

O.S. ENGINE MAX-21™ w/T-Maxx or Revo Manifold INSTRUCTION MANUAL

It is of vital importance, before attempting to operate your engine, to read the general 'SAFETY INSTRUCTIONS AND WARNINGS' in the following section 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.

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 or abused. 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 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.

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 it.



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.

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.

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.

ABOUT THE ENGINE

These engines are designed especially to power the T-Maxx or Revo. Purposely designed LC3 glow plug is supplied with the engine for improved power, fuel economy and durability. The carburetor offers easy handling as well as high performance.

T-Maxx and Revo are trademarks of Traxxas Corp.

Standard accessories

- Glow Plug LC3
- Exhaust Seal Ring 1pc.
- Exhaust Manifold for T-Maxx
- Exhaust Manifold for Revo

TOOLS, ACCESSORIES, etc.

The following items are necessary for operating the engine.

Items necessary for starting

FUEL
Generally, it is suggested that the user selects a fuel that is commercially available for model two-stroke engines and contains 10-30% nitromethane. As a starting point, we recommend a fuel containing 20% nitromethane, changing to a fuel containing more nitro if necessary. When the brand of fuel is changed, or the nitro content increased, it is advisable to repeat the running-in procedure referred to in the RUNNING-IN paragraphs. Please note that with high-nitro fuels, although power may be increased for competition purposes, glowplug elements do not last as long and engine life will be shortened.

FUEL FILTER

To installed in the fuel line between fuel tank and carburetor to prevent foreign matter from entering the carburetor.

GLOWPLUG IGNITER

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

Install 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.

Before starting the engine, always check the tightness of all the screws and nuts especially those of joint and movable parts such as throttle arm. Missing retightening the loose screws and nuts often causes the parts breakage that is capable of harming you.

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.

FUEL PUMP

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



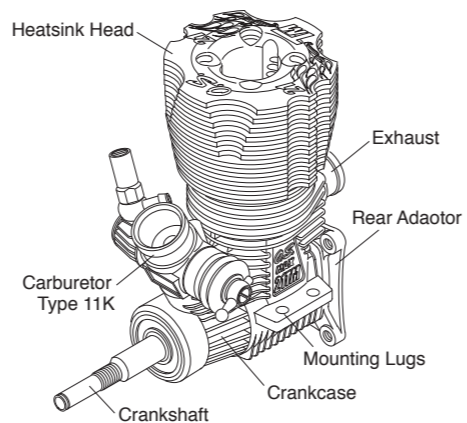
O.S. SPEED SILICONE FUEL LINE (optional extra)

The connection between the fuel tank and the engine. 2.5mm ID

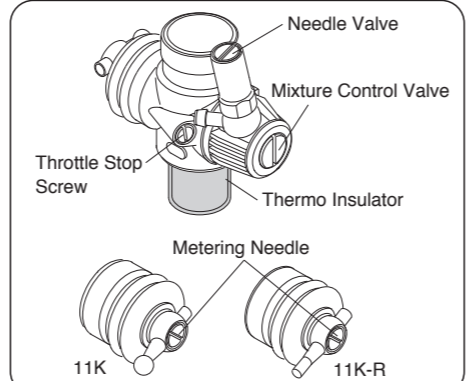
TOOLS

- O.S. SPEED DRIVER TOOLS
- O.S. SPEED FLYWHEEL KEY
- O.S. SPEED CLUTCH WRENCH & ADJUSTER
- O.S. SPEED FLYWHEEL PULLER
- O.S. SPEED PLUG WRENCH

BASIC ENGINE PARTS MAX-21™-T



CARBURETOR CONTROLS 11K, 11K-R



CARBURETOR CONTROLS

Four adjustable controls are provided on this carburetor.

The Needle-Valve:

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

The Mixture Control Valve:

For changing the mixture strength at mid speed and acceleration. (Do not rotate the screw more than one turn.)

