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**O.S. ENGINE****MAX-12TR SERIES**

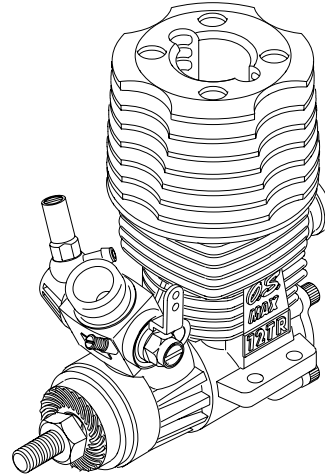
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**OWNER'S INSTRUCTION MANUAL**

It is of vital importance, before attempting to operate your engine, to read the general **'SAFETY INSTRUCTIONS AND WARNINGS'** section on pages 2-5 of this booklet and to strictly adhere to the advice contained therein.

- Also, please study the entire contents of this instruction manual, so as to familiarize yourself with the controls and other features of the engine.
- Keep these instructions in a safe place so that you may readily refer to them whenever necessary.
- It is suggested that any instructions supplied with the vehicle, radio control equipment, etc., are accessible for checking at the same time.

**CONTENTS**

SAFETY INSTRUCTIONS AND WARNINGS ABOUT YOUR O.S. ENGINE .....	2-5	IF THE ENGINE FAILS TO START .....	16
MAX-12TR SERIES INSTRUCTIONS .....	6	FINAL ADJUSTMENT .....	17-18
BASIC ENGINE PARTS .....	7	CARBURETOR CLEANLINESS .....	18-19
INSTALLATION .....	7-8	CARE AND MAINTENANCE .....	20
AIR CLEANER TYPE 103 .....	9	O.S. GENUINE PARTS & ACCESSORIES .....	21
GLOWPLUG .....	10	ENGINES EXPLODED VIEW & PARTS LIST .....	22-29
TOOLS, ACCESSORIES, etc. ....	11-12	CARBURETOR EXPLODED VIEW & PARTS LIST .....	30-32
CARBURETOR CONTROLS .....	12-13	THREE VIEW DRAWING .....	33-34
PRESSURIZED FUEL SYSTEM .....	14		
STARTING THE ENGINE & RUNNING-IN('Breaking-in) .....	14-16		

## SAFETY INSTRUCTIONS AND WARNINGS ABOUT YOUR O.S. ENGINE

Remember that your engine is not a "toy", but a highly efficient internal-combustion machine whose power is capable of harming you, or others, if it is misused.

As owner, you, alone, are responsible for the safe operation of your engine, so act with discretion and care at all times.

If at some future date, your O.S. engine is acquired by another person, we would respectfully request that these instructions are also passed on to its new owner.

■ The advice which follows applies basically to ALL MODEL ENGINES and is grouped under two headings according to the degree of damage or danger which might arise through misuse or neglect.



### WARNINGS

These cover events which might involve serious (in extreme circumstances, even fatal) injury.



### NOTES

These cover the many other possibilities, generally less obvious sources of danger, but which, under certain circumstances, may also cause damage or injury.

2



### WARNINGS

• Model engine fuel is poisonous. Do not allow it to come into contact with the eyes or mouth. Always store it in a clearly marked container and out of the reach of children.



• Model engine fuel is also highly flammable. Keep it away from open flame, excessive heat, sources of sparks, or anything else which might ignite it. Do not smoke or allow anyone else to smoke, near to it.



• Never operate your engine in an enclosed space. Model engines, like automobile engines, exhaust deadly carbon-monoxide. Run your engine only in an open area.

• Model engines generate considerable heat. Do not touch any part of your engine until it has cooled. Contact with the muffler (silencer), cylinder head or exhaust header pipe, in particular, may result in a serious burn.



3



## NOTES

- This engine is intended for model cars. Do not attempt to use it for any other purpose.
- Mount the engine in your model securely, following the manufacturers' recommendations, using appropriate screws and locknuts.
- Fit an effective silencer (muffler). Frequent close exposure to a noisy exhaust (especially in the case of the more powerful highspeed engines) may eventually impair your hearing and such noise is also likely to cause annoyance to others over a wide area.
- The wearing of safety glasses is also strongly recommended.
- Take care that the glowplug clip or battery leads do not come into contact with rotating parts. Also check that the linkage to the throttle arm is secure.
- For their safety, keep all onlookers (especially small children) well back (at least 20 feet or 6 meters) when preparing your model for running.



## NOTES

- To stop the engine, fully retard the throttle stick and trim lever on the trans-mitter, or, in an emergency, cut off the fuel supply by pinching the fuel delivery line from the tank.
- Warning! Immediately after a glowplug-ignition engine has been run and is still warm, conditions sometimes exist whereby it is just possible for the engine to abruptly restart if it is rotated over compression WITHOUT the glowplug battery being reconnected.

## MAX-12TR SERIES INSTRUCTIONS

This manual handles the following six versions.

MAX-12TR with 10M and 10J carburetor

MAX-12TR(S) with 10M carburetor

MAX-12TR(P) with 10J carburetor

MAX-12TR(P)-T with 11A carburetor

MAX-12TR(P)-T E Spec with 11A carburetor

The MAX-12TR Series are high-performance engines for 1/10 class R/C racing cars. The MAX-12TR has a conventional crankshaft, while the MAX-12TR(P) employs a special crankshaft with integral pilot crankshaft. The 10M is a drum valve carburetor, while 10J and 11A are slide valve carburetors.

### Standard accessories

- Glow Plug A5 (for 12TR, 12TR(S) and 12TR(P))
- Glow Plug P6 (for 12TR(P)-T, 12TR(P)-T E Spec)
- Super Air Cleaner 103 Assembly
  - 103 Cleaner Body
  - 103 Filter Elements (2pcs.)
- Exhaust seal ring
- Instruction manual

**NOTE:** With this engine, the piston will feel tight at the top of its stroke when the engine is cold. This is normal. The piston and cylinder are designed to achieve a perfect running clearance when they reach their normal running temperatures.

### NOTE

As delivered, the engine has its carburetor lightly fit into its intake. Secure it changing its angle according to the car chassis.

