Performance Turbocharger Catalog

2014 Version

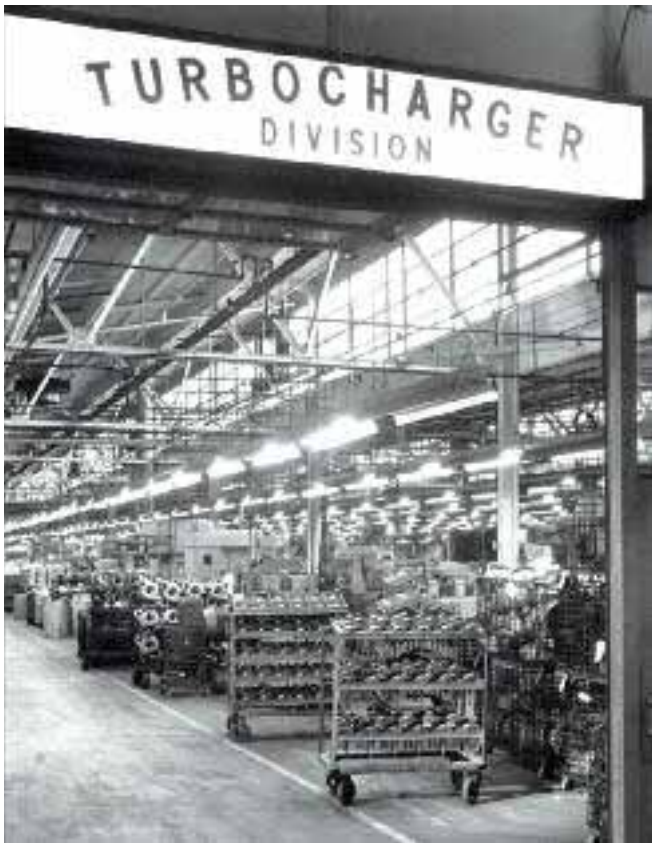
BorgWarner

About BorgWarner Turbo Systems

For over 100 years, BorgWarner has exhibited their commitment to the automotive industry and motorsports through the momentum of their technological advances. In the late 1990's, BorgWarner took the step of becoming a pacesetter in leading turbo technologies. In October of 1998, BorgWarner, Inc. purchased 100% of the net assets of German turbocharger and turbo machinery manufacturer, AG Kühnle, Kopp & Kausch renaming it 3K-Warner Turbosystems. In March of the following year BorgWarner acquired Kuhlman Corporation in order to gain access to Schwitzer, Inc., which was a leading manufacturer of turbochargers for commercial transportation and industrial equipment. Since the integration of 3K-Warner Turbosystems and Schwitzer, BorgWarner Turbo Systems continues to set new technological standards in the field of engine boosting.

BorgWarner Turbo Systems provides customers worldwide with a comprehensive range of 3K and Schwitzer replacement turbochargers and spare parts.

LOUIS SCHWITZER
-Automotive Hall of Fame



Fast forward to the new millennium and BorgWarner Turbo Systems has become a well positioned player in the engine boosting arena, with development centers, production sites and sales offices throughout the world. In keeping with our maxim "Local Power—Global Strengths" we use all of the resources and talents available within our worldwide organization to surpass the needs of our customers. To ensure that our sites work efficiently across the world, we have standardized vital processes and best practice methods, without compromising location-specific flexibility and autonomy. Our goal is to continually offer you solutions that are perfectly tailored to meet the specific requirements of you and your market.

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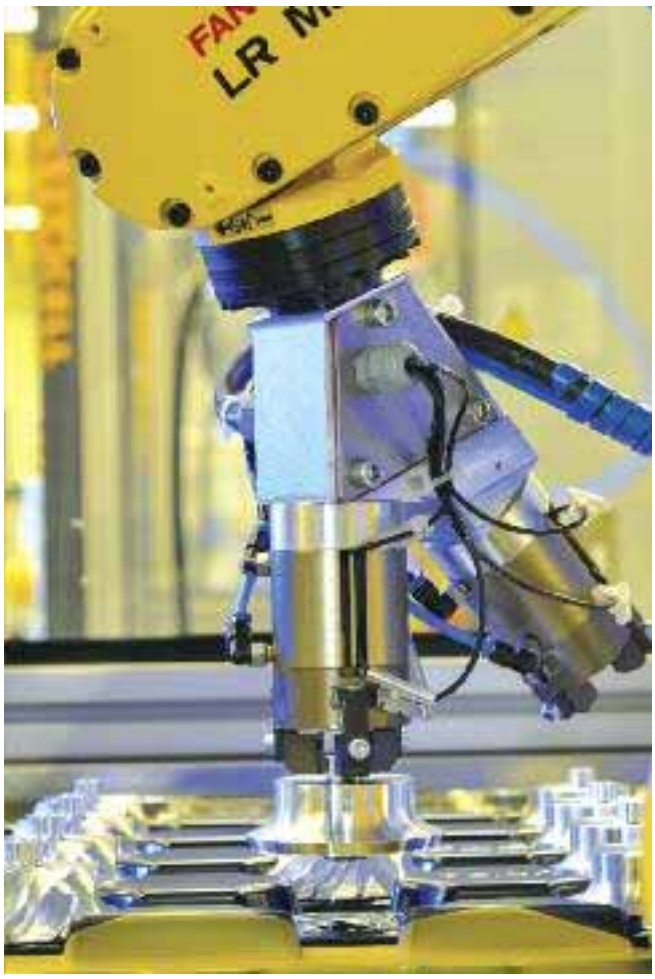
World Headquarters: Kirchheimbolanden, Germany

BorgWarner Technology & Innovation

Innovation, speed, flexibility, quality and a customer focus are the yardsticks by which our customers measure us. We therefore not only explore new avenues in technological development – we also seek ways to further improve cooperation with our customers in product development, manufacturing and quality assurance. Yet the fast exchange of the latest product data with the customer is also becoming increasingly important in setting up optimum processes. From the very start of development, we involve people from design, production, purchasing and quality assurance to save time and money and ensure that the turbocharging systems we supply meet proven serial production quality in terms of reliability and performance right from start of production.

The latest generations of compressor and turbine stages assure optimum thermodynamic results. With the further development of materials and processing methods – such as forged milled compressor wheels – we not only optimize performance, but also enhance durability and reliability of our turbocharging systems.



Commitment to performance

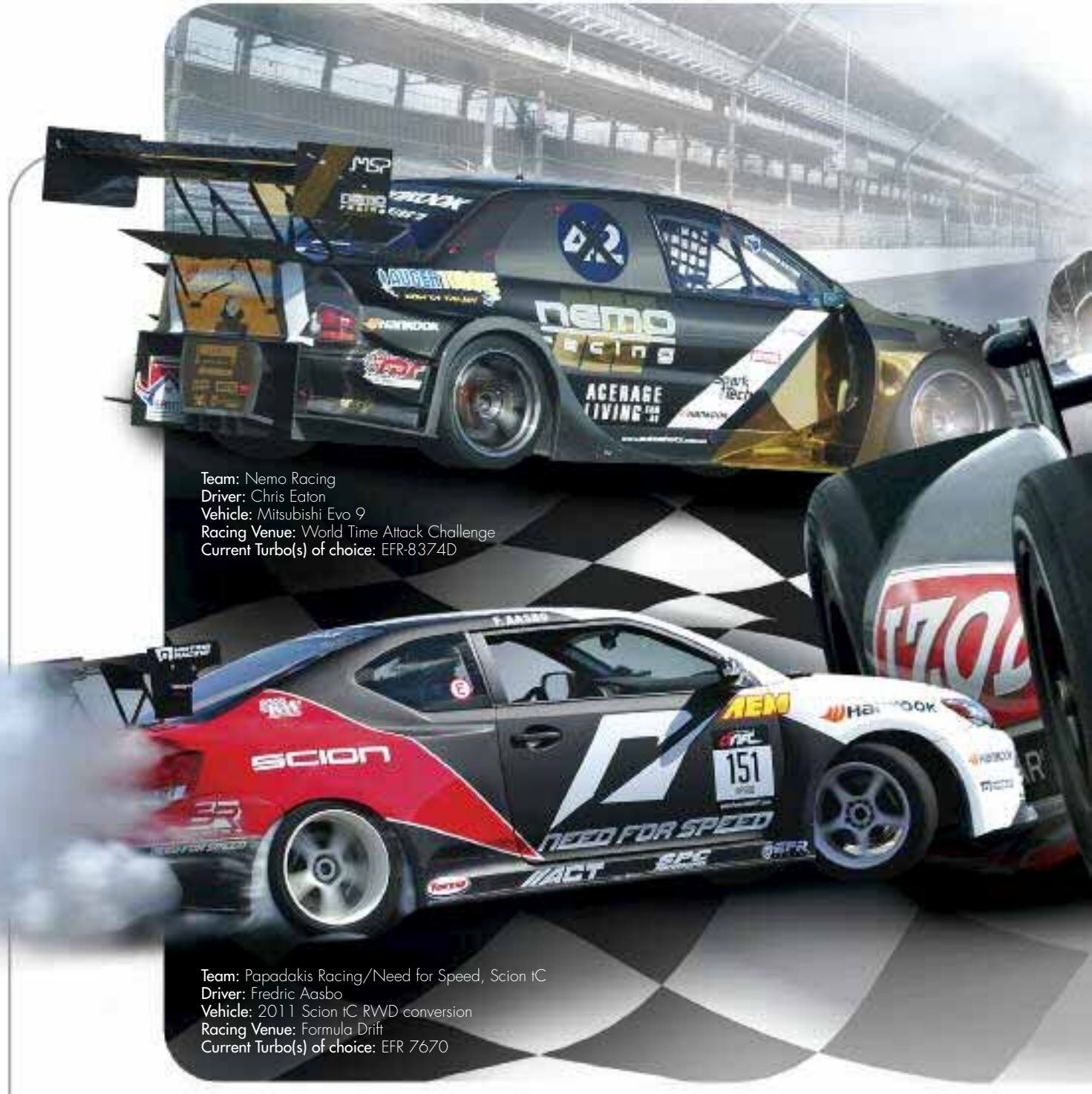
AirWerks is an independent aftermarket program from BorgWarner Turbo Systems. This venture is focused on creating exceptionally high engine performance through forced induction technology. Why do the world's most prominent auto manufacturers select products from BorgWarner Turbo Systems? Simply put, we are the world leader in turbos for high speed, high temperature gasoline engines. The BorgWarner Turbo Systems performance line features an assortment of carefully chosen K and S series turbochargers and the EFR series to meet a wide array of high-performance engine requirements. These turbos will be steadily improved based on the latest findings in aerodynamic and materials technology.

Audi 90 (quattro) GTO was one of the most technologically advanced four-door race cars to ever hit the tracks. The 1988 Trans Am Manufacturer's champion was banned from the 1989 season due to its dominance. Boost was provided by a single BorgWarner K-series turbocharger.

Innovation, a fruit of competition

Racing has long been known as a fertile research and development arena and proving ground for new technology. BorgWarner takes full advantage of its rich racing heritage using some of the same materials and aerodynamic techniques that produced boost for winning cars, elevating and incorporating it into the hardware available through BorgWarner Turbo Systems. Partnerships fostered at the track can create alignment and uncommon results, in the marketplace.

Mercedes Silver Arrows C11, World Sportscar Champion. 5.0 liter V8 twin 3K turbo engine



Team: Nemo Racing
Driver: Chris Eaton
Vehicle: Mitsubishi Evo 9
Racing Venue: World Time Attack Challenge
Current Turbo(s) of choice: EFR-8374D

Team: Papadakis Racing/Need for Speed, Scion tC
Driver: Fredric Aasbo
Vehicle: 2011 Scion tC RWD conversion
Racing Venue: Formula Drift
Current Turbo(s) of choice: EFR 7670

Exclusive EFR-7163s with mixed flow technology, will provide the boost for the IZOD INDYCAR Series in 2014.

A legacy of boost continues

From 1952, when the first forced induction motor vehicle graced the Indianapolis Motor Speedway, to the Mulsanne of Le Mans and the winding roads of Nürburgring. These are just a few settings where turbochargers from BorgWarner were pushed to their engineering limits, and thrived.

Precision engineering can be learned from decades of championship level motorsports participation and that legacy is embedded into every genuine BorgWarner turbocharger.

2012 marked the return of the turbocharged engine to the IZOD Indy Car Series with BorgWarner Turbo Systems providing its pace setting expertise in engine boosting technology.

BorgWarner Boosted!

Driver: Carey Bales
Vehicle: Honda S2000
Racing Venue: NHRA Super Stock
Current Turbo(s) of choice: S400SX3

Team: Team VCMC
Driver: Richard Basford & Sead Causevic
Vehicle: Scion FR-S
Racing Venue: Knox Mountain Hill Climb, Pikes Peak Hill Climb
Current Turbo(s) of choice: S200SX

Team: Stuckey Racing
Driver: Phillip Palmer
Vehicle: Dodge 5.9
Racing Venue: NHRDA
Current Turbo(s) of choice: Compound S400SX & S500SX

Team: Tilton Interiors Racing
Driver: Kostya Pohorukov & Garth Walden
Vehicle: Mitsubishi Evo 9
Racing Venue: Superlap, WTAC
Current Turbo(s) of choice: S300SX

Driver: Eric Calabrese
Vehicle: Volkswagen Bug
Racing Venue: Pro Racing Association
Current Turbo(s) of choice: Single S400SX

Driver: Tony & Bob Niemczyk
Vehicle: Dragster
Racing Venue: NHRA Comp Eliminator 1-Drag Class
Current Turbo(s) of choice: S400SX

Driver: Chuck Johnson
Vehicle: Nissan S13 240SX
Racing Venue: World Land Speed Record Bonneville
Current Turbo(s) of choice: EFR 8374

Team: ADF Motorsport
Vehicle: BMW 335i
Racing Venue: Bridgestone Production Car Championship
Current Turbo(s) of choice: EFR-7670

BorgWarner Boosted!

Team: Green Brothers Racing
Driver: Ben Belcher
Vehicle: Mazda RX-7
Racing Venue: D1NZ
Current Turbo(s) of choice: S300SX

Team: Level 5 Motorsports
Driver: Scott Tucker
Vehicle: Honda - HPD ARX03b
Racing Venue: Superlap, WTAC
Current Turbo(s) of choice: Twin EFR-6758s

Driver: Mike Reichen
Vehicle: Mitsubishi EVO
Racing Venue: Standing mile/Drag Racing/Dyno
Current Turbo(s) of choice: Single S400SX

Team: EB3 Motorsports
Driver: Ev Bernardo
Vehicle: 1996 Ford Mustang
Current Turbo(s) of choice: Twin S500SX

Team: FXMD
Driver: Billy Johnson
Vehicle: Acura NSX
Racing Venue: Time Attack
Current Turbo(s) of choice: EFR 9180

Team: FCS Racing
Driver: Jason Park
Vehicle: Acura
Racing Venue: Sport Compact FWD
Current Turbo(s) of choice: S400SX 72mm

Team: Mike Ryan Motorsports
Driver: Mike Ryan
Vehicle: Freightliner
Racing Venue: Pikes Peak International Hill Climb
Current Turbo(s) of choice: S510SX

Driver: Wade Moody
Vehicle: Chevy Duramax
Racing Venue: NADM, NHRDA
Current Turbo(s) of choice: Twin S300SX3

BorgWarner Match-Bot Instructional

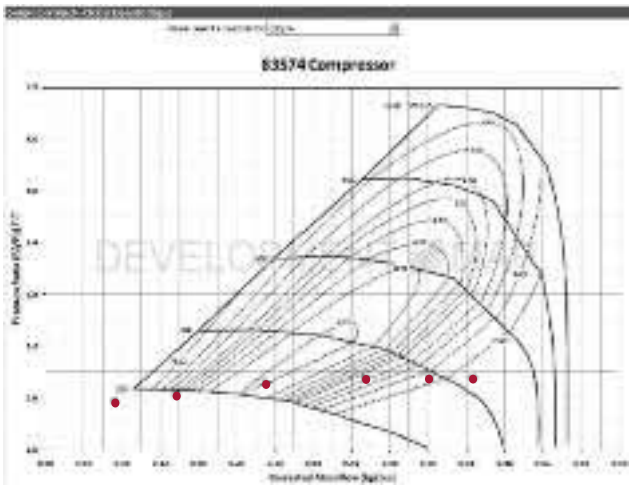
The team at BorgWarner has developed an interactive turbo matching program that is internet based. Called Match-Bot, the first step is to enter the engine input data. For each piece of input data, helpful pop-up's are provided. These helpful tips guide the user through entering appropriate engine targets by means of giving example ranges of numbers. Parameters such as BSFC, VE, and exhaust gas temperature is often difficult for the user to estimate, but helpful suggestions are offered each step of the way.

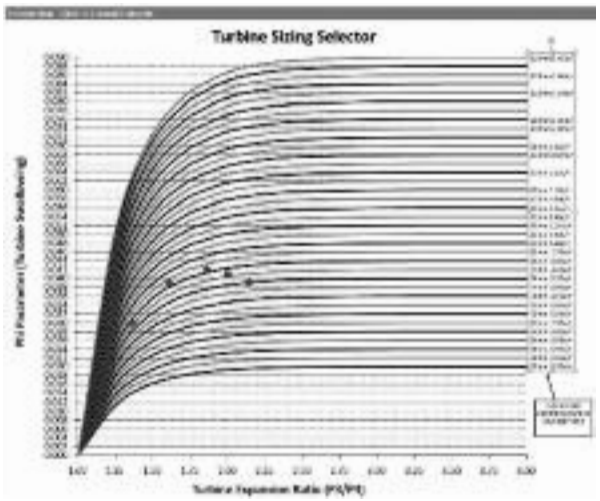
Calculated Outputs

		#1	#2	#3	#4	#5	#6
Compressor Pressure Ratio	\	1.36	1.71	2.07	2.22	2.23	2.23
Compressor Outlet Temp	deg F	149.05	200.46	240.46	252.92	263.94	282.25
Intake Manifold Air Temp	def G	75.74	81.27	83.25	89.23	93.89	95.72
Intake Manifold Air Density	lb/in3	0.000057	0.000071	0.000085	0.000009	0.000089	0.000088
Density Ratio (Intercooled)	\	1.34	1.67	2.01	2.12	2.1	2.09
Actual Flow Rate (Not Corrected)	lb/min	5.89	12.29	20.69	27.32	34.13	39.69
Actual Flow Rate (Not Corrected)	cfm	85.4	178.13	300.03	396.14	494.94	575.52
Correct Air Flow Rate	lb/min	5.94	12.4	20.91	27.67	34.64	40.33
Correct Air Flow Rate	kg/sec	0.045	0.094	0.158	0.209	0.262	0.305
Correct Air Flow Rate	kg/hr	161	337	568	752	941	1096
Correct Air Flow Rate	m3/sec	0.041	0.085	0.143	0.189	0.237	0.276
1/BSAC	hp-min/lb	12	11.5	10.8	10.3	9.9	9.3
Turbo Shaft Power	Hp	2.49	8.79	19.49	27.74	36.8	46.94
Engine Power	Hp	71.5	142.4	224.9	285.1	342.5	376.5
Torque	lb-ft	187.67	249.36	295.31	299.45	299.78	282.5
Fuel Requirement	lb/hr	30.7	64.1	108	142.5	178.1	207.1
	TURBINE MATCH OUTPUTS						
Exhaust Manifold Pressure	psi	3.2	6.6	10.9	14.4	17.7	21.4
Engine Delta Pressure (dP)	psi	2	3	4	3	-1	-4
Turbine Swallowing Parameter	PHI	0.0219	0.0213	0.0258	0.0267	0.0283	0.0287
Turbine Corrected Flow @ 59F	lb/min	9.2	15.2	18.4	19	20.2	20.5
Is the Wastegate Flow Choked	\	No	No	No	No	Yes	Yes
Wastegate Flow Area @ CF=0.8	in2	0.03	0.13	0.44	0.73	0.96	1.11
Port Diameter Requirement	mm	5	11	19	24	28	30

Text-Based Output is Provided as Well as Graphical Mapping

The Match-Bot interactive tool can be found at www.borgwarnerboosted.com





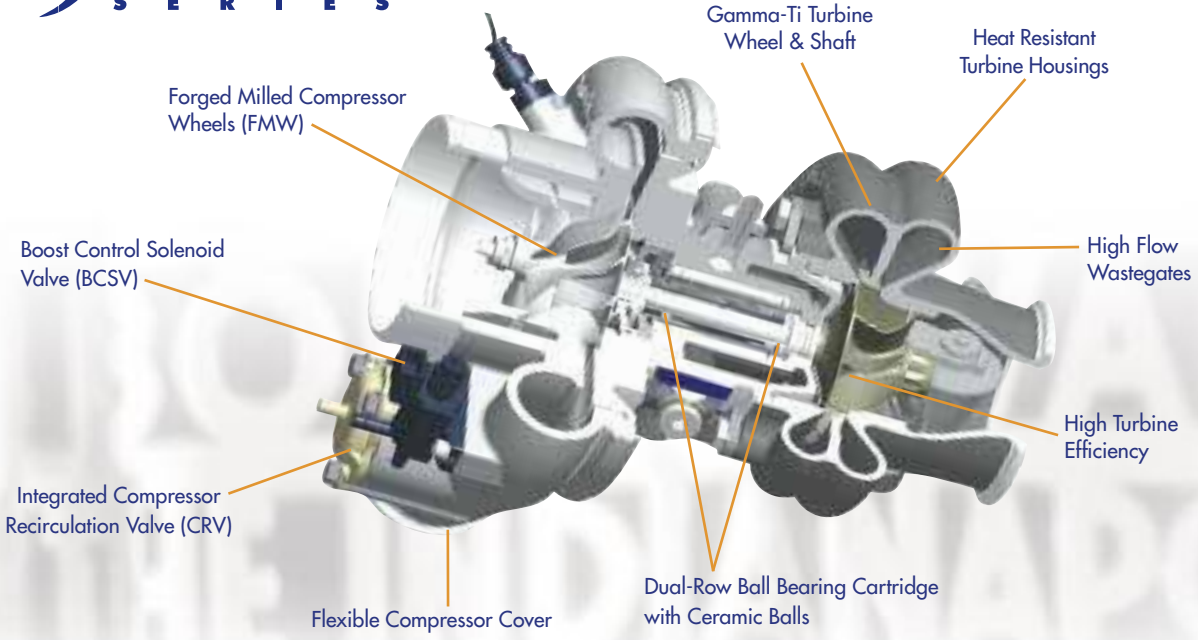
An Equation for Engine Boosting Excellence

The EFR line of turbos was born out of an internal BorgWarner Turbo Systems program labeled Advanced Aftermarket Products or AAP. So, the first thing you might be wondering is what does a new product line of high-performance turbochargers have to do with commercial applications? Commercial/industrial turbo products have extreme requirements for durability, reliability, and aerodynamic performance. Since modern passenger car applications use turbos smaller than 55mm in turbine wheel diameter, it's the aerodynamic development from the commercial side of the business (i.e. everything larger) that feeds into what the performance enthusiast wants and needs for big power production. Boost pressures of 45-50 psi (3 bar+) are the norm, not the exception. Also required is resistance to abusive thrust loads, high vibrations, and robustness for a wide range of lubrication conditions. Additionally, our commercial product validation standards are among the highest in the engine boosting industry – all good things that also benefit the performance enthusiast or racer.

Those are the commonalities, now here are the differences. Unlike commercial applications, high performance users want lightweight, compact, versatile designs. They also deliver the turbocharger very high exhaust gas temperatures and have high expectations for fast response. They also place value in cosmetic appearance and want integrated features that aid the installation process and remove the need for other turbo related accessories. Those performance and packaging requirements are quite common among the modern aftermarket passenger car turbo customer.

So, what happens when you tie together all those necessities and put them in front of passionate car people looking to advance the pace of aftermarket boosting solutions? There is a discovery that something new is needed in order to meet the needs of the next generation turbo consumer. There is the need for an "it" that really changes the game or raises the bar or whatever other metaphor you care to use.