The Metering Needle:

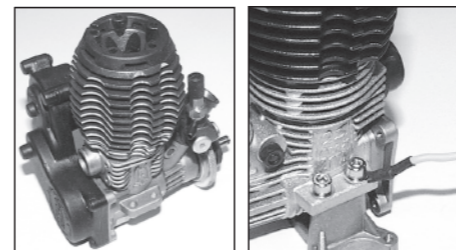
For adjusting the mixture strength at part-throttle and idle speed, to obtain steady idling and smooth acceleration to mid speed.

The Throttle Stop Screw:

For setting the minimum idle speed:

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

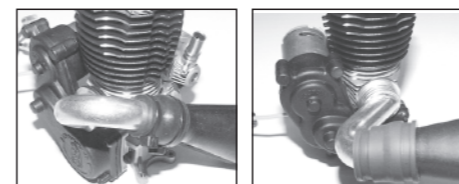
ENGINE INSTALLATION



First, remove the original engine, from the engine mount.

Install the engine on the engine mount with ground wire.

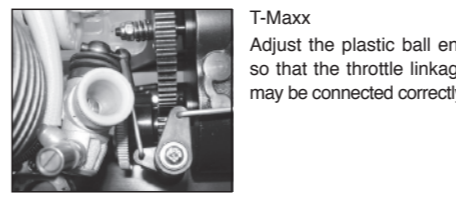
Install the flywheel and clutch.



T-Maxx

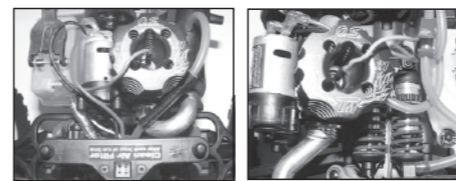
Revo

Install the electric starter taken from the original engine. Install the manifold supplied with the engine.



Revo

Adjust the stopper end so that the throttle linkage may be made correctly.



T-Maxx

21™-R

Finally, connect the wire for glow plug heating to the glow plug.

Finally, insert the wire for heating the glow plug.

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

For long life and high performance, every engine needs to be 'run-in' or 'broken-in'. With care, running-in of the MAX-21™ can be carried out with the engine installed in the vehicle.

Be sure to install the air-cleaner on the carburetor and use a muffler-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.

Fill the tank completely with fuel.

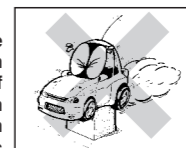
Temporarily remove the glowplug to check that it glows bright red when energized.

The carburetor on this engine has been set at the starting setting when the engine leaves the factory.

Switch on the transmitter, and check that all the linkage moves correctly.

Attention:

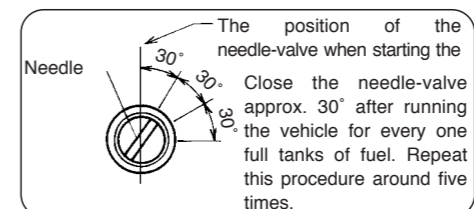
It is vitally important to set the throttle at the correct position before starting the engine. If the engine is allowed to run with the throttle too far open under "no load" conditions (i.e. with the driving wheels not in contact with the ground) it will rapidly over-heat and may be seriously damaged.



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.

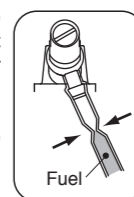
Run the car on the track until one tank of fuel has been consumed, then close the Needle-Valve 30°. Repeat this procedure again until five tanks of fuel have been consumed, during which time the throttle may be opened for brief bursts of increased power. If the engine stops at medium speeds, close the Mixture Control Valve 30°.



Note:

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 or the fuel being changed, especially to high nitro fuel, the complete running-in should be repeated.

To stop the engine, close the throttle to idle 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 carburetor.

