

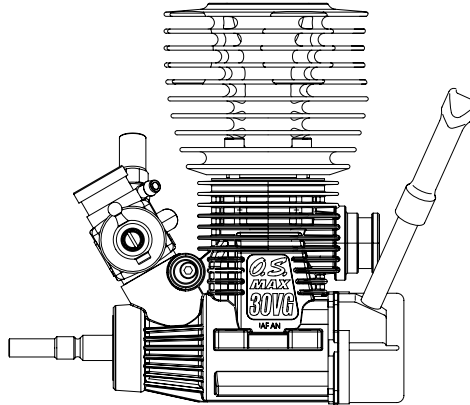
MAX-30VG(P) SERIES

MAX-30VG(P)/MAX-30VG(P)-X
MAX-30VG(P)SR/MAX-30VG(P)ES

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.



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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.

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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 an 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.



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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 manufacturer's recommendations, using appropriate screws and locknuts.
- 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.

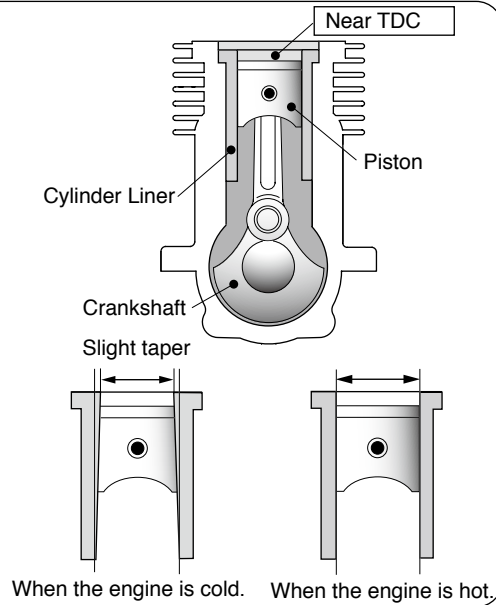


NOTES

- To stop the engine, fully retard the throttle stick and trim lever on the transmitter, or, in an emergency, cut off the fuel supply by pinching the fuel delivery line from the tank.
- Do not attempt to disassemble the recoil starter of the 30VG(P)-X. If you do so, the very strong spring inside will be suddenly ejected. This can be very dangerous.
- Do not extend the starter cord more than 40cm (16"). Do not abruptly release the operating handle. Allow the cord to rewind smoothly while still holding the handle.
- Pull the operating handle straight out when starting the engine, so that the cord does not rub against the vehicle body or engine. This will help prevent the cord from being damaged by abrasion or engine heat.
- 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.

ENGINE CONSTRUCTION

With this engine, the piston will feel tight at the top of its stroke (TDC) when the engine is cold. This is normal. The cylinder bore has a slight taper. The piston and cylinder are designed to achieve a perfect running clearance when they reach operating temperature.

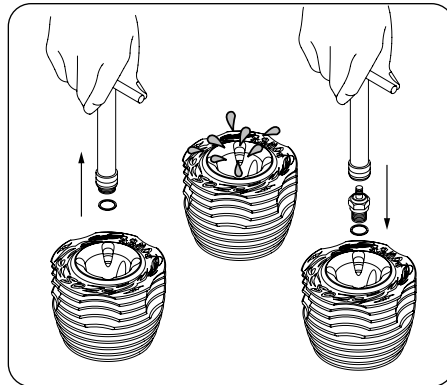


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NOTES WHEN APPLYING AN ELECTRIC STARTER

Do not over-prime. This could cause a hydraulic lock and damage the engine on application of the electric starter.

If over-primed, remove glowplug, close needle-valve and apply starter to pump out surplus fuel. Cover the head with a rag to prevent pumped out fuel getting into your eyes.



NOTE

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

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MAX-30VG(P) SERIES INSTRUCTIONS

This manual handles the following four versions.

- MAX-30VG(P)
- MAX-30VG(P)-X (with recoil starter)
- MAX-30VG(P) SR (for ROTO STARTER)
- MAX-30VG(P) ES (for ROTO STARTER)

ABOUT THE ENGINE

These are rear exhaust and developed for mainly Monster Trucks. They are the largest displacement in the O.S. line up for model cars and offer overwhelming torque and power. The new 21E carburetor is a single adjustment type and fitted with a thermo insulator. It offers stable running.