EFR Product Feature Set



EFR 6258

225 - 450 HP Turbo

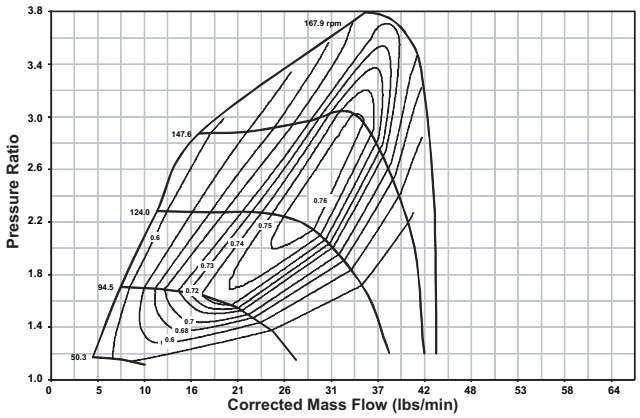
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T25 mounting flange

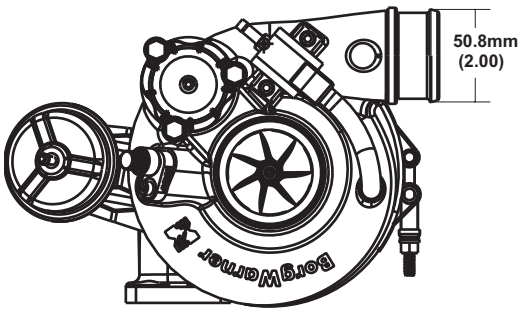
Not included with turbo assemblies:

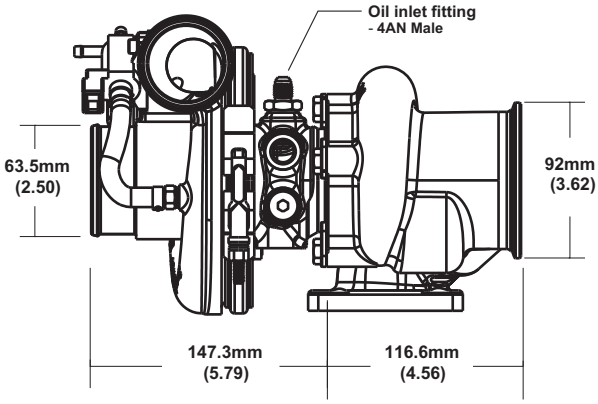
- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

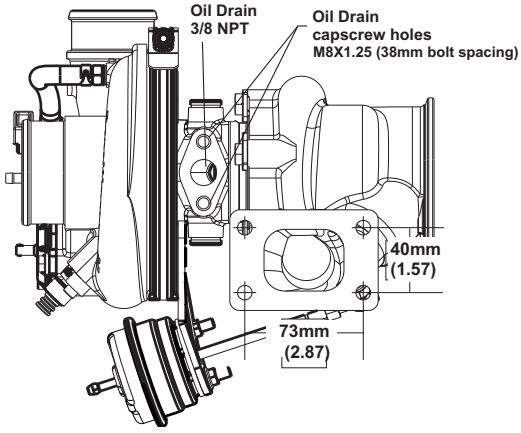
Compressor Map



Turbo Frame Dimensions







Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
11581009006	0.64	T25	Single Scroll WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
179150	B1	179140	62	49	58	.64	T25

EFR 6258

225 - 450 HP Turbo

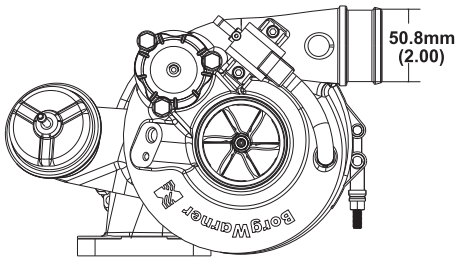
Turbo Features

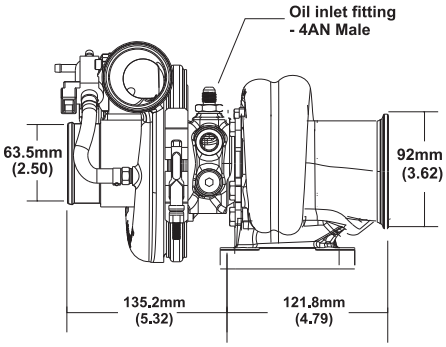
- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled Aluminum bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T4 mounting flange

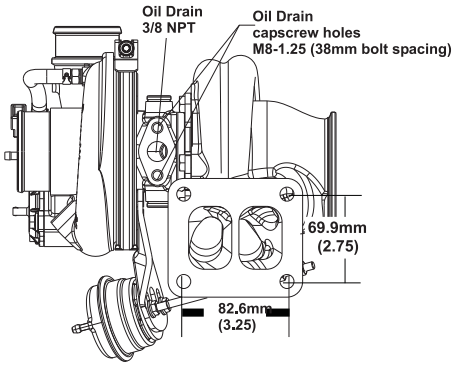
Not included with turbo assemblies:

- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

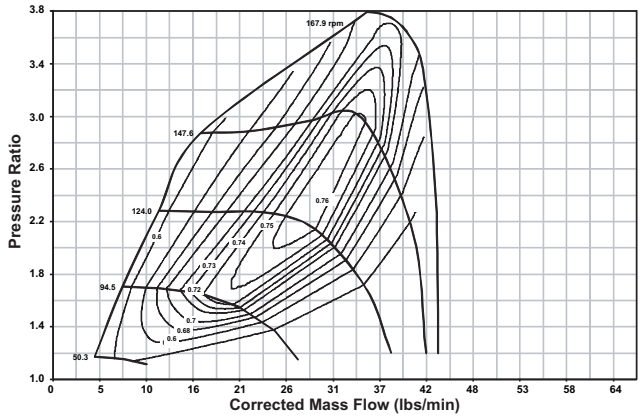
Turbo Frame Dimensions







Compressor Map



Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
11581008000	0.85	V-Band	V-Band, WG
11581008001	0.85	T25	Single Scroll WG
11581008003	0.85	V-Band	V-Band, Non WG
11581009006	0.64	T25	Single Scroll, WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
11589880036	B1	11587105002	62	49	58	0.80	T4

EFR 6758

275 - 500 HP Turbo

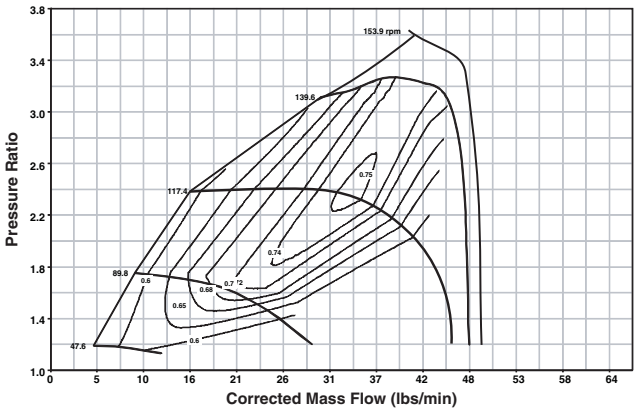
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T25 mounting flange

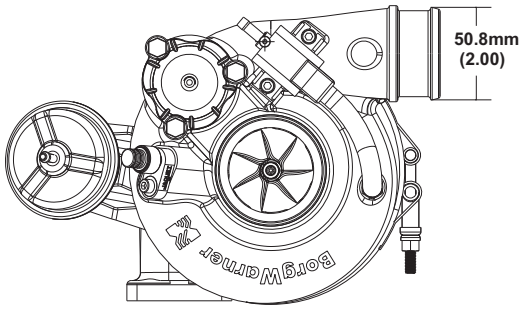
Not included with turbo assemblies:

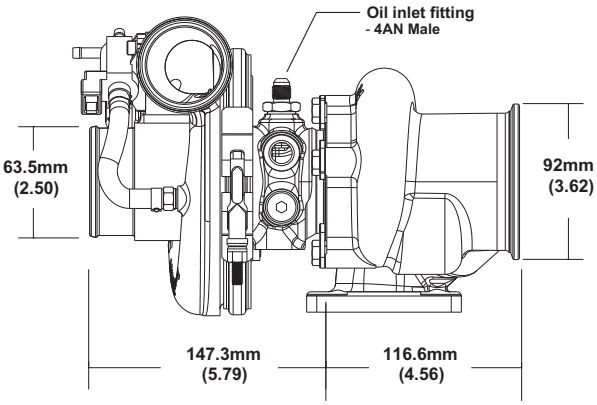
- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

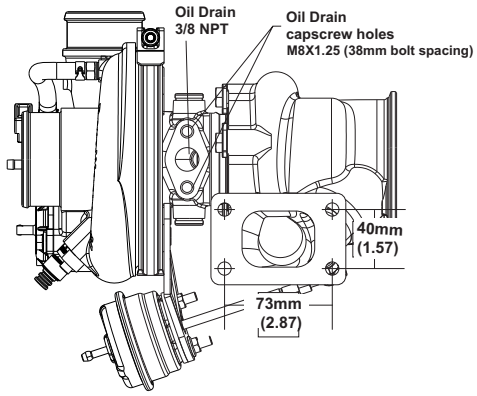
Compressor Map



Turbo Frame Dimensions







Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
11581009006	0.64	T25	Single Scroll WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
179388	B1	179375	67	54	58	.64	T25

EFR 6758

225 - 500 HP Turbo

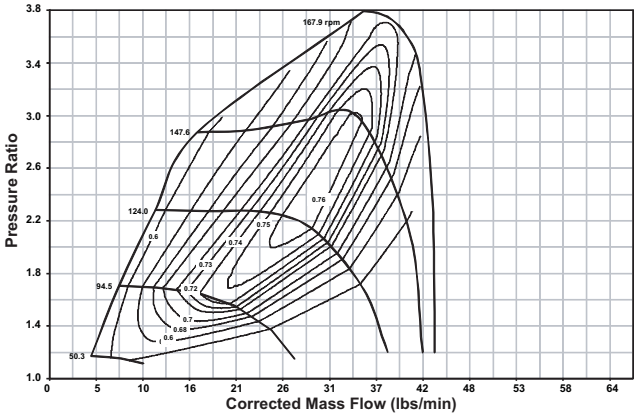
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled Aluminum bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- T25 Inlet Connection

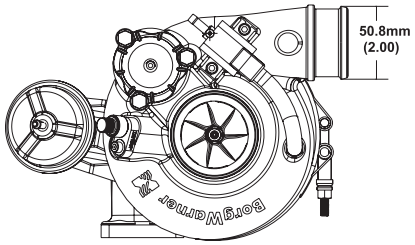
Not included with turbo assemblies:

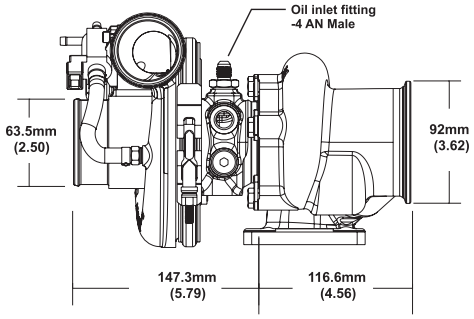
- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

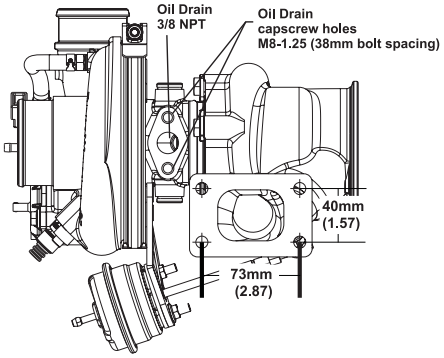
Compressor Map



Turbo Frame Dimensions







Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
11581008001	0.85	V-Band	V-Band, WG
11581008002	0.80	T4	Twin Scroll, WG
11581008003	0.85	V-Band	V-Band, Non WG
11581009006	0.64	T25	Single Scroll, WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
11589880034	B1	11587105001	67	54	58	0.85	T25

EFR 6758

225 - 500 HP Turbo

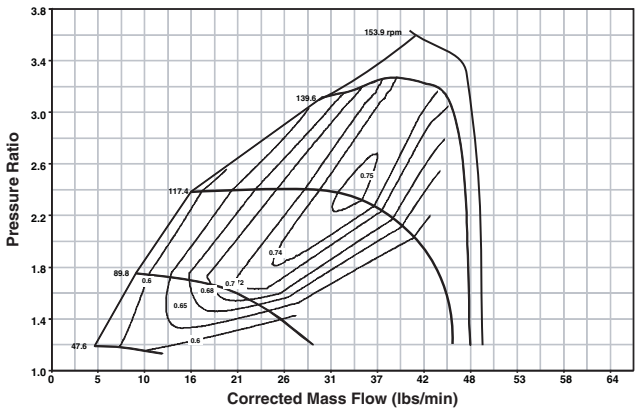
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled Aluminum bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- V-Band Inlet Connection

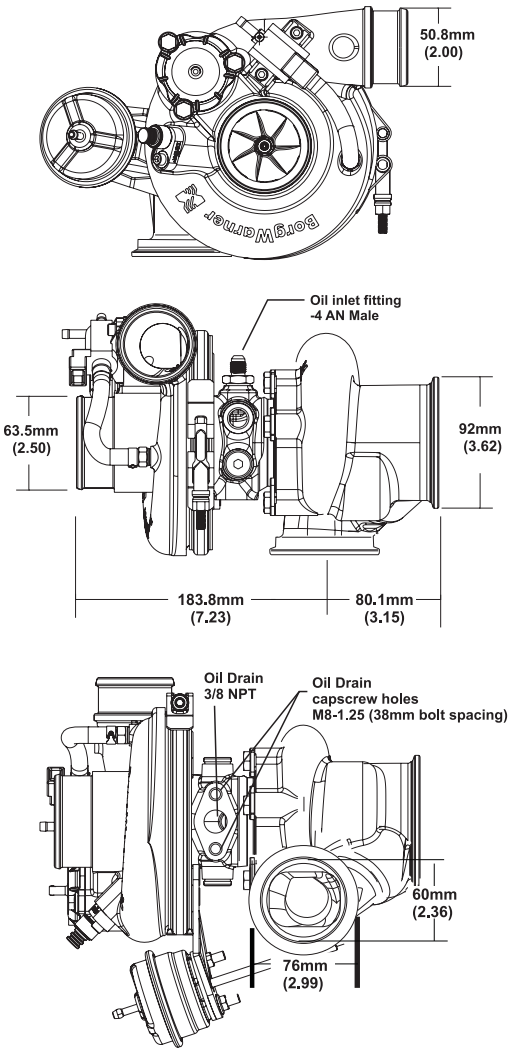
Not included with turbo assemblies:

- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

Compressor Map



Turbo Frame Dimensions



Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
11581008000	0.85	T25	Single Scroll WG
11581008002	0.80	T4	Twin Scroll, WG
11581008003	0.85	V-Band	V-Band, Non WG
11581009006	0.64	T25	Single Scroll, WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
11589880035	B1	11587105001	67	54	58	0.85	V-Band

EFR 6758

225 - 500 HP Turbo

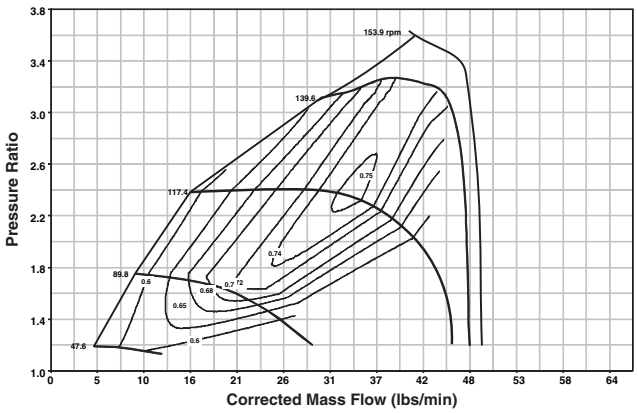
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled Aluminum bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T4 mounting flange

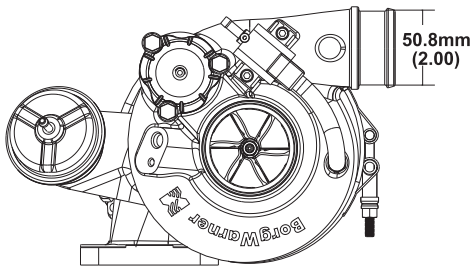
Not included with turbo assemblies:

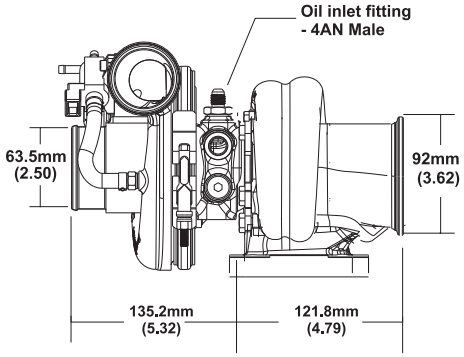
- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

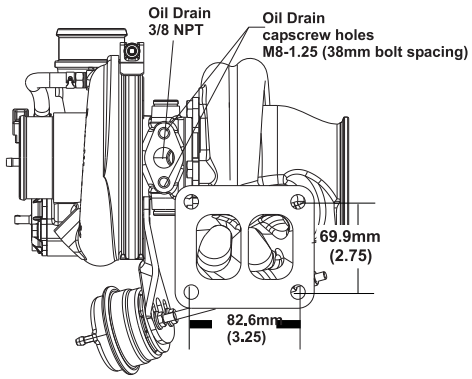
Compressor Map



Turbo Frame Dimensions







Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
11581008000	0.85	T25	Single Scroll WG
11581008001	0.85	V-Band	V-Band, WG
11581008003	0.85	V-Band	V-Band, Non WG
11581009006	0.64	T25	Single Scroll, WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
11589880037	B1	11587105001	67	54	58	0.80	T4

EFR 7163

225 - 550 HP Turbo

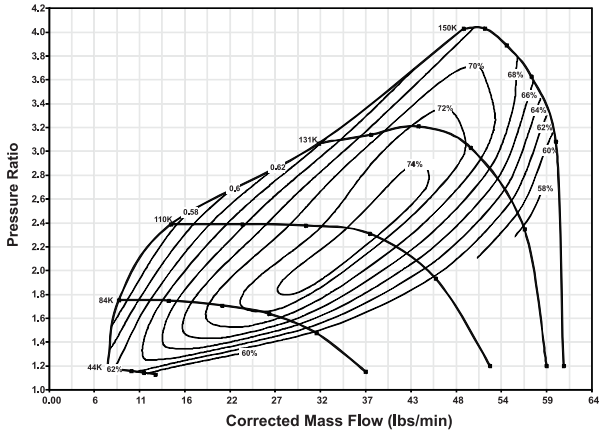
Turbo Features

- Mixed Flow Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled Aluminum bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- T25 Inlet Connection

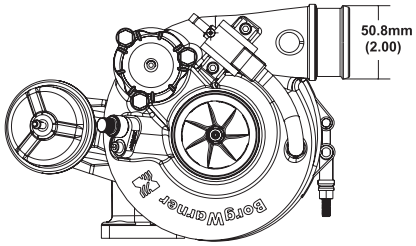
Not included with turbo assemblies:

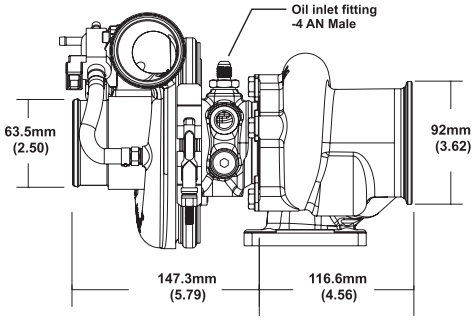
- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

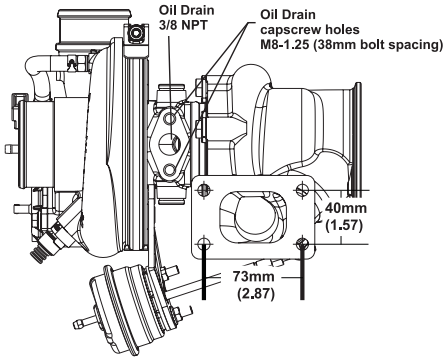
Compressor Map



Turbo Frame Dimensions







Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
11631008001	0.85	V-Band	V-Band, WG
11631008002	0.80	T4	Twin Scroll, WG
11631008003	0.85	V-Band	V-Band, Non WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
11639880005	B1	11637105000	71	57	63	0.85	T25

EFR 7163

225 - 600 HP Turbo

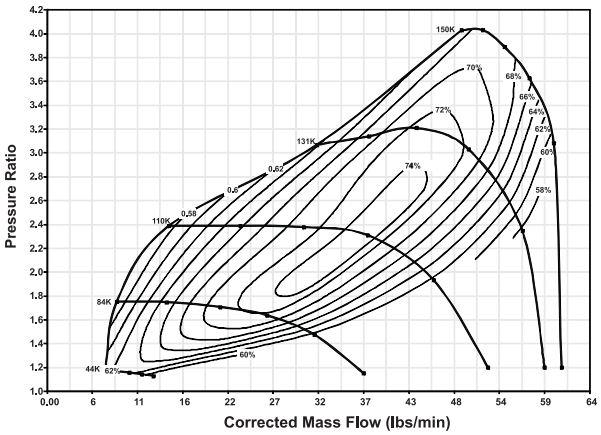
Turbo Features

- Mixed Flow Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled Aluminum bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- V-Band Inlet Connection

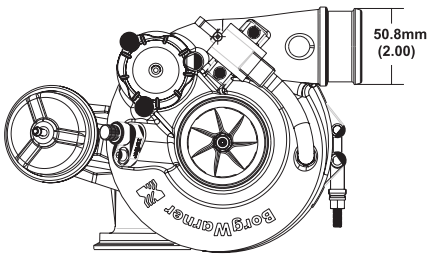
Not included with turbo assemblies:

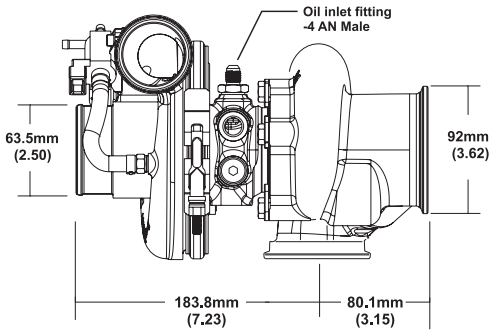
- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

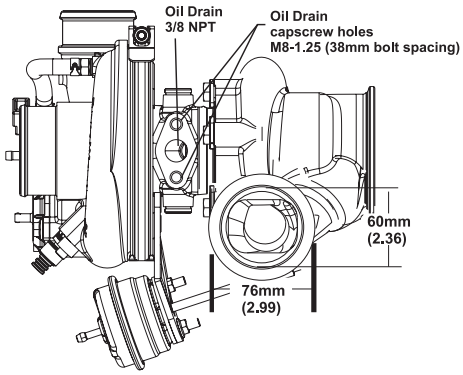
Compressor Map



Turbo Frame Dimensions







Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
11631008000	0.85	T25	Single Scroll WG
11631008002	0.80	T4	Twin Scroll, WG
11631008003	0.85	V-Band	V-Band, Non WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
11639880006	B1	11637105000	71	57	63	0.80	V-Band

EFR 7163

225 - 550 HP Turbo

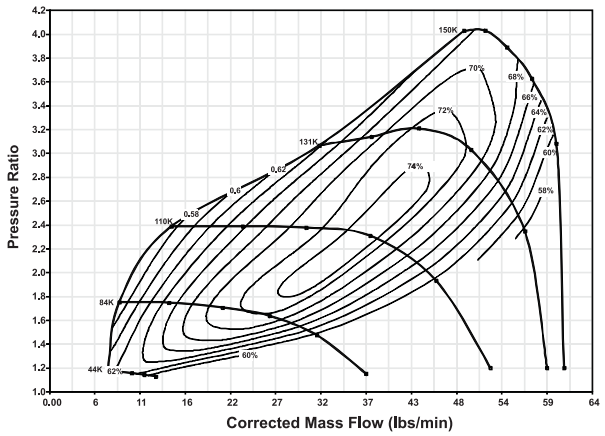
Turbo Features

- Mixed Flow Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled Aluminum bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T4 mounting flange

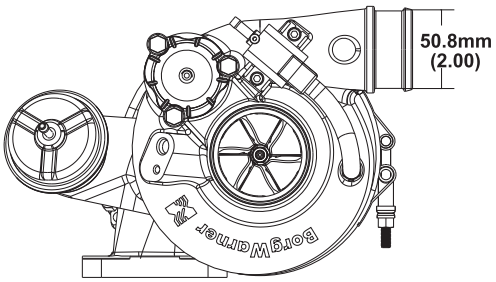
Not included with turbo assemblies:

