COMPETITION

TUNING NOTES

for the

JOWETT JAVELIN

ALL MODELS

These special service instructions are issued by Jowett Cars Ltd. for the use of Javelin owners wishing to obtain maximum performance for competition work. Owners are reminded that any modifications made to a Javelin for the purpose of competition work, or participation in competitions, automatically invalidates the guarantee.

Service Department is normally willing to undertake the tuning of Javelins by appointment.

JOWETT CARS LIMITED · BRADFORD

JAVELIN TUNING NOTES

SPECIAL SERVICE INSTRUCTION

These instructions apply to the Javelin car and are intended as a guide to tuning for maximum performance.

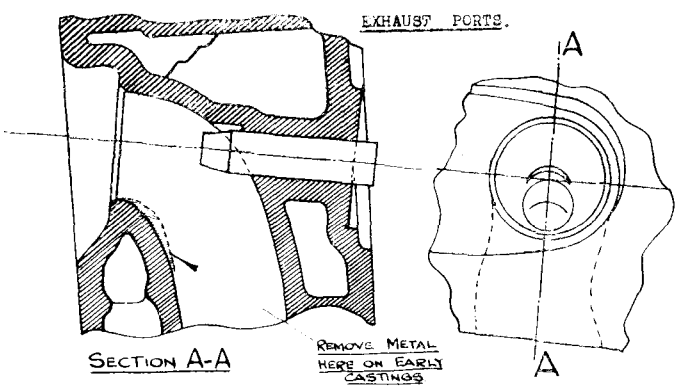
It is extremely important that these are read in conjunction with the Maintenance Manual for the Javelin, which describes in detail the work involved in stripping and assembling the units concerned. In addition it is important that the standards of workmanship and cleanliness are of the highest order if success is to be assured.

1. ENGINE

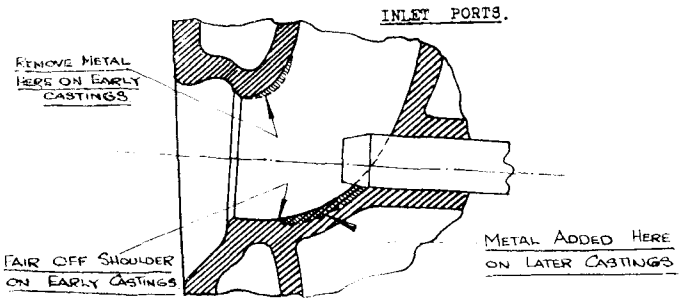
It is important that the Cylinder Heads are polished and subsequently corrected for capacity in the following manner.

(a) **Induction and Exhaust Valve Ports.** In addition to generally polishing out the ports, some benefit may be obtained from attention to the following : –

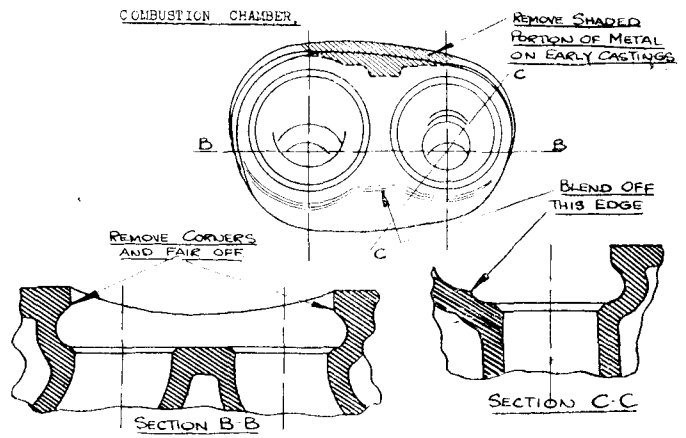
Exhaust Ports. On Cylinder Heads fitted to early cars, the radius under the lower side of the Exhaust Valve Seating may be considerably increased. Metal has been removed here on later castings, increasing the cross section area at the throat of the Port.



(b) **Inlet Ports.** As with Exhaust Ports, early castings have more metal than is desirable under the Valve Seating. On later castings, metal has been left on the opposite wall, with improved results. This cannot be done on the early castings, but the rough edge may be faired off to reduce the buffer effect under the shoulder.