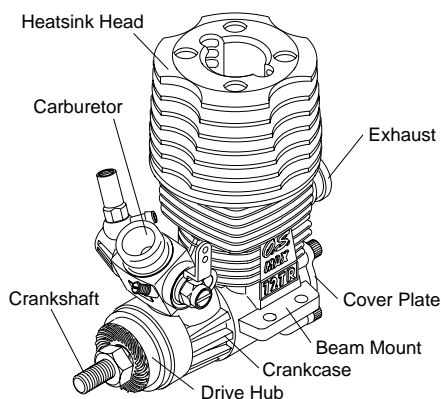
### About Head Gasket

These engines are fitted with two head gaskets of 0.1mm thick and 0.2mm thick. It is suggested to adjust the total thickness according to atmospheric temperature, humidity and glowplug used.

- At early stage of running-in, when a glowplug tends to burn out early or when high nitromethane content fuel is used, try to run the engine as it is or removing a 0.1mm gasket.
- When low nitromethane content fuel is used, try to run the engine removing a 0.2mm gasket.

6

## BASIC ENGINE PARTS

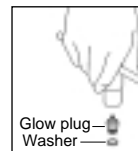


MAX-12TR

## INSTALLING THE GLOWPLUG

### In case of the A5 Plug

Install washer on glowplug and insert carefully into cylinder-head, making sure that it is not cross-threaded before tightening firmly.



### In case of the P6 Plug

Washer is not supplied as it is not needed.

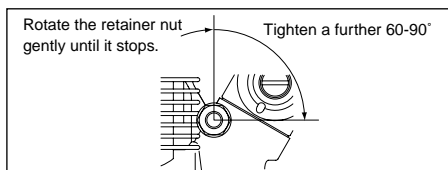
- Fit the exhaust seal ring supplied.

7

## INSTALLATION OF THE CARBURETOR

As delivered, the engine has its carburetor lightly fit into the intake boss. Secure it as follows.

1. Loosen the retainer screw, rotate the carburetor to its correct position and make sure that it is pressed well down into the intake boss, compressing the rubber gasket, before retightening screw.
2. Rotate the retainer screw gently until it stops, then tighten a further 60-90°. Do not overtighten the screw as this will damage the carburetor body.

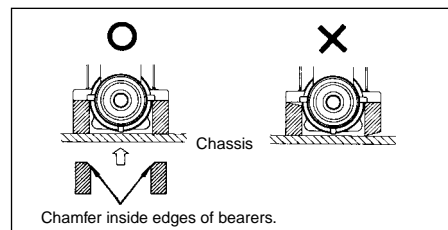


## ENGINE INSTALLATION

Make sure that the vehicle's engine mounting surfaces are level and in the same plane. Poor installation may cause distortion of the crankcase, bearings, etc., resulting in erratic running and loss of performance.

The recommended screws for securing the engine are 3mm or 4-40 steel Allen hexagon socket type.

If existing holes in the engine mount do not align perfectly with engine mounting lugs, enlarge them slightly with a needle-file so that screws enter vertically.



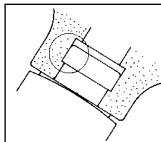
8

## AIR CLEANER TYPE 103

It has a single filter element and is intended primarily for circuit racing. The lower height of the Super Air-Cleaner 103 also facilitates easier installation in cars where available space may be restricted.

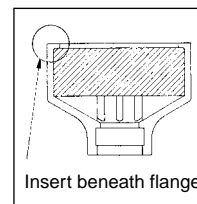
### INSTALLATION OF AIR CLEANER

- Carefully clean the carburetor, removing any old adhesive or sealant that may have been previously used on the outside of the air intake.
- Press the air cleaner body firmly over the carburetor air intake. Make sure that the outer rim of the air intake engages the internal annular groove in the air cleaner: failure to do so may result in the air cleaner falling off.
- Position the air cleaner correctly, so that it does not foul the cylinder-head or obstruct the needle-valve.



### INSTALLING THE FILTER ELEMENT

- The element is already impregnated with a special filter oil. As this oil is very sticky, take care, when handling it, to prevent dust or dirt from adhering to the element. If your fingers become contaminated, wash them with soap and water.



- During storage, the oil may have become unevenly dispersed through the element. This will be indicated if the blue colour of the element material appears patchy. In this case, place the element in a small plastic bag and gently rub it between finger and thumb to redistribute the oil.

### REPLACEMENT OF ELEMENT

- It is advisable to replace the filter element with a new one after not more than one hour of running time. Always remove contaminated elements carefully, to ensure that dirt cannot enter the carburetor.

9

## GLOWPLUG

Since the compatibility of glowplug and fuel may have a marked effect on performance and reliability, it may be worthwhile to choose the R/C type plug found most suitable after tests.

### In case of the 12TR/12TR(P)

When it is necessary to replace a glowplug, recommended O.S. plugs are A5, No.8 and R5.

**(T Series plugs cannot be used with these engines.)**

### In case of 12TR(P)-T, 12TR(P)-T E Spec

When it is necessary to replace a glowplug, recommended O.S. plugs are T Series P6(Hot), P7(Medium) and P8(Cold).

**(Standard glowplug cannot be used with this engine.)**

### The role of the glowplug

With a glowplug engine, ignition is initiated by the application of a 1.5-volt power source. When the battery is disconnected, the heat retained within the combustion chamber remains sufficient to keep the plug filament glowing, thereby continuing to keep the engine running. Ignition timing is 'automatic': under reduced load, allowing higher rpm, the plug becomes hotter and, appropriately, fires the fuel/air charge earlier; conversely, at reduced rpm, the plug becomes cooler and ignition is retarded.

### Glowplug life

Particularly in the case of very high performance engines, glowplugs must be regarded as expendable items.

However, plug life can be extended and engine performance maintained by careful use, i.e.:

- Install a plug suitable for the engine.
- Use fuel containing a moderate percentage of nitromethane unless more is essential for racing events.
- Do not run the engine too lean and do not leave the battery connected while adjusting the needle.

### When to replace the glowplug

Apart from when actually burned out, a plug may need to be replaced because it no longer delivers its best performance, such as when:

- Filament surface has roughened and turned white.
- Filament coil has become distorted.
- Foreign matter has adhered to filament or plug body has corroded.
- Engine tends to cut out when idling.
- Starting qualities deteriorate.