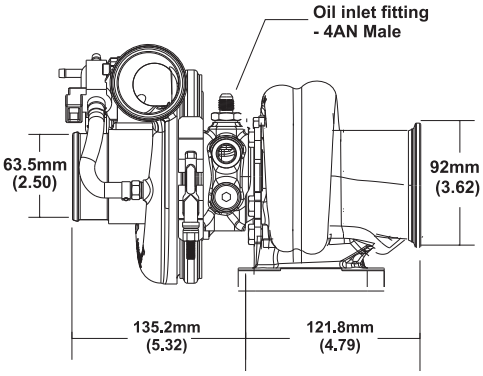
- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

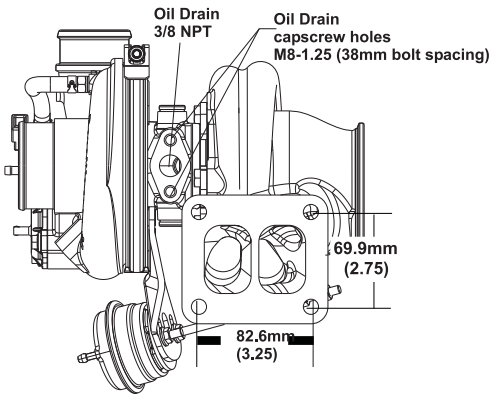
Compressor Map



Turbo Frame Dimensions







Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
11631008000	0.85	T25	Single Scroll WG
11631008002	0.80	V-Band	V-Band, WG
11631008003	0.85	V-Band	V-Band, Non WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
11639880002	B1	11637105000	71	57	63	0.80	T4

EFR 7064

300 - 550 HP Turbo

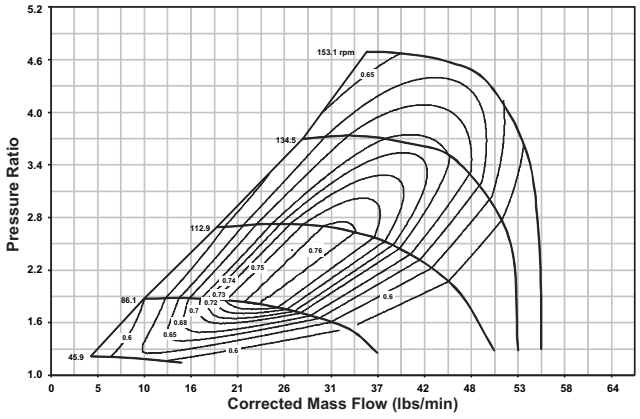
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T3 mounting flange

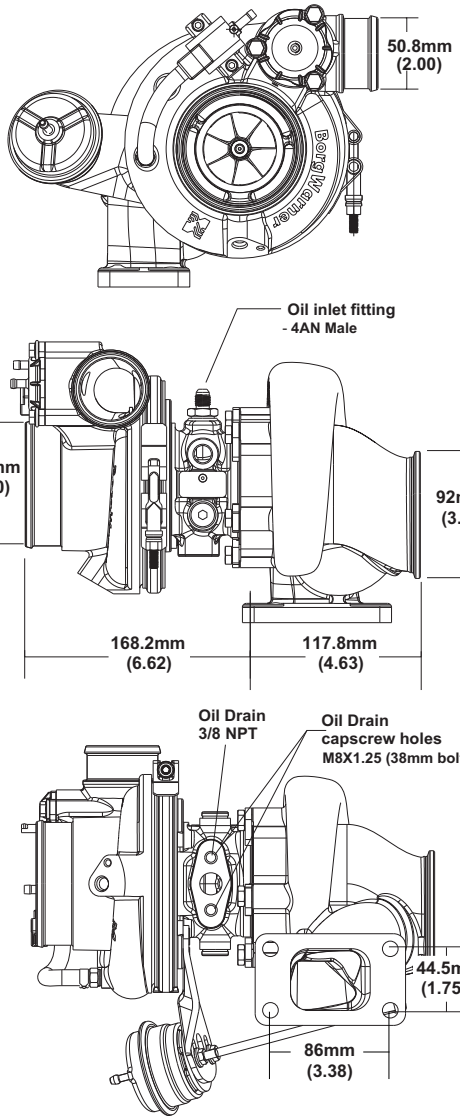
Not included with turbo assemblies:

- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

Compressor Map



Turbo Frame Dimensions



Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
12641008006	0.83	T3	Single Scroll WG
12641008007	0.92	T4	Twin Scroll WG
12641019016	1.05	T4	Twin Scroll Non-WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
179355	B2	179354	70	52	64	.83	T3

EFR 7064

300 - 550 HP Turbo

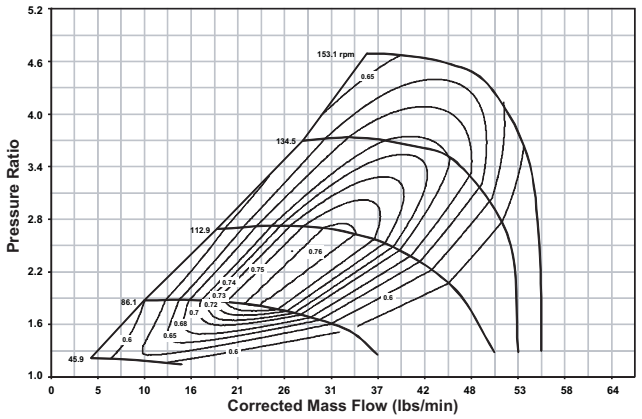
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T4 mounting flange

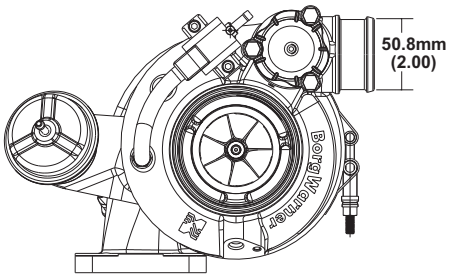
Not included with turbo assemblies:

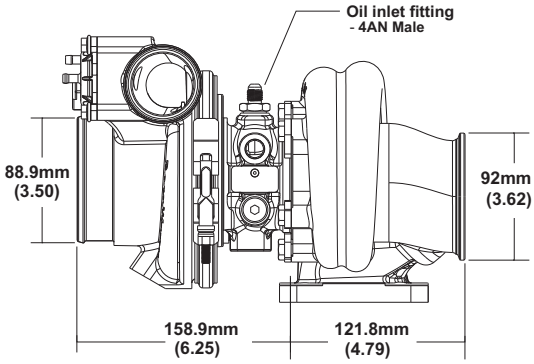
- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

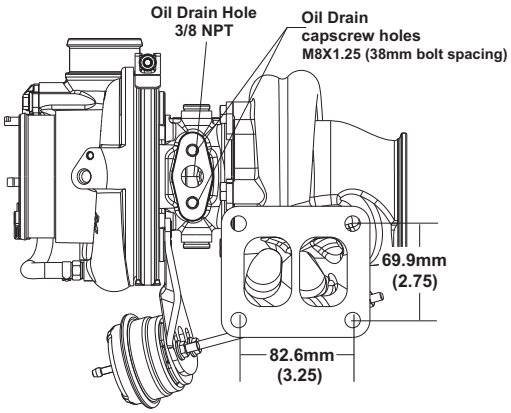
Compressor Map



Turbo Frame Dimensions







Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
12641008006	0.83	T3	Single Scroll WG
12641008007	0.92	T4	Twin Scroll WG
12641019016	1.05	T4	Twin Scroll Non-WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
179389	B2	179354	70	52	64	.92	T4

EFR 7064

300 - 550 HP Turbo

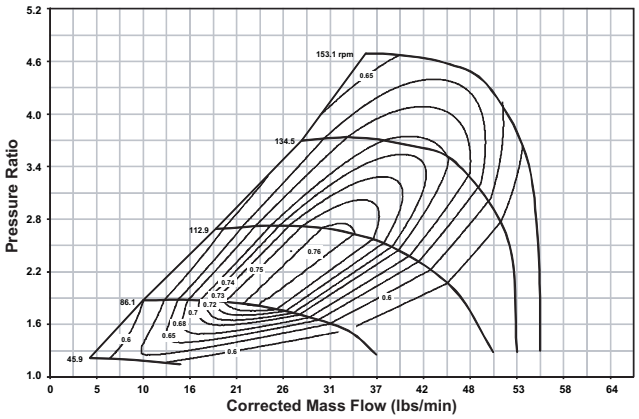
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled bearing housing
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T4 mounting flange

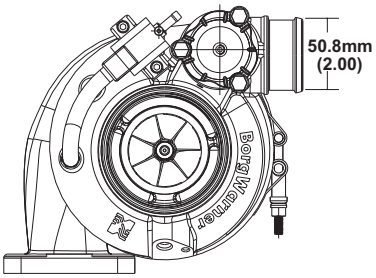
Not included with turbo assemblies:

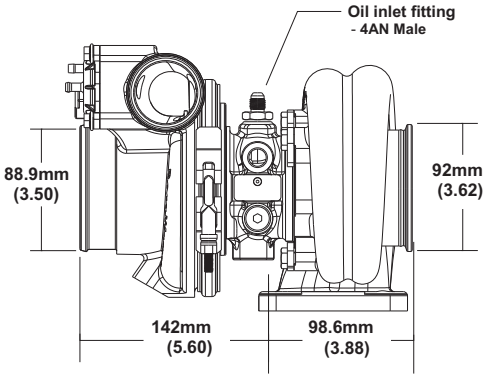
- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

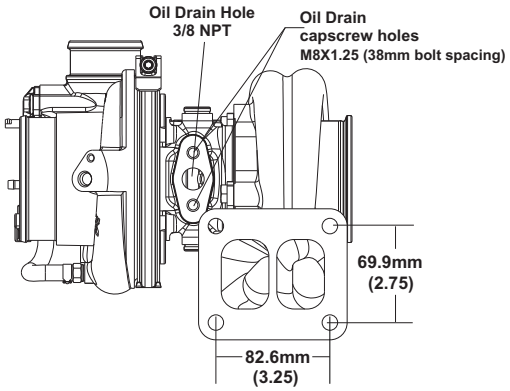
Compressor Map



Turbo Frame Dimensions







Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
12641008006	0.83	T3	Single Scroll WG
12641008007	0.92	T4	Twin Scroll WG
12641019016	1.05	T4	Twin Scroll Non-WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
179391	B2	179354	70	52	64	1.05	T4

EFR 7670

375 - 650 HP Turbo

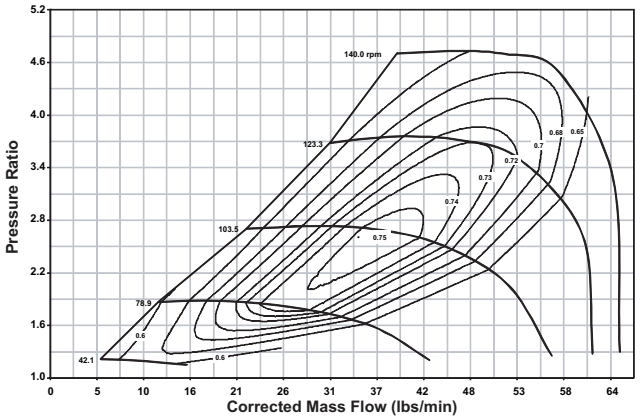
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T3 mounting flange

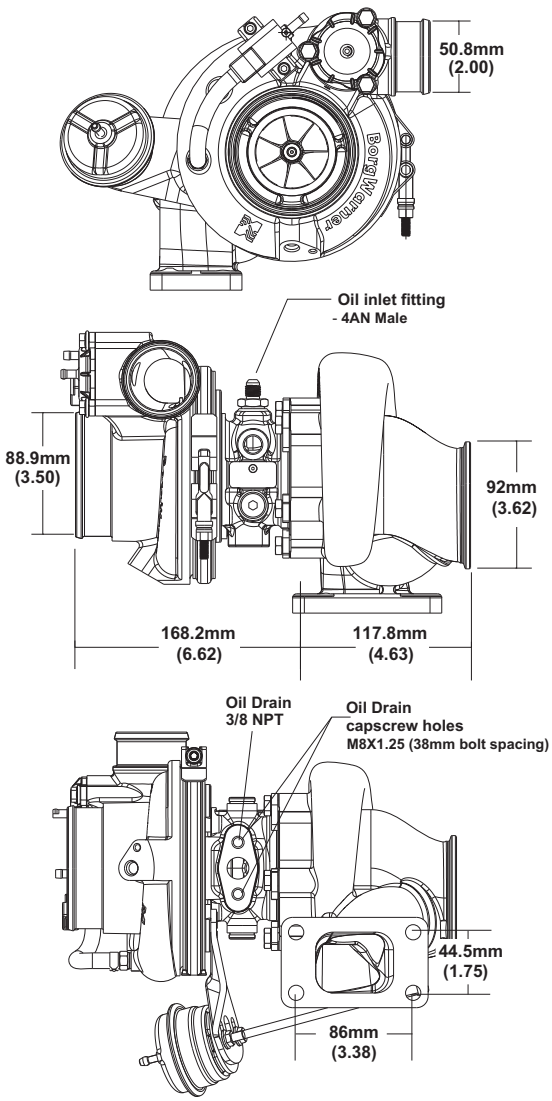
Not included with turbo assemblies:

- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

Compressor Map



Turbo Frame Dimensions



Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
12701008014	0.83	T3	Single Scroll WG
12701008016	0.92	T4	Twin Scroll WG
12701019047	1.05	T4	Twin Scroll Non-WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
179351	B2	179350	76	57	70	.83	T3

EFR 7670

375 - 650 HP Turbo

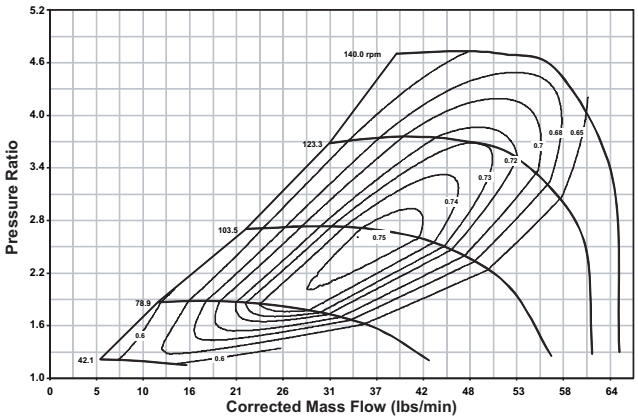
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T4 mounting flange

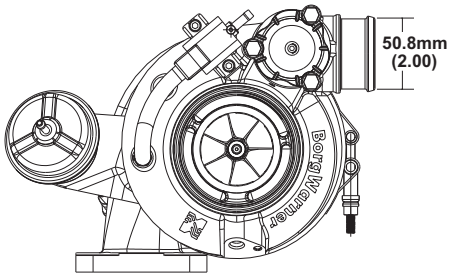
Not included with turbo assemblies:

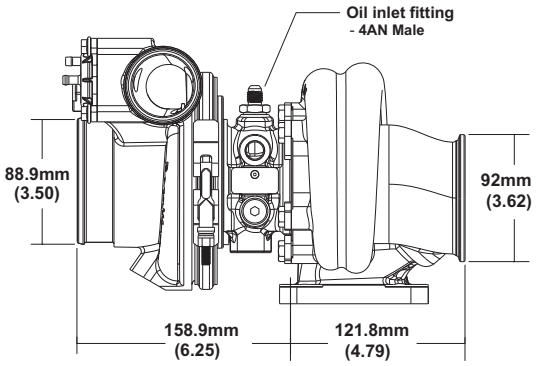
- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

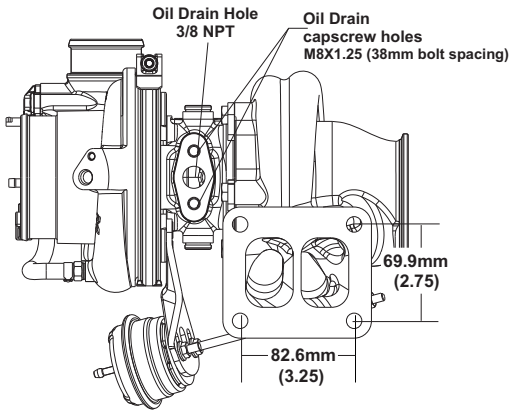
Compressor Map



Turbo Frame Dimensions







Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
12701008014	0.83	T3	Single Scroll WG
12701008016	0.92	T4	Twin Scroll WG
12701019047	1.05	T4	Twin Scroll Non-WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
179390	B2	179350	76	57	70	.92	T4

EFR 7670

375 - 650 HP Turbo

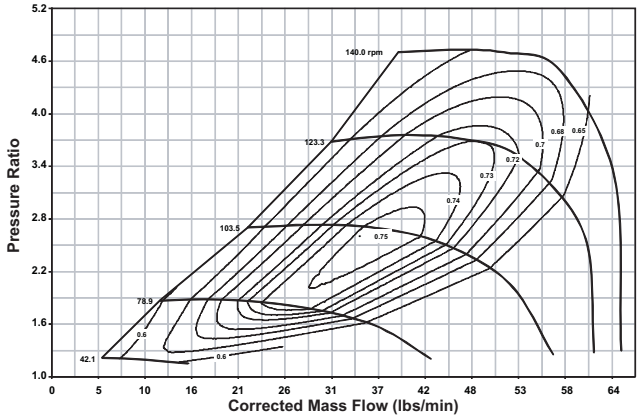
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled bearing housing
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T4 mounting flange

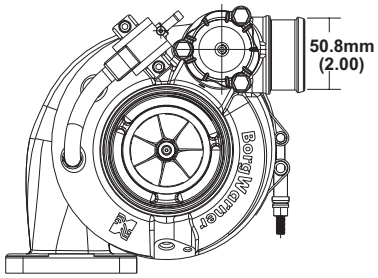
Not included with turbo assemblies:

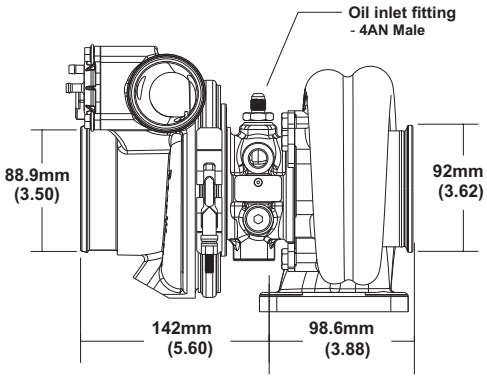
- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

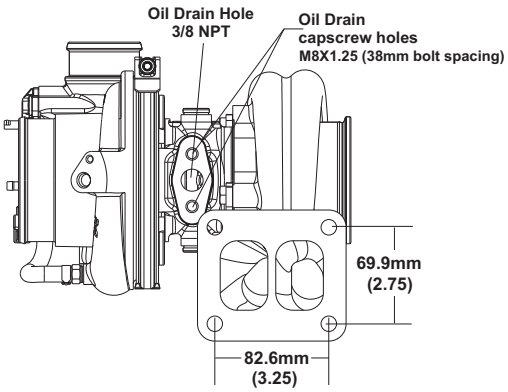
Compressor Map



Turbo Frame Dimensions







Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
12701008014	0.83	T3	Single Scroll WG
12701008016	0.92	T4	Twin Scroll WG
12701019047	1.05	T4	Twin Scroll Non-WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
179392	B2	179350	76	57	70	1.05	T4

EFR 8374

475 - 750 HP Turbo

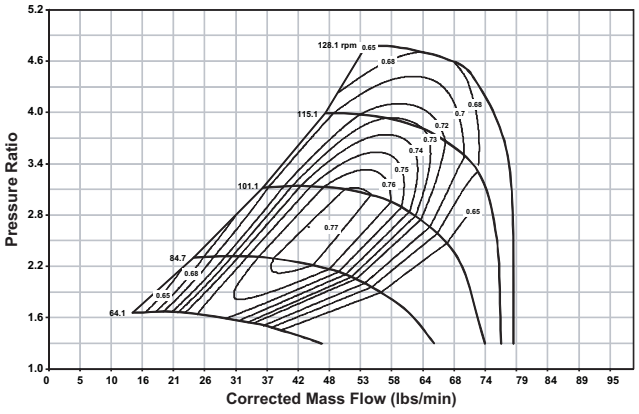
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T3 mounting flange

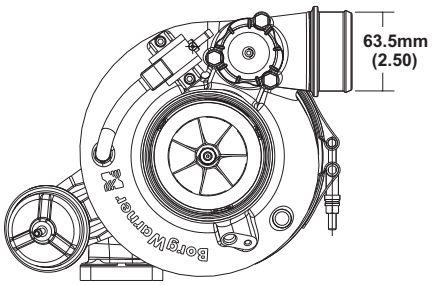
Not included with turbo assemblies:

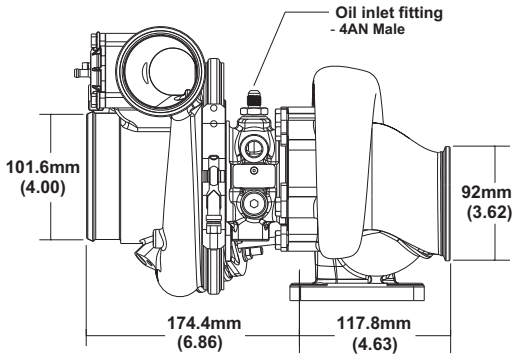
- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

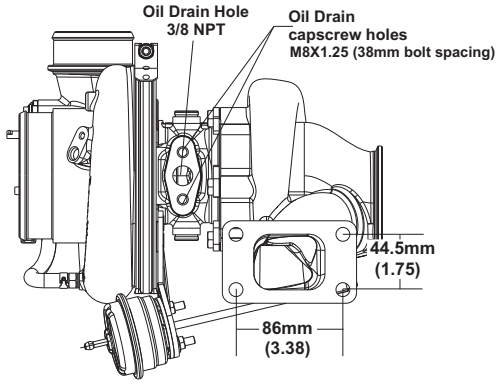
Compressor Map



Turbo Frame Dimensions







Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
12741008000	0.83	T3	Single Scroll WG
12741008001	0.92	T4	Twin Scroll WG
12741019002	10.5	T4	Twin Scroll Non-WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
179258	B2	179257	83	62	74	.83	T3

EFR 8374

475 - 750 HP Turbo

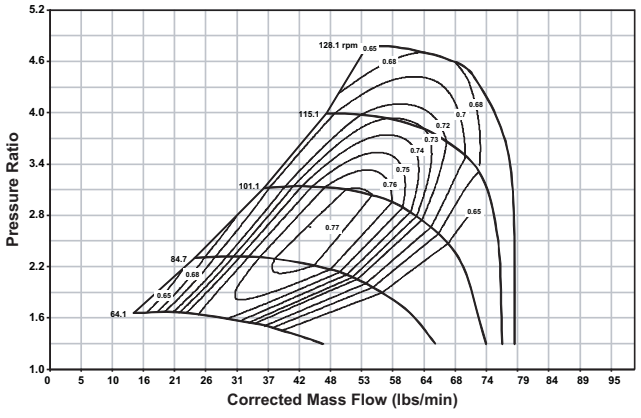
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T4 mounting flange

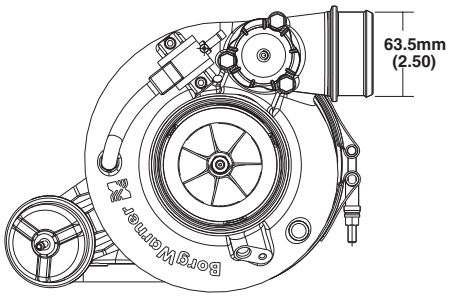
Not included with turbo assemblies:

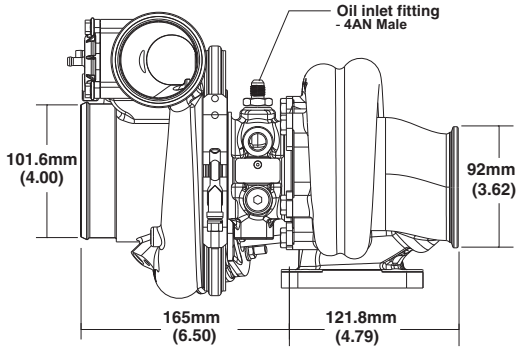
- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