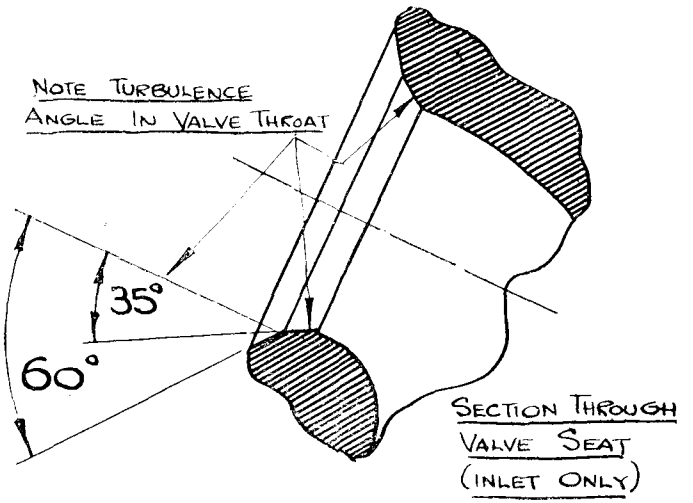
(c) **Combustion Chamber.** All sharp edges should be removed. The undercuts round each valve should be blended off to ensure a smooth gas flow and to assist turbulence.



(d) Alignment of Exhaust Ports with Induction Manifolds. This is particularly important and can be checked by blueing the flange faces and then bolting up with paper between; by observing the pattern on each side of the paper, the

points where metal is to be removed to make the Ports coincide can be observed.

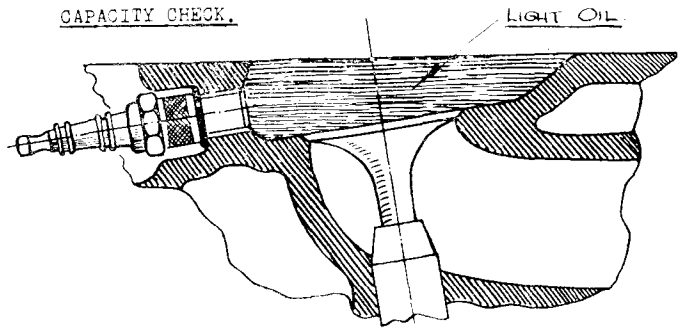
(e) **Valves.** The Valves and Seats must be in first-class condition, with no signs of pitting or excessive narrowness. A seat width of 3/32" should be maintained for the Exhaust Valve and 1/16" for the Inlet Valve. It is important that the turbulence angle is maintained on the Valve Seats, as shown on the sketch below.



(f) **Valve Springs.** If it is desired to lift the Valve Bounce point of the Engine above 5,500 R.P.M. stronger Outer Springs should be fitted, our Part No. 52964.

(g) **Cylinder Head Capacity.** After the above work has been completed the capacity of the Combustion Chamber should be checked as follows :—

Remove the Cylinder Head and lay flat on a bench with the Combustion face up. Insert a set of spare Spark Plugs. Fill the Combustion Chamber with fluid, flush to the face. This capacity should be between 40 and 41 c.cs.



(h) **Compression Ratio.** With the above Cylinder Head Capacity of 40 to 41 c.cs. and a standard Gasket which has a Combustion Space Capacity of 7½ c.cs. compressed, the following Compression Ratios may be obtained by the use of the Pistons quoted :—

Piston Part No. 50656 gives 7.2 to 1
" " " 53228 " 7.6 to 1 | Higher Compression
" " " 53227 " 8.0 to 1 | Ratios

It is recommended that the higher Compression Ratios should not be used unless fuel of at least 80 Octane rating or 25% Benzole mixture is available.
As a final check the Compression Ratio on the Engine can be checked as follows :—

With the Head in position on the Engine and the Pistons at T.D.C. fill with liquid to the level of the Sparking Plug Facing, rocking the Engine to make sure that all air is ejected. The relative volumes should be as follows :—

7.2 to 1	58 c.cs.
7.6 to 1	56 c.cs.
8.0 to 1	53 c.cs.

an error of ± 2% is allowable in the above volumes.
Any correction to the capacity can be made by machining the Cylinder Head Gasket Facing .011" (.2794 mm.) removed here reduces the capacity by 1 c.c.