The engine mount size is the same as the 21 size and easily replaced in most models.

Standard accessories

For MAX-30VG(P) / MAX-30VG(P)-X

- Glow Plug No.8 1piece



- Exhaust Seal Ring 1piece



- Super Air Cleaner 203 Assembly



For MAX-30VG(P) ES

- Glow Plug No.8 1piece



- Super Air Cleaner 203 Assembly



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For MAX-30VG(P) SR

- Glow Plug No.8 1piece



- One-way Clutch 1piece



- Super Air Cleaner 203 Assembly



■ About MAX-30VG(P) SR

This engine is designed to utilize the SAVAGE ROTO STARTER System #87110 (for S-25 engine).

In case you own a SAVAGE ROTO STARTER System #87110, remove the back plate unit #87117 from the System and install it to the engine. The back plate unit #87127 from the ROTO STARTER System #87126 for Nitro Star K Series cannot be installed to the engine. You need to purchase a back plate unit #87117 from HPI.

Note on installing the HPI back plate unit

When installing the back plate unit, be sure to apply the LOCTITE to the fixing screws after removing the oil on the screws by alcohol or thinner. It is recommended to check the screw tightness before and after running the engine. The engine may be damaged if the engine keeps running with the screws loosened.

* SAVAGE, ROTO STARTER and Nitro Star are the product name of HPI RACING.

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TOOLS, ACCESSORIES, etc.

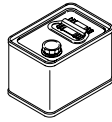
The following items are necessary for operating the engine.

■ 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.



REMINDER!



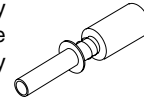
Model engine fuel is poisonous. Do not allow it to come into contact with the eyes or mouth. Always store it in a clearly marked container and out of the reach of children.



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. Do not smoke or allow anyone else to smoke, near to it.

GLOWPLUG IGNITER

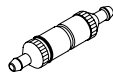
Commercially available handy glowplug heater in which the glowplug battery and battery leads are integrated.



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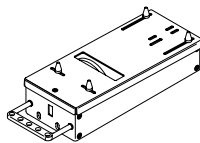
FUEL FILTER

To be installed in the fuel line between fuel tank and carburetor to prevent dust from entering the carburetor.



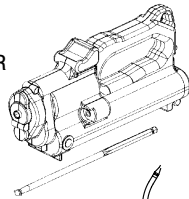
STARTER BOX

For starting the engine. It is not necessary for 30VG(P)-X, 30VG(P)SR and 30VG(P)ES.



ROTO START

For starting the 30VG(P)SR and 30VG(P)ES.



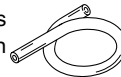
FUEL PUMP

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



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.



