

COSWORTH YBC PHASE II RALLY ENGINE

Issue 3 August 1988

<u>Capacity</u>	1995 cc	<u>Bore</u>	90.82mm	<u>Stroke</u>	77mm
<u>Compression Ratio</u>	7.2:1				
<u>Configuration</u>	Four cylinder in line				
<u>Firing Order</u>	1-3-4-2			<u>Max R.P.M.</u>	7500

Important Dimensions

<u>Crankshaft</u>	End Float	0.1/0.254mm
	Main journal dia	56.959/56.975mm
	Crank pin dia	51.977/51.993mm
<u>Con Rods</u>	End float	0.09/0.25mm
<u>Pistons</u>	Height above block face	0.53/0.58mm
<u>Piston Rings</u>	Gaps on all rings	0.40/0.55mm
<u>Valve Timing</u>	Inlet valve fully open	110 degrees A.T.D.C
	Exhaust valve fully open	110 degrees B.T.D.C
<u>Valve Lift</u>		8.544mm
<u>Valve Springs</u>	Free length	39.8mm

Oil System

Oil pressure: Approximately 4.4 bar (64 p.s.i.) at 2500 R.P.M. rising to approximately 4.8 bar (70 p.s.i.) at 6000 R.P.M. with a 15w/50 oil at 85°C.

Cooling System

Expansion tank pressure: 1/1.2 bar at 80/90°C.

To enable the water pump to remain efficient it is imperative that the expansion tank is kept full and maximum pressure is maintained within the expansion tank. If the cap is removed during service, the system must be repressurised.



Radiator

The water radiator should flow a minimum of 46 G.P.M. with a maximum pressure drop of 550mm Hg, (the standard Ford Cosworth Sierra Radiator will not meet this specification).

The fitting of a thermostat is not recommended. To reach the running temperature of 80/90°C it may, under certain conditions, be necessary to mask part of the radiator.

Fuel System

The fuel pressure varies with the running conditions of the engine, but as a guide, it will be approximately 2.9 bar (42 p.s.i.) on start up rising to 4.6 bar (67 p.s.i.) with 1.0 bar boost.

Engine Management System

It is of vital importance that the wiring loom and all connections are kept in first class condition at all times and receive regular inspection. All recommendations regarding the installation and maintenance of the management system must be followed.

There are two levels of E.C.U, both can be identified by the following codes which are carried on a Weber label attached to each E.C.U.

Level 1 E.C.U. (Cosworth Part No YB0493)

IAW 045 WD45.01-IC.60

or

IAW 045 WD45.01-IF.64

For Phase II applications use YB0542 eprom.

Level 2 E.C.U. (Cosworth Part No YB0845)

IAW 045 W45.06/L20-67

For Phase II applications use YB0844 Eprom.

Each level of E.C.U. with its correct eprom is interchangeable with the others only YB0411 injectors and YB0543 3 bar M.A.P. sensor should be used with these eproms.

All additional electrical devices, 2 way radios, trip meters etc, must be housed in an earthed metal box and kept as far away as possible from the E.C.U. and management looms.

The plenum pressure sensor (M.A.P. sensor) must be mounted with the hose inlet connection pointing vertically downwards. The base of the M.A.P. sensor must not be twisted or stressed when attached to its bracket.

The pressure signal pipe from the plenum chamber to the M.A.P. sensor must be 280 ± 10 mm in length with no other connections made to it.

We also recommend that the car instrumentation is calibrated and kept in good working order.

Turbocharger

Replace the three turbine M8 studs with PP3486 M10 studs. Only YB0413 wastegate actuators can be on phase II YBC engines.

Actuator Adjustment

Adjust the rod to obtain 1080mb of boost at 4500 R.P.M., full throttle, with a plenum temperature of 50°C.

Boost Pressures

Typical boost values.

4500 R.P.M.	1080mb
6000 R.P.M.	1010mb
7500 R.P.M.	850mb

Exhaust System

The back pressure offered by the exhaust system effects the engine performance and therefore should be kept to a minimum.

