

# Elva Mk4-T.

## Specification

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Revised 25/10/05

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**PRATHER RACING ENGINE DATA SHEET**

BLOCK: MGB 5-Main

BORE: 3.200

STROKE: 3.500

CRANK: Steel / Deep Nitrated / Bull Nosed / Index Grind .010/.010

RODS: Carillo 589.0 g

PISTONS: Omega Flat Top 364.2 g

PISTON DOME: N/A

PUSHRODS: 5/16 Iskenderian

COMBUSTION CHAMBER DISPLACEMENT: 37.5 cc

COMPRESSION RATIO: 13.3 to 1

VALVE SIZE: INTAKE: 1.690 EXHAUST: 1.440

CAMSHAFT: 348/350 Prather Racing Custom

CAM TIMING: INTAKE 24/47 at .050 EXHAUST: 57/27 at .050

CYLINDER HEAD: APT

HEADERS: Custom Y Branch. Dallas Tech Racing

ROCKERS: Stock Modified 1.45

CARBS: HS8

MUFFLER: Glass Pack

SPARK PLUGS: B9ES

SPECS: DWELL: Ignitor TIMING: 35 degrees max.

VALVES: INTAKE: .015 Hot

VALVES: EXHAUST: .016 Hot

| DYNO SPECS:    | TORQUE: | HORSEPOW |
|----------------|---------|----------|
| 4500 RPM: 23.5 | 123.43  | 121.72   |
| 5000 RPM: 24.0 | 126.05  | 138.12   |
| 5500 RPM: 23.8 | 124.99  | 150.67   |
| 6000 RPM: 23.2 | 123.23  | 160.22   |
| 6500 RPM: 22.2 | 121.85  | 166.09   |
| 7000 RPM: 20.2 | 116.60  | 162.52   |
| 7500 RPM: 17.8 | 93.49   | 153.66   |

|                  |   |
|------------------|---|
| Muffler          | Glass pack  |
| Plugs            | NKG B9ES  |
| Plug gap         | 0.032" (or 0.025 if Lucas or Bosch coil fitted)                                   |
| Points           | Pointless Ignitor type (Standard points are 0.015")                               |
| Belt & tensioner |   |
| Fuel Pump        | Facet interrupter 23 gal/hr (Pegasus # 1105)                                      |
| Oil Sump         | Modified with baffle plate and hinged anti-surge                                  |
|                  | Use large style oil strainer  |
|                  | Accusump pre-pressuring device  |
| Oil cooler       | 5" x 12" x 1 3/4" 19 row built into right vent. Direct feed duct from front grill |
| Water Radiator   | Aluminum crossflow.   |

## Carburetor.

|                |  |
|----------------|--|
| Type           | 2 x 2" SU HS8  |
| Needles        | UH (Steel on brass needle & seats)   |
| Main Jets      | Gros 0.125"  |
| Fuel Regulator | Holley   |
| Fuel Cell      | Fuel Safe Sportsman tank and bladder 10 gallons (Feb 00)<br>(Serial #305764) 2 1/2 " filler. 1 x central fuel pick up point. |
| Air box        | Direct feed from front grill. Formula Ford air filter  |

## Transmission.

|            |   |
|------------|---|
| Gearbox 1  | ZF 5 speed syncro Ref : SS.18.3<br>5 <sup>th</sup> :0.9, 4 <sup>th</sup> :1.1, 3 <sup>rd</sup> :1.305, 2 <sup>nd</sup> :1.76, 1 <sup>st</sup> :2.99, Rev ?<br>(See Appendix for full spec.) |
| Gearbox 2  | MGB Straight cut close ratio  |
| Ratios C/r | NOTE. Input shaft to gearbox shortened by 3/8"  |
| Std        | Top 1.00:1, 3 <sup>rd</sup> 1.26:1, 2 <sup>nd</sup> 1.62:1, 1 <sup>st</sup> 2.45:1, Rev 4.75<br>1.00      1.37      2.21      3.63      4.75  |