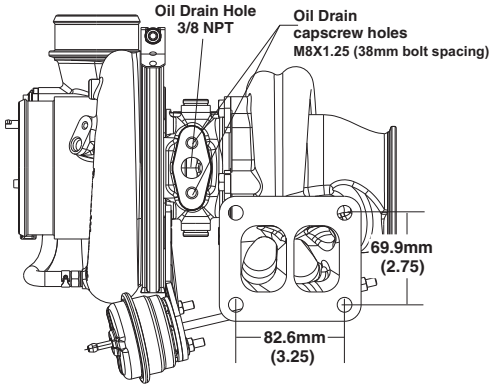
Compressor Map



Turbo Frame Dimensions







Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
12741008000	.83	T3	Single Scroll WG
12741008001	.92	T4	Twin Scroll WG
12741019002	1.05	T4	Twin Scroll Non-WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
179357	B2	179257	83	62	74	.92	T4

EFR 8374

475 - 750 HP Turbo

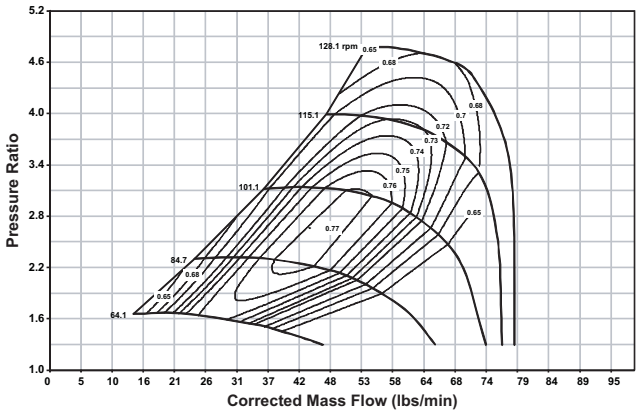
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled bearing housing
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T4 mounting flange

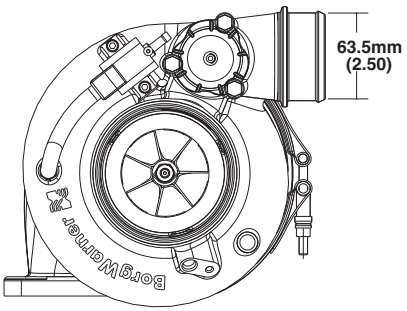
Not included with turbo assemblies:

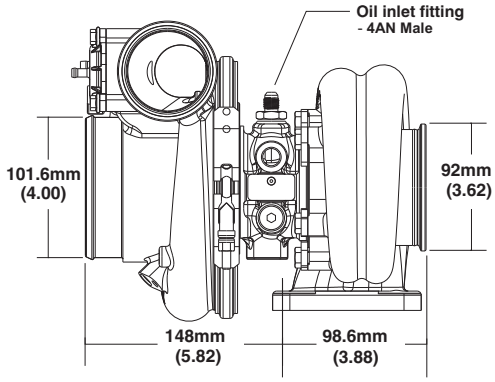
- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

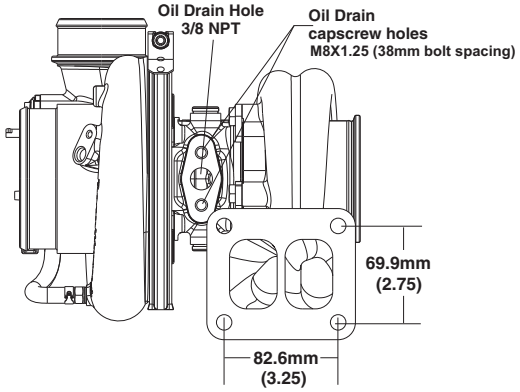
Compressor Map



Turbo Frame Dimensions







Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
12741008000	.83	T3	Single Scroll WG
12741008001	.92	T4	Twin Scroll WG
12741019002	1.05	T4	Twin Scroll Non-WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
179393	B2	179257	83	62	74	1.05	T4

EFR 9180

600 - 1000 HP Turbo

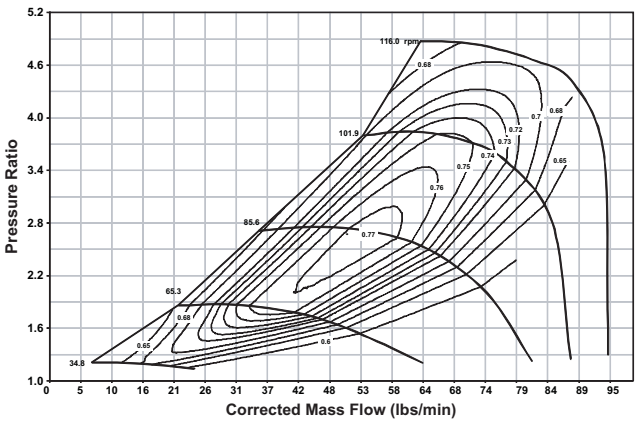
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T3 mounting flange

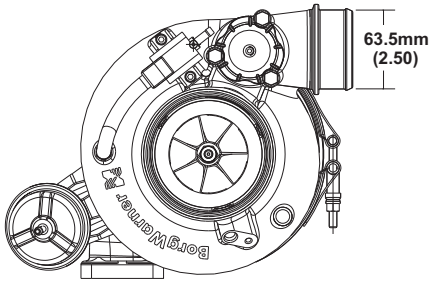
Not included with turbo assemblies:

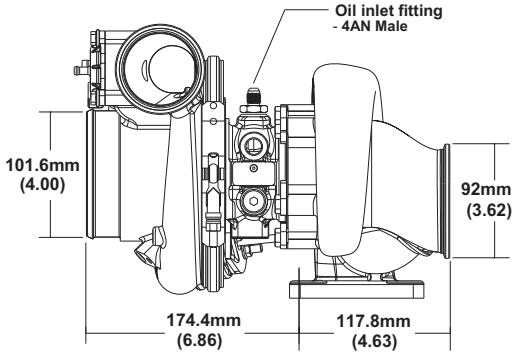
- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

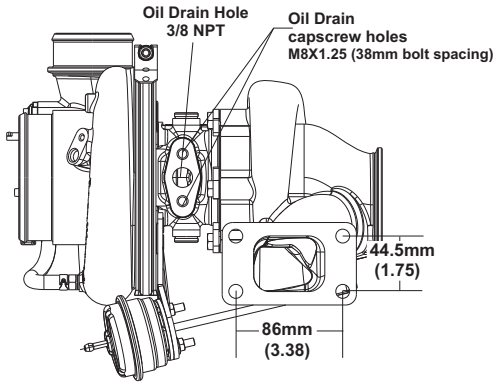
Compressor Map



Turbo Frame Dimensions







Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
12801008002	.83	T3	Single Scroll WG
12801019009	0.92	T4	Twin Scroll WG
12801019001	1.05	T4	Twin Scroll Non-WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config
179358	B2	179356	91	68	80	.83	T3

EFR 9180

600 - 1000 HP Turbo

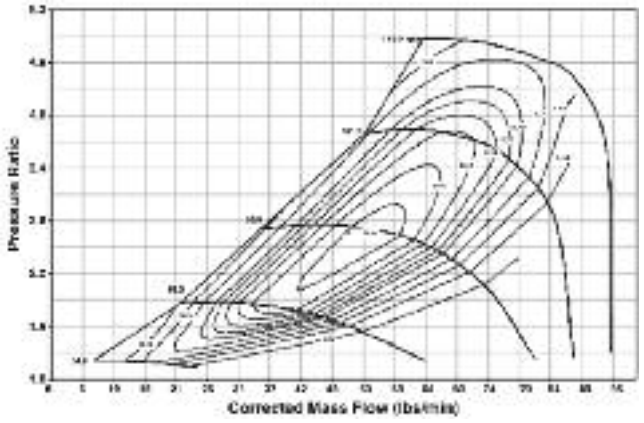
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled bearing housing
- Large internal wastegate
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T3 mounting flange

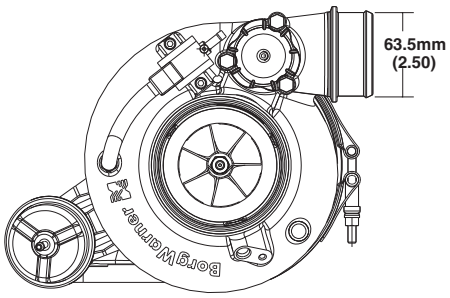
Not included with turbo assemblies:

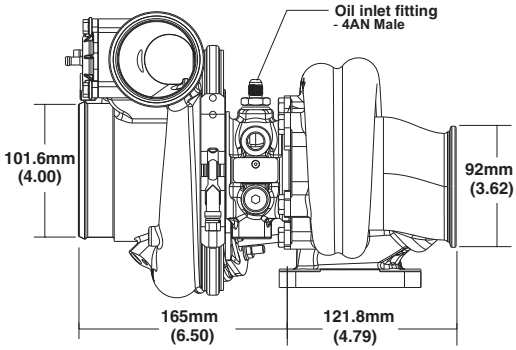
- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

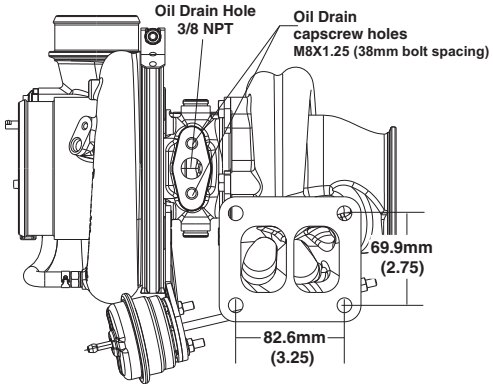
Compressor Map



Turbo Frame Dimensions







Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
12801008002	.83	T3	Single Scroll WG
12801019009	0.92	T4	Twin Scroll WG
12801019001	1.05	T4	Twin Scroll Non-WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config
12809880000	B2	179356	91	68	80	.92	T4

EFR 9180

600 - 1000 HP Turbo

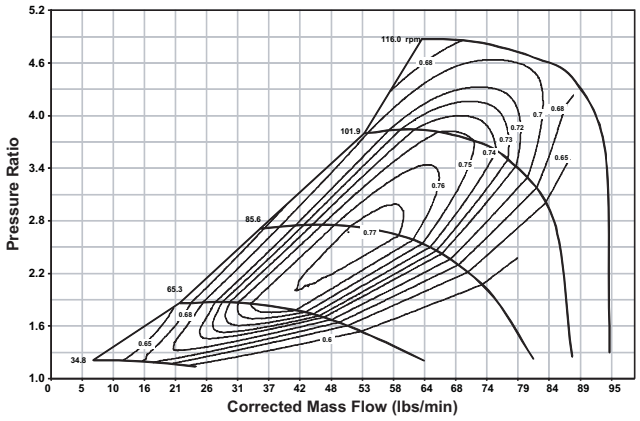
Turbo Features

- Gamma-Ti turbine wheel
- Dual ceramic ball bearing assembly with metal cage
- Forged milled extended tip compressor wheel
- Stainless steel turbine housing
- Water cooled bearing housing
- Compressor recirculation valve (a.k.a BOV)
- Boost control solenoid valve
- Standard T4 mounting flange

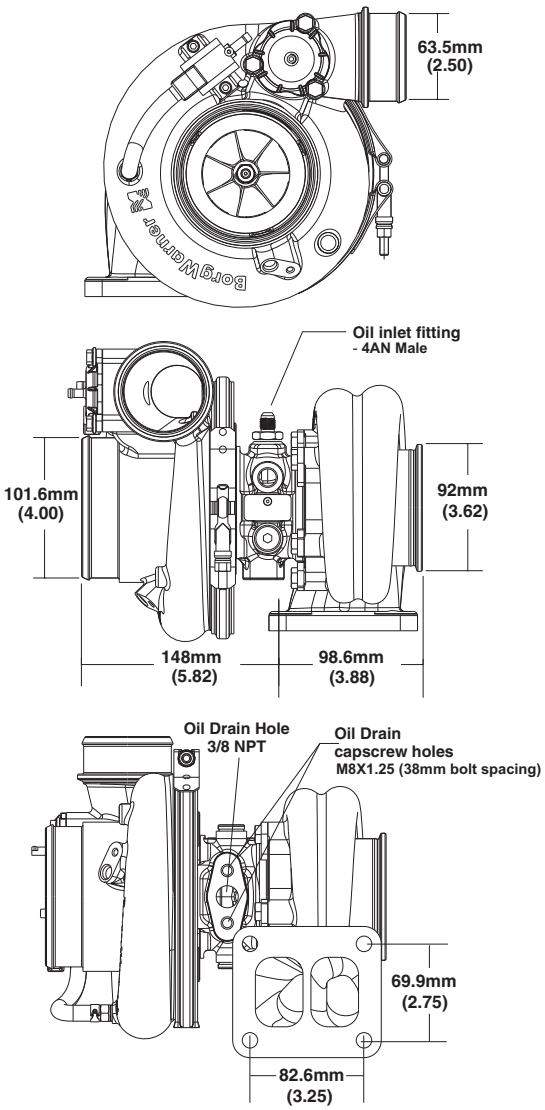
Not included with turbo assemblies:

- Speed sensor
- Turbine outlet V-Band
- Turbine inlet gasket
- Oil drain gasket or drain port fitting

Compressor Map



Turbo Frame Dimensions



Super Core Configuration

The following parts are not included as part of the super-core assembly: turbine housing, assembly clamp plate hardware, wastegate parts.

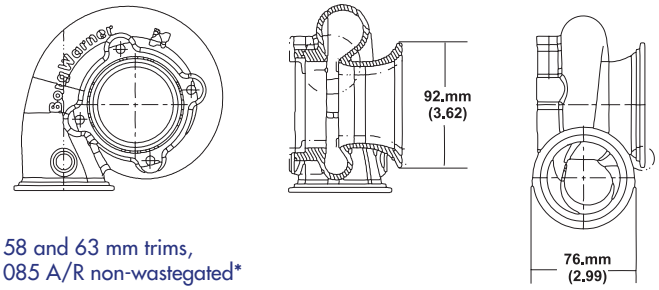
Turbine Housing Options

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
12801008002	.83	T3	Single Scroll WG
12801019009	0.92	T4	Twin Scroll WG
12801019001	1.05	T4	Twin Scroll Non-WG

Turbo Part Number	Turbo Frame Size	Super Core Part Number	Comp. Wheel Outer Dia. (mm)	Comp. Wheel Inducer Dia.	Turbine Wheel Outer Dia.	Turbo A/R	Inlet Flange Config.
179394	B2	179356	91	68	80	1.05	T4

EFR Supplemental Turbine Housing Options

B1 Turbine Housing, "I" Type

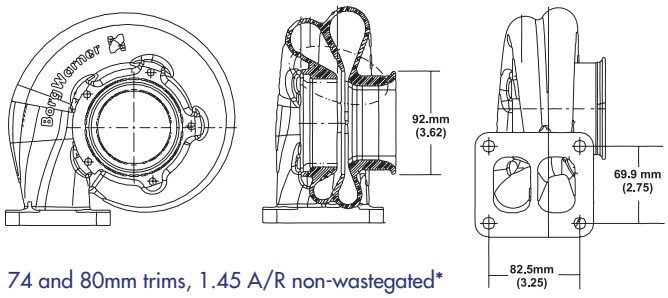


58 and 63 mm trims,
085 A/R non-wastegated*

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
11581008003	0.85	V-Band Inlet	Single Scroll, Non-WG
11631008003	0.85	V-Band Inlet	Single Scroll, Non-WG

*Sold as loose turbine housing only

B2 Turbine Housing, "H" Type



74 and 80mm trims, 1.45 A/R non-wastegated*

Turbine Housing Part Number	A/R	Inlet Flange Shape	Housing Config.
12741008003	1.45	T4	Twin Scroll, Non-WG
12801008006	1.45	T4	Twin Scroll, Non-WG

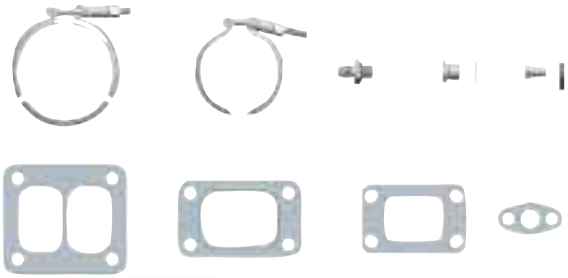
*Sold as loose turbine housing only

Ancillary Parts EFR Series

Part Number 179430

Speed Sensor Kit

(1) Speed sensor, frequency output
(1) Speed sensor hold-down bolt
***Note: Speed Sensor signal conversion and display accessories can be purchased at: www.roadragegages.com



Part Number 179423

Hardware/Installation Kit

(1) Turbine housing outlet V-band clamp
(2) V-band clamp nuts
(2) Water port plugs
(6) Water port plug sealing washers
(2) Oil drain flange gaskets
(1) Oil inlet fitting (-4an) w/seal and washer
(1) Compressor cover outlet V-band clamp for 83 & 91mm
(5) Clamp plate bolts
(5) Clamp plates
(1) Turbine inlet gasket for T25 flange
(1) Turbine inlet gasket for T3 flange
(1) Turbine inlet gasket for T4 divided flange

Part Number 179424

Compressor Recirculation Valve Kit

(1) CRV plastic cover w/hose nipple
(1) CRV disabling block-off plate
(1) CRV diaphragm/piston assembly
(1) CRV spring
(3) Cover plate bolts w/locking compound

Part Number 179425

Boost Control Solenoid Valve (BCSV) Kit

(1) Boost control solenoid valve
(2) BCSV screws
(4) Hose clamps
(1) Compressor cover boost port fitting
(1) Comp cover boost port washer
(1) Wastegate signal hose, 110mm
(1) Wastegate signal hose, 410mm

Part Number 179426

Wastegate Hose Kit

(1) Wastegate signal hose, 410mm
(2) Hose clamps

EFR Wastegate Canister Selection Guide

Core Assy	0.64a/r TH	0.80a/r TH	0.83a/r TH	0.85a/r TH	0.92a/r TH
6258	179282, 179283, or 179284	179420, 179421, or 179422			
6258*	179282, 179283, or 179284	179420, 179421, or 179422			
6758	179282, 179283, or 179284	179420, 179421, or 179422		179282, 179283, or 179282	
6758*	179282, 179283, or 179284	179420, 179421, or 179422		179282, 179283, or 179283	
7163*		179420, 179421, or 179422		179282, 179283, or 179284	
7064			179285, 179286, or 179287		179285, 179286, or 179287
7670			179285, 179286, or 179287		179285, 179286, or 179287
8374			179285, 179286, or 179287		179285, 179286, or 179287
9180			179285, 179286, or 179287		179285, 179286, or 179287

EFR Wastegate Canister Bracket Kit Selection Guide

Core Assy	0.64a/r TH	0.80a/r TH	0.83a/r TH	0.85a/r TH	0.92a/r TH
6258	179427	179428			
6258*	179427	179428			
6758	179427	179428		179427	
6758*	179427	179428		179427	
7163*		179428		179427	
7064			179428		179428
7670			179428		179428
8374			179429		179429
9180			179429		179429

Each Wastegate Bracket Kit Includes:

(1) Stainless steel bracket
(3) Bracket to bearing housing screws
(2) Canister to bracket lock nuts
(1) Actuator rod nut (outboard side)
(1) Long 410mm wastegate signal hose
(2) Hose clamps

*Core assembly includes aluminum bearing housing

EFR Turbine Housing Product Selection Guide

Turbine Housing Configuration	TH Letter Designation	6258	6758	7163	7064	7670	8374	9180
.64 A/R, T25 flange Single Scroll, WG	A-Type	179150 / 11581009006	179388 / 11581009006					
.83 A/R, T3 flange Single Scroll, WG	B-Type				179355 / 12641008006	179351 / 12701008014	179258 / 12741008000	179358 / 12801008002
.92 A/R, T4 flange Twin Scroll, WG	C-Type				179389 / 12641008007	179390 / 12701008016	179357 / 12741008001	12809880000 / 12801019009
1.05 A/R, T4 flange Twin Scroll, Non-WG	D-Type				179391 / 12641019016	179392 / 12701019047	179393 / 12741019002	179394 / 12801019001
.85 A/R, T25 flange Single Scroll, WG	F-Type		1158980034 / 11581008000	11639880005 / 11631008000				
.85 A/R, V-Band Inlet Single Scroll, WG	F-Type		11589880035 / 11581008001	11639880006 / 11631008001				
.80 A/R, T4 flange Twin Scroll, WG	G-Type	11589880036 / 11581008002	11589880037 / 11581008002	11639880002 / 11631008002				
1.45 A/R, T4 flange Twin Scroll, Non-WG	H-Type						Sold as loose housing only / 12741008003	Sold as loose housing only / 12801008006
.85 A/R, V-Band Inlet Single Scroll, Non-WG	I-Type		Sold as loose housing only / 11581008003	Sold as loose housing only / 11631008003				

Legend

Turbo Assembly
TH Assembly

ROD & SPRING PRELOAD (mm / nut turns)	FULL STROKE CAPABILITY inches (mm)	179282, 179420, or 179285 LOW BOOST WG CANISTER		179283, 179421, or 179286 MEDIUM BOOST WG CANISTER		179284, 179422, or 179287 HIGH BOOST WG CANISTER	
		WG Crack-Open Pressure (psi)	Full Stroke Pressure (psi)	WG Crack-Open Pressure (psi)	Full Stroke Pressure (psi)	WG Crack-Open Pressure (psi)	Full Stroke Pressure (psi)
0	0.67" (17mm)	4.0 psi	13.7 psi	8.8 psi	20.6 psi	16.8 psi	32.3 psi
1	0.63" (16mm)	4.9 psi	13.8 psi	9.6 psi	20.6 psi	17.3 psi	32.3 psi
2	0.59" (15mm)	5.7 psi	14.0 psi	10.8 psi	20.6 psi	17.6 psi	32.3 psi
3	0.55" (14mm)	6.1 psi	14.1 psi	11.2 psi	20.6 psi	17.8 psi	32.3 psi
4	0.51" (13mm)	6.8 psi	14.3 psi	11.9 psi	20.6 psi	17.9 psi	32.3 psi
5	0.47" (12mm)	7.3 psi	14.4 psi	12.3 psi	20.6 psi	18.1 psi	32.3 psi
6	0.43" (11mm)	8.0 psi	14.4 psi	13.2 psi	20.6 psi	18.6 psi	32.3 psi
7	0.39" (10mm)	8.5 psi	14.6 psi	14.0 psi	20.6 psi	19.0 psi	32.3 psi
8	0.35" (9mm)	9.1 psi	14.6 psi	14.5 psi	20.6 psi	19.3 psi	32.3 psi
9	0.31" (8mm)	9.6 psi	14.7 psi	14.8 psi	20.6 psi	19.4 psi	32.3 psi
10	0.28" (7mm)	9.9 psi	14.7 psi	15.9 psi	20.6 psi	19.6 psi	32.3 psi
		Use with up to 13 psi applied pressure		Use with up to 19 psi applied pressure		Use with up to 31 psi applied pressure	

Note 1: Avoid too little preload. The diaphragm can rub (and wear) against the top of the can. We recommend 3mm of preload as a starting point.

Note 2: Avoid too much preload. Too much preload can cause premature diaphram wear, but can be used functionally to limit travel and avoid boost droop at high RPM.

Note 3: When using solenoid valve boost control, the signal pressure that the WG canister sees can be bled off. Select a canister that will allow nearly full stroke.

Note 4: The "use with up to" pressures avoid long-term wear. By bottoming out the stroke, the diaphragm can be distressed over the course of time.

Note 5: EFR turbo assemblies come standard with the "Medium Boost" WG canisters. "Low" or "High" boost actuator canisters can be purchased from and EFR dealer.

2012 LMP2 Class Winner of 24 hours of Le Mans, 12 hours of Sebring

Team: Starworks Motorsport
Vehicle: Honda - HPD ARX03b
Racing Venue: American Le Mans Series, World Endurance Championship
Turbo of choice: Twin EFR-6758s

AirWerks Series

In 2002, the aftermarket group of BorgWarner Turbo Systems started a program named AirWerks. This independent aftermarket program was created to assist the needs of BorgWarner distributors who currently sell into the market of competitive motorsports or are assisting those customers who are looking for a little more performance to a factory turbocharged car or to retrofit a naturally aspirated engine.