(i) **Bearings.** Engines up to No. EO PB 8902 were fitted with White Metal Connecting Rod and Main Bearings, and an un-hardened Crankshaft. It is advisable to replace this Assembly by an induction hardened Shaft to our part No. 50647, which will necessitate the use of Copper Lead

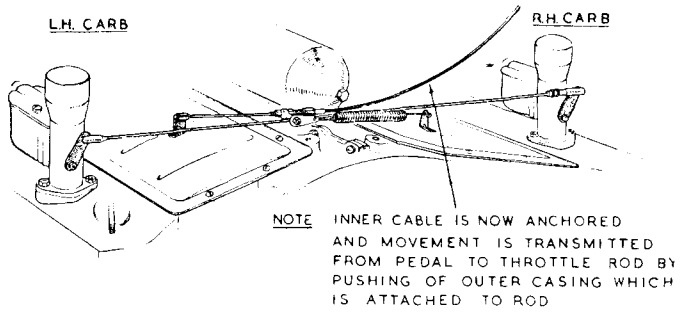
Bearings, except for the Rear Main Bearings which remain in White Metal, the Part Nos. of these are Connecting Rod Assembly—J.54444, Main (Front and Centre) Bearings—52573, Rear Main Bearings—50646.
It is vital when refitting Bearings that absolute cleanliness is assured and rag should under no circumstances be used to wipe components: they should be washed in clean petrol and blown off by air. Great attention should also be paid to the sealing of the Crankcase Balance Pipe Rubber Ring as detailed on Page 35 of the Maintenance Manual.

(j) **Clutch.** It is desirable to replace the Clutch Friction Disc with one of a woven type having a greater coefficient of friction, this is available under our Part No. 52420/A.

(k) **Carburetters.** Special 30 V.M. Carburetters with the following settings :—

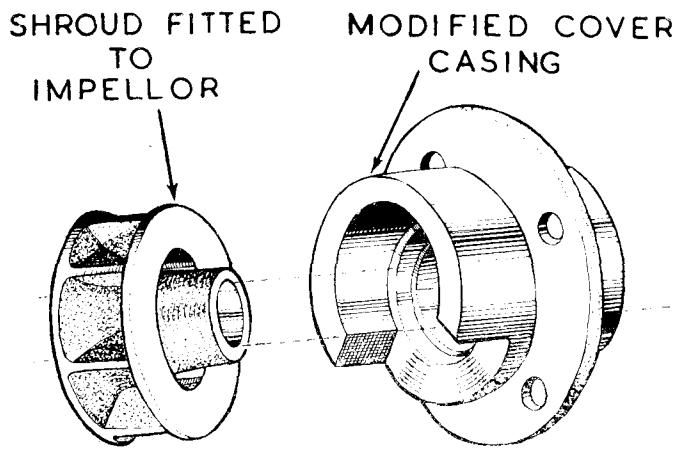
27 mm. Choke 110 Main 50 Compensating
2.2 Vent over Capacity 45 Slow Running
120 Progression 1.5 mm. Needle Seating (1 mm. Washer)

should be fitted in place of the standard V.M. 4 or 5. These Carburetters are interchangable and carry our Part Nos.:—L.H.—I.53732; R.H.—I.53733
The Throttle Spindle operation is in the reverse direction, and the Throttle Cable must consequently be rearranged. A suggested method is to fit a Cable approx. 9" (25 cm.) longer than standard, securing the Inner Cable to the Bracket on the left hand Tappet Cover, and the Outer Cable to the Throttle Rod. The Throttle Return Spring should be connected to the Clip to which the original Outer Cable was secured on the right hand Tappet Cover.



(l) **Water Pump.** On all Engines prior to PA.5857 the Water Pump should be modified to increase its capacity to 7 gallons/min. at 1,500 R.P.M. On Engines subsequent to the above number the modification was incorporated.

The modification consists of a modified Cover and the addition of a Shroud Assembly to the Impellor, as shown.



In addition to the above the Thermostat should have the 2 Bleed Holes enlarged to 3/16" dia. if prior to the above number.

(m) **Oil Pump.** It is recommended that an Oil Pump of increased capacity be fitted to our Part No. AS.52403. Engines built subsequent to PA.800 have this modification incorporated.

(n) **Oil Cooler.** It is recommended that the Rear Timing Case Cover Part No. 50690 and early type Oil Filter Assembly should be replaced by the latest type Assembly as shown. Engines built subsequent to E1 PC 16603 incorporate this latest type of new Timing Case Cover to our Part No. 53030 and Tecalemit Oil Filter Assembly.