## Clutch.

|                     |                                  |
|---------------------|----------------------------------|
| Type                | Tilton 7 1/4" OT-11 Single plate |
| Flywheel            | Tilton Alloy                     |
| Cover               | Tilton                           |
| Center Plate        | Tilton                           |
| Throw-out Bearing   | Tilton                           |
| Flywheel Bolts      | ARP Part # FBB716                |
| Operating Mechanism | Hydraulic internal diaphragm     |

## Final Drive.

|                                  |   |
|----------------------------------|---|
| Propeller shaft                  | 21/2" Universal joints, 2" shaft  |
| Rear drive shafts                | Modified TVR  |
| Stub shafts                      | Made by Webster CA  |
| Differential                     | MGB "Banjo" axle final drive.<br>Limited Slip - Quaife torque proportioning |
| Alternative - Tranex clutch type | limited slip (Supplied by Bob Yarwood Engr) set at 100/120 lbs              |
| Diff Carrier                     | TVR Early Griffin   |
| Ratio                            | 3.91 or 4.10  |
| Lubricant                        | Redline Synthetic Shockproof  |

## Wheels.

|                      |   |
|----------------------|---|
| Lug nut pattern      | MGB type 4 1/2"   |
| Wheels 1 (2 x Sets)  | 14" dia x 6" rim Panasport Minilite replicas<br>Offset 18mm (4 1/2" inside instep)  |
| Wheels 2             | 13" dia x 5 1/2" Panasport Minilite replica<br>Offset   |
| Nuts                 | 3/8 <sup>th</sup> UNF Dome Bevel shoulder 15 degrees  |
| Tires                | Camber set for radial tires 2.5 deg<br>Hoosier Radial 205/14 x 60<br>Yokohama A-008 195/60D – 13<br>Yokohama A-032 185/60D - 13 |
| Operating Parameters | Min 140 deg F. Max 240 deg F. Ideal 180 – 200 deg F<br>Set up Front 23 psi<br>Rear 22 psi                                       |

## Electrical.

|               |   |
|---------------|---|
| Starter Motor | High Performance Tilton Ref CMGB4<br>(Cambridge Motor Sport mod by Craftwork)   |
| General       | 12 volt negative earth  |
| Coil          | Accell S Coil   |
| Distributor   | Aldon Comp Part #101BR (Lucas 45D)<br>Modified by Butch Gilbert-10 ° idle 30° @4500<br>Gap 0.015" (Car & spare set up the same) |
| Timing        | 35 degrees max advance BTDC @ 4000 –4500rpm   |

Plugs NGK B9EV for racing

Fuel Pump Electrical

Switches  
Master cut out  
Protected ignition  
Fuel pump on/off  
Start button  
Fire bottle pull release  
Fan (pit use only)

Gauges  
Tachometer  
Oil pressure + warning light  
Oil temperature  
Water temperature

## **Steering.**

System Standard rack and pinion  
Wheel 13" Motolita

## **Suspension.**

### Front.

Spring 2 1/4" 8" Coil spring 400 lbs At 1" comp .3/ 8" dia  
580 lb spare (400lbs are Hypercoil)

Shocks Spax G-761-AS 11 point adjustable

Sway Bar ... dia. Rose jointed fully adjustable

Bushings Nylatron except where Rose jointed

Wishbone Upper and lower Triumph GT-6

Toe in

Camber

Castor

Wheel bearing end float

see Appendix 2

### Rear.

Spring 2 1/4" 10" Coil spring 165 lbs. At 1" comp. 3/8" dia  
225 and 200lb (12" spare - Eibach)

Shocks Spax 11 point adjustable

Sway Bar ... dia

Bushings Nylatron except where Rose jointed

|               |                                       |
|---------------|---------------------------------------|
| Uprights      | TVR Griffin (Early)                   |
| Axle Location | TVR Griffin upper and lower wishbones |
| Toe in        |                                       |
| Camber        | See Appendix 2                        |
| Castor        |                                       |

### Corner Weights (May 00)

|              |          |
|--------------|----------|
| RF – 213 lbs | LF – 208 |
| RR – 192     | LR – 196 |

Without driver.