When D Sport magazine started building a Honda engine for the 72MM class limit turbo, they reached for the S400SX3 from BorgWarner's Airwerks division. This turbo is capable of supporting over 1000 horsepower, offers super-quick response and the durability associated with the BorgWarner name.

Team: Speedfactory
Driver: Cole Marmon
Vehicle: Civic
Racing Venue: Sport Compact FWD
Turbo of choice: S400SX 72mm

S1BG

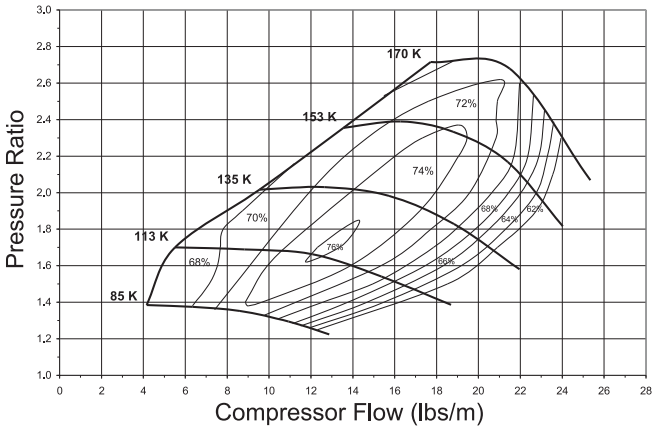
120 - 320 HP Turbo

Turbo Features

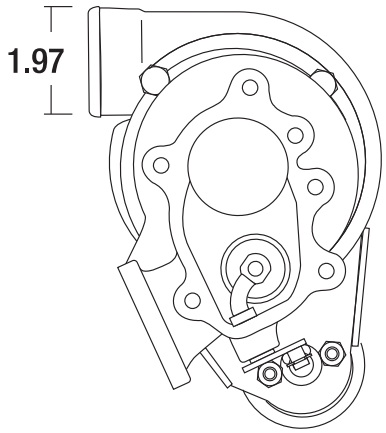
- Twin hydrodynamic journal bearings
- Integrated wastegate assembly
- Adjustable compressor and turbine housing orientation

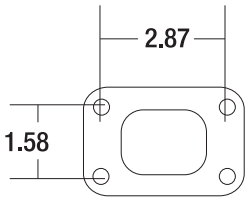
Compressor Map

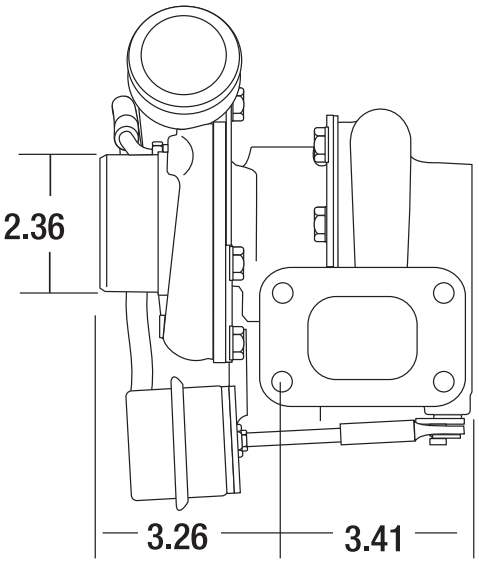
(Applicable to part number 313296)



Turbo Frame Dimensions





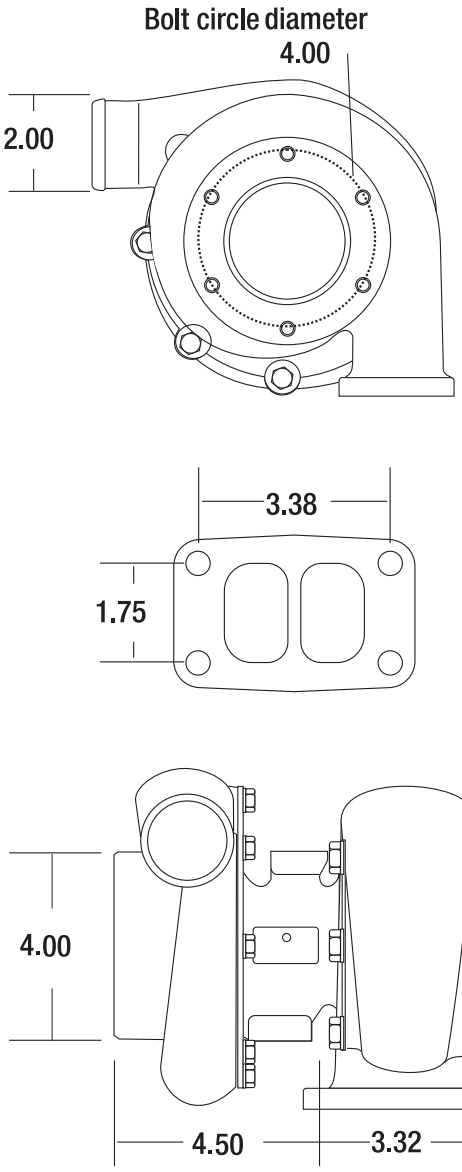


Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Cartridge Assembly	Service Kit
313295	1.90	1.35	34	1.85	47	1.57	40	.35	N/A	318374
313296	2.08	1.55	39	2.08	53	1.80	46	.46	315358	318374
313683	2.08	1.55	39	2.08	53	1.80	46	.61	N/A	318374
313297	2.28	1.70	43	2.08	53	1.80	46	.61	313737	318374
313798	2.28	1.70	43	2.08	53	1.80	46	.81	313737	318374

S200

320 - 580 HP Turbo

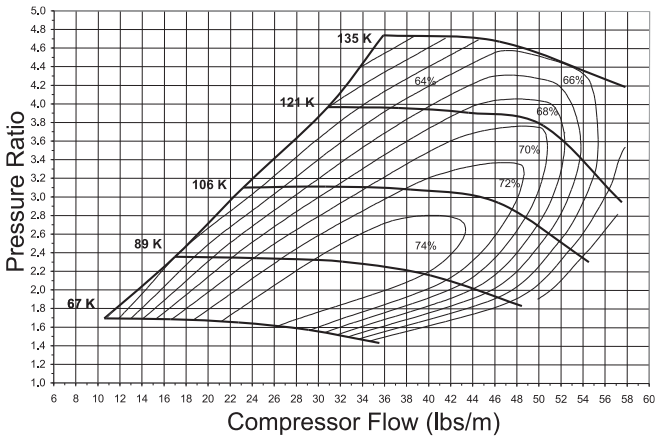
Turbo Frame Dimensions



Turbo Features

- Twin hydrodynamic journal bearings
- Extended tip technology compressor wheel
- Twin scroll turbine housing
- Adjustable compressor and turbine housing orientation
- Compressor cover recirculation grooves

Compressor Map

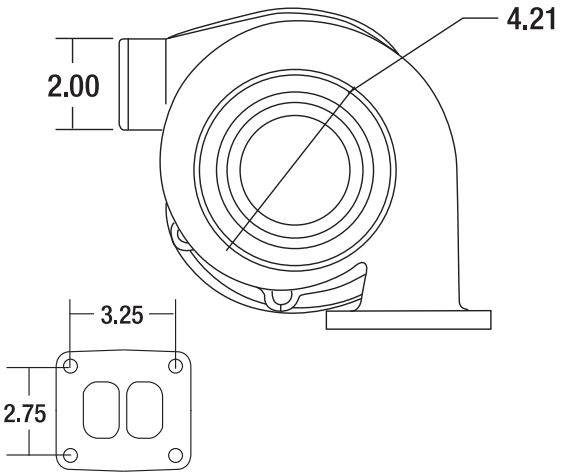


Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Cartridge Assembly	Service Kit
317222	3.14	2.20	56	2.92	74	2.54	65	.85	316999	318382
317246	3.14	2.20	56	2.92	74	2.54	65	.76	316999	318382

S200SX

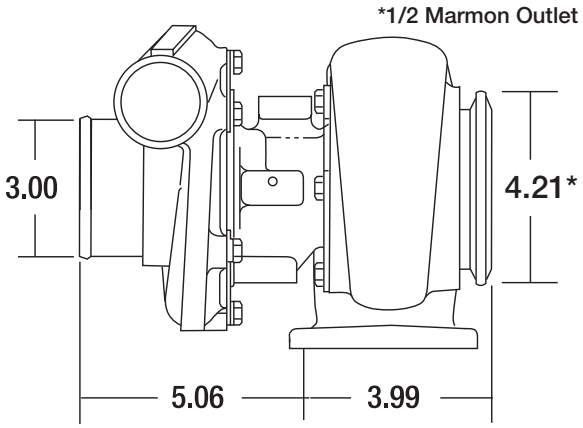
220 - 580 HP Turbo

Turbo Frame Dimensions



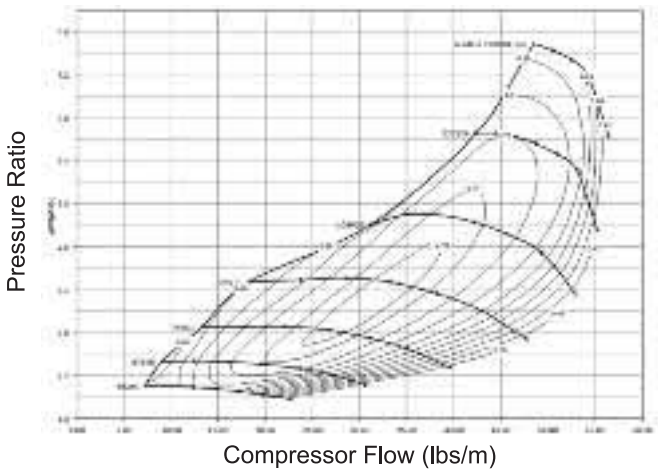
Turbo Features

- Twin hydrodynamic journal bearings
- Extended tip technology compressor wheel
- Twin scroll turbine housing
- Adjustable compressor and turbine housing orientation



Compressor Map

(Applicable to part number 177268)



Turbine Housing

Part Number	A/R
177193	1.00
177192	1.15
177194	1.22

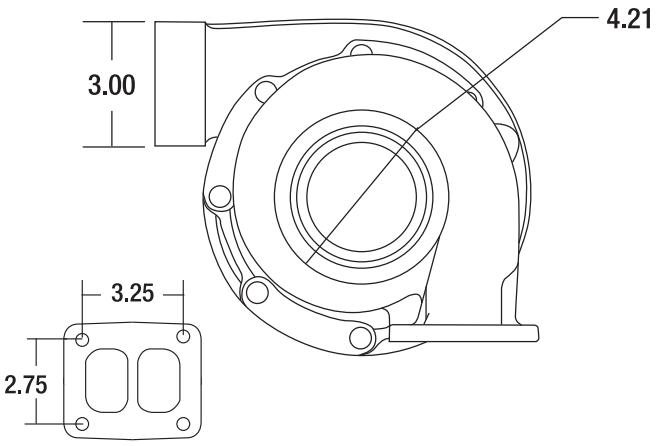
Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Cartridge Assembly	Service Kit
177258	2.74	1.81	46	2.74	70	2.42	61	.83	176639	318383
177267	2.74	1.95	50	2.74	70	2.42	61	1.09	176642	318383
177257	2.74	2.00	51	2.74	70	2.42	61	.83	176638	318383
177268	3.00	2.19	56	2.74	70	2.42	61	1.22	176637	318383
178034*	3.00	2.20	56	2.74	70	2.42	61	1.22	N/A	318383
178042*	3.00	2.20	56	2.74	70	2.42	61	1.27	N/A	318383

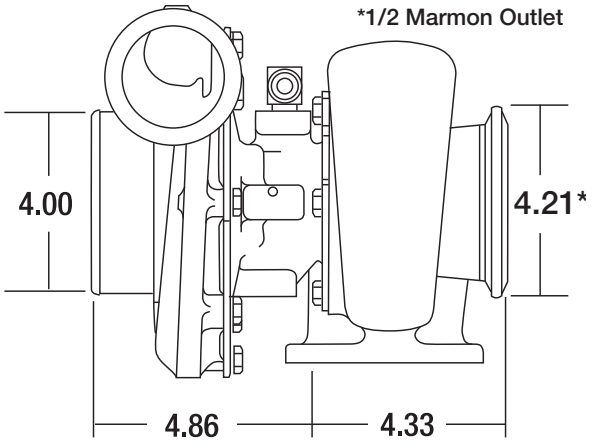
* Compressor inlet diameter 4.00"

S300SX3

320 - 800 HP Turbo

Turbo Frame Dimensions



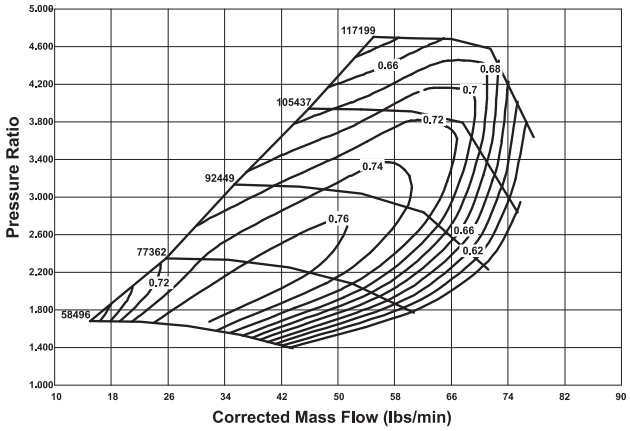


Turbo Features

- Twin hydrodynamic journal bearings
- Extended tip technology compressor wheel
- Twin scroll turbine housing options available
- Adjustable compressor and turbine housing orientation
- Compressor cover recirculation grooves

Compressor Map

(Applicable to part number 177281 & 177275)



Turbine Housing

Part Number	A/R	Notes
177211	0.88	
177208	0.91	
177209	1.00	(177272 Only)
177210	0.88	(177272 Only)

Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Cartridge Assembly	Service Kit
177281	3.60	2.60	66	3.14	80	2.89	73	.88	176634	318393
177275	3.60	2.60	66	3.14	80	2.89	73	.91	176646	318393
177272	3.29	2.36	60	3.00	76	2.66	68	.91	176635	318393

S300SX3

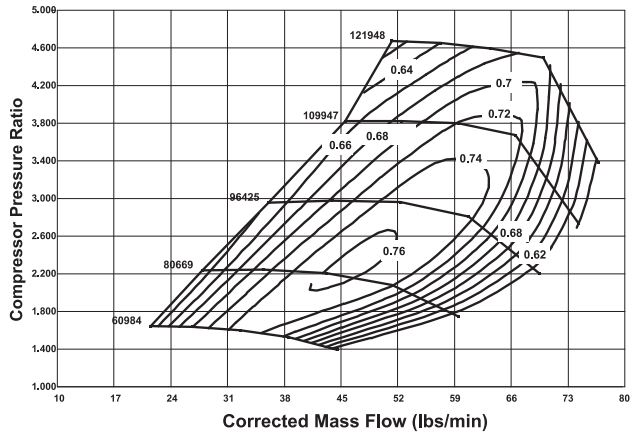
320 - 800 HP Turbo

Turbo Features

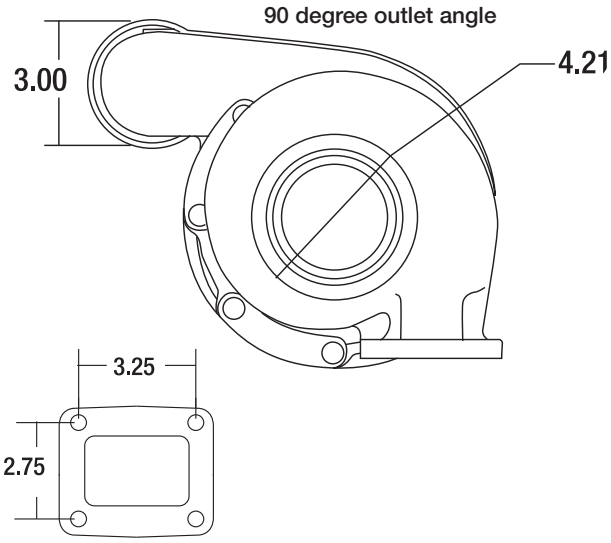
- Twin hydrodynamic journal bearings
- Extended tip technology compressor wheel
- Twin scroll turbine housing options available
- Adjustable compressor and turbine housing orientation
- Compressor cover recirculation grooves

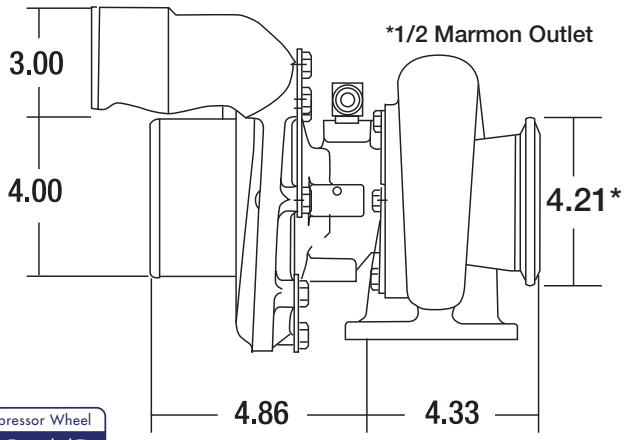
Compressor Map

(Applicable to part number 177283)



Turbo Frame Dimensions





Turbine Housing

Part Number	A/R	Notes
177207	0.91	(177280 & 283 Only)
177209	1.00	(177280 & 283 Only)
177211	0.88	(177284 Only)

Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Cartridge Assembly	Service Kit
177280	3.29	2.36	60	3.00	76	2.66	68	.88	171901	318393
177283	3.44	2.48	63	3.00	76	2.66	68	.88	176648	318393
177284	3.60	2.60	66	3.14	80	2.89	73	.91	176650	318393

S300GX

AIRWerks by BorgWarner Turbo Systems

Cummins 5.9 Upgrade

BorgWarner S300G Upgrade Turbo for Cummins 5.9 Engines

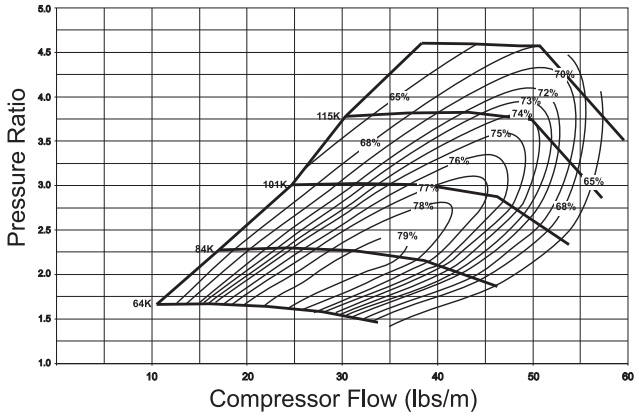
Turbo Features

The BorgWarner S300GX replacement turbo is more than a great match for your Cummins 5.9 engine. The S300G is aerodynamically designed to provide boost that can propel your Cummins 5.9 engine to 400 wheel horsepower. A rugged thrust bearing system helps insure the durability of your S300G, even under these extreme load conditions.

To realize the full horsepower potential of your S300G, we highly recommend the use of the following upgrade components:

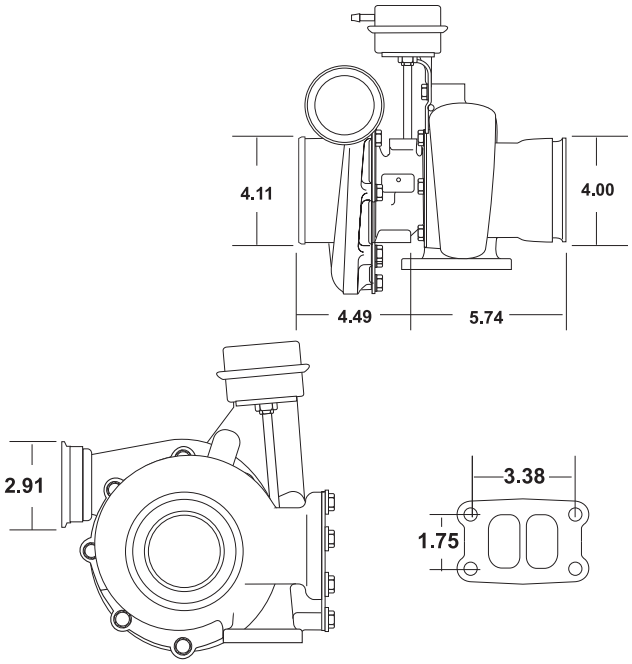
- 4" Exhaust System
- Performance Chip
- High Flow Fuel Injectors
- High Flow Air Filter
- Ram Air Intake Tube
- Boost Control Fitting

Compressor Map



Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Whl Inducer Dia. (mm)	Turbo Wheel O.D.	Turbo Wheel Exducer	Turbo Whl Exducer Dia (mm)	Turbo A/R
174430	3.29	2.25	57.10	2.92	2.54	64.50	.80

Turbo Frame Dimensions



Dodge 5.9 Engine Performance Turbo Upgrade Chart

Model Year	Transmission Type	Stock Horsepower	BWTS Turbo Part Number	Turbo Mfr. Model Number
1994	Auto	160	174430	S300G
1994	Manual	175		
1994	One Ton Truck	240		
1995	Auto	160	174430	S300G
1995	Manual	175		
1996	Auto	180	174430	S300G
1996	Manual	215		
1996	California Emission	180		
1997	Auto	180	174430	S300G
1997	Manual	215		
1997	California Emission	180		
1998	12 Valve Auto	180	174430	S300G
1998	12 Valve Manual	215		
1998	12 Calif Emission	180		
1998.5	12 Valve Auto & Manual	215	174430	S300G
1999	Auto	215	174430	S300G
1999	Manual	230		
2000	Auto	215	174430	S300G
2000	Manual	230		
2001	Auto	235	174430	S300G
2001	Manual	245		
2002	Auto	235	174430	S300G
2002	Manual	245		

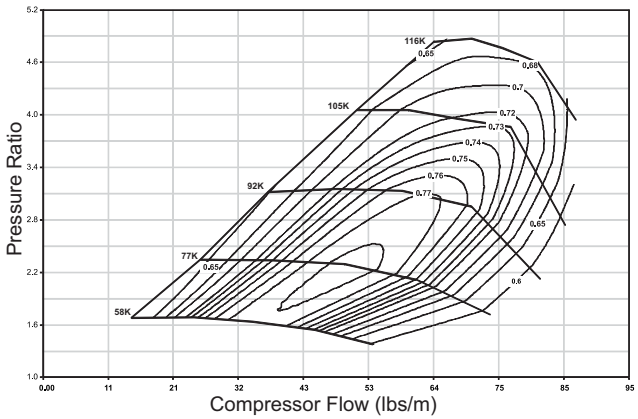
S400SX3

400 - 900 HP Turbo

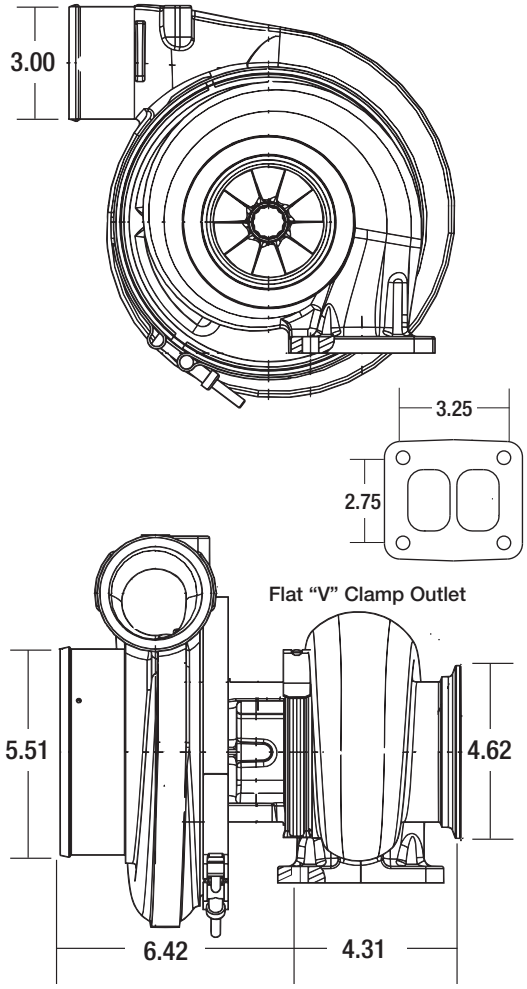
Turbo Features

- Twin hydrodynamic journal bearings.
- Extended Tip Technology Compressor Wheel
- Twin Scroll Turbine Housing
- Adjustable compressor and turbine housing orientation
- Compressor cover recirculation grooves
- Optimized compressor inlet geometry
- Forged Milled Wheel Technology

