

INSTRUCTIONS FOR O.S. MAX-21VF-BABC ENGINE

IMPORTANT: Before attempting to operate your MAX-21VF-B, please read through these instructions so as to familiarize yourself with the controls and other features of the engine. Also, pay careful attention to the recommendations contained in the "Safety Instructions and Warnings" leaflet enclosed.

The MAX-21VF-B is a high-performance 3.5cc class power unit that has been designed specifically for radio-controlled model 'off-road' racing cars or 'buggy' type vehicles. The engine is a development of the powerful MAX-21VF-C track car engine, has revised port timing and a modified combustion chamber. To meet the severe conditions of off-road operation, the MAX-21VF-B is fitted with a special heat-sink type cylinder-head having deep, curved cooling fins to ensure the most efficient cooling, irrespective of the direction of the air-flow, and it is also equipped with a special O.S. Type 2K carburettor that comes complete with a large renewable-element air-filter and a bellows type dust cover to protect the throttle rotor.

BEFORE STARTING THE ENGINE

Please read through the attached "Precautions" (yellow sheet) and "Operational Instructions for O.S. Type 2K Carburettor" leaflets before attempting to start your engine for the first time.

RUNNING-IN ('Breaking-In')

For long life and high-performance, every engine needs to be properly 'run-in' or 'broken-in'. There are several running-in methods, but the following is suitable for use with this engine.

1. Turn the needle-valve clockwise slowly and gently until it stops. This is the fully closed position. Do not use force to turn the needle-valve beyond this point. Now reopen the needle-valve two-and-one-half turns. (The set screw on the needle-valve knob may be used as a reference mark.)
2. Set the throttle at the starting position (see "Precautions" sheet) and start the engine.

WARNING! It is vitally important to set the throttle at the correct starting position as described in the "Precautions" sheet before starting the engine. If the engine is allowed to run under 'no-load' conditions (i.e. with the wheels of the car not in contact with the ground), the engine will speed up to extremely high revolutions — even at part-throttle settings — which may result in serious damage.

3. Leaving the needle-valve set at the starting setting of 2½ turns open, run the vehicle on level ground several times until at least three full tanks of fuel have been consumed. (It should be noted that, at this stage, it may not be possible for the engine to idle reliably because of the over-rich setting of the needle-valve.)
4. This completes the initial running-in stage. For the remaining period of running-in, refer to the adjustment procedures detailed in the accompanying "Operational Instructions for O.S. Type 2K Carburettor" leaflet. The car will need to be run for about 10 tanks of fuel to complete the running-in period.

FUEL

Use only top quality model two-stroke engine fuel. The MAX-21VF-B is designed to run on both low and high nitromethane content fuels, i.e. from mild mixtures containing a few percent of nitromethane, up to high-speed racing fuels containing 50%, or more, of nitromethane. Generally, power output is increased — up to a certain point — as the nitromethane content of the fuel is increased. As a starting point, we recommend a fuel containing 10 — 20% nitromethane, changing to a fuel containing more nitro if necessary. When the nitro content of the fuel is increased or the brand of fuel is changed, it is advisable to initially run the engine with a richer needle-valve setting, so that the optimum setting for the new fuel may be rechecked as described in the carburettor instructions leaflet.

GLOW-PLUG

The type of glow-plug used may greatly affect the performance of the engine under different atmospheric conditions and on different fuels. Select the best one by practical tests. Recommended O.S. glow-plug is No.8.

INSTALLATION

Make sure that the chassis engine mounting blocks are parallel and have their top surfaces in the same plane. Poor installation may not only cause erratic running and loss of power but may also damage the engine itself by distorting the crankcase, bearings, etc.



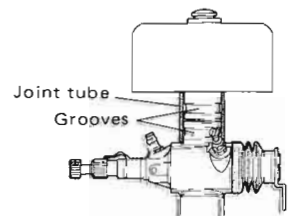
SPECIFICATIONS

Displacement	3.46cc (0.211 cu. in.)
Bore	16.6 mm (0.654 in.)
Stroke	16.0 mm (0.630 in.)
Power Out-put	1.1 BHP (PS) at 26,000 rpm
Practical R.P.M.	2,500 — 29,000 rpm
Weight	350 g (12.35 oz) (Incl. Air Cleaner) 320 g (11.29 oz) (without Air Cleaner)

AIR CLEANER

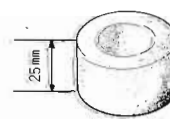
This is a high quality replaceable element air filter that has been developed especially for 'off-road' operation, where vehicles are frequently exposed to very dusty and gritty conditions. In order to ensure that the air cleaner provides maximum protection without loss of engine performance, please observe the following.

1. Connect the air cleaner to the carburettor air intake with the flexible joint tube provided.
2. Position the air cleaner so that it does not touch the cylinder-head or any part of the car, such as the roll-bar, then secure the air cleaner to the carburettor firmly with the two special straps provided. Make sure that these are located in line with the grooves on both air cleaner and carburettor intake. (See sketch.)