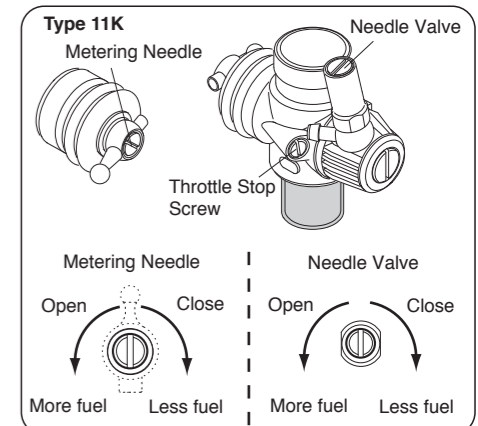


Warning!

Do not touch rotating parts, engine and silencer when stopping the engine as they become very hot, and contact with them may result in a serious burn.

FINAL ADJUSTMENT

Final adjustment should be carried out only after the running-in has been completed.



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°.

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 idle mixture is too rich. In this case, turn the Metering Needle clockwise 30°. If, on the other hand, the engine tends to speed up momentarily and then cut out abruptly when the throttle is opened, the idle mixture is too lean. Correct this by turning the Metering Needle counter-clockwise 30°.

NOTE:

Metering Needle adjustment should be made in steps of not more than 30°, carefully checking the effect, on throttle response, of each small adjustment.

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 Metering Needle, 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.

With the optimum mixture control position, light smoke is visible during high speed running, and the engine rpm increases 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 the needle-valve and metering needle 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.

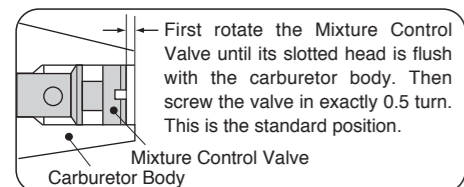
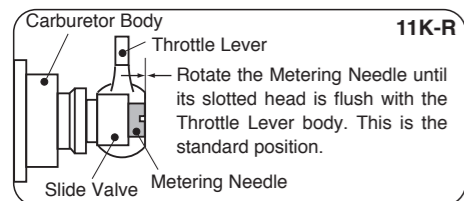
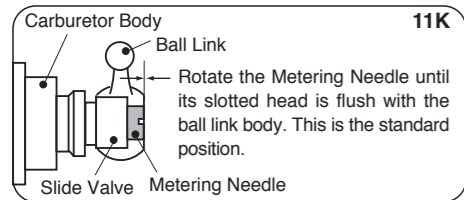
Finally, beyond the nominal break-in period, a slight readjustment toward a leaner needle setting may be required to maintain maximum performance.

■ CARBURETOR CLEANLINESS

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

■ REALIGNMENT OF METERING NEEDLE AND MIXTURE CONTROL VALVE

In the course of making carburetor adjustments, it is just possible that the Metering Needle and the Mixture Control Valve may be inadvertently screwed in or out too far and thereby moved beyond its effective adjustment range. The basic positions can be found by rotating the Metering Needle until its slotted head is flush with the ball link body or throttle lever body.



■ 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 installed to the pickup 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.

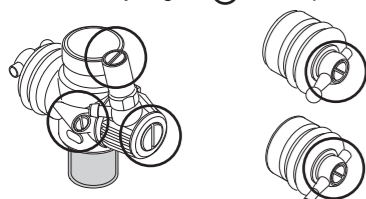
Note:

Do not inject after-run oil into the carburetor as this can cause the O rings inside the carburetor to deteriorate.

Add the oil through the glowplug hole and turn the engine over several times by hand.

5. Finally, when cleaning the exterior of the engine, use methanol or a household cleaning agent. Do not use gasoline, kerosene, or any petroleum based chemical which can damage silicone fuel tubing.

Dirt and dust may lodge in marked places.



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.

■ INSTALLING DUST CAPS (Optional extra)

When storing the engine, install the cap on the exhaust port, carburetor, etc. to prevent dust from entering the engine.

■ CHECKING THE ENGINE

If the engine will not develop normal performance after long time running due to wearing of parts. It is suggested to replace necessary parts when the following symptoms are detected.