Compressor Map



Turbo Frame Dimensions



Compressor Wheel
Extended Tip Technology

FMW FORGED MILLED WHEEL TECHNOLOGY

Turbine Housing

Part Number	A/R
177102	0.90
177103	1.00
177104	1.10
177105	1.25

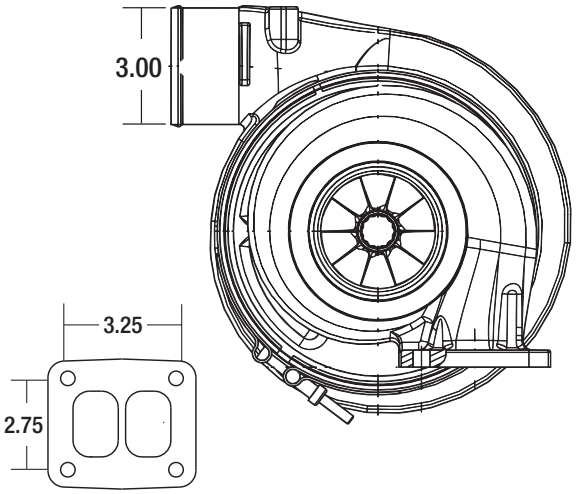
Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Super Core	Cartridge Assembly	Service Kit
178855	3.60	2.66	67.66	3.29	83.47	2.92	74.29	1.10	179352*	178856	318396

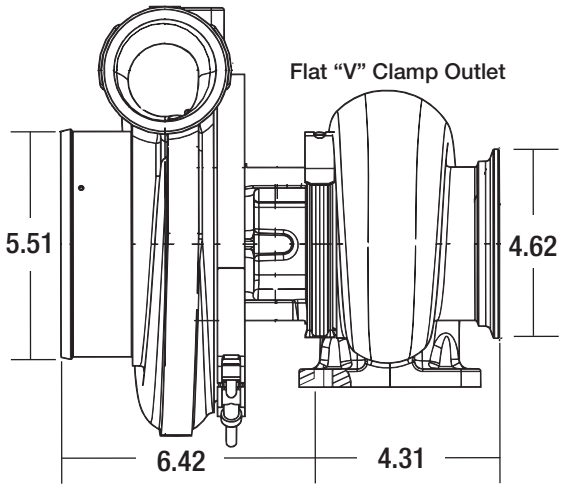
* Super core options found on page 52

S400SX3

500 - 1000 HP Turbo

Turbo Frame Dimensions

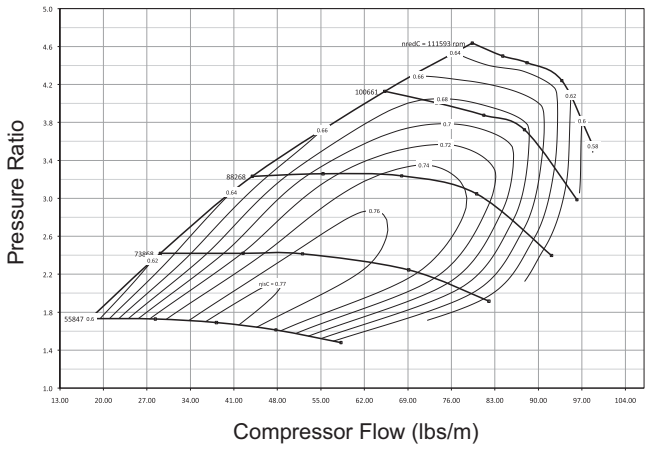




Turbo Features

- Twin hydrodynamic journal bearings.
- Extended Tip Technology Compressor Wheel
- Twin Scroll Turbine Housing
- Adjustable compressor and turbine housing orientation
- Standard turbine inlet and outlet allows for drop-in to exsisting turbo'd applications
- Compressor cover recirculation grooves

Compressor Map



Turbine Housing

Part Number	A/R
178787	0.90
178788	1.00
178789	1.10
178790	1.25

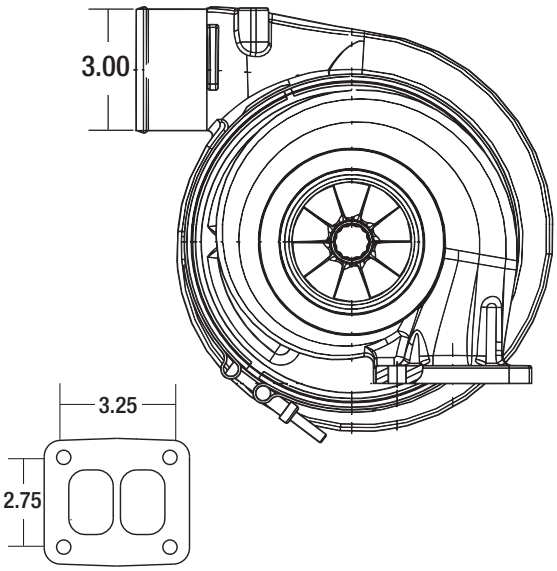
Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel Exducer	Turbine Wheel Exducer Dia (mm)	Turbine A/R	Super Core	Cartridge Assembly	Service Kit
179172	3.78	2.83	72	87.37	3.22	81.74	1.10	179171	14009097000	318396

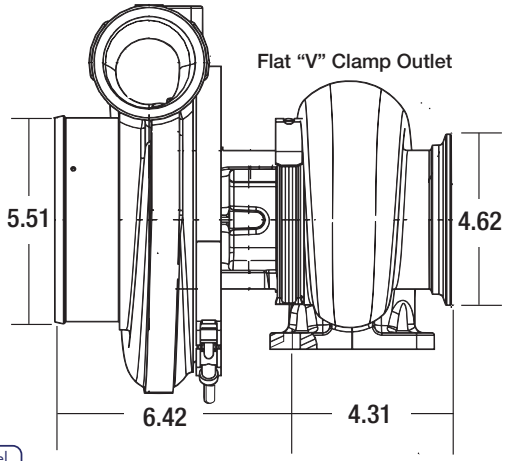
* Super core options found on page 52

S400SX3

500 - 1050 HP Turbo

Turbo Frame Dimensions

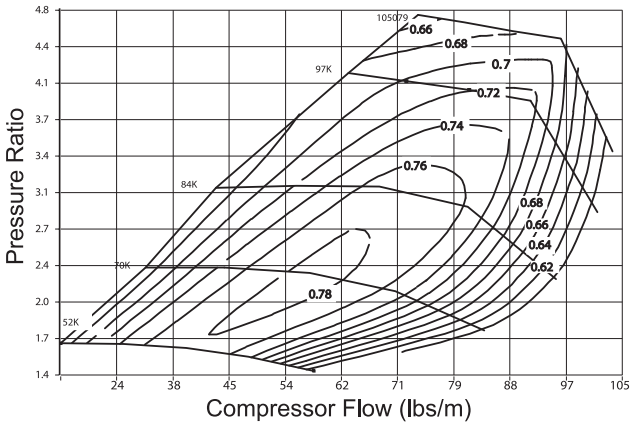




Turbo Features

- Twin hydrodynamic journal bearings.
- Extended Tip Technology Compressor Wheel
- Twin Scroll Turbine Housing
- Adjustable compressor and turbine housing orientation
- Standard turbine inlet and outlet allows for drop-in to existing turbo'd applications
- Compressor cover recirculation grooves

Compressor Map



Turbine Housing

Part Number	A/R
178787	0.90
178788	1.00
178789	1.10
178790	1.25

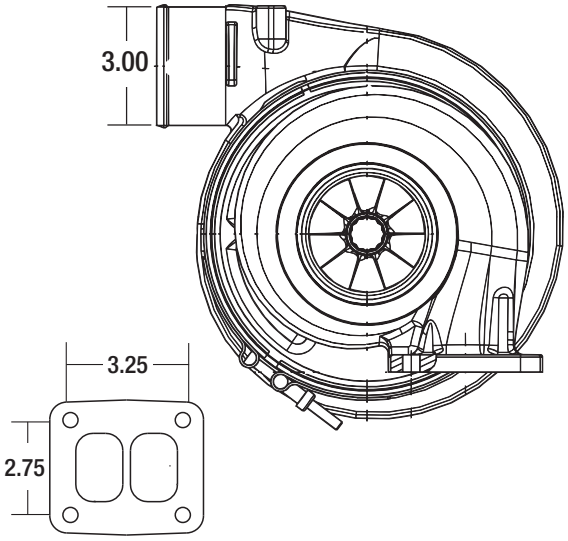
Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer Dia (mm)	Turbine A/R	Super Core	Cartridge Assembly	Service Kit
179174	3.94	2.94	74.56	3.44	87.37	3.22	81.74	1.10	179175	14009097001	318396

* Super core options found on page 52

S400SX3

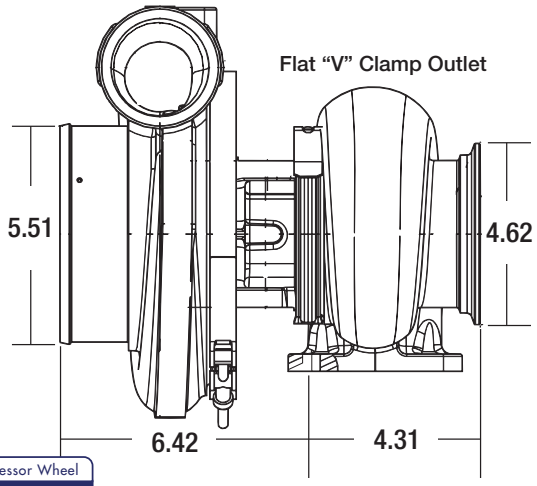
550 - 1100 HP Turbo

Turbo Frame Dimensions

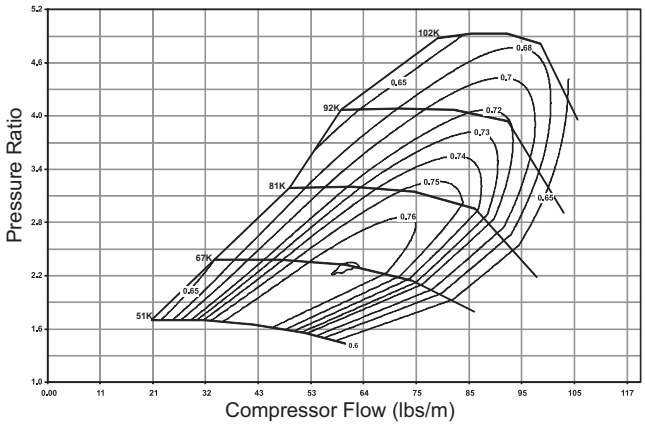


Turbo Features

- Twin hydrodynamic journal bearings.
- Extended Tip Technology Compressor Wheel
- Twin Scroll Turbine Housing
- Adjustable compressor and turbine housing orientation
- Compressor cover recirculation grooves
- Optimized compressor inlet geometry



Compressor Map



Compressor Wheel
Extended Tip Technology

Turbine Housing

Part Number	A/R
178787	0.90
178788	1.00
178789	1.10
178790	1.25

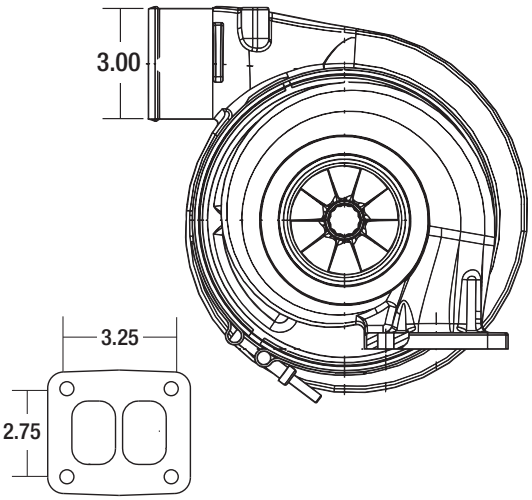
Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Super Core	Cartridge Assembly	Service Kit
179176	4.13	2.99	76.00	3.44	87.37	3.22	81.74	1.10	178781*	178782	318396

* Super core options found on page 52

S400SX3

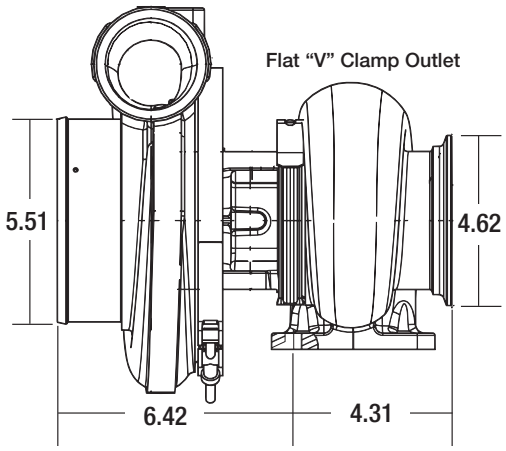
750 - 1250 HP Turbo

Turbo Frame Dimensions

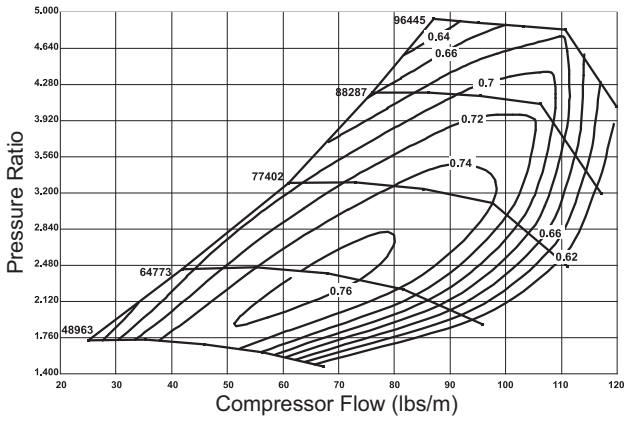


Turbo Features

- Twin hydrodynamic journal bearings.
- Extended Tip Technology Compressor Wheel
- Twin Scroll Turbine Housing
- Adjustable compressor and turbine housing orientation
- Compressor cover recirculation grooves
- Optimized compressor inlet geometry
- Forged Milled Wheel Technology



Compressor Map



Compressor Wheel
Extended Tip Technology

FMW FORGED MILLED WHEEL TECHNOLOGY

Turbine Housing

Part Number	A/R
178787	0.90
178788	1.00
178789	1.10
178790	1.25

Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Super Core	Cartridge Assembly	Service Kit
179180	4.32	3.16	80.30	3.44	87.37	3.22	81.74	1.25	179179*	179181	318396

* Super core options found on page 52

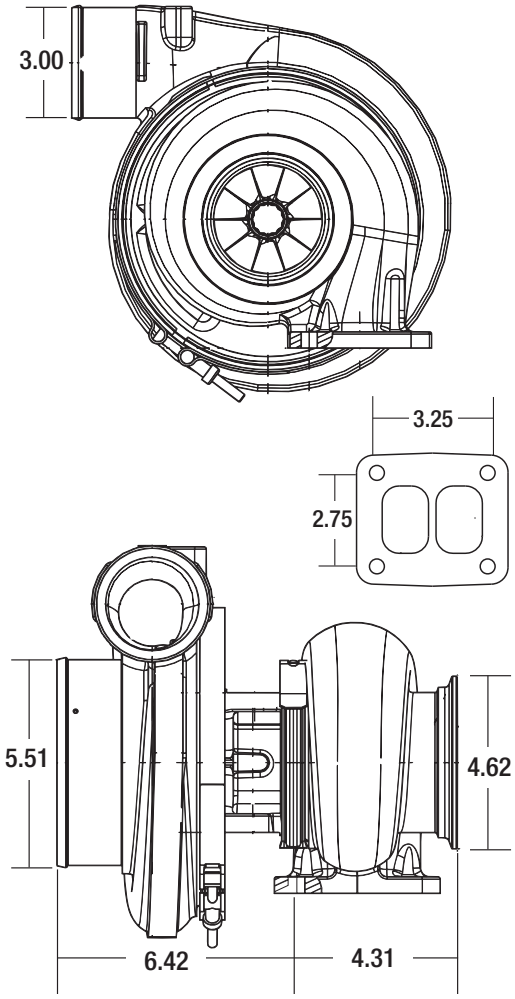
S400SX3

750 - 1300 HP Turbo

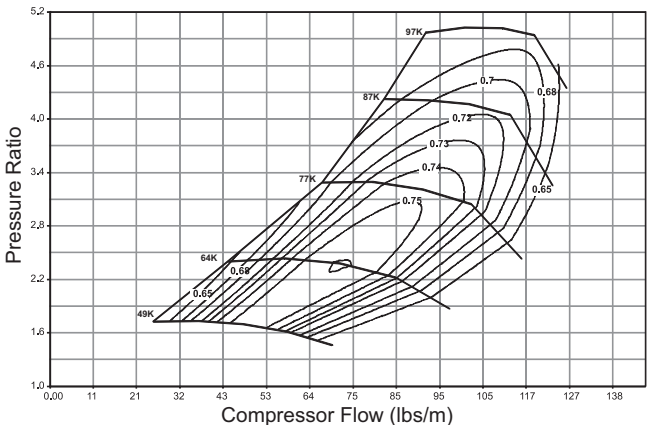
Turbo Features

- Twin hydrodynamic journal bearings.
- Extended Tip Technology Compressor Wheel
- Twin Scroll Turbine Housing
- Adjustable compressor and turbine housing orientation
- Compressor cover recirculation grooves
- Optimized compressor inlet geometry
- Forged Milled Wheel Technology

Turbo Frame Dimensions



Compressor Map



Compressor Wheel
Extended Tip Technology

FMW FORGED MILLED WHEEL TECHNOLOGY

Turbine Housing

Part Number	A/R
178787	0.90
178788	1.00
178789	1.10
178790	1.25

Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Super Core	Cartridge Assembly	Service Kit
179182	4.32	3.24	82.20	3.44	87.37	3.22	81.74	1.25	179184*	179183	318396

* Super core options found on page 52

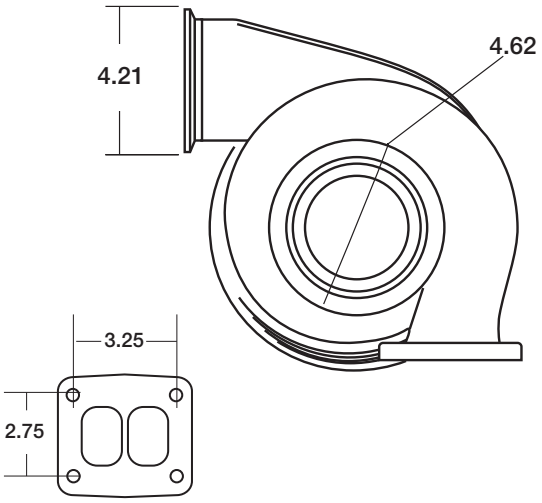
S400SX3

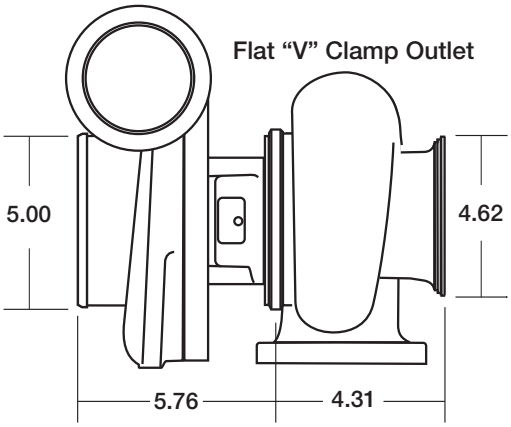
500 - 1050 HP Turbo

Turbo Features

- Twin hydrodynamic journal bearings
- Extended tip technology compressor wheel
- Twin scroll turbine housing
- Adjustable compressor and turbine housing orientation
- Standard turbine inlet and outlet allows for drop-in to existing turbocharged applications
- Compressor cover recirculation grooves

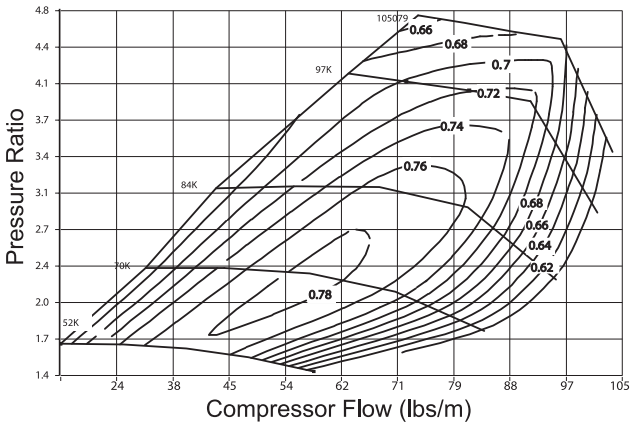
Turbo Frame Dimensions





Compressor Map

(Applicable to part number 177101)



Turbine Housing

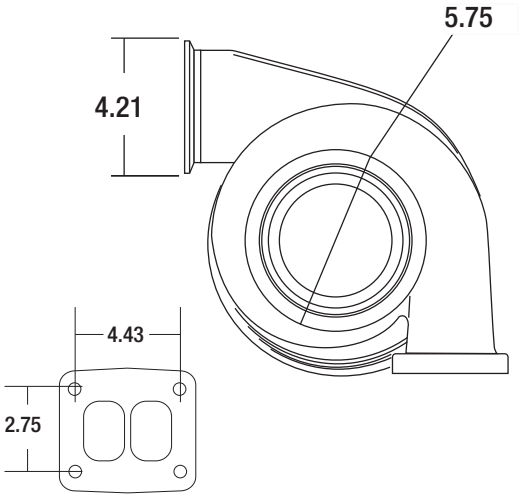
Part Number	A/R
177102	0.90
177103	1.00
177104	1.10
177105	1.25

Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D.	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Cartridge Assembly	Service Kit
177248	3.94	2.80	71.08	3.29	83	2.93	74	1.10	177249	318396
177101	3.94	2.94	74.56	3.29	83	2.93	74	1.10	176807	318396

S400SX4

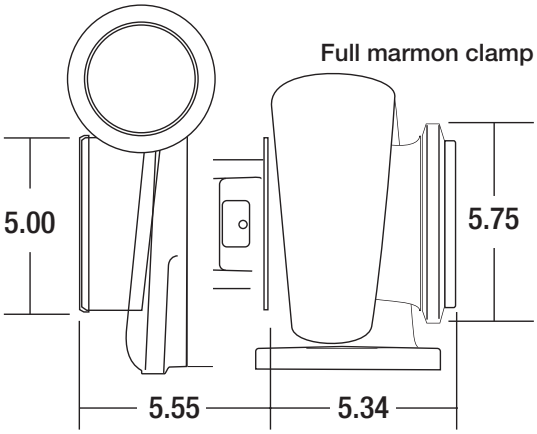
500 - 1050 HP Turbo

Turbo Frame Dimensions



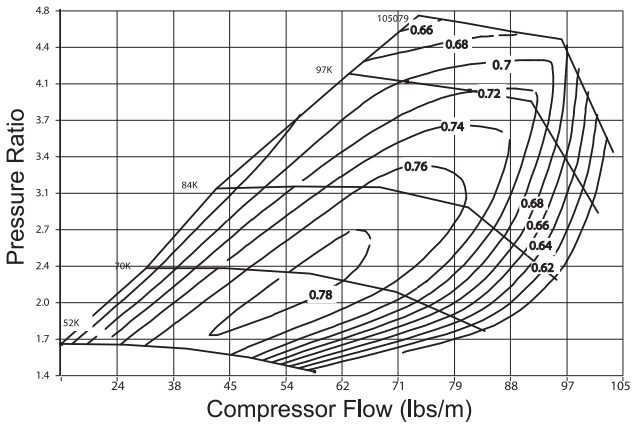
Turbo Features

- Twin hydrodynamic journal bearings
- Extended tip technology compressor wheel
- Twin scroll turbine housing
- Adjustable compressor and turbine housing orientation
- Compressor cover recirculation grooves