The above allows an Oil Cooler, Part No. J.54532 to be fitted as shown by use of two Flexible Pipes to Part No. J.54519.

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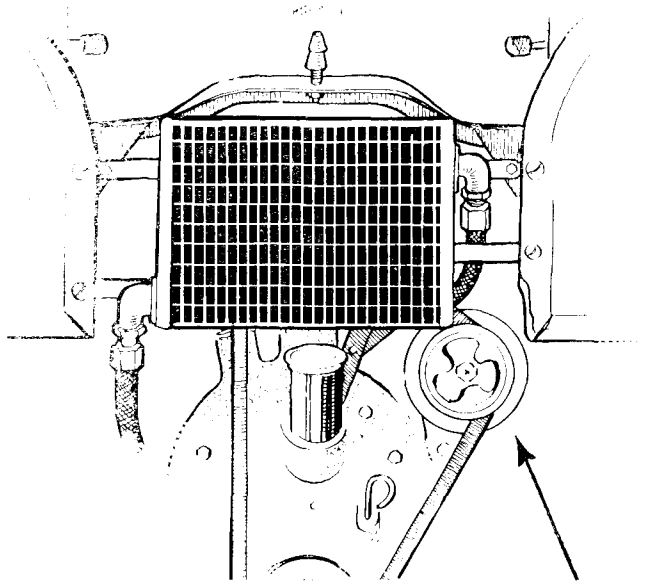
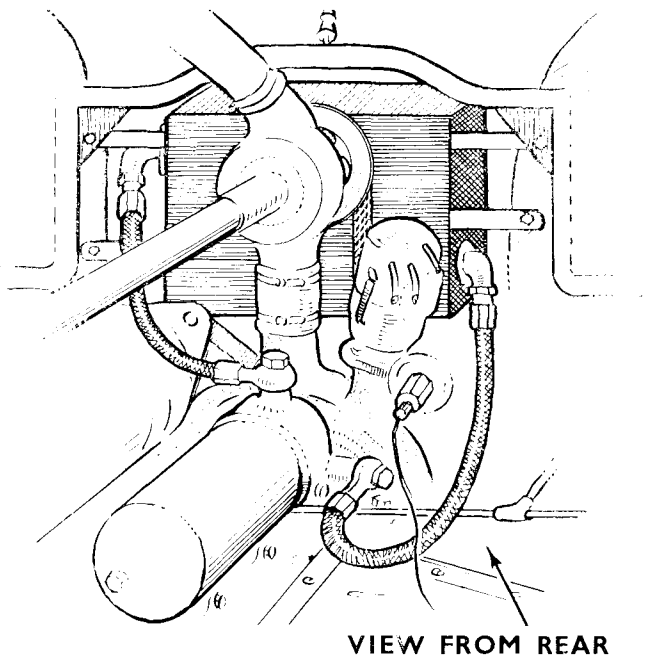


FRONT VIEW OF COOLER (GRILLE REMOVED)



VIEW FROM REAR

(o) **Fan.** The Fan Blades should be stiffened by the addition of extra welding along the base of the Blade where it abuts on to the Centre Spider. This will necessitate re-balancing the Fan Assembly which can be done by mounting it on a suitable arbor and rolling on knife edges, metal being removed from the tips of the Blades in order to restore static balance

(p) **Ignition Setting.** The recommended setting is with the points breaking at approx. $\frac{1}{4}$" (6.5 mm.) A.T.D.C. (measured on the Flywheel Rim). This setting will cause the Engine to ' pink ' on 1/3 to 1/2 Throttle at 20 - 30 M.P.H. (32 - 48 K.P.H.) when suction advance is operating. The ' pink ' should disappear completely on Full Throttle.

2. GEARBOX.

Special constant mesh Gears, providing a higher ratio in the Intermediate Gears, are available, and we are, therefore, including a chart showing the road characteristics with the various ratios.
These carry our Part Nos. as follows :—

Stem Gear — 52733.
Layshaft — 52734.

Cars fitted with gearboxes numbered J1, upwards, on the gearbox top incorporate these ratios.

3. TRANSMISSION.

Propellor Shaft Universal Joint (591). These Joints, particularly at the Front, should be carefully examined on all cars which have run more than 6,000 miles (9,500 Kms.) and if any rubbers show signs of cracking round the studs, the Joint should be replaced.

