

## WHAT IS NEEDED TO COMPLETE ELECTRONIC FUEL INJECTION?

Looking to upgrade to electronic fuel injection (EFI), there are a few things to consider:

- A set of Jenvey throttle bodies, designed, tested and proved on performance engines by championship winning racing drivers and teams.
- A manifold if you are not using a direct to head set-up, either DCOE flange or custom made to suit the Jenvey single bodies flange style.
- Fuel pump, regulator and fuel rail with suitable fittings. -6jic or push-on can be supplied with Jenvey fuel rails.
- Air horns, air filters and air boxes.
- Injectors – Jenvey can supply Bosch, Pico and Siemens injectors.
- Throttle Position Sensor.
- An aftermarket ECU and wiring loom, able to read engine speed, coolant and air temperature as well as throttle position as a bare minimum.

## WHAT TYPE OF THROTTLE BODY DO I NEED?

There are three main types of throttle bodies to consider when looking at upgrading to EFI:

- **Twin bodies** – The most common of our throttle bodies due to the availability of DCOE manifolds either designed and manufactured by Jenvey to perfectly fit your engine or readily available on the open market.
- **Direct-to-Head bodies** – These bodies mount directly to the cylinder head. They are simple to fit but much harder to match to the inlet ports and they are less versatile than single or twin bodies.
- **Single bodies** – These are the best for outright performance gains. The manifold can be easily port matched and the choice of tapered or parallel bores, single or twin injectors, means the variety of tuning options make the Jenvey single throttle bodies the best for serious engine tuning.



Ford Direct to Head kit

## WHAT IS THE BEST THROTTLE BODY DIAMETER?

There are several factors to consider when selecting throttle body diameter, power output, RPM, cylinder head design, engine capacity, injector position and throttle body position along the inlet path.

The table shows guidelines to be followed when selecting bore size for assumed BHP/cylinder using an assumed rev range up to 9,000rpm. We tend to go 1 size up from the associated carbs to ensure no restriction, while precise mapping can ensure no driveability issues.

| BHP | Millimetres |
|-----|-------------|
| 35  | 40          |
| 40  | 42          |
| 45  | 45          |
| 55  | 48          |
| 65  | 50          |



## CALCULATING THE SYSTEM LENGTH

Calculating the correct system length is crucial when building a performance engine. As a guide, from the face of the air horn to the centre of the valve head needs to be 290mm for an engine revving to 9,000rpm. This is scalable and for an

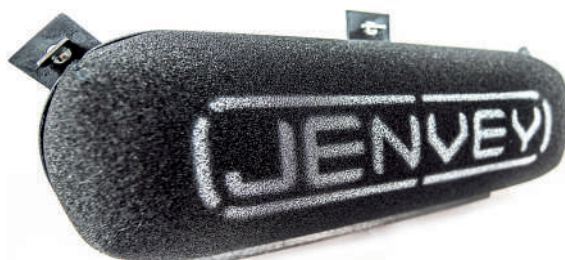
18,000rpm engine the figure is 175mm. The system length is also affected by adding air filters and air boxes as this can have an effect on the power curve, especially if the air box is too small.

## WHERE SHOULD I PLACE THE BUTTERFLY & INJECTORS?

Butterfly position is important in aiding the fuel to air mixing. When too close to the valve the fuel and air don't have time to mix properly, too far away and the throttle response will be less.

As a guideline, for an engine revving between 7-9,000rpm the minimum advisable length is 200mm between the butterfly and valve.

The best place to inject fuel is immediately after the butterfly, this optimises mixing by using the turbulence created from the butterfly to aid mixing the fuel but also gives the mix enough time to settle before entering the engine. It is also a good compromise across the rev range. Injectors in the cylinder head or close to the valve are very good for -7 emissions but poor for performance.



Foam Air Filter

# WHAT INJECTORS DO I NEED?

All Jenvey throttle bodies are designed to accept either Bosch or Pico injectors, with only the fuel rail mounting brackets changing to suit the different lengths.

For a 4-cylinder engine, we recommend that for every 70BHP you need 100cc/min per injector. So for a 210BHP engine you need an injector with a capacity of at least 300cc/min.

## OTHER THINGS TO CONSIDER

- **Taper throttle bodies** – have consistently proved to give better torque and power. All our single bodies can be bored to custom sizes.
- **Turbo or Super Charging** – Generally our bodies can be used with boosts up to 6 bar, although if you intend to use over 2 bar or temperatures above 150°C we recommend talking to our technical team for further advice.
- **Air Bypass Valves** – Complete kits are readily available and work with all Jenvey bodies and manifolds. More information can be found on our website [www.jenvey.co.uk](http://www.jenvey.co.uk)
- **Electronic Actuation** – the Jenvey ETA2 Motorsport electronic throttle actuator has been created specifically for use with motorsport and high performance engines. It will operate Jenvey individual throttle body systems as well as other applications requiring fast and accurate response within its operating range. For more information go to page 12.



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