Compressor Map

(Applicable to part numbers 177101)



Turbine Housing, 176806 Only

Part Number	A/R
176809	0.90
176810	1.00
176811	1.10
176812	1.25

Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D.	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Cartridge Assembly	Service Kit
171701	3.94	2.80	71	3.77	96	3.47	88	1.32	171699	176391
171702	3.94	2.94	75	3.77	96	3.47	88	1.32	171703	176391
176806	3.94	2.94	75	3.29	83	2.93	74	1.10	176807	318396

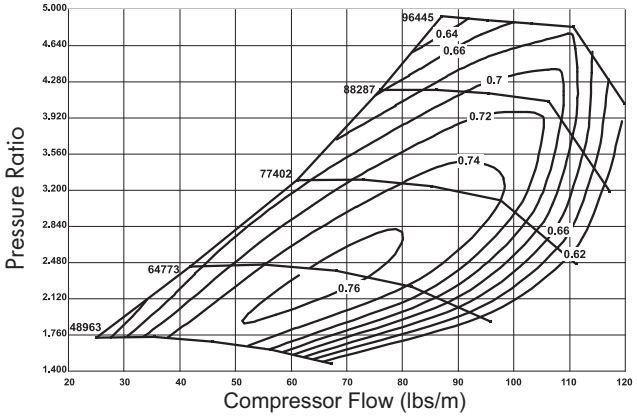
S400SX4

750 - 1250 HP Turbo

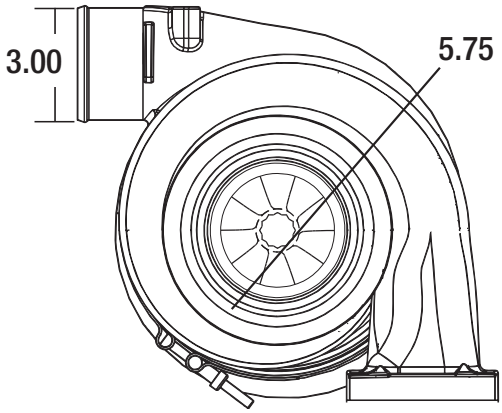
Turbo Features

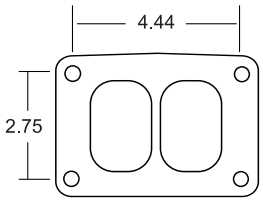
- Twin hydrodynamic journal bearings
- Extended tip technology compressor wheel
- Twin scroll turbine housing
- Adjustable compressor and turbine housing orientation
- Compressor cover recirculation grooves

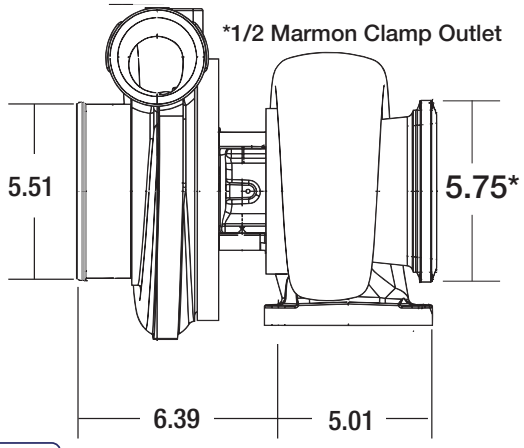
Compressor Map



Turbo Frame Dimensions







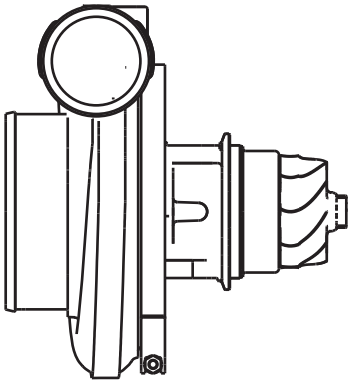
Turbine Housing

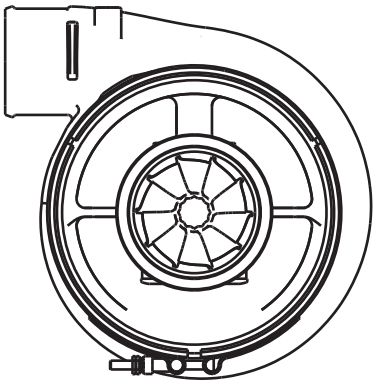
Part Number	A/R	Notes
171698	1.32	Divided flow
14961016100	1.58	Divided flow

Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Cartridge Assembly	Service Kit
177287	4.32	3.16	80	3.77	96	3.47	88	1.32	176654	176391

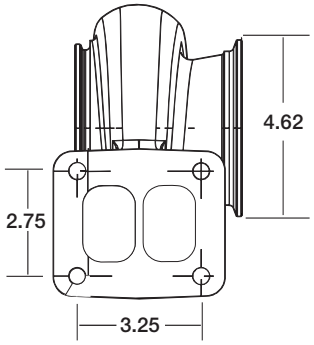
S400SX Super Core

320 - 800 HP Turbo

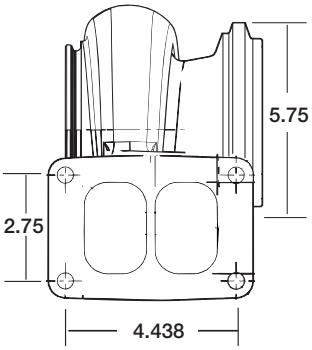




Outlet Configuration "Flat V"



Outlet Configuration "Full Marmon"



83mm (O.D.) Turbine Wheel

Component	Part Number
Turbo	178855
Super Core	179352

Turbine Housing Options

Part No.	A/R	Outlet Configuration
177102	0.90	Flat V
177103	1.00	Flat V
177104	1.10	Flat V
177105	1.25	Flat V

87mm (O.D.) Turbine Wheel

Component	Part No.	Part No.	Part No.	Part No.	Part No.
Turbo	179172	179174	179176	179180	179182
Super Core	179171	179175	178781	179179	179184

Turbine Housing Options

Part No.	A/R	Outlet Configuration
178787	0.90	Flat V
178788	1.00	Flat V
178789	1.10	Flat V
178790	1.25	Flat V

Paul Protacio, SFWD
S400SX3

Ricky Everly, SFWD
S400SX3

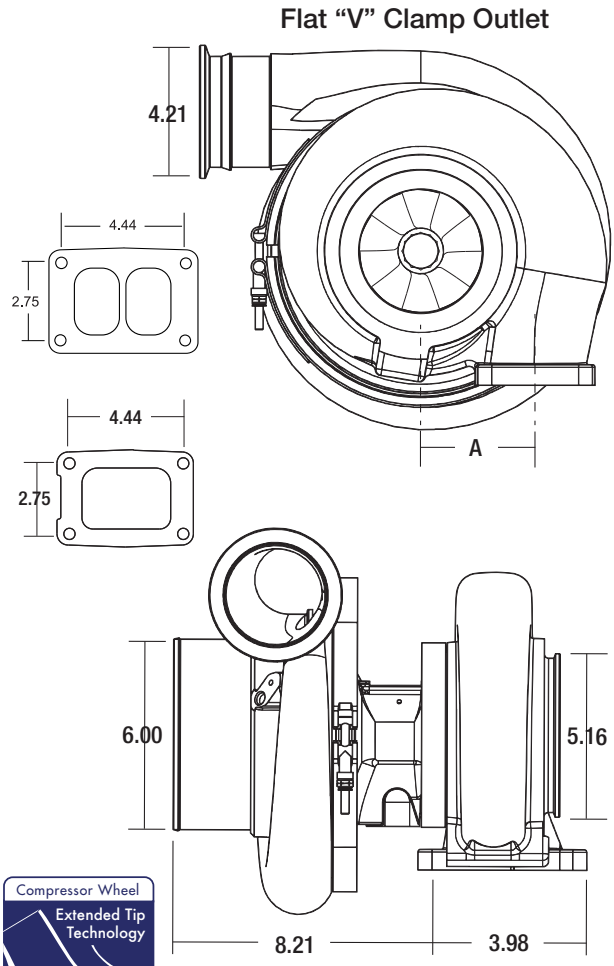
S500SX

900 - 1475 HP Turbo

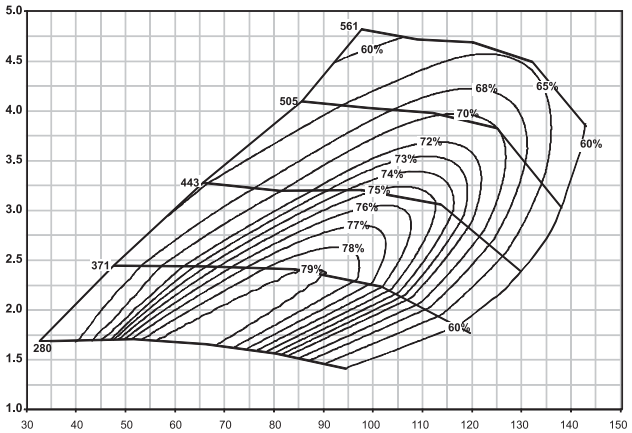
Turbo Features

- Twin hydrodynamic journal bearings.
- Extended Tip Technology Compressor Wheel
- Available in twin scroll and open flow turbine volute options
- Adjustable compressor and turbine housing orientation
- Compressor cover recirculation grooves
- Optimized compressor inlet geometry
- Dual machined compressor cover discharge connection (v-band or hose bead)
- Premachined speed sensor mounting boss

Turbo Frame Dimensions



Compressor Map



Turbine Housing

A/R	Part Number	Turbine Inlet Centerline (A)	Other Notes
0.85	179159	3.62"	Volute, Open Flow
1.00	179160	3.62"	Volute, Open Flow
1.15	179161	4.25"	Volute, Open Flow
1.30	178498	3.62"	Volute, Open Flow; .50" longer turbine discharge
1.45	179162	4.25"	Volute, Open Flow
1.15	179478	3.62"	Volute, Twin Flow (Divided)
1.45	179192	3.62"	Volute, Twin Flow (Divided)
1.60	179193	3.62"	Volute, Twin Flow (Divided)

Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Super Core	Cartridge Assembly	Service Kit
179188	120.20	3.47	88.19	4.32	109.73	3.90	99.08	0.85	179186*	179187	173611

* Super core options found on page 55

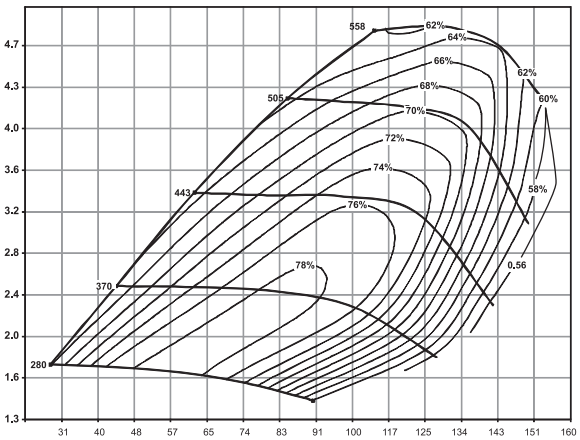
S500SX

900 - 1575 HP Turbo

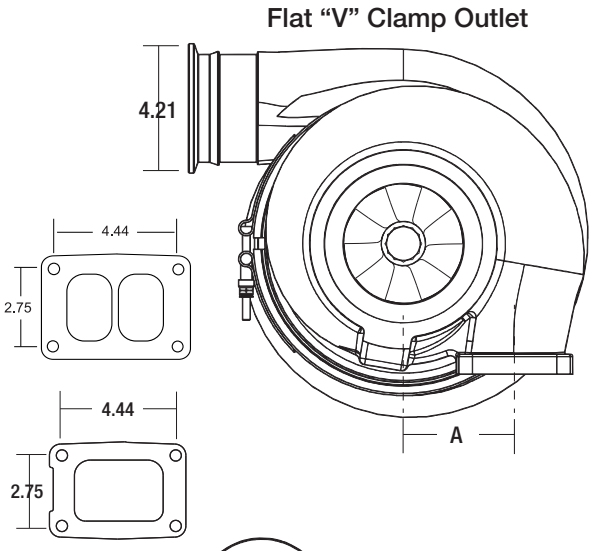
Turbo Features

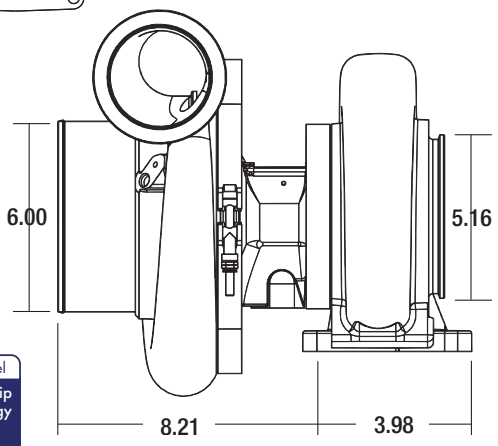
- Twin hydrodynamic journal bearings.
- Extended Tip Technology Compressor Wheel
- Available in twin scroll and open flow turbine volute options
- Adjustable compressor and turbine housing orientation
- Compressor cover recirculation grooves
- Optimized compressor inlet geometry
- Dual machined compressor cover discharge connection (v-band or hose bead)
- Premachined speed sensor mounting boss

Compressor Map



Turbo Frame Dimensions



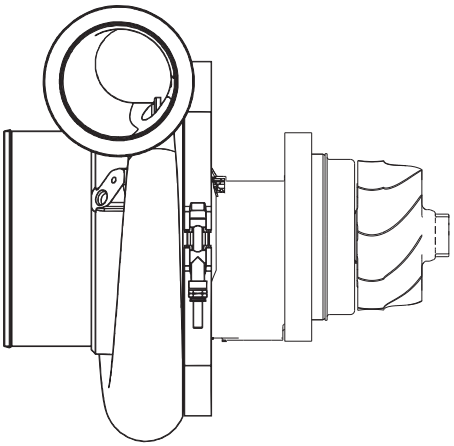


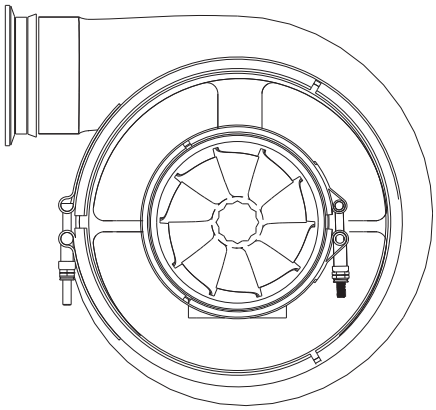
Turbine Housing

A/R	Part Number	Turbine Inlet Centerline (A)	Other Notes
0.85	179159	3.62"	Volute, Open Flow
1.00	179160	3.62"	Volute, Open Flow
1.15	179161	4.25"	Volute, Open Flow
1.30	178498	3.62"	Volute, Open Flow; .50" longer turbine discharge
1.45	179162	4.25"	Volute, Open Flow
1.15	179478	3.62"	Volute, Twin Flow (Divided)
1.45	179192	3.62"	Volute, Twin Flow (Divided)
1.60	179193	3.62"	Volute, Twin Flow (Divided)

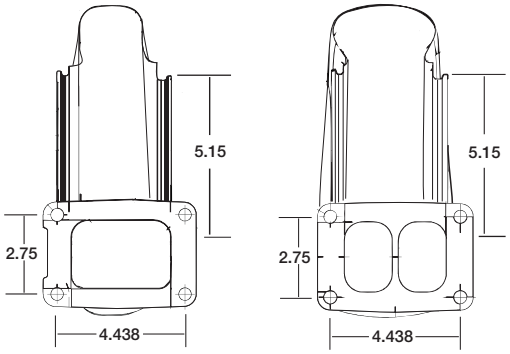
Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Super Core	Cartridge Assembly	Service Kit
179191	4.73	3.57	90.67	4.32	109.73	3.90	99.08	0.85	179190*	179189	173611

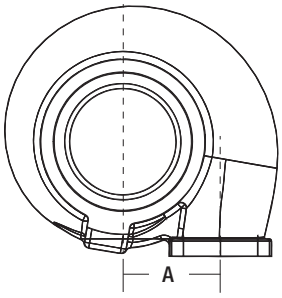
* Super core options found on page 55





Turbine Housing Configurations



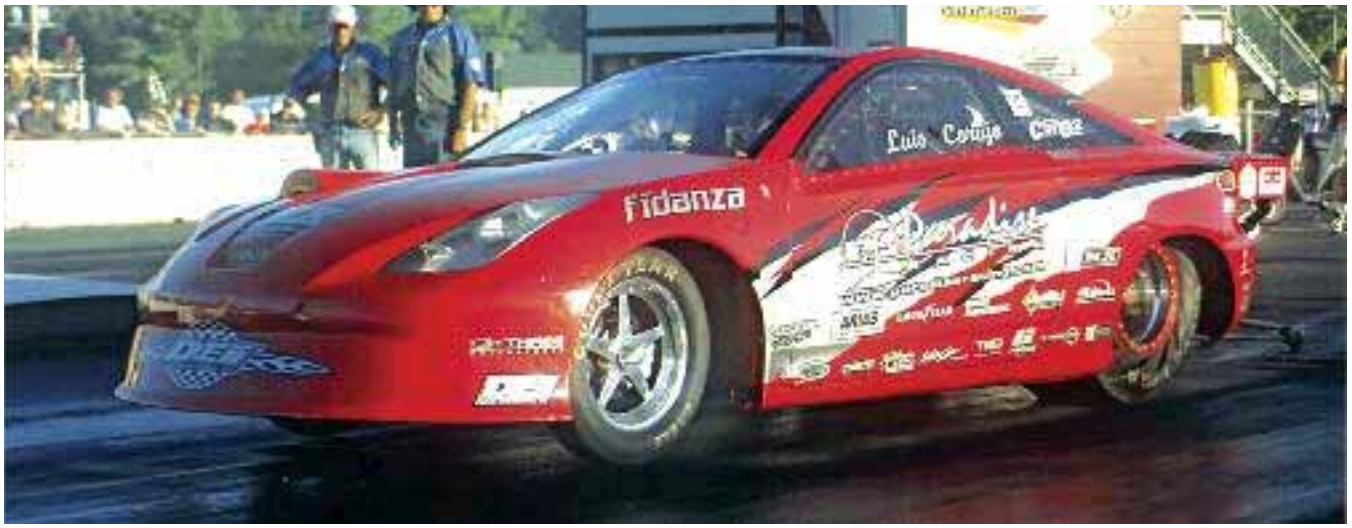


Turbine Housing

A/R	Part Number	Turbine Inlet Centerline (A)	Other Notes
0.85	179159	3.62"	Volute, Open Flow
1.00	179160	3.62"	Volute, Open Flow
1.15	179161	4.25"	Volute, Open Flow
1.30	178498	3.62"	Volute, Open Flow; .50" longer turbine discharge
1.45	179162	4.25"	Volute, Open Flow
1.15	179478	3.62"	Volute, Twin Flow (Divided)
1.45	179192	3.62"	Volute, Twin Flow (Divided)
1.60	179193	3.62"	Volute, Twin Flow (Divided)

110mm (O.D.) Turbine Wheel

Component	Part Number	Part Number
Turbo	179188	179191
Super Core	179186	179190

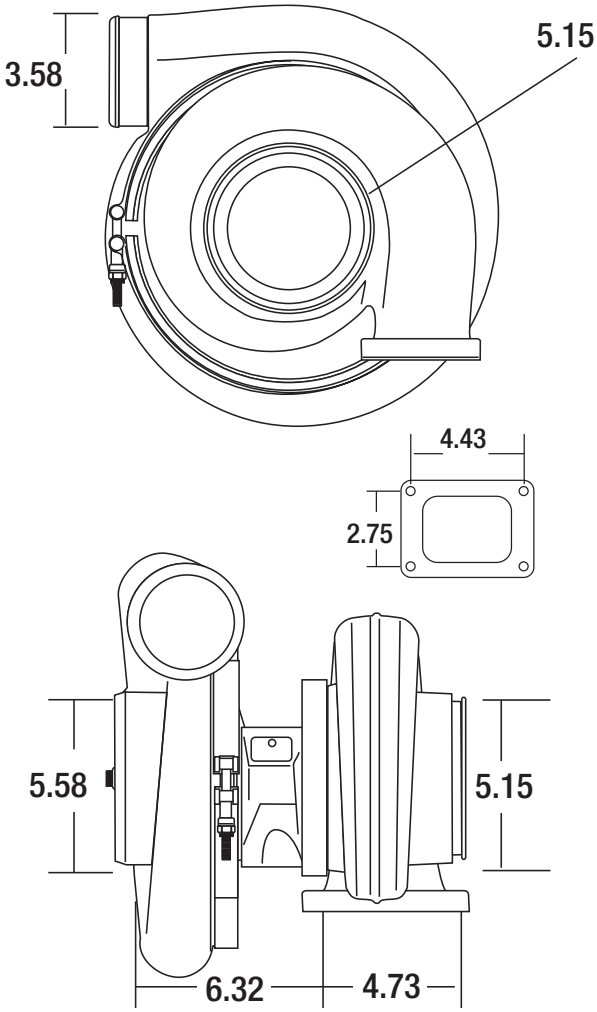


Luis Corujo, Paradise Racing S500SX

S510

1000 - 1650 HP Turbo

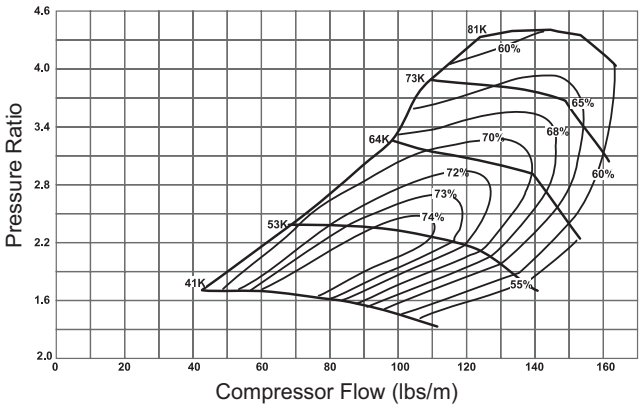
Turbo Frame Dimensions



Turbo Features

- Twin hydrodynamic journal bearings
- Extended tip technology compressor wheel
- Open flow turbine housing
- Adjustable compressor and turbine housing orientation
- Compressor cover recirculation grooves

Compressor Map

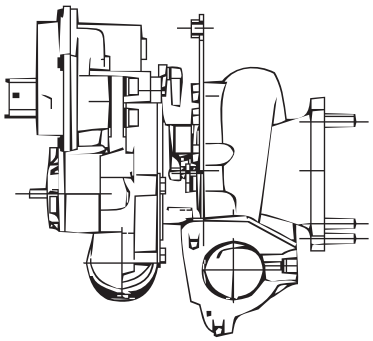


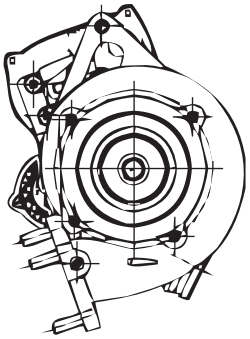
Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Cartridge Assembly	Service Kit
174289	5.18	3.75	95	4.32	110	3.90	99	1.15	174291	173611
174290	5.18	3.75	95	4.32	110	3.90	99	1.45	174291	173611

BV50

Porche 997 Upgrade

Turbo Frame Dimensions

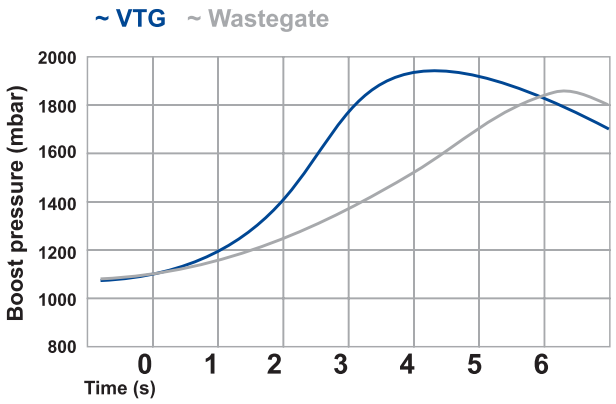




BV50

BorgWarner was the first manufacturer in the world to offer VTG turbochargers for gasoline engines in mass production. BV turbos employ materials and designs that are optimally tuned to the high thermal loads in gasoline engines. BorgWarner has developed a robust VTG mechanism that works reliably even in the toughest of conditions and also employ a CFD-Optimized vane design that provides excellent efficiency.