### Brakes.

|                  |  |
|------------------|--|
| System           | Tilton twin master with balance bar                    |
| Fluid            | Castrol LMA  |
| Hoses            | Braided  |
| Front            |  |
| Disks            | 10 1/8" disk (Machined from Lotus Elite 101/2 " disks) |
| Calipers         | Triumph GT-6 Caliper brakes made to size               |
| Caliper brackets | Custom fabricated                                      |
| Pads             | As Lotus Elan Plus 2 Hawk-blue, or Porterfield R-4     |
| Swept area       |  |
| Rear             |  |
| Drums            | „„„„„".Alfin from Triumph TR-3                         |
| Lining           | rivet and glued  |
| Lining size      |  |
| Swept area       |  |
| Compound         | Porterfield R - 4                                      |

### Body.

|               |   |
|---------------|---|
| Chassis       | E-1124 Fiberglass on steel tube chassis |
| Weight        | 1526 lbs                                |
| Specification | Built to 1972 SCCA regulations          |
| Paint         | Red                                     |
| Tow Hook      | Front only. Bolted to chassis leg       |
| Seat          | Sparco Pro                              |
| Safety Belts  | Simpson 4" Camlok 5 point               |
| Weight        | 1594 lbs (May 00)                       |

## **Lubricants.**

|                          |  |
|--------------------------|--|
| Engine                   | Kendal 20/50, Motul 300v or Mobile 1 synthetic |
| Gearbox                  | Redline 75 -90                                 |
| Differencial             | Redline Synthetic 75W90NS                      |
| Grease points & bearings | Redline "Red" high pressure                    |

## **Safety Equipment.**

|                  |  |
|------------------|--|
| Belts            | Simpson 4" Camlock 5 point   |
| Fire suppression | Halon 5 lb bottle, nozzles in engine and trunk, pull activated                 |
| Rollbar          | SCCA standard welded to chassis with, cross and diagonal bars                  |
| Fuel Cell        | Fuel safe sportsman bladder in Aluminum tank<br>Serial number (Serial #305764) |
| Seat             | Sparco Pro   |

## **Suppliers.**

|                 |  |
|-----------------|--|
| Engine          | Prather Racing, Wakarusa, Kansas, USA<br><br>MG Sports<br>Wayside<br>Hemel Road<br>Bovingdon Herts HP3 0HE<br><br>Tel: 01442 832019 Doug Smith   |
| Shock absorbers | Spax Ltd<br>Bicester, UK   |
| Wheels          | Averill Racing<br>Detroit Michigan<br>810 585 9139   |
| Carburetors     | Joe Curto Inc<br>22-09 126 Street<br>College Point<br>New York<br>Tel; 718 762 7878 Fax; 718 762 6287<br><br>Burlen Fuel Systems Ltd<br>Spitfire House<br>Castle Road<br>Salisbury<br>Wilts SP1 3SA<br>Tel; 01722 412500 Fax; 01722 334221 |

## Appendix 1

**Alternative 5 speed gearbox. RAC homologation papers available**

*Phil Jones Engine Developments*  
*Of Chipping Sodbury*

Competition Engines, Gearboxes and Differentials.  
 Full Dynamometer and Engine Management Facility.

