

# EFR Series

## A Look Inside



### Forged Milled Compressor Wheels (FMW)

EFR turbos contain wheels that are fully milled from forged aluminum, commonly known as "billet". Cut from custom forgings, their strength exceeds that which is available from typical bar-stock and also exceeds the material properties of an aluminum casting.

### Gamma Ti turbine Wheel & Shaft

Gamma-Ti turbine wheel cuts turbine inertia by roughly 50% dramatically improving turbo response. Turbine sizes range from 58 to 80mm in outside diameter. 63mm turbine wheels with mixed flow technology provides even quicker spool-up.

### Two Bearing Housing Options

Watercooled bearing housings available in cast iron or cast aluminum for additional weight savings.

### Stainless Steel Turbine Housings

Stainless steel turbine housings improve durability and offer a smooth internal flow channel. Turbine housings have thin walls to reduce weight and thermal mass.

### Sensor Mounting Convenience

Speed sensor mounting provisions are also supplied on every compressor cover. Speed sensors are sold separately.

### High Flow Wastegates

Purpose designed large wastegate ports on EFR Turbos enable a wide range of boost control.

### Boost Control Solenoid Valve (BCSV)

A boost control solenoid valve (BCSV) is included with every EFR turbo.

### High Turbine Efficiency

EFR turbine wheels include "Superback" and "Fullback" features which improve efficiency and transient response. The Superback shape adds a curved profile to the backdisk which lowers centrifugal stress and enables higher rotational speeds. The Fullback replaces scallops and brings the full circumference of the wheel closer to the turbine housing creating a smooth flow transition from housing to wheel.

### Enhanced Turbo Response

EFR turbochargers use a dual-row ball bearing cartridge with ceramic balls and metal cage. This bearing system provides substantial friction reduction at low turbo speeds and in the process helps improve turbo response.

### Integrated Compressor Recirculation Valve (CRV)

Integrated compressor recirculation valve (CRV) to help avoid compressor surge and backflow during a throttle lift event. This feature helps to simplify the installation task and lowers overall system install cost.

### Flexible Compressor Cover

The "large" cover has a dual-machined outlet, both for a hose connection and a v-band connection.

### Adjustable Wastegate

The fabrication and installation task is simplified with wastegated EFR models that feature adjustable wastegates available in three different canisters.

### Ease of Orientation

Turbo orientation flexibility is facilitated by the wastegate bracket to bearing housing mounting arrangement.