- ◆ Engine sound changes and easily overheats.
- ◆ Power has dropped extremely.
- ◆ Idle is unstable and/or engine tends to stop at idle.

In most cases, ball bearings, cylinder & piston assembly, connecting rod and/or crankcase have become worn. Check the parts carefully and replace them if necessary.

■ O.S. GENUINE PARTS & ACCESSORIES

● O.S. GLOW PLUG

- LC3 (71653000)

● MANIFOLD SPRING (2pcs.)

(72106172)

● O.S. SPEED SILICONE TUBE

(72506100) 2.5mm x 1000mm

● O.S. SPEED DUST CAP SET FOR 12-30 CLASS

3mm(2pcs.) / 16mm(2pcs.) / 18mm(1pc.)
(22884254)

● O.S. SPEED CLUTCH WRENCH & ADJUSTER

(71415300)

● O.S. SPEED FLYWHEEL KEY

(71415200)

● O.S. SPEED FLYWHEEL PULLER

(71415100)

● O.S. SPEED PLUG WRENCH

(71520100)

● O.S. SPEED PHILLIPS SCREW DRIVER No.1

(71417100)

● O.S. SPEED PHILLIPS SCREW DRIVER No.2

(71417200)

● O.S. SPEED SPRING REMOVER

(71415500)

● O.S. SPEED BODY REAMER

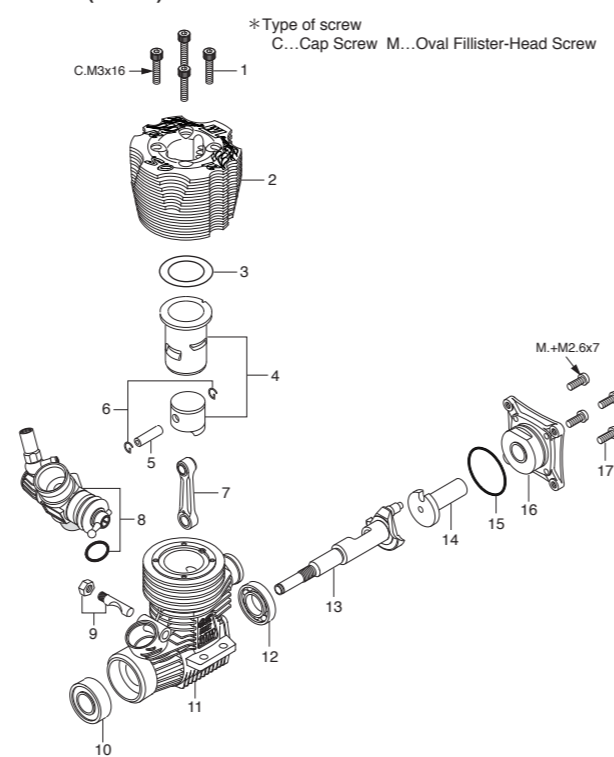
(71415400)

● O.S. SPEED DRIVER TOOLS

Code No.	Description
71410150	O.S. SPEED HEX WRENCH DRIVER 1.5
71410200	O.S. SPEED HEX WRENCH DRIVER 2.0
71410250	O.S. SPEED HEX WRENCH DRIVER 2.5
71410300	O.S. SPEED HEX WRENCH DRIVER 3.0
71411200	O.S. SPEED HEX BALL WRENCH DRIVER 2.0
71411250	O.S. SPEED HEX BALL WRENCH DRIVER 2.5
71412300	O.S. SPEED FLAT HEAD SCREWDRIIVER 3.0
71413550	O.S. SPEED NUT DRIVER 5.5
71413600	O.S. SPEED NUT DRIVER 6.0
71413700	O.S. SPEED NUT DRIVER 7.0