■ TOOLS

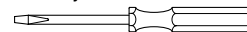
HEX SCREWDRIVER

Necessary for engine installation. 1.5mm, 2mm, 2.5mm, 3mm



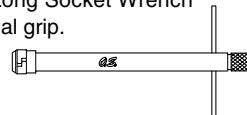
SCREWDRIVER

Necessary for carburetor adjustments. No.1, No.2, etc



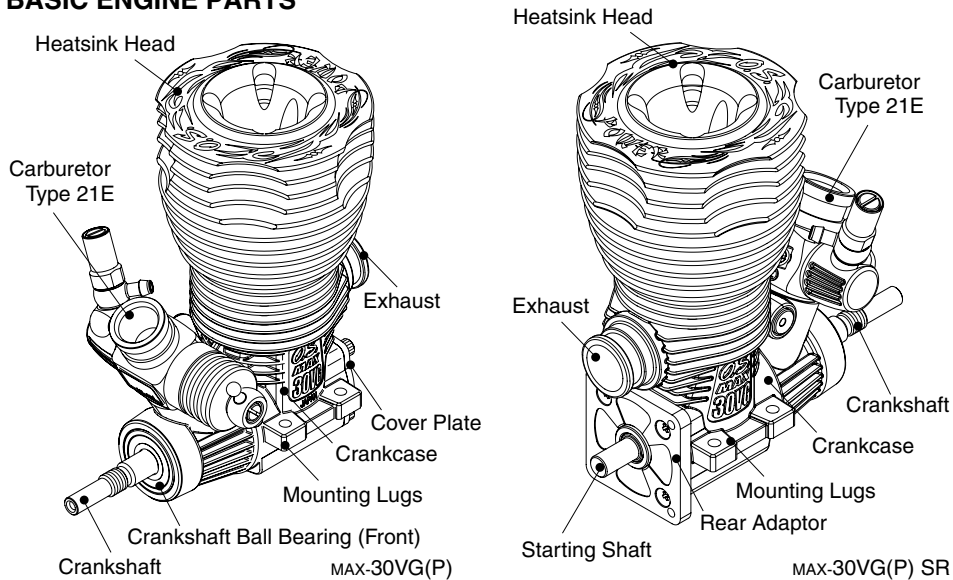
LONG SOCKET WRENCH WITH PLUG GRIP

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



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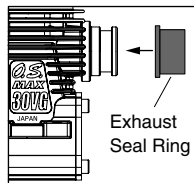
BASIC ENGINE PARTS



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INSTALLATION OF THE STANDARD ACCESSORIES

- Installing the glow plug.
- Install the exhaust seal ring supplied.



When the exhaust seal ring supplied cannot be fitted to the exhaust manifold you have, use a seal ring supplied with the car kit or the exhaust manifold.

■ About the Head Gasket

These engines are equipped with two head gaskets of 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 with both gaskets or removing the 0.1mm gasket.

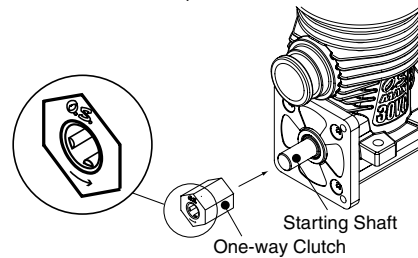
- When low nitromethane content fuel is used, try to run the engine removing one gasket.

■ MAX-30VG(P) SR

Exhaust seal ring is not supplied with the engine. Use an exhaust seal ring supplied with the car kit.

Installation of one-way clutch

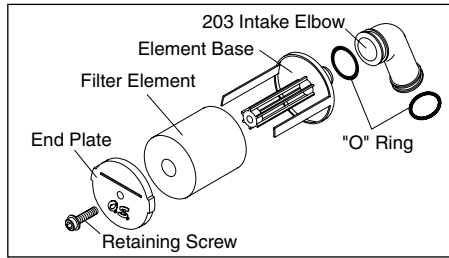
- Inert the one-way clutch on the starting shaft with the O.S. and an arrow mark facing outside.
- Then, install the back plate unit #87117.



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■ AIR CLEANER TYPE 203

This is a heavy-duty wet type air cleaner that has been developed specifically for 3.5cc 'off-road' model car engines.

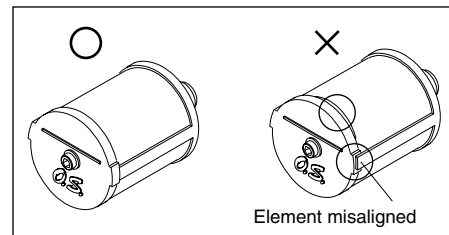


NOTE:

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.

ASSEMBLY

- Insert the filter element on the element base.
- Install the end plate with retaining screw, making sure that the element fits correctly between the end plate and base.
- Insert the joint pipe on the element base and secure it with "O" ring.
- Install the end plate, retaining screw, making sure that the element fits correctly between the end plate and base.



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REPLACEMENT OF ELEMENT

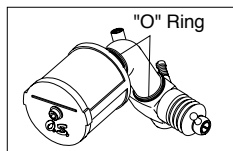
NOTE:

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

- It is advisable to replace the filter element after each hour of running time. Be careful not to allow dirt and dust to enter the carburetor.

INSTALLATION

- Carefully clean the carburetor, removing any old adhesive or sealant that may have been previously used on the outside of the air intake.