10

## TOOLS, ACCESSORIES, etc.

The following items are necessary for operating the engine.

### FUEL

Use only top quality methanol-based model engine fuel. For consistent performance and long engine life, it is advisable to use fuel containing AT LEAST 18% lubricant. This engine 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 40% 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 only 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 RUNNING-IN paragraphs. When engines are run at very high speeds and on high-nitro fuels, glowplug elements do not last as long.

### Reminder!

**Model engine fuel is poisonous. Do not allow it to come into contact with the eyes or mouth. Always store it in a clearly marked container and out of the reach of children.**

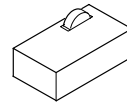


**Model engine fuel is also highly flammable. Keep it away from open flame, excessive heat, sources of sparks, or anything else which might ignite it.**



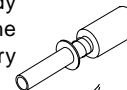
### ELECTRIC STARTER BOX

For starting the engine.



### BATTERY INTEGRATED GLOWPLUG HEATER

Commercially available handy glowplug heater in which the glowplug battery and battery leads are integrated.



### FUEL PUMP

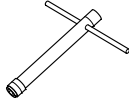
For filling the fuel tank, a simple, polyethylene "squeeze" bottle, with a suitable spout, is required.



11

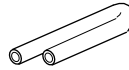
### LONG SOCKET WRENCH

Recommended for easy removal and replacement of the angled and recessed glowplug, the O.S. Long Socket Wrench incorporates a special grip.



### SILICONE FUEL LINE

Heatproof silicone tubing of approx. 5mm o.d. and 2mm i.d. is required for the connection between the fuel tank and engine.



### CARBURETOR CONTROLS (10J)

Three adjustable controls are provided on this carburettor.

- **The Needle-Valve:**

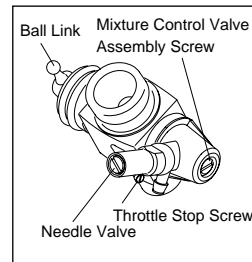
For adjusting the mixture strength when the throttle is fully open.

- **The Mixture Control Screw:**

For adjusting the mixture strength at part-throttle and idling speeds, to obtain steady idling and smooth acceleration to mid speeds.

- **The Throttle Stop Screw:**

For setting the minimum idling speed.



### CARBURETOR CONTROLS (10M)

Three adjustable controls are provided on this carburettor.

- **The Needle-Valve:**

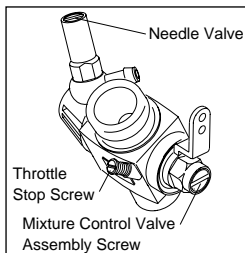
For adjusting the mixture strength when the throttle is fully open.

- **The Mixture Control Screw:**

For adjusting the mixture strength at part-throttle and idling speeds, to obtain steady idling and smooth acceleration to mid speeds.

- **The Throttle Stop Screw:**

For setting the minimum idling speed:



**NOTE:**  
Readjustment may be necessary, occasionally to allow for changes in fuel, gear ratio or clutch engagement point.

### CARBURETOR CONTROLS (11A)

Four adjustable controls are provided on this carburettor.

- **The Needle-Valve:**

For adjusting the mixture strength when the throttle is fully open.

- **The Mixture Control Screw:**

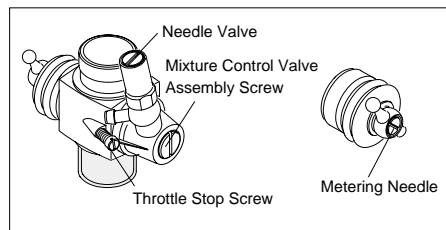
For changing the feeling at mid speeds and acceleration. (Do not rotate the screw more than one turn.)

- **The Metering Needle:**

For adjusting the mixture strength at part-throttle and idling speeds, to obtain steady idling and smooth acceleration to mid speeds.

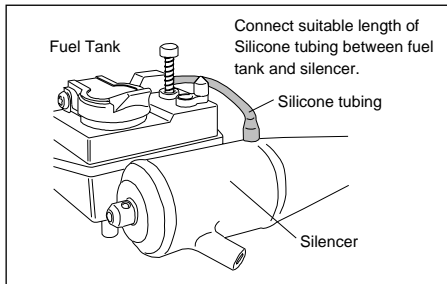
- **The Throttle Stop Screw:**

For setting the minimum idling speed:



## PRESSURIZED FUEL SYSTEM

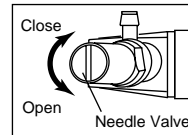
- The somewhat violent changes of vehicle attitude that occur in off-road running, combined with the fact that, in buggy type cars, the fuel tank is often located some distance from the carburetor, means that fuel 'head' at the carburetor can vary and upset running. Therefore, it is recommended that a muffler pressurized fuel feed system be used.
- Never run your vehicle without installing the air cleaner. Dust and dirt that may otherwise be drawn into the engine will rapidly shorten its life.



## STARTING THE ENGINE & RUNNING-IN ('Breaking-in')

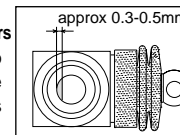
The following procedure is suitable for these engines when the O.S. T-1030 tuned silencer and a fuel containing up to 30% nitromethane are used.

- Use the same fuel as is to be employed for all initial running and containing NOT LESS THAN 18% lubricant.
- Temporarily remove the glowplug to check that it glows bright red when energized.
- Re-check the needle-valve and throttle settings. 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.
- Open the Needle-Valve 2 turns from the fully closed position.



### ■ In case of the 10J/11A carburetors

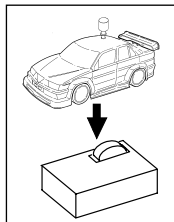
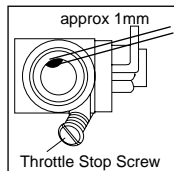
- Set the throttle-stop screw so that the minimum throttle opening (idle setting) is approximately 0.3-0.5mm.



14

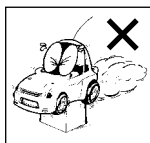
### ■ In case of the 10M carburetor

- Set the throttle-stop screw so that the minimum throttle opening (idle setting) is approximately 1.0mm.
- DO NOT energize glowplug, but apply electric starter to draw fuel to carburetor.



