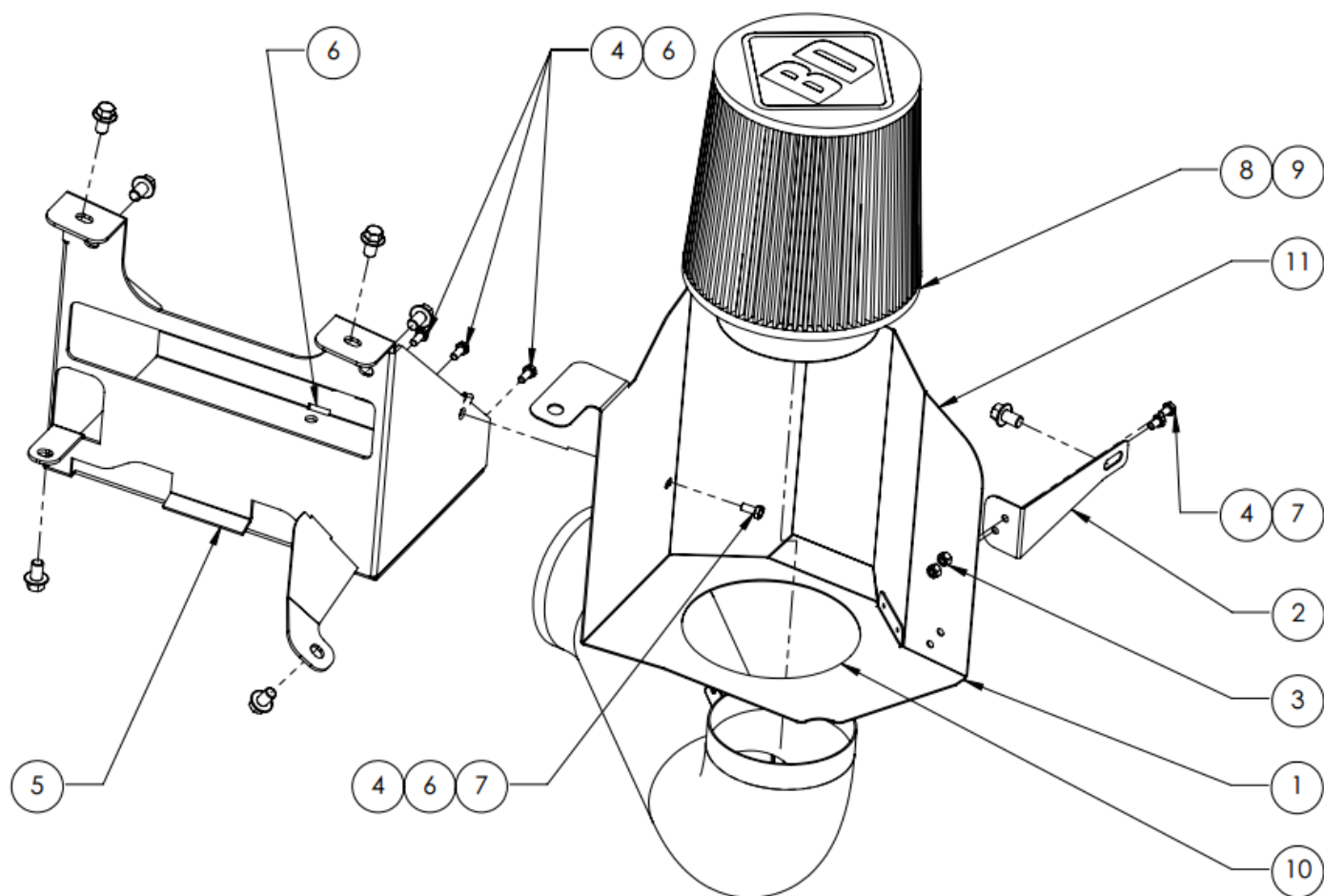
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Air Box & Battery Tray Layout



Item No.	Part Number	Description	Qty.
1	1405442-1	Air Box	1
2	1405442-2	2003 – 2012 Air Box Bracket	1
	1405457	2013 – 2018 Air Box Bracket	1
3	1130058	Nut; Nylock M6x1.0	2
4	1900037	Bolt; M6-1.0x12	6
5	1405438	Battery Box	1
6	11864	U Nut; M6-1.00 Extruded	5
7	1100111	Washer, Flat - 1/4"	3
8	2925	Air Filter	1
9	HS-96	Gear clamp	1
10	1453820	Air Intake Seal	20"
11	1453820	Air Intake Seal	27"

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Troubleshooting

You may have general information here that may aid in troubleshooting.

Charge Air Cooler tube is touching the hood liner or intake tube.

- Make sure the secondary turbo outlet is oriented correctly. See Step 23.
- The CAC tube has slipped in the boots at either end due to too much boost. Either turn down the power or install a boot lock kit (1045201).

Air Filter is touching the hood

- Make sure the 5" inlet pipe is pushed upwards when installing the air filter. The air filter needs to sit at the bottom of the air box and will keep the 5" intake from touching the fender liner.