FURTHER PRECAUTIONS

When removing the air cleaner, check the inside of the element base and carburetor venturi. If any dirt is detected, this indicates that the filter element was incorrectly installed or should have been replaced earlier. In this event, it is vitally important to wash out the inside of the engine thoroughly, with alcohol or fuel, before it is used again, otherwise rapid wear of the piston/cylinder assembly, bearings, connecting-rod, etc., will occur. Obviously, it will be necessary to carry out the same procedure with the air cleaner and to replace the filter element.

NOTE:

Be careful not to splash alcohol or fuel over the filter element, or the filter oil will be washed away, and the filter capacity will be lowered.

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GLOWPLUG

Since the glowplug and fuel combination used may have a marked effect on performance and reliability, it would be worthwhile to experiment with different plug types. An O.S. No.8 glowplug is supplied with the engine. Recommended O.S. plugs are the No.8 and A5. Carefully install plug finger-tight, before final tightening with the correct size plug wrench.

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:

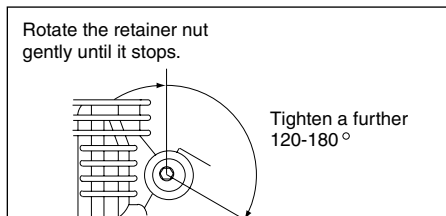
- Filament surface has roughened and turned white.
- Filament coil has become distorted.
- Foreign matter has adhered to filament or plug body has corroded.
- Engine tends to cut out when idling.
- Starting qualities deteriorate.

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INSTALLATION OF THE CARBURETOR

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

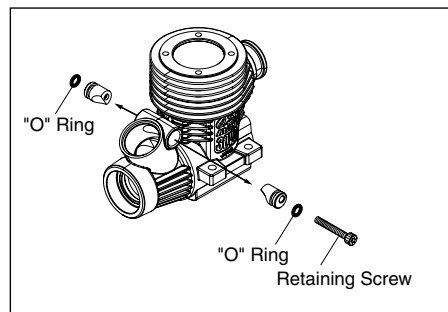
1. Loosen the retainer screw, rotate the carburetor to its correct position and make sure that it is pressed well down into the intake boss, compressing the rubber gasket, before retightening screw.
2. Rotate the retainer screw gently until it stops, then tighten a further 120-180°
Do not overtighten the screw as this will damage the carburetor body.



Note

Be careful not to damage the O rings when removing the carburetor retainer from the engine.

First, remove the retainer Retaining screw, then pull out each part. Do not push the part in or damage the O rings.



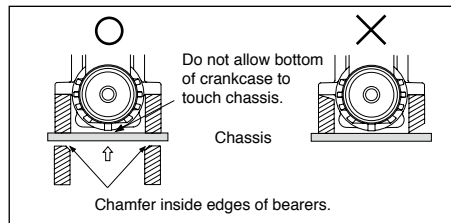
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ENGINE INSTALLATION

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 are in alignment with the mounting holes.



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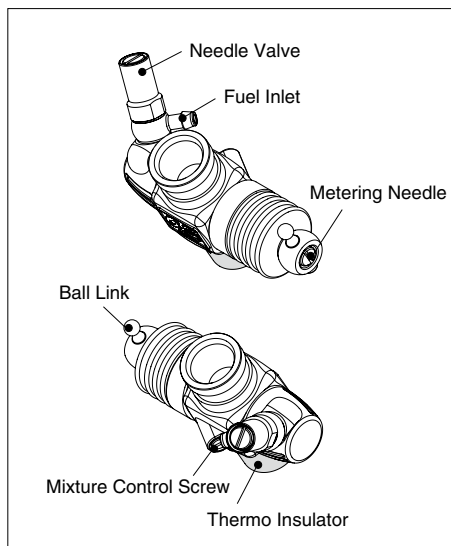
NOTES CONCERNING THE RECOIL STARTER

REMINDER!