### Remember!

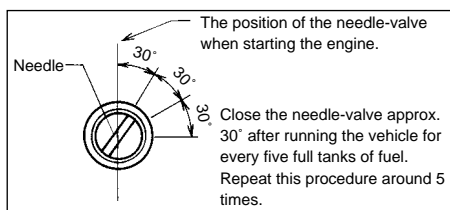
It is vitally important to set the throttle at the correct position before attempting to start the engine. If the engine is allowed to run with the throttle too far open under "no load" conditions, it will rapidly overheat and may be seriously damaged.



- When the engine starts, first allow it to operate in short runs on its very rich starting settings, with the glowplug battery still connected and with its driving wheels clear of the ground. The rich mixture will, under these conditions, provide adequate lubrication and cooling, indicated by profuse smoke from the exhaust.
- Next, disconnect the glowplug battery and try running the car on the track. If the engine stalls, open the throttle fractionally, but try to keep the engine running as rich as possible: if it stops because of being excessively over-rich, close the Needle-Valve 30° and try again.
- Run the car on the track until five tanks of fuel has been consumed, then close the Needle-Valve 30°. Repeat this procedure again until 5 tanks of fuel have been consumed, during which time the throttle may be opened for brief bursts of increased power. If the engine stops at medium speeds, close the Mixture Screw 45-90°.

15





- To stop the engine, close the throttle to idling speed, then shut it off completely with the trim lever on the transmitter. To cut off the fuel supply, pinch the fuel delivery tube to the carburettor.

**Remember!**

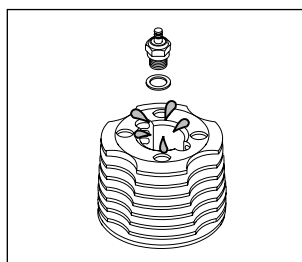
If the engine should need to be disassembled (e.g. for cleaning or minor parts replacement) it is advisable to return the Needle-Valve to the original rich, starting setting and check whether further running-in time is required before the car is raced again. In the event of any major working parts (e.g. piston/cylinder liner assembly) being replaced, the complete running-in should be repeated.

## IF THE ENGINE FAILS TO START

**Check the following:**

- Glowplug battery discharged or glowplug defunct.
- Fuel not reaching carburettor.
- Engine flooded. Do not over-prime. (This could also cause hydraulic lock and damage the engine on application of the electric starter.)

Remove glowplug, close needle-valve and apply starter to pump out surplus fuel. At this time cover the plug hole with waste so that splashing fuel will not get into your eyes or mouth.



16

## FINAL ADJUSTMENT

- Run the vehicle (with throttle fully open) over the longest available straight course, in order to observe the model's speed. Next return the car to the starting point, close the Needle-Valve 30° and repeat the run, taking note of the improvement in performance. Continue with further runs, gradually reducing the Needle-Valve setting and aiming to achieve the highest straight-line speed. Remember, however, that, if the Needle-Valve is shut down too far, the engine will overheat and, accompanied by visibly diminished exhaust smoke, the model will lose speed. At this point, throttle down immediately, stop the vehicle and reopen the Needle-Valve 30°.
- Having established the optimum Needle-Valve setting, check the Mixture Control Valve setting as follows.
- With the engine running, close the throttle and allow it to idle for about five seconds, then reopen the throttle fully. If, at this point, the engine puffs out an excessive amount of smoke and the vehicle does not accelerate smoothly and rapidly, it is probable that the idling mixture is too rich.

- In this case, turn the Mixture Control Valve in case of the 10M/10J and the Metering Needle in case of the 11A clockwise 45 degrees. If, on the other hand, the engine tends to speed up momentarily and then cut out abruptly when the throttle is opened, the idling mixture is too lean. Correct this by turning the Mixture Control Valve in case of the 10M/10J and the Metering Needle in case of the 11A counter-clockwise 45 degrees.
- Carry out adjustments patiently, under actual running conditions, until the engine responds quickly and positively to the throttle control.

**Warning!**

Mixture adjustments (whether via the Mixture Control Valve, or the Needle-Valve) cannot be made accurately under 'no-load' conditions, which, in any case, are not advised, since such operation carries the risk of seriously damaging the engine through over-revving and overheating.

17

- With the optimum mixture control position, light smoke is visible during high speed running, and the engine revolutions increase smoothly during acceleration. Remember that, if the engine is operated with the fuel/air mixture slightly too lean, it will overheat and run unevenly. As with all engines, it is advisable to set both needle-valve and mixture control screw very slightly on the rich side of the best rpm setting, as a safety measure.
- If the engine runs too fast with the throttle closed, the throttle stop screw should be turned counter-clockwise to allow the throttle opening to be reduced.
- Finally, beyond the nominal break-in period, a slight readjustment toward a leaner needle setting may be required to maintain performance.

## CARBURETOR CLEANLINESS

The correct functioning of the carburetor depends on its small fuel orifices remaining clear.

### ■ BALL LINK AND SLIDE VALVE EXTENSION (In case of the 10J/11A carburetors)

It is seldom necessary to separate the slide-valve extension from the slide-valve itself. For cleaning, withdraw this complete sub-assembly from the carburetor body after removing the slide-valve guide screw. Then wash with methanol or glow-fuel.

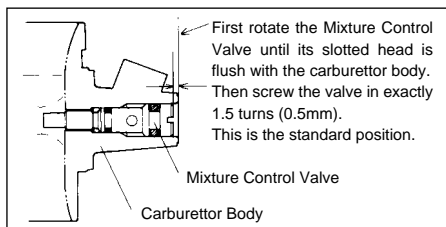
(Note: take care not to lose the guide screw; it is a special one.) When it is necessary to adjust the ball-link position, loosen the ball-link retaining screw with a 3mm(10J) or 1mm(11A) hexagon key, re-align the ball-link and retighten the screw firmly.