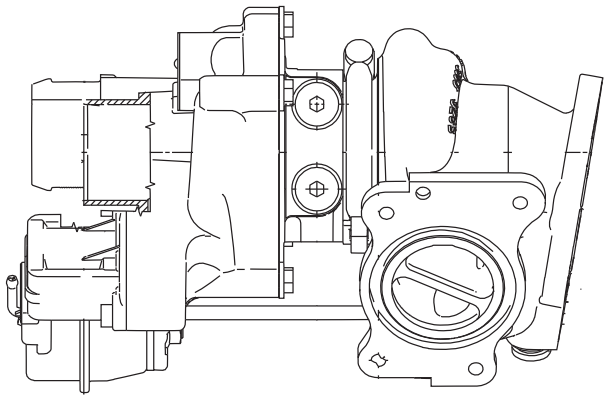
Turbo Comparison



Manufacturer	Vehicle	Reference No.	Year	HP	Litres	Service Turbo No.	Model Spec	Remarks
Porsche	911 Turbo (997)	997.123.014.72	2005	480	3.6	5304 988 0060	BV50-2277	Stock Turbo (Right Side)
Porsche	911 Turbo (997)	997.123.013.72	2005	480	3.6	5304 988 0061	BV50-2277	Stock Turbo (Left Side)
Porsche	911 GT2 (997)	997.123.078.71	2007	530	3.6	5304 988 0080	BV50-2280	Upgrade Turbo (Right Side)
Porsche	911 GT2 (997)	997.123.014.70	2007	530	3.6	5304 988 0081	BV50-2280	Upgrade Turbo (Left Side)

K03-2074

Mini Upgrade



Turbo Features

- High temperature alloy turbine housing
- Extended tip compressor wheel
- Twin scroll turbine housing
- Water cooled bearing housing

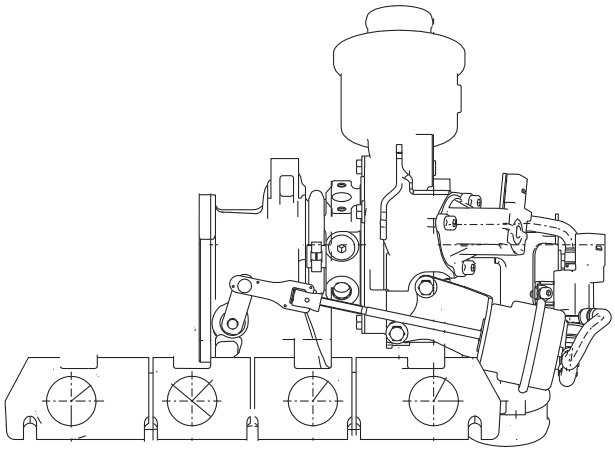
Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Whl Inducer Dia. (mm)	Turbo Wheel O.D.	Turbo Wheel Exducer	Turbo Whl Exducer Dia (mm)	Turbo A/R
5303 988 0146	51.00	1.61	41	45	1.58	40.3	4cm^2

Manufacturer	Year	Engine	Stock Turbo	Stock Turbo HP Limit	Upgrade HP	Upgrade Turbo	Model Spec Part Number	Remarks
Mini	From 2006	EP6 DTS	5303 988 0163	215	255	5303 988 0146	K03-2074D	Twin Scroll Turbine Housing

K03-2080

AIRWerks by BorgWarner Turbo Systems

Audi A4 Upgrade



Turbo Features

- High temperature alloy turbine housing
- Extended tip compressor wheel
- Water cooled bearing housing

The 1.8 TFSI also uses a compact integrated turbocharger module. Since the manifold and turbine housing are combined to form a single component made of a highly heat-resistance material, this system not only saves space, it also offers thermodynamic advantages.

Manufacturer	Vehicle	Year	Engine	Stock Turbo	Stock Turbo HP Limit	Upgrade HP	Upgrade Turbo Part Number	Model Spec	Remarks
Audi	A4	From 2007	1.8 TFSI	5303 988 0141	215	255	5303 988 0106	K03-2080D	Integrated Manifold
Audi	A4	From 2007	1.8 TFSI	5303 988 0119	160	255	5303 988 0106	K03-2080D	Integrated Manifold

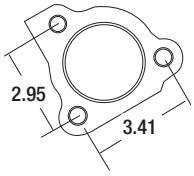
K04-2075

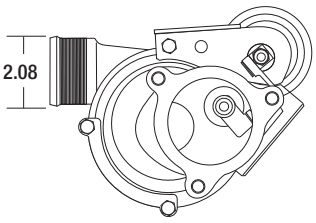
220 HP Turbo

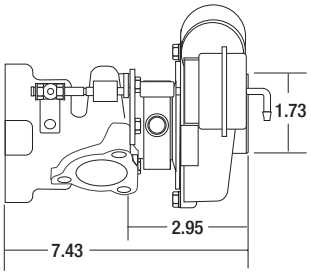
Turbo Features

How about a BorgWarner AirWerks K04 series performance upgrade turbo, developed specifically for Audi and VW 1.8 liter engines? This upgrade option can enhance engine performance as much as 15%. Ultimate output may vary depending on prior engine condition, fuel settings and other supporting performance components. Only qualified companies and tuner shops should attempt to make performance modifications to the engine and the vehicle.

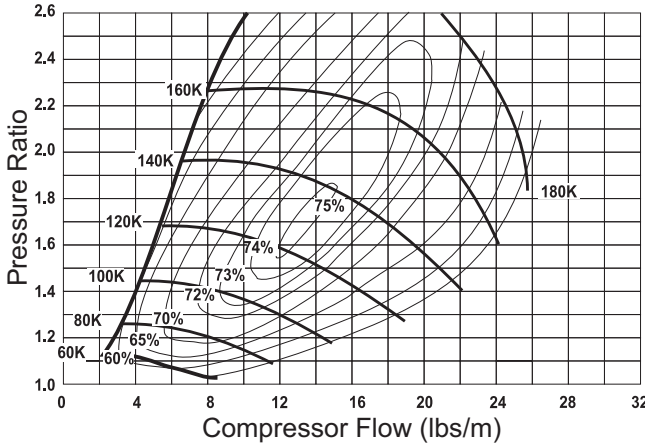
Turbo Frame Dimensions







Compressor Map



Application Model	Model Year	Engine Spec	Rated HP
Audi A4 A6 / 1.8T	95-99	1.8 liter 5-Valve, Inline	220
Passat	96-99	1.8 liter 5-Valve, Inline	220

Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Cartridge Assembly	Service Kit
5304 988 0015	1.97	1.48	37.6	1.81	46	1.65	42	4 cm^2	5304 710 0503	5303 711 0000

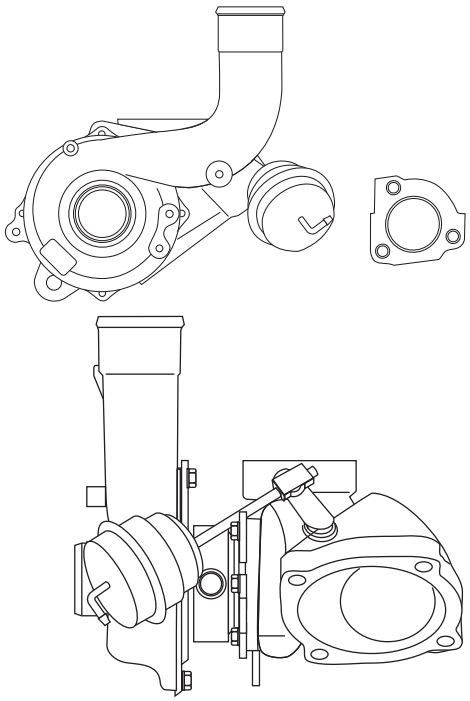
K04-2075

220 HP Turbo

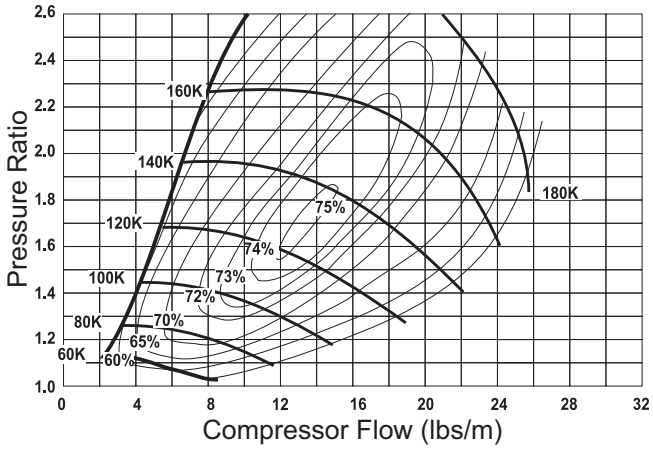
Turbo Features

How about a BorgWarner AirWerks K04 series performance upgrade turbo, developed specifically for Audi and VW 1.8 liter engines? This upgrade option can enhance engine performance as much as 15%. Ultimate output may vary depending on prior engine condition, fuel settings and other supporting performance components. Only qualified companies and tuner shops should attempt to make performance modifications to the engine and the vehicle.

Turbo Frame Dimensions



Compressor Map



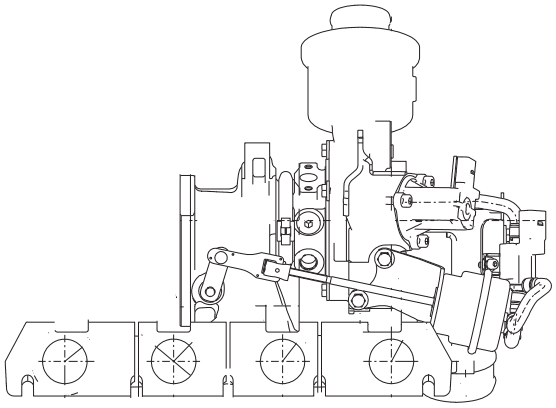
Application Model	Model Year	Engine Spec	Rated HP
Audi A3 1.8T, VW Beetle	96-01	1.8 liter 5-Valve, Transverse	220
Golf	1996	1.8 liter 5-Valve, Transverse	220

Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Cartridge Assembly	Service Kit
5304 950 0001	1.97	1.70	37.6	1.81	46	1.65	42	5 cm^2		5303 711 0000

K04-2283

325 Peak Horsepower

Turbo Frame Dimensions



The electrical recirculation valve, which is also integrated into the compressor casing, guarantees fast response times when closing the throttle valve. The use of a "latest generation" turbine wheel helps increase the efficiency of the turbocharger significantly, while optimized thermodynamics have led to further improvements in fuel consumption and transient behavior, i.e. the acceleration of the engine at full throttle. Original turbo has electronic pop-off valve integrated into comp/hsg, upgrade turbo has not. External pop-off valve has to be fitted. Moreover, K04-064 has a larger compressor housing discharge.

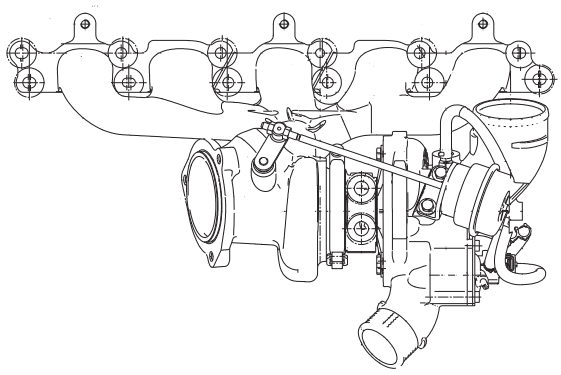
Turbo Features

- High-temperature alloy turbine housing
- Extended tip compressor wheel
- Water cooled bearing housing

Manufacturer	Vehicle	Year	Engine	Stock Turbo	Stock Turbo HP Limit	Upgrade HP	Upgrade Turbo Part Number	Model Spec	Remarks
Audi	A4	From 2004	2.0 TFSI	5303 988 0105	255	325	5304 988 0064*	K04-2283D	Integrated Manifold
Audi	A4	From 2003	2.0 TFSI	5303 988 0086	255	325	5304 988 0064*	K04-2283D	Integrated Manifold

K16-2480

370 Peak Horsepower



Volvo's requirement for the developers at BorgWarner was to replace the bi-turbo boosting of the previous engine with a new unit with single-turbo boosting. The new 6-cylinder engine also had to possess at least the same transient response as its predecessor, and of course fuel consumption and emissions needed to be brought up to date. With the K16 used in the Volvo 6-cylinder engine, BorgWarner unveils the first in a wide range of turbos for gasoline engines displacing from 1.6 to 3.0 liters or between 150 and 285 bhp.

Turbo Features

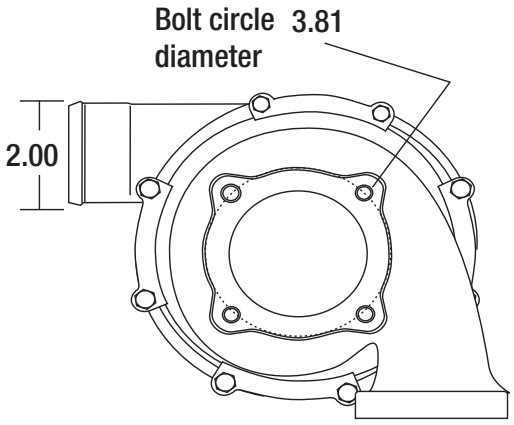
- High-temperature alloy turbine wheel
- Extended tip compressor wheel
- Water cooled bearing housing

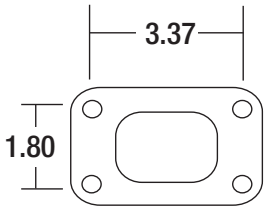
Manufacturer	Vehicle	Year	Engine	Stock Turbo	Stock Turbo HP Limit	Upgrade HP	Upgrade Turbo Part Number	Model Spec	Remarks
Volvo	S40/V50/XC60/C70	From 2003	2.5L RNC-RS	5304 988 0033	300	370	5316 998 0010	K16-2480D	Integrated Manifold
Ford	Focus	From 2005	2.5L RNC-RS	5304 988 0033	300	370	5316 998 0010	K16-2480D	Integrated Manifold

K27-3072

250 - 550 HP Turbo

Turbo Frame Dimensions

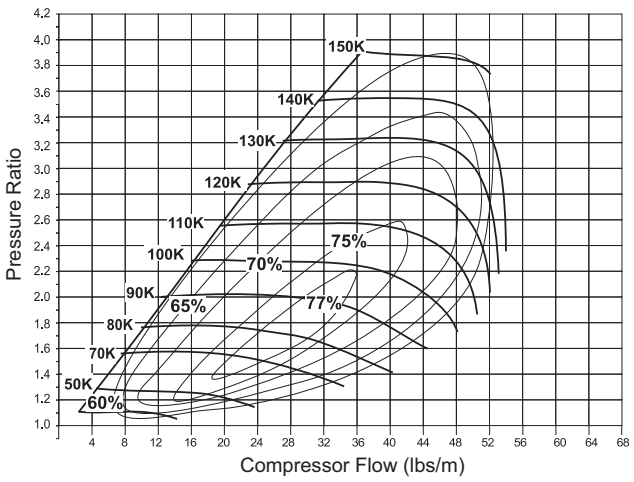


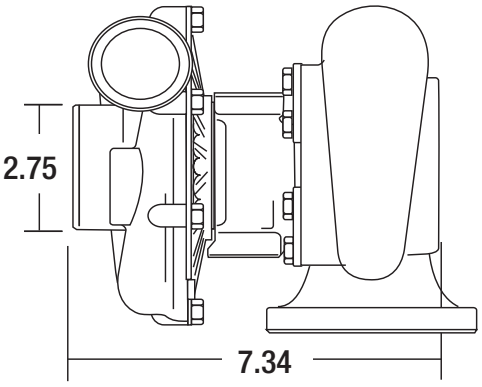


Turbo Features

- Twin hydrodynamic journal bearings
- Open volute design
- Adjustable compressor and turbine housing orientation
- Compact design
- High temperature alloy turbine housing

Compressor Map



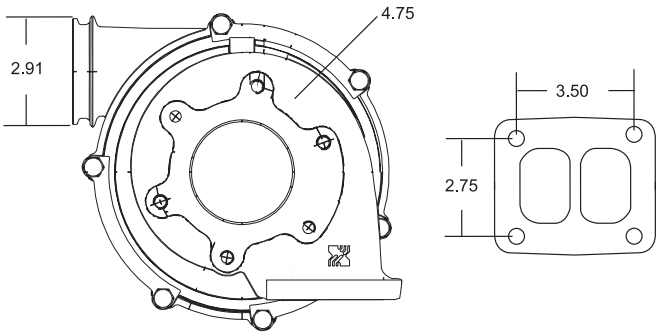


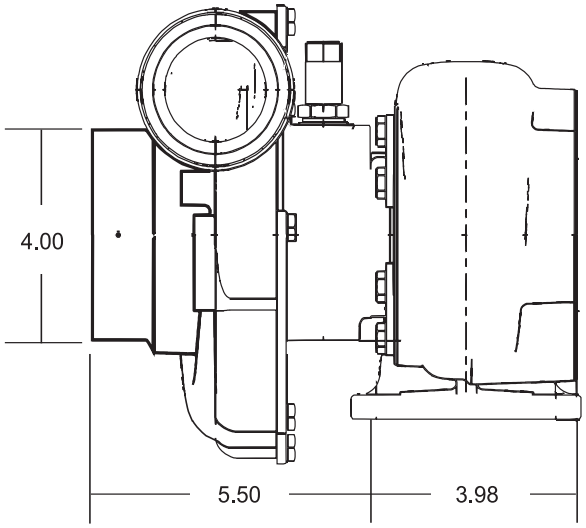
Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Cartridge Assembly	Service Kit
5327 988 7200	3.00	2.16	55	2.75	70	2.31	59	11²cm	5327 710 0518	5326 711 0040

K29-3775

500 - 875 HP Turbo

Turbo Frame Dimensions

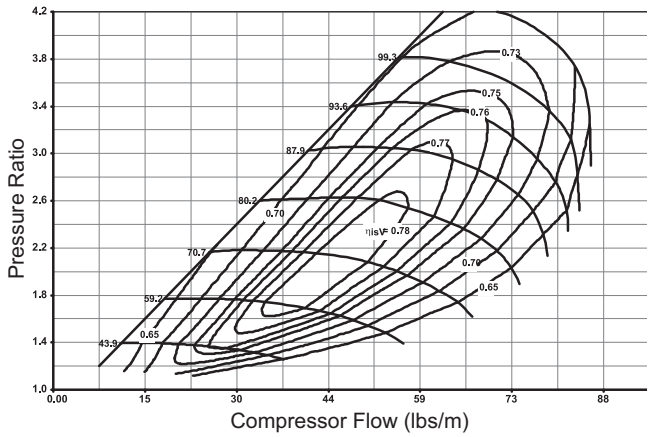




Turbo Features

- Twin hydrodynamic journal bearings
- Forged milled compressor wheel
- Twin scroll turbine housing
- Adjustable compressor and turbine housing orientation
- Compact design

Compressor Map



FMW FORGED MILLED WHEEL TECHNOLOGY

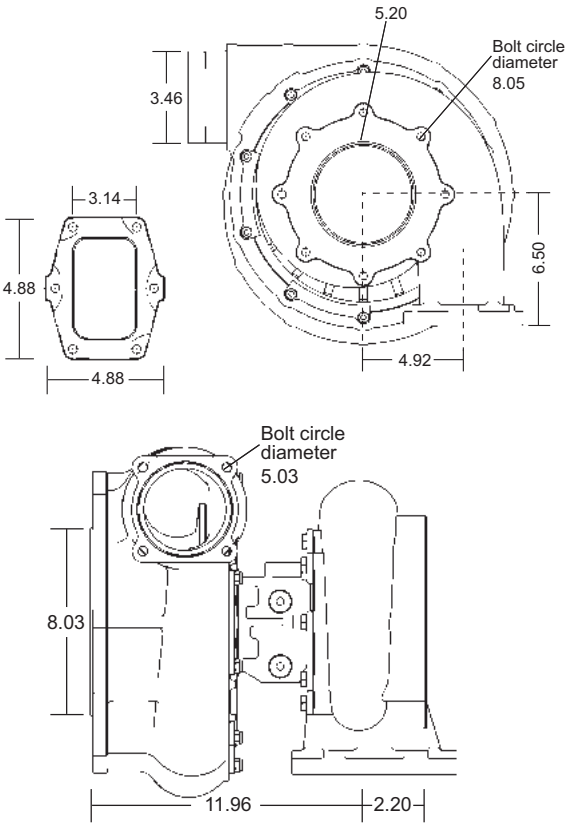
- Stronger Than Cast Wheels
- Higher Pressure Ratio
- Resists High Cycle Fatigue

Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D.	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer (mm)	Turbine A/R	Cartridge Assembly	Service Kit
53299887129	3.70	2.79	70.93	3.23	82	2.80	71.00	17²cm	N/A	5331 711 0005

K44

1100 - 2000 HP

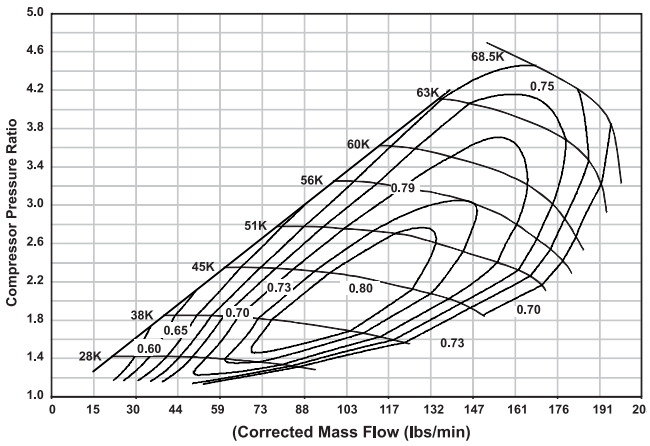
Turbo Frame Dimensions



Turbo Features

- 360 degree thrust bearing
- Twin hydrodynamic journal bearings.
- Adjustable compressor and turbine housing orientation
- Compressor cover recirculation grooves
- Frequency optimized compressor wheel

Compressor Map



Turbine Housing

Part Number	A/R
5344 101 6300	40²cm
5345 101 6301	36²cm

Turbo Part Number	Comp. Wheel O.D.	Comp. Wheel Inducer Dia.	Comp. Wheel Inducer Dia. (mm)	Turbine Wheel O.D. (mm)	Turbine Wheel Exducer	Turbine Wheel Exducer Dia. (mm)	Turbine A/R	Cartridge Assembly	Service Kit
5344 988 6900	6.14	4.24	107.7	140	4.92	125	32²cm	5344 710 0018	5344 711 0501

Limited Warranty: BorgWarner Turbo Systems, Inc. ("BWTS") warrants that its goods or merchandise will be free from defects in material and workmanship for its intended use and service. This warranty shall extend for a period of twelve (12) months from the date of purchase by end user. BWTS will repair or provide a replacement product, at BWTS's sole option, for any defective part. Replaced parts will be warranted in time only through the remaining period of this warranty. BWTS shall not be obligated to repair or replace any defective part unless it receives notice, in writing, within 14 days of discovery of a defect. Any action for breach of warranty, contract or otherwise, shall be barred unless BWTS is provided with notice as provided herein. Specifically excluded from this warranty are design defects or damage caused by improper installation, misuse, neglect, improper maintenance, handling or operation of the product or unauthorized repair or alterations or externally induced physical damage.

Further, this warranty shall not apply if any person attempts to repair or replace the defective part without BWTS written authorization. Any auxiliary equipment sold hereunder and not manufactured by BWTS carries only such warranty as given by the manufacturer thereof and which is hereby assigned without recourse to BWTS. No warranty is made for any other claims or special, indirect or consequential damages (including but not limited to component removal or installation, equipment down time, prospective profits or other economic losses) because of any defect deemed warrantable by BWTS.

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Any claim made under this limited warranty must be presented to BWTS, with valid proof of date of purchase by end-user. All merchandise or goods shipped to BWTS, for warranty consideration, must be shipped prepaid - freight. Collect shipments will be refused.

No warranty on competition applications or applications not approved in writing by BorgWarner Turbo Systems.

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