(30VG(P)-X ONLY)

- ◆ Do not attempt to disassemble the recoil starter. If you do so, the very strong spring inside will be suddenly ejected. This can be very dangerous.
- ◆ Do not extend the starter cord more than 40cm (16"). Do not abruptly release the operating handle. Allow the cord to rewind smoothly while still holding the handle.
- ◆ Pull the operating handle straight out when starting the engine, so that the cord does not rub against the vehicle body or engine.
- ◆ This will help prevent the cord from being damaged by abrasion or engine heat.
- ◆ Try to avoid spilling fuel over the starter unit and its cord. Some fuels have a detrimental effect on these parts.
- ◆ The starter prevents the engine from being rotated in the wrong direction. The unit will be damaged if you attempt to force the flywheel in the opposite direction (i.e. clockwise when viewed from the crankshaft end).

CARBURETOR CONTROLS 21E



Three adjustable controls are provided on this carburetor.

- **The Needle-Valve**
For adjusting the mixture strength when the throttle is fully open.
- **The Metering Needle: (Adjusted at the factory):**
For adjusting the mixture strength at part-throttle and idle speed, to obtain steady idling and smooth acceleration to mid speed.
- **The Mixture Control Screw: (Adjusted at the factory):**
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.

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

Lay the chassis on a stand and start the engine so that the tires are not in contact with the ground.

Running-in is a procedure for an engine to come close to actual running conditions (fuel, r.p.m., engine temperature, etc.).

Excessively rich running and prolonged low speed running should be avoided. Prolonged low speed running and low temperature running may result in the oil in the fuel being gelled and piston/liner being glued together.

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.

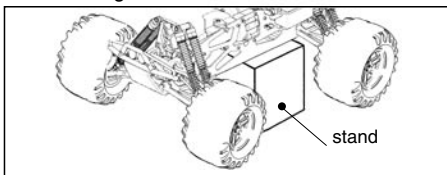
Before starting the engine, always check the tightness of all the screws and nuts especially those of joint and movable parts such as throttle arm. Missing retightening the loose screws and nuts often causes the parts breakage that is capable of harming you.



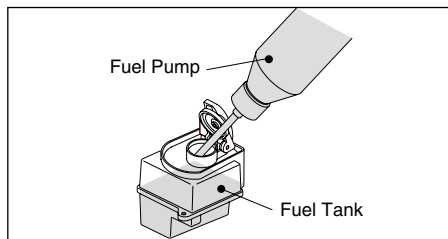
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The following procedure is suitable when a fuel containing up to 30% nitromethane is used.

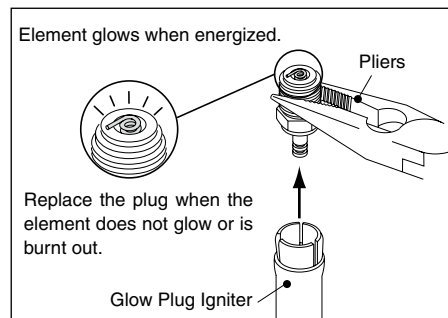
- ◆ Lay the chassis on a stand and start the engine so that the tires are not in contact with the ground.



- ◆ Fill the tank completely with fuel.



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



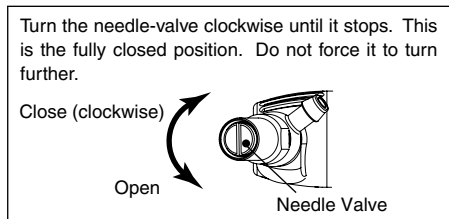
Do not hold a glowplug with fingers and use pliers when checking the brightness. Do not have your face close to the glowplug or boiled fuel remaining in the coil will burn you.



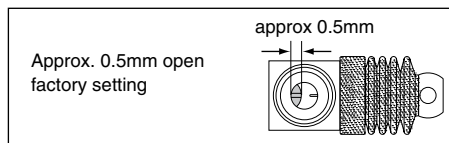
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The carburetor is set as shown below at the factory. Start the engine as it is.

- ◆ The needle-valve is set approx. 2-3/4 turns opened from the fully closed position.



- ◆ Throttle is set approx. 0.5mm open.

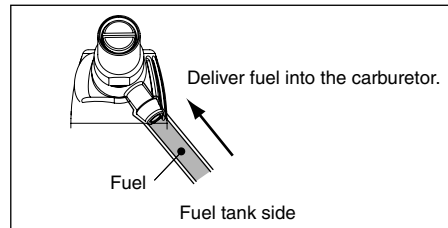


- ◆ Metering needle is set at basic position. (Refer to P28.)