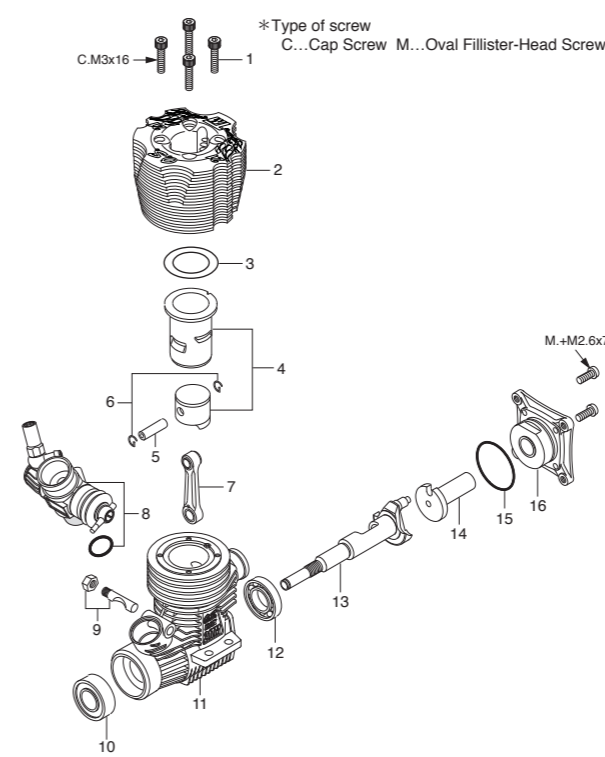
Code No.	Description
71414015	O.S. SPEED HEX WRENCH TIP ONLY 1.5
71414020	O.S. SPEED HEX WRENCH TIP ONLY 2.0
71414025	O.S. SPEED HEX WRENCH TIP ONLY 2.5
71414030	O.S. SPEED HEX WRENCH TIP ONLY 3.0
71414120	O.S. SPEED HEX BALL WRENCH TIP ONLY 2.0
71414125	O.S. SPEED HEX BALL WRENCH TIP ONLY 2.5
71414230	O.S. SPEED FLAT HEAD SCREWDRIIVER TIP 3.0
71414355	O.S. SPEED NUT DRIVER TIP ONLY 5.5
71414360	O.S. SPEED NUT DRIVER TIP ONLY 6.0
71414370	O.S. SPEED NUT DRIVER TIP ONLY 7.0

■ 21TM (T-Maxx) ENGINE EXPLODED VIEW & ENGINE PARTS LIST



No.	Code No.	Description
1	79871160	Cylinder Head Retaining Screw (10pcs.)
2	21914200	Heatsink Head
3	21921400	Head Gasket (1pc.)
4	21913300	Cylinder & Piston Assembly
5	23906000	Piston Pin
6	21817000	Piston Pin Retainer (2pcs.)
7	21915000	Connecting Rod
8	21982000	Carburetor Complete (Type 11K)
9	25381701	Carburetor Retainer
10	23731000	Crankshaft Ball Bearing (Front)
11	21921020	Crankcase
12	21931010	Crankshaft Ball Bearing (Rear)
13	21912000	Crankshaft
14	21922000	Starting Shaft
15	21921800	Cover Gasket
16	21911800	Rear Adaptor
17	79860070	Rear Adaptor Retaining Screw (10pcs.)
	71653000	Glow Plug LC3
	21427200	Exhaust Seal Ring (2pcs.)
	72103800	Exhaust Manifold M1020
	72106172	Manifold Spring (2pcs.)