Telephone (Workshop) 0454 30936 (Dyno Cell) 0836 575765  
 VAT No 452 861244

Registered Office  
 63 Kestrel Close  
 Chipping Sodbury  
 Nr Bristol  
 Avon DS17 SXR

Date 4-11-99

|                              |                                 |
|------------------------------|---------------------------------|
| GEARBOX TYPE                 | <b>55-18.3-ZF</b>               |
| INPUT SPLINES                | <b>1" X10</b>                   |
| SPLINE SPLINE DIAMETER       | <b>1"</b>                       |
| OUTPUT SHAFT TYPE            | <b>SLIDING YOKE</b>             |
| TYPE OF OIL TO USE           | <b>CASTROL EP20</b>             |
| GEAR ANGLE                   | <b>HELICAL</b>                  |
| GEAR TO SHAFT BEARING TYPE   | <b>NEEDLE CAGES</b>             |
| SAFE ENGINE REVS FOR GEARBOX | <b>9000</b>                     |
| REBUILD PERIOD               | <b>1 YEAR</b>                   |
| DO NOT EXCEED                | <b>200 BHP 190LBS/FT TORQUE</b> |

### RATIOS

FIRST 2.99 SECOND 1.76 THIRD 1.305 FOURTH 1:1 FIFTH 0.9

### NOTES

3 Aluminium Forks    3 Brass rings    Rebuilt using all new Bearings, Seals and Syncros/



## Suspension Specs

### Appendix 2

Front and rear camber adjustable by shim

### Car – 1964 Elva Courier Mk4 IRS.

**Weight - 1592 lbs    Weight distribution 50/50 front to rear**

#### Front shocks. Spax G761 - AS

Compressed length – 11 ½”

Extended length – 14 ½” (to top of attachment post)

Diameter of body – 2”

Diameter of shaft – 0.550”

Top attachment post – threaded post 3/8” diameter

Bottom attachment – horizontal bushing

Spring - 525 lbs measured at 1” compression

#### Rear shocks. Spax G936 - AS

Compressed length – 11”

Extended length – 17”

Diameter of body – 2”

Diameter of shaft – 0.550”

Top attachment – horizontal bushing

Bottom attachment – horizontal bushing

Spring 250 lbs measured at 1” compression

|                              |         |           |         |           |
|------------------------------|---------|-----------|---------|-----------|
| Camber Angle<br>(In degrees) | LF<br>2 | RF<br>1 ¼ | LR<br>2 | RR<br>1 ¾ |
| Shock Bump/rebound           | 30%     | -         | -       | -         |
| Spring Weight @ 2”           | 580 lbs | 575       | 225     | 225       |
| Corner Weights               | 208     | 200       | 196     | 192       |
| Toe in                       | 0       | 0         | 1/16”   | 1/16”     |
| Total toe                    | Front   | 0         | Rear    | 1/8”      |

String set up – 63 ½ “ apart front and rear parallel  
4” from front wheel centre  
3 ½ “ from rear wheel centre

**MGM5 – SP CAM ANALYSIS.****Appendix 3**

From MG Sports Doug Smith Bovingdon

Intake and Exhaust.

|                 |   |     |           |
|-----------------|---|-----|-----------|
| Lobe Centre Sep | – | 104 | Cam Deg   |
| Valve Overlap   | – | 92  | Crank Deg |

Intake.

|                |   |        |                 |
|----------------|---|--------|-----------------|
| Valve Opening  | – | 46     | “BTDC           |
| Lobe Centre    | – | 103.9  | “ATDC           |
| Valve Closure  | – | 74.4   | “ABDC           |
| Duration       | – | 300.4  | Crank degrees   |
| Max Cam Lift   | – | .33791 | Inch (at .020”) |
| Net Valve Lift | – | .3537  | Inch            |
| Lobe ‘Area’    | – | 31.06  | Inch in degrees |

Exhaust.

|                |   |        |               |
|----------------|---|--------|---------------|
| Valve opening  | – | 73.9   | “BBDC         |
| Lobe Centre    | – | 104.1  | “BTDC         |
| Valve Closure  | – | 46     | “ATDC         |
| Duration       | – | 299.9  | Crank degrees |
| Max Cam Lit    | – | .33677 | Inch          |
| Net Valve Lift | – | .35045 | Inch          |
| Lobe ‘Area’    | – | 30.95  |               |

Cold clearances

Int – 0.018”  
Ext – 0.019”

***REPLACED MARCH 01 with Prather Cam.***