Note

Check the throttle opening at idle before installing an air cleaner. After the engine is started, be sure to install an air cleaner.

- ◆ If the fuel tank is equipped with a choke button, push the button to send the fuel to the carburetor. If not, apply an electric starter to send the fuel to the carburetor.



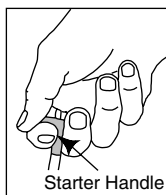
- ◆ Now connect glowplug battery lead to heat the plug filament and start the engine.

■ In case of the 30VG(P)

- ◆ Start the engine using a starter box, making sure the engine rotation direction is correct (counter-clockwise seen from the crankshaft end). Be sure to install an air cleaner when starting.

■ In case of the 30VG(P)-X

- ◆ Pull the starter handle briskly straight out several times to start the engine.



■ In case of the 30VG(P) SR and 30VG(P) ES

- ◆ Use the ROTO START to start the engine.

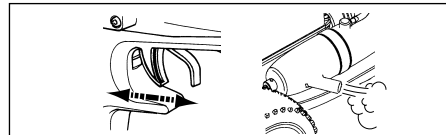
Attention:

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



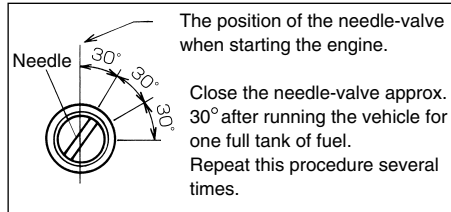
"no load" conditions (i.e. with the driving wheels not in contact with the ground) it will rapidly over-heat and may be seriously damaged.

- ◆ When the engine starts, first allow it to operate in short runs at the very rich starting settings, with the glowplug battery still connected and the 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° and run the car for another full tank of fuel. Repeat this procedure until 1/2 gallon of fuel have been consumed, during which time the throttle may be opened for brief bursts of increased power.

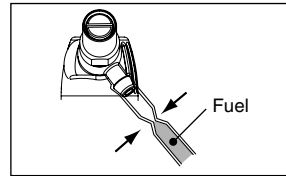


Note:

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.

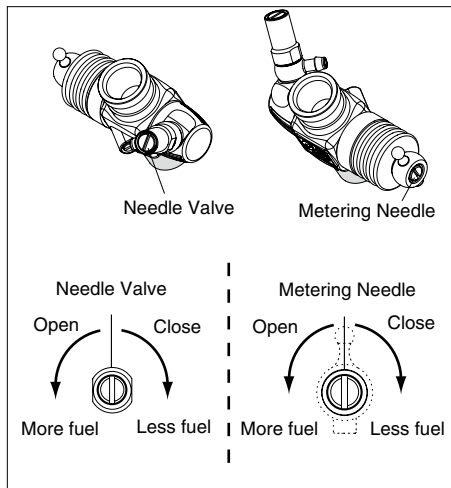


Warning!

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 45~90°.

Note

Be sure to set the needle-valve a little open from the optimum position so that the mixture may become a little rich.

- ◆ 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 45-90°. 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 45-90°.

NOTE:

Metering Needle adjustment should be made in steps of not more than 45-90°, 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 Mixture Control 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.

NOTE

The above mentioned needle opening is a guide. It varies according to the fuel used and silencer. Usually, when a lower nitro content fuel is used, it will be necessary to close the needle-valve.

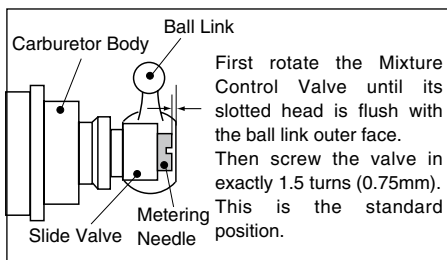
Do not close the needle-valve too much or rust will be generated and the engine will be damaged.

■ CARBURETOR CLEANLINESS

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

REALIGNMENT OF METERING NEEDLE

In the course of making carburetor adjustments, it is just possible that the Metering Needle 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.