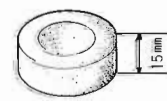


Filter Element: Two sizes of filter elements, 'L' and 'S', are supplied. These should be used in different combinations according to purpose and course conditions.

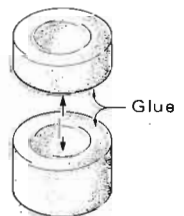
Purpose or Course conditions	Filter element(s)
Very dusty and dirty courses	L + L
Standard buggy courses	L + S
Off-road courses with less dust (e.g. grass)	S + S
1/8-scale racing cars (paved circuits)	L



(L)



(S)



The engine is supplied with two 'L' and 'S' filter elements, one of each being contained in the air cleaner when the engine leaves the factory. When conditions require the use of two elements, glue them together with a contact cement of the type suitable for synthetic rubber.

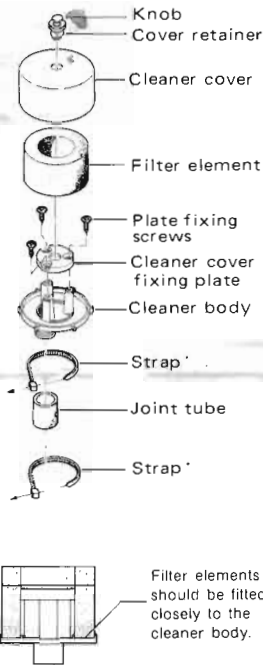
Note: When using two 'L' size filters, air supply is reduced and it will be necessary to close the needle-valve 1/4 to 1/3 turn to maintain correct air/fuel mixture ratio.

Replacing filter elements

In protecting the engine from the ingress of abrasive dust and dirt, the filter elements gradually become clogged and it is therefore necessary to check their condition periodically and to replace them as required. Generally, it is recommended that the elements be replaced every one to two hours' running time, or every three to four heats during competition events. Procedure is as follows:

1. Holding the air cleaner firmly, pull the knob on the cover retainer until it 'clicks' and releases the cover.
2. Gently lift off the cover and check the elements. If they are very dirty, remove them carefully so that disturbed foreign matter does not enter the carburettor intake.
3. Carefully wipe the inside of the body and cover with a piece of clean cloth moistened with alcohol.
4. Fit fresh elements as shown in the sketch.
5. Replace cleaner cover, pushing down knob to lock it in place.

Note: Washing and re-using the filter elements is not recommended as it is almost impossible to completely remove all foreign matter deeply embedded in the elements. Spare filter elements are available.
(Code No. 72401016)

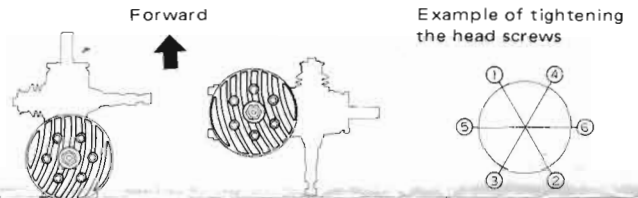


HEATSINK HEAD

The heatsink type cylinder head of this engine has special tapered-section curved fins so that, by simply rotating the head through 60 degrees, the fins are correctly presented to the airstream, irrespective of whether the type of transmission used requires the engine to be mounted on the chassis with its crankshaft located longitudinally or transversely.

Procedure for relocating the head is as follows:

1. Release the cylinder-head screws with 2 mm hex key wrench supplied, working diagonally. Remove all screws.
2. Rotate head to new position. (The cylinder liner is pinned to prevent rotation.) Replace screws, lightly running each one down with hex key between finger and thumb, then backing off half-a-turn. Finally, tighten screws progressively, each a few degrees at a time, following the diagonal pattern shown in the sketch. Tightening the screws of a cylinder head unevenly can cause distortion and serious loss of performance.



Note: If the cylinder head is removed, take care not to allow foreign matter to enter the cylinder.

CARBURETTOR

The MAX-21VF-B is equipped with an O.S. Type 2K automatic mixture control carburettor. See separate instruction leaflet for details of adjustments, spare parts, etc.

PARTS LIST

Code No.	Description	Code No.	Description
22801000	Crankcase	22814000	Gasket set
22801600	Front Housing	22615000	Carburettor Rubber Gasket
22802000	Crankshaft	22620003	Thrust Washer
22803030	ABC Cylinder & Piston Ass'y	22831000	Ball Bearing (Front)
22804310	Heatsink Head	22630002	Ball Bearing (Rear)
22805000	Connecting Rod	22883000	Carburettor Complete (2K)
22806000	Piston Pin	25381701	Carburettor Retainer
22807000	Cover Plate	72401000	Air Cleaner Complete
22808000	Drive Washer	22826110	Exhaust Adaptor (No.2)
*23009006	Propeller Washer	*72401060	Filter Elements (2 pairs)
23210007	Propeller Nut	*71521000	Long Socket Wrench (w/plug grip)
22813000	Screw Set	*22881900	Separate Needle Valve

* Optional extra parts. The above specifications are subject to change without notice for improvement.

FILTER ELEMENTS
(2 pairs)



LONG SOCKET WRENCH
(with plug grip)



SEPARATE NEEDLE VALVE



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