Intercooler

The intercooler should be capable of maintaining a maximum plenum temperature of 50°C.

Air Filter Element

Part No DF8104.

Spark Plugs

Champion C57C or equivalent.
Use graphite grease on plug threads.

Service Adjustments

Crankshaft R.P.M. sensor gap	0.4mm/1.0mm
Distributor phase sensor gap	0.2mm/0.3mm
Ignition timing	Not adjustable
Timing belt tension	9.5/10.5 Lowener units
Idle mixture Co.	5/6%
Idle speed	1000 R.P.M.

Timing Belt Tension Adjustment

To increase the timing belt tension, turn the adjuster into the belt in a clockwise direction and tighten the locking nut. Rotate the engine several times in a clockwise direction and subsequently one full turn anticlockwise to T.D.C., check the belt tension on the longest straight section. Repeat the procedure until the specified tension is achieved.

Idle Speed Adjustment

Disconnect the multiplug from the idle speed control valve, release lock nut and adjust idle speed screw to obtain 1000 R.P.M. with a warm engine. After re-fitting the multiplug, the engine speed will increase for a short period of time.

Idle Mixture Adjustment

The CO adjustor screw is located on the left hand side of the E.C.U., adjacent to the multiplug, it may be covered by a tamper proof plug, if so, take care not to penetrate the plug by more than 3 mm when extracting it or damage to the potentiometer may occur.

Bolt Torques

Engine oil on threads and under head unless otherwise stated.

	<u>NM</u>
Main Cap	87.5 - 101
Connecting rod/cap (A.S.P. under bolt head)	55 - 60
Flywheel/crank	63 - 69
Clutch/flywheel	18.5 - 21.5

Cylinder Head

Cam Caps

6mm nuts	8 - 10
8mm nuts	19 - 23
Crankshafts pulley	122 - 135
Auxiliary belt shaft pulley	44 - 49
Timing belt adjuster lock nut	40 - 48
Camshaft pulleys	59 - 63

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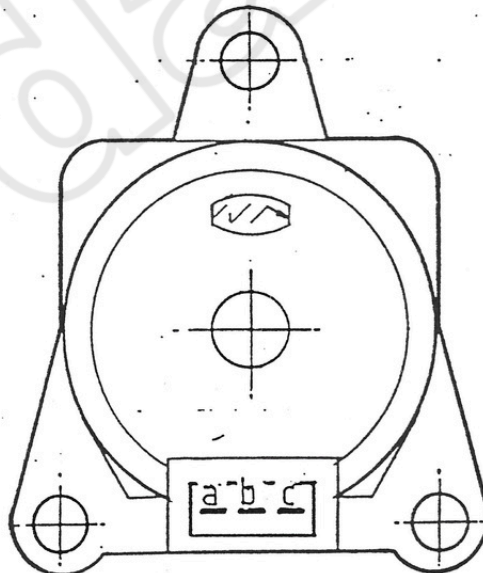
WEBER 3 BAR MAP SENSOR

To check the operation of the sensor at atmospheric pressure:

1. Supply 5 volts to terminals 'a' and 'b'.
2. Connect a volt meter to terminals 'b' and 'c'.
3. The output for atmospheric pressure (approx 1000 millibars) should be approximately 1.5 volts.

To check the sensor over its working range, supply pressure to the sensor and use the following table to verify the results.

<u>Absolute Pressure</u> <u>Millibars</u>	<u>Volts Signal</u> <u>Out</u>
1000mb	1.5
1500mb	2.3
2000mb	3.1
2500mb	3.9



Terminal 'a' = Positive
 'b' = Negative
 'c' = Signal out

Items to Remove if Converting from YBB to YBC Specification

1. Completely remove the bypass valve connecting the intercooler and compressor inlet hose.
2. Amal valve and pipe work.

Note: Reconnect the signal off take located on the compressor snail to the 130 jet side of YB8048 with the unrestricted outlet connected to the wastegate actuator.