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CARE AND MAINTENANCE

■ In case of the 30VG(P) , 30VG(P) SR and 30VG(P) ES

- ◆ 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.
- ◆ 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.
- ◆ 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.

■ In case of the 30VG(P)-X

- ◆ 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.
- ◆ 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.
- ◆ Then, inject some after-run oil into the engine, and rotate the engine pulling the recoil starter to distribute the oil to all the working parts.

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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.

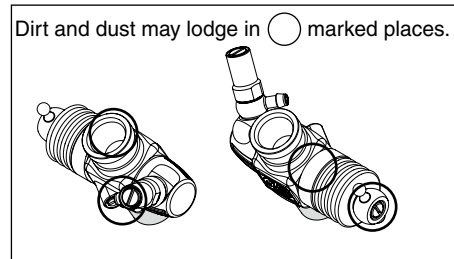
■ Finally, when cleaning the exterior of the engine, use methanol or kerosene. Do not use gasoline or any solvent that might damage the silicone fuel tubing.

■ **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.

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.



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CHECKING THE ENGINE

If the engine suffers a loss of performance after a long period of running it may be due to the wearing of parts. It is suggested that the worn parts be replaced when the following symptoms are detected.

- ◆ Engine sound changes and easily overheats.
- ◆ Power has dropped considerably.
- ◆ 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 out or abnormal. Check the parts carefully and replace them if necessary.

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TROUBLE SHOOTING		Symptom
		Engine fails to fire.
Cause	Corrective action	
Fuel tank is empty. Fuel not reaching the engine.	Fill the tank with fuel and repeat Priming procedure.	
Glowplug element is burnt out. Glowplug battery discharged	Replace glowplug. Recharge or replace the battery.	
Clogged fuel filter Air cleaner and silencer inside is dirty.	Clean or replace fuel filter. Replace cleaner element and clean inside silencer.	
Over priming	Remove glowplug and pump out excess fuel.	
Fuel tubing is disconnected. Fuel tubing is kinked, split or has a hole.	Connect fuel tubing securely. Check the tubing carefully and replace if necessary.	
Incorrect carburetor settings	Return the metering needle and mixture control valve to basic position.	
Incorrect servo linkage	adjust linkage after setting servo at neutral.	
Reverse rotating direction of electric starter.	Make sure it rotates counter clockwise seen from crankshaft side.	

Symptom	
Engine fires intermittently but does not run.	
Cause	Corrective action
Insufficient fuel in the tank.	Fill the tank with fuel.
Deteriorated glowplug	Replace glowplug.
Clogged fuel filter Air cleaner and silencer inside is dirty.	Clean or replace fuel filter. Replace cleaner element and clean inside silencer.
Engine overheated	Wait until engine is cooled.
Incorrect clutch release	Adjust the tension of clutch spring.
Glowplug battery disconnected too soon.	Do not disconnect plug battery and wait until r.p.m. become stable.
Fuel foaming in tank	Fit O rings to the tank screws to prevent foaming.

Symptom	
Unstable idle	
Cause	Corrective action
Unsuitable glowplug	Use suggested glowplug in the instructions.
Unsuitable fuel	Do not use extremely high nitro or low oil fuel.
Extremely light flywheel	Use heavier fly wheel.
Silencer is disconnected or has play	Install silencer securely.
Symptom	
Not reaching expected peak r.p.m.	
Cause	Corrective action
Insufficient warming up or running-in.	Set the needle only after warming up. Complete running-in.
Silencer or manifold is not securely connected or disconnected.	Replace seal ring. Check the connections and secure them.
Fuel tubing from tank to is split or broken.	Replace the tubing.

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Symptom	
Poor response	
Cause	Corrective action
Deteriorated glowplug	Replace glowplug.
Incorrect carburetor settings	Readjust low r.p.m. range with metering needle and mixture control valve.
Incorrect setting of transmitter Exponential function.	Check the transmitter setting.
Symptom	
Poor r.p.m. drop	
Cause	Corrective action
Throttle open too far at idle.	Close metering needle to adequate position to lower idle r.p.m.
Incorrect carburetor fitting	Fit carburetor securely.