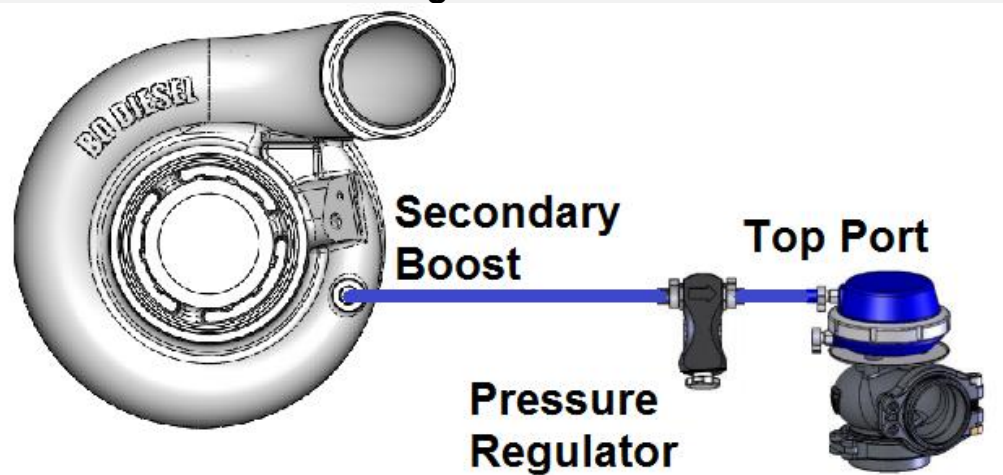
Oil Leaking from turbo oil drains

- The O-rings can tear when inserted into the block if not lubricated or inserted all the way. Replacement O-rings are a 2.5 x 18 metric O-ring. (BD PN FT-99604856)

Wastegate opening too soon/ never opening

The Cobra kit comes with a wastegate (WG) ready manifold, which is designed to fit a Turbosmart Hypergate 45mm. A WG should only be plumbed from the manifold directly to atmosphere or exhaust.

Mechanical Pressure Regulator:



Secondary boost pressure should be plumbed into a mechanical pressure regulator and then into the top port of the WG. Increase the regulated pressure to increase boost. If the pressure regulator is set to zero, the WG will open around 35-45psi of drive pressure.

BD Engine Brake Inc.

Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

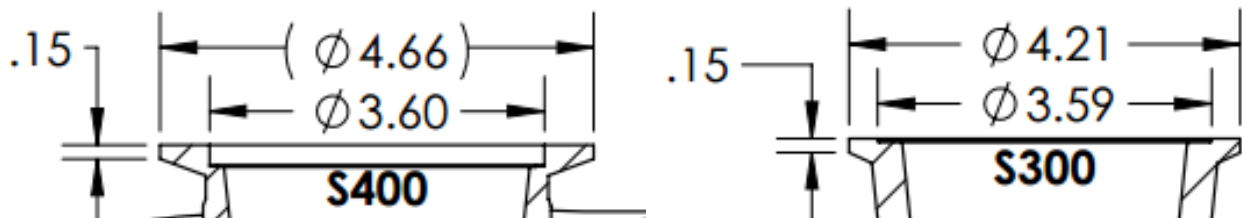
U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

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

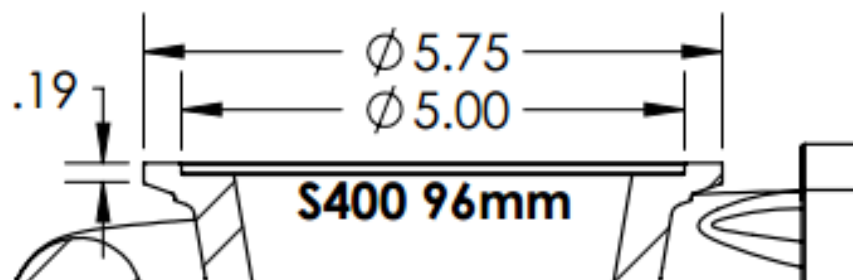
Install Kits

Complete BD Cobra kits are designed to bolt on without any additional machining, however if an Install kit was ONLY purchased, the following machining and parts will be required to have your turbo bolt in.

Secondary Turbine Housing Outlet

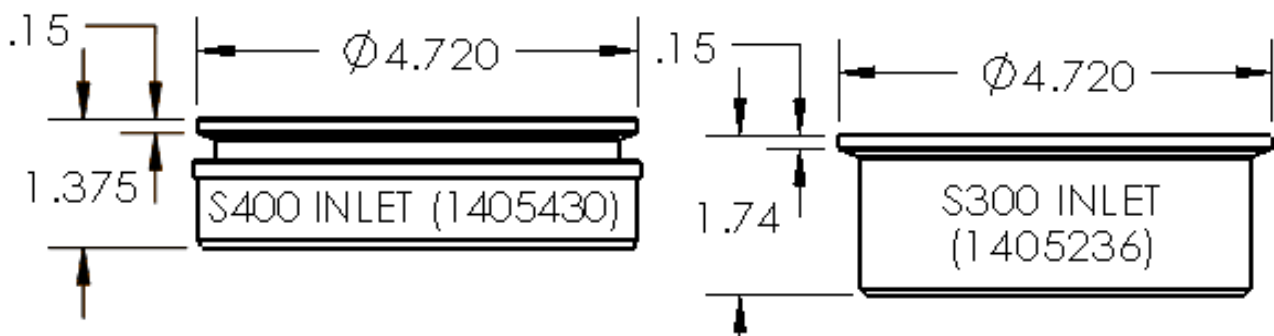


Primary Turbine Housing Outlet



Secondary Compressor Inlet

The secondary (manifold) turbo compressor cover will need an adapter welded to the turbocharger inlet.



These will need to be purchased separately depending on the turbo being used.

A 90 degree compressor cover will need to be used to fit the CAC tube or a 90 degree elbow must be used (1452226, 1452225, & 1453251).