18

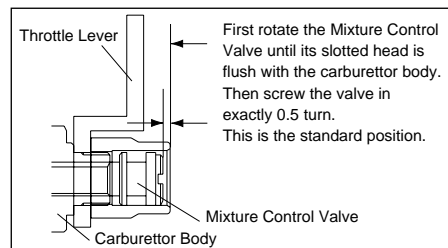
### ■ REALIGNMENT OF MIXTURE CONTROL VALVE AND METERING NEEDLE

In the course of making carburetor adjustments, it is just possible that the Mixture Control Valve or Metering Needle may be inadvertently screwed in or out too far and thereby moved beyond its effective adjustment range. In this case, return it to the basic position shown in the sketches.

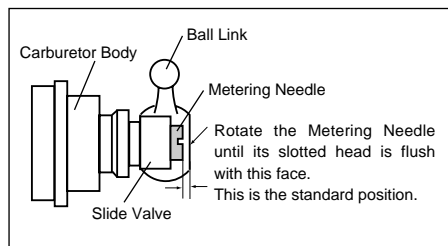
#### In case of the 10J/11A carburetors



#### In case of the 10M carburetor



#### In case of the 11A carburetor



19

## CARE AND MAINTENANCE

1. The minute particles of foreign matter, that are present in any fuel may, by accumulating and partially obstructing fuel flow, cause engine performance to become erratic and unreliable.

O.S. 'Super-Filters' (large and small) are available, as optional extras, to deal with this problem.

One of these filters, fitted to the outlet tube inside your refueling container, will prevent the entry of foreign material into the fuel tank. It is also recommended that a good in-line filter be installed between the tank and carburetor.

2. Do not forget to clean the filters regularly to remove dirt and lint that accumulate on the filter screens. Also, clean the carburetor itself occasionally.

3. At the end of each operating session, drain out any fuel that may remain in the fuel tank. Afterwards, energize the glow-plug and try to restart the engine, to burn off any fuel that may remain inside the engine. Repeat this procedure until the engine fails to fire. Do this while the engine is still warm.

4. Then, inject some after-run oil into the engine, and rotate the engine with an electric starter for 4 to 5 seconds to distribute the oil to all the working parts.

### Note:

**Do not inject after-run oil into the carburetor as this may cause the O-rings inside the carburetor to deteriorate. These procedures will reduce the risks of starting difficulties or corrosion after a period of storage.**

5. Finally, when cleaning the exterior of the engine, use methanol or kerosene. Do not use gasoline or any solvent that might damage the silicone fuel tubing.

### Caution:

**The rear crankshaft bearing of this engine uses a special plastic retainer. If the front housing needs to be heated to remove or replace the bearing, do not allow the bearing to exceed 120°C (248°F), otherwise it may be damaged and rendered unserviceable.**



## O.S. GENUINE PARTS & ACCESSORIES

### ■ O.S. Glow Plug



**No.8**  
(71608001)  
**R5**  
(71605200)



**T Series**  
**P6**  
(71641600)  
**P7**  
(71641700)  
**P8**  
(71641800)

### ■ 12TR Exhaust Header Pipes

**For Super10 Class** (72106160)  
**Header Pipe Spring** (72106172)

**For Pure10 Class Short** (72106170)  
**Header Pipe Spring** (72106172)

**For Pure10 Class Long** (72106180)  
**Header Pipe Spring** (72106172)

### ■ 12TR Hyper Head

for 12TR, 12/15CV-R series  
(72011000)

### ■ Super Joint Tube 15

(72103310)



### ■ T-1030 Tuned Silencer

(72103030)

### ■ T-1031 Tuned Silencer

(72103031)

Exhaust outlet pipe is located on right side of silencer.

For KYOSHO Super 10 chassis

### ■ T-1032 Tuned Silencer

(72103032)

Exhaust outlet pipe with 5mm dia.

Is located on left side of silencer

IFMAR regulation legal

### ■ Exhaust Seal Ring

For 12TR Series (2pcs.)  
(21427200)

### ■ Super Air Cleaner 103

(72403300)

#### 103 Cleaner Body

(72403310)

#### 103 Filter Elements (4pcs.)

(72403320)

### ■ Dust Cap Set

Ø 3 (73300305)

For Carburetor Nipple

Ø 7 (73300712)

For T-1020/1030/1031  
1032 Tuned Silencer

Ø12 (73301212)

For 10J/10M/11A  
Carburetor

### ■ Cap Screw Set

(10pcs. set)

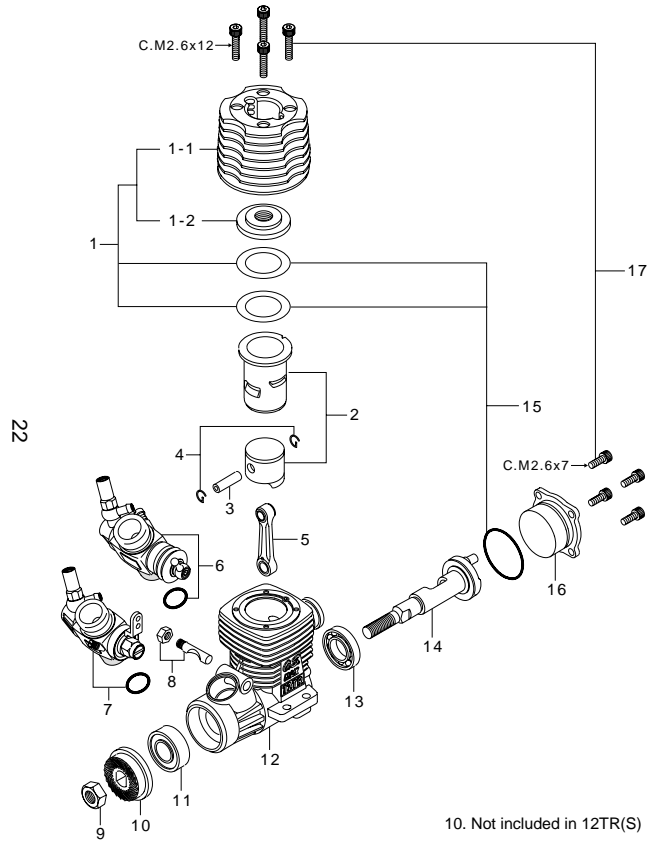
**M2.6x7** (79871020)

**M2.6x12** (79871040)

### ■ Long Socket Wrench With Plug Grip

(71521000)

## 12TR/12TR(S) EXPLODED VIEW



\* Type of screw  
 C...Cap Screw M...Oval Fillister-Head Screw  
 F...Flat Head Screw N...Round Head Screw S...Set Screw

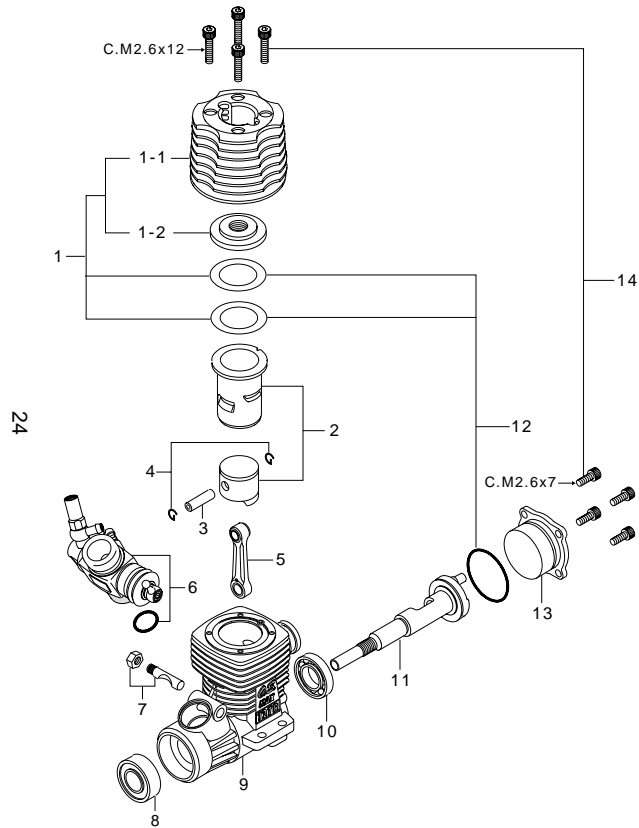
## 12TR/12TR(S) ENGINE PARTS LIST

23

No.	Code No.	Description
1	21454600	Heatsink Head Assembly
1-1	21454620	Outer Head
1-2	21454610	Inner Head
2	21453001	Cylinder & Piston Assembly
3	21256000	Piston Pin
4	21817000	Piston Pin Retainer (2pcs.)
5	21455000	Connecting Rod
6	21483000	Carburetor Complete (Type 10J)
7	21484000	Carburetor Complete (Type 10M)
8	25381701	Carburetor Retainer
9	20810007	Propeller Nut
10	21458000	Drive Hub
11	22631020	Crankshaft Ball Bearing (Front)
12	21451000	Crankcase
13	21430000	Crankshaft Ball Bearing (Rear)
14	21452000	Crankshaft
	21452020	Crankshaft (For 12TR(S))
15	21464010	Gasket Set
16	21457000	Cover Plate
17	21213000	Screw Set
	71605100	Glow Plug A5
	21427200	Exhaust Seal Ring (2pcs.)
	72403300	Super Air Cleaner 103 (W/2 filter elements)
	72403310	103 Cleaner Body
	72403320	103 Filter Elements (4pcs.)

The specifications are subject to alteration for improvement without notice.

## 12TR(P) EXPLODED VIEW



\* Type of screw

C...Cap Screw M...Oval Fillister-Head Screw

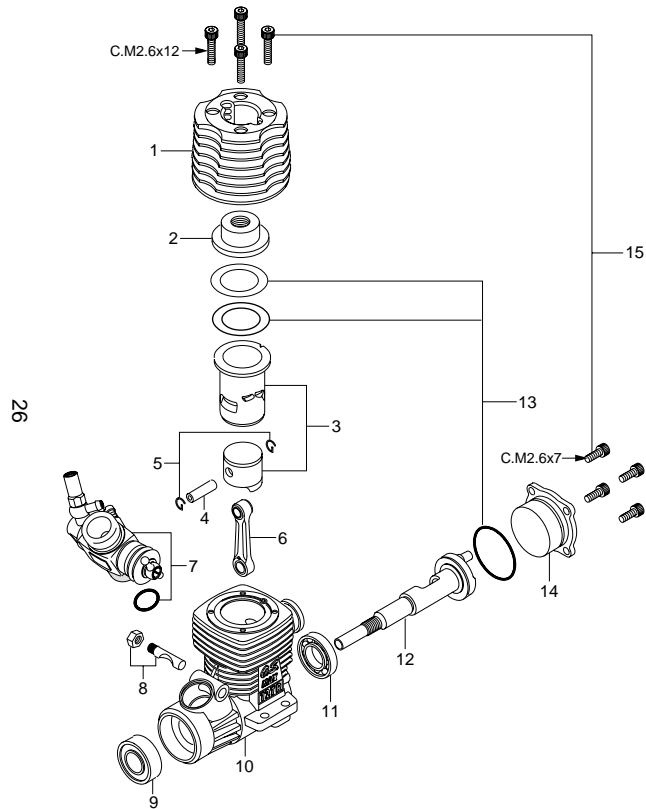
F...Flat Head Screw N...Round Head Screw S...Set Screw

## 12TR(P) ENGINE PARTS LIST

No.	Code No.	Description
1	21454600	Heatsink Head Assembly
1-1	21454620	Outer Head
1-2	21454610	Inner Head
2	21453001	Cylinder & Piston Assembly
3	21256000	Piston Pin
4	21817000	Piston Pin Retainer (2pcs.)
5	21455000	Connecting Rod
6	21483000	Carburetor Complete (Type 10J)
7	25381701	Carburetor Retainer
8	22631020	Crankshaft Ball Bearing (Front)
9	21451000	Crankcase
10	21430000	Crankshaft Ball Bearing (Rear)
11	21452010	Crankshaft
12	21464010	Gasket Set
13	21457000	Cover Plate
14	21213000	Screw Set
	71605100	Glow Plug A5
	21427200	Exhaust Seal Ring (2pcs.)
	72403300	Super Air Cleaner 103 (W/2 filter elements)
	72403310	103 Cleaner Body
	72403320	103 Filter Elements (4pcs.)

The specifications are subject to alteration for improvement without notice.

## 12TR(P)-T EXPLODED VIEW



\* Type of screw

C...Cap Screw M...Oval Fillister-Head Screw

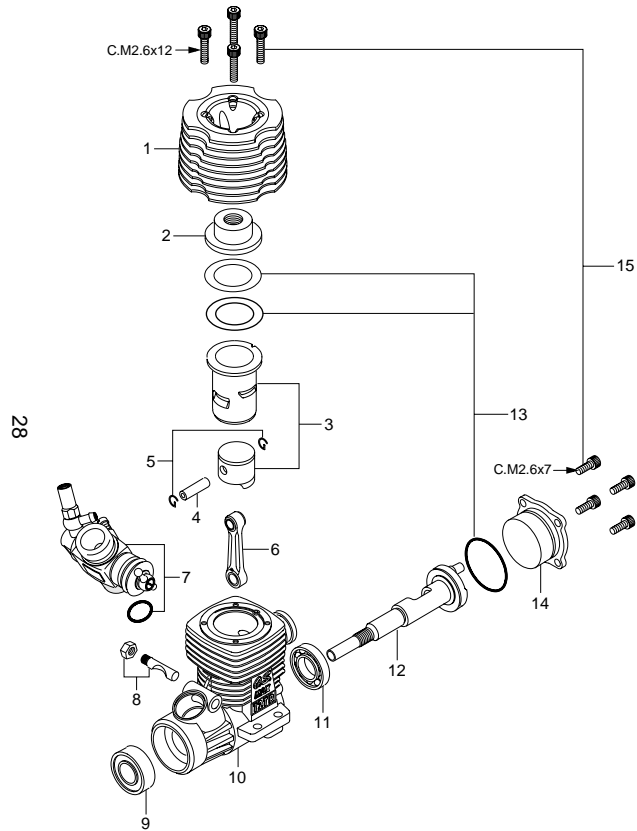
F...Flat Head Screw N...Round Head Screw S...Set Screw

## 12TR(P)-T ENGINE PARTS LIST

No.	Code No.	Description
1	21454620	Outer Head
2	21454611	Inner Head
3	21453020	Cylinder & Piston Assembly
4	21256000	Piston Pin
5	21817000	Piston Pin Retainer (2pcs.)
6	21455000	Connecting Rod
7	21483020	Carburetor Complete (Type 11A)
8	25381701	Carburetor Retainer
9	22631020	Crankshaft Ball Bearing (Front)
10	21451010	Crankcase
11	21430000	Crankshaft Ball Bearing (Rear)
12	21452010	Crankshaft
13	21464010	Gasket Set
14	21457010	Cover Plate
15	21213000	Screw Set
	71641600	Glow Plug P6
	21427200	Exhaust Seal Ring (2pcs.)
	72403300	Super Air Cleaner 103 (W/2 filter elements)
	72403310	103 Cleaner Body
	72403320	103 Filter Elements (4pcs.)

The specifications are subject to alteration for improvement without notice.

## 12TR(P)-T E Spec EXPLODED VIEW



\*Type of screw

C...Cap Screw M...Oval Fillister-Head Screw

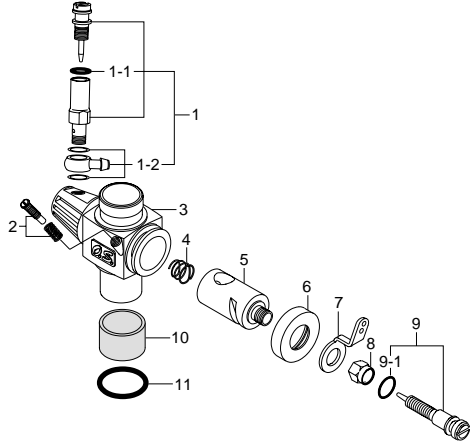
F...Flat Head Screw N...Round Head Screw S...Set Screw

## 12TR(P)-T E Spec ENGINE PARTS LIST

No.	Code No.	Description
1	72011010	Outer Head
2	21454611	Inner Head
3	21453001	Cylinder & Piston Assembly
4	21256000	Piston Pin
5	21817000	Piston Pin Retainer (2pcs.)
6	21455000	Connecting Rod
7	21483020	Carburetor Complete (Type 11A)
8	25381701	Carburetor Retainer
9	22631020	Crankshaft Ball Bearing (Front)
10	21451010	Crankcase
11	21430000	Crankshaft Ball Bearing (Rear)
12	21452010	Crankshaft
13	21464010	Gasket Set
14	21457010	Cover Plate
15	21213000	Screw Set
	71641600	Glow Plug P6
	21427200	Exhaust Seal Ring (2pcs.)
	72403300	Super Air Cleaner 103 (W/2 filter elements)
	72403310	103 Cleaner Body
	72403320	103 Filter Elements (4pcs.)

The specifications are subject to alteration for improvement without notice.

## 10M CARBURETOR EXPLODED VIEW & PARTS LIST

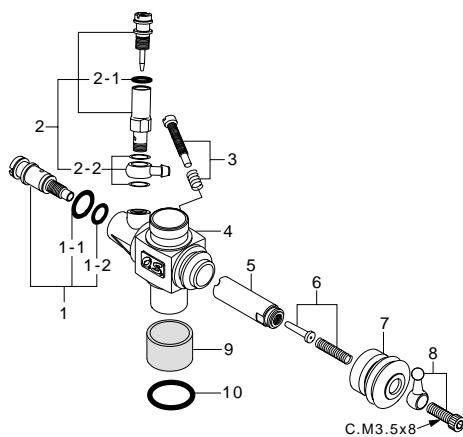


No.	Code No.	Description
1	21285901	Needle Valve Assembly
1-1	27881820	"O" Ring (2pcs.)
1-2	21881950	No.14 Universal Nipple Assembly
2	22681310	Throttle Stop Screw
3	21484100	Carburetor Body (w/Thermo Insulator)
4	22481506	Rotor Spring
5	21484200	Carburetor Rotor
6	21283210	Dust Cover
7	22681419	Throttle Lever
8	21481420	Throttle Lever Fixing Nut
9	21484600	Mixture Control Screw
9-1	27881820	"O" Ring (2pcs.)
10	21165010	Thermo Insulator
11	22615000	Carburetor Rubber Gasket

The specifications are subject to alteration for improvement without notice.

30

## 10J CARBURETOR EXPLODED VIEW & PARTS LIST



No.	Code No.	Description
1	21285600	Mixture Control Valve Assembly
1-1	46066319	"O" Ring(L) (2pcs.)
1-2	22781800	"O" Ring(S) (2pcs.)
2	21285901	Needle Valve Assembly
2-1	27881820	"O" Ring (2pcs.)
2-2	21881950	No.14 Universal Nipple Assembly
3	23818500	Throttle Stop Screw
4	21483100	Carburetor Body (w/Thermo Insulator)
5	21483200	Slide Valve
6	21483600	Metering Needle Assembly
7	21881320	Dust Cover
8	23818420	Ball Link No.4
9	21165010	Thermo Insulator
10	22615000	Carburetor Rubber Gasket

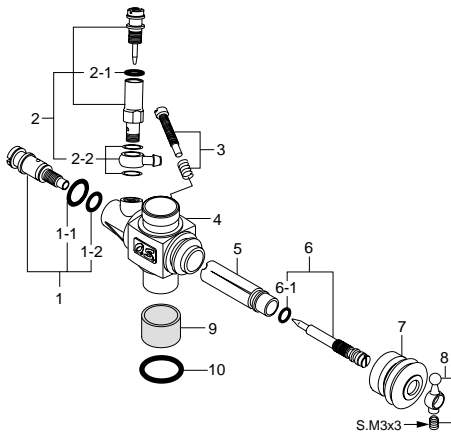
The specifications are subject to alteration for improvement without notice.

\* Type of screw  
 C...Cap Screw M...Oval Fillister-Head Screw  
 F...Flat Head Screw N...Round Head Screw S...Set Screw

31



## 11A CARBURETOR EXPLODED VIEW & PARTS LIST



No.	Code No.	Description
1	21285600	Mixture Control Valve Assembly
1-1	46066319	"O" Ring(L) (2pcs.)
1-2	22781800	"O" Ring(S) (2pcs.)
2	21285901	Needle Valve Assembly
2-1	27881820	"O" Ring (2pcs.)
2-2	21881950	No.14 Universal Nipple Assembly
3	23818500	Throttle Stop Screw
4	21483110	Carburetor Body (w/Thermo Insulator)
5	21483220	Slide Valve
6	21483610	Metering Needle Assembly
6-1	22781800	"O" Ring(S) (2pcs.)
7	21881320	Dust Cover
8	23818430	Ball Link No.5
9	21165010	Thermo Insulator
10	22615000	Carburetor Rubber Gasket

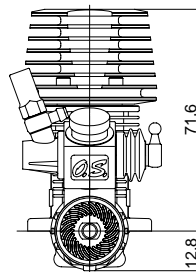
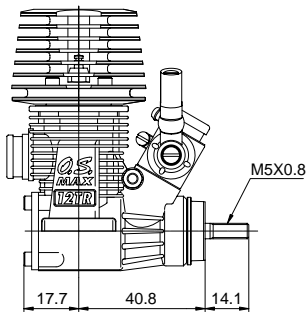
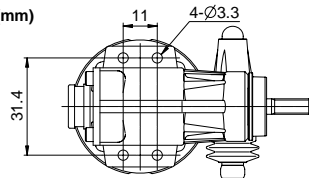
The specifications are subject to alteration for improvement without notice.

\*Type of screw  
 C...Cap Screw M...Oval Fillister-Head Screw  
 F...Flat Head Screw N...Round Head Screw S...Set Screw

32

## 12TR THREE VIEW DRAWING Dimensions(mm)

SPECIFICATIONS	
■ Displacement	2.11 cc (0.129 cu.in.)
■ Bore	14.0mm (0.551 in.)
■ Stroke	13.7mm (0.539 in.)
■ Practical R.P.M.	4,000-36,000 r.p.m.
■ Power output	1.1 bhp / 30,000 r.p.m.
■ Weight	216.5g(7.5oz.)



MAX-12TR W/10J

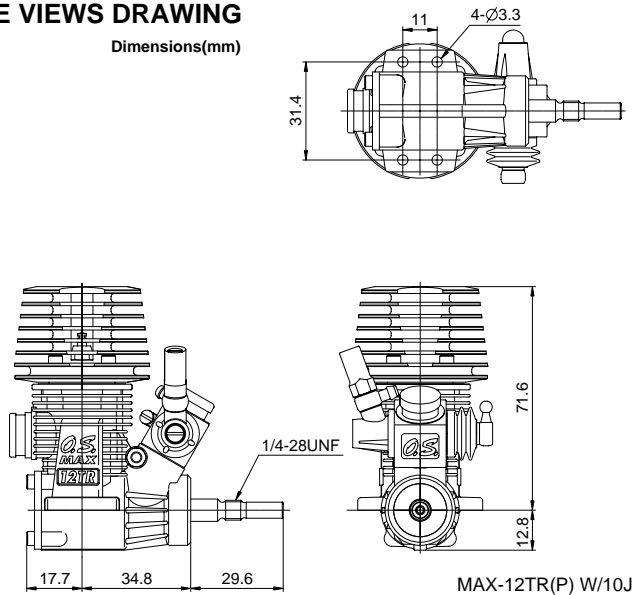
33

## 12TR(P)/12TR(P)-T THREE VIEWS DRAWING

12TR(P) SPECIFICATIONS	
■ Displacement	2.11 cc (0.129 cu.in.)
■ Bore	14.0mm (0.551 in.)
■ Stroke	13.7mm (0.539 in.)
■ Practical R.P.M.	4,000-36,000 r.p.m.
■ Power output	1.1 bhp / 30,000 r.p.m.
■ Weight	210g(7.27oz.)

12TR(P)-T SPECIFICATIONS	
■ Displacement	2.11 cc (0.129 cu.in.)
■ Bore	14.0mm (0.551 in.)
■ Stroke	13.7mm (0.539 in.)
■ Practical R.P.M.	4,000-38,000 r.p.m.
■ Power output	1.3 bhp / 30,000 r.p.m.
■ Weight	210g(7.27oz.)

Dimensions(mm)



34



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