

## Session 3 - Engine Workshop

Time : 13:30

Date : 26/11/19

Technician : Barry

The 3<sup>rd</sup> session is after the team disassembled the Engine in session 2

Aims :

- Measure components from the zetec engine

- Piston

- Valves, etc

- Calculate the actual Cubic Capacity of the engine (cc)

- Reassemble the engine

- First - Health and Safety requirements are met as for all previous sessions

- The team/group made use of the Sheet Barry supplied and filling it out.

- I am taking notes of all the required measurements (take photo and add it at the end)

- Reassemble the engine

- I connected the piston and rod to the Crankshaft

- After doing this I am aiding the group to fit it to the cylinder block

- Group fits the cylinder block assembly to the crankcase and I screw the bolts to connect  
\* 1 missing bolt \*
- Valves are fitted to the cylinder head and connected to the head gasket
- Fitted to the cylinder block  
\* I went for a break while others continued on the engine
- When I returned I aligned the timing belts and tensioner
- member of the team fitted the water pump  
\* End of Session

Throughout the sessions I learned a lot about all components of the engine. In session 1 and during this session, I learned how to rebuild an entire engine (excluding wiring). I also learned how to measure the CC of an engine.

Next session is about gearboxes

TEAM 3.

# 018 Workshop Zetec Engine Measurements

| Engine part to be measured                                | Measurement (mm) |               |            |            |            |
|-----------------------------------------------------------|------------------|---------------|------------|------------|------------|
|                                                           | CYL 1            | CYL 2         | CYL 3      | CYL 4      |            |
| 4 Piston crowns                                           | 78.43            | 78.42         | 78.42      | 78.37      |            |
| 4 Piston skirts                                           | 79.00            | 78.94         | 78.99      | 78.93      |            |
| 5 Main crankshaft journal diameters                       | 1<br>2.95        | 2<br>3.05     | 3<br>3.02  | 4<br>3.04  | 5<br>3.07  |
| 4 Big End Journal diameters                               | 1<br>/           | 2<br>/        | 3<br>/     | 4<br>/     |            |
| Thrust washers on main bearing 3                          | 1.87             |               | 1.83       |            |            |
| All Cylinder bore values                                  | 1<br>78.86       | 2<br>78.68    | 3<br>78.76 | 4<br>78.61 |            |
| Cylinder 1 stroke (using cyl.2 on TDC)                    |                  |               |            |            |            |
| All Main bearings<br>(both halves)                        | 1<br>48.10       | 2<br>48.08    | 3<br>47.97 | 4<br>48.20 | 5<br>47.98 |
|                                                           | 1<br>44.11       | 2<br>44.01    | 3<br>44.09 | 4<br>44.09 | 5<br>/     |
| All Big end bearings<br>(both halves)                     | CYL 1<br>1.5     | CYL 2<br>1.53 | CYL 3      | CYL 4      |            |
|                                                           | CYL 1<br>1.53    | CYL 2<br>1.52 | CYL 3      | CYL 4      |            |
| Actual engine cubic capacity (cc)<br>Using equation below | 1610             |               |            |            | cc         |
| Inlet valve spring free length                            | 48.16 mm         |               |            |            |            |
| Inlet valve stem diameter                                 | 5.97             |               |            |            |            |
| Inlet valve head diameter                                 | 28.83            |               |            |            |            |

## Engine cc equation:

$0.7854 \times \text{bore (cm)} \times \text{bore (cm)} \times \text{stroke (cm)} \times \text{number of cylinders} =$

$$0.7854 \times (7.86) \times (7.86) \times (8.3) \times 4 = \text{actual cc}$$