4. BRAKES

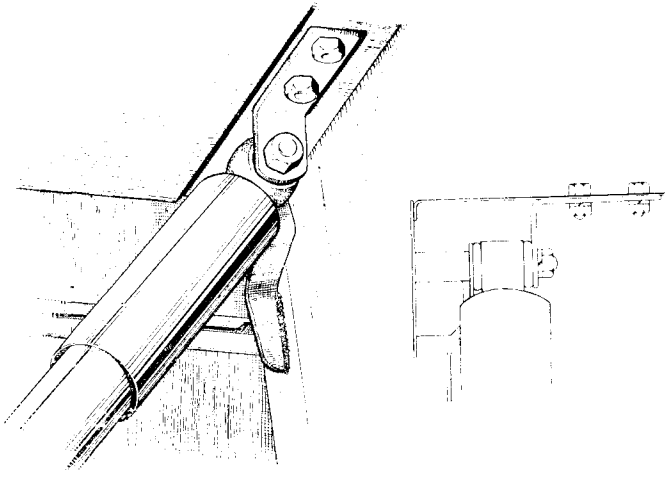
It is recommended that high duty Linings be fitted for high speed competition work and we would recommend :—

Mintex M.14 or 15
Ferrodo M.R. 41

Care should be taken to specify whether the car has the early Hydraulic Front, Mechanical Rear operated system or the Full Hydraulic, when ordering these.

5. SUSPENSION

Rear Shock Absorber Upper Pin. A modification to stiffen up the Rear Shock Absorber Upper Pin was introduced at Car No. 17672. Check that this has been carried out and if not modify the Mounting of the Pin in accordance with the following drawing :—



Shock Absorbers. A 25% stronger all round setting is recommended for most types of Competition work. As an alteration in the setting involves complete dismantling of the Shock Absorbers, replacement by the stronger type is advised ; these carry our Part Nos. : –

Front 54385 (fitted as standard from Engine No. 16500)

Rear 50467S (Competition)

6. GENERAL EQUIPMENT

Batteries. It will be found advisable to protect these at the front and base with a sheet metal case for high speed motoring over loose surfaces.

7. NORMAL SERVICE

In addition to the special work described above it is very necessary that the normal servicing of the car, as detailed in the Instruction Book and the Maintenance Manual, is carried out.

8. SPARES

The special items previously mentioned are summarized herewith for easier reference.

	Part Nos.
Stiffer Outer Valve Spring	52964
7.6:1 Compression Ratio Piston	53228
8.0:1 Compression Ratio Piston	53227
Induction Hardened Crankshaft	50647
Copper Lead Connecting Rod Bearing Assy.	J.54444
Copper Lead Main Bearings, Front and Centre	52573
White Metal Rear Main Bearing	50646
Higher Coefficient Clutch Friction Disc	52426/A
30 V.M. Carburetter—L.H.	J.53732
—R.H.	J.53733
New type Water Pump Cover	52710
New type Water Pump Impellor	J.54414
Latest type Thermostat	50768
Increased Capacity Oil Pump	AS.52403
Latest type Rear Timing Case Cover	53030
Tecalemit Oil Filter Assembly	53422
Oil Cooler	J.54532
Flexible Oil Cooler Pipe—2 off	J.54519
Higher Ratio Stem Gear	52733
Higher Ratio Layshaft	52734
25% Stiffener Absorbers—Front	54385
—Rear	50467S

9. JAVELIN ROAD CHARACTERISTICS

Back Axle Ratio 4.875:1

Gear Ratios	*Standard Gearbox*	*Modified Gearbox*
First Speed	1:19	1:17.4
Second Speed	1:11.6	1:10.6
Third Speed	1:7.34	1:6.7
Top Speed	1:4.87	As Standard

Rolling Radius of Tyre 12.7" Tyre Size 5.25 x 16

Valve Spring Surge occurs at 5,500 Revs. per min. with Standard Valve Springs.

For Engine Road Speed Chart, please see opposite page.

Key to Chart

SGFG	Standard Gearbox First Gear
MGFG	Modified Gearbox First Gear
SGSG	Standard Gearbox Second Gear
MGSG	Modified Gearbox Second Gear
SGTG	Standard Gearbox Third Gear
MGTG	Modified Gearbox Third Gear