■ 21TM (Revo) ENGINE EXPLODED VIEW & ENGINE PARTS LIST

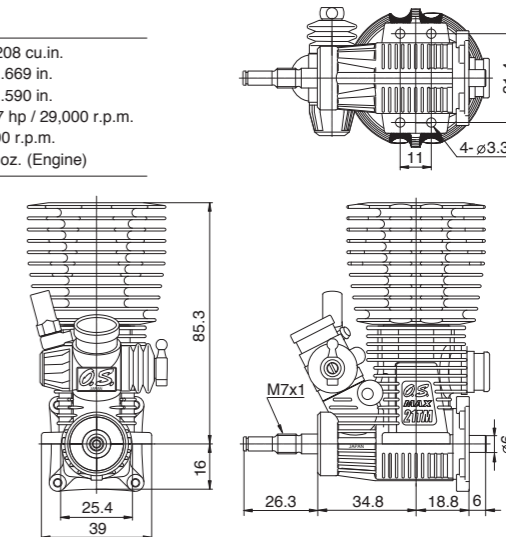


No.	Code No.	Description
1	79871160	Cylinder Head Retaining Screw (10pcs.)
2	21914200	Heatsink Head
3	21921400	Head Gasket (1pc.)
4	21913300	Cylinder & Piston Assembly
5	23906000	Piston Pin
6	21817000	Piston Pin Retainer (2pcs.)
7	21915000	Connecting Rod
8	21982010	Carburetor Complete (Type 11K-R)
9	25381701	Carburetor Retainer
10	23731000	Crankshaft Ball Bearing (Front)
11	21921020	Crankcase
12	21931010	Crankshaft Ball Bearing (Rear)
13	21912000	Crankshaft
14	21922000	Starting Shaft
15	21921800	Cover Gasket
16	21911800	Rear Adaptor
17	79860070	Rear Adaptor Retaining Screw (10pcs.)
	71653000	Glow Plug LC3
	21427200	Exhaust Seal Ring (2pcs.)
	72103810	Exhaust Manifold M1021
	72106172	Manifold Spring (2pcs.)

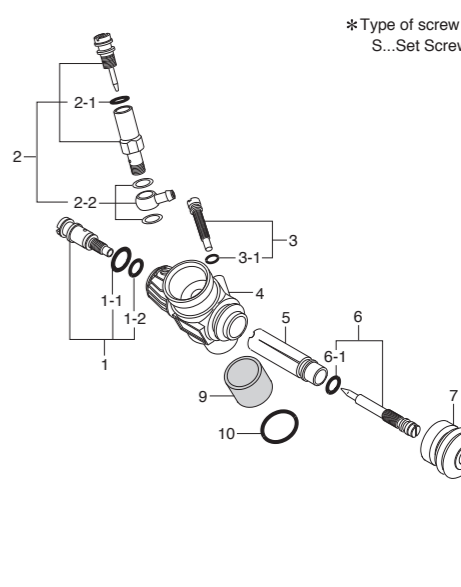
■ THREE VIEW DRAWING (21TM-T & 21TM-R) Dimensions (mm)

SPECIFICATIONS

■ Displacement	3.41 cc / 0.208 cu.in.
■ Bore	17.0 mm / 0.669 in.
■ Stroke	15.0 mm / 0.590 in.
■ Output	1.8 ps / 1.77 hp / 29,000 r.p.m.
■ Practical R.P.M.	3,000-35,000 r.p.m.
■ Weight	243g / 8.57 oz. (Engine)



■ 11K / 11K-R CARBURETOR EXPLODED VIEW & ENGINE PARTS LIST



No.	Code No.	Description
1	21982700	Mixture Control Valve Assembly
1-1	27881820	"O" Ring (L) (2pcs.)
1-2	22781800	"O" Ring (S) (2pcs.)
2	21285901	Needle Valve Assembly
2-1	27881820	"O" Ring (2pcs.)
2-2	2AP81950	No.21 Universal Nipple Assembly
3	21982620	Throttle Stop Screw
3-1	22781800	"O" Ring (S) (2pcs.)
4	21982100	Carburetor Body (w/Thermo Insulator)
5	21982210	Slide Valve
6	21982540	Metering Needle Assembly
6-1	22781800	"O" Ring (S) (2pcs.)
7	21982520	Dust Cover
8	23818430	Ball Link No.5
	23818440	Throttle Lever
9	21982900	Thermo Insulator
10	22615000	Carburetor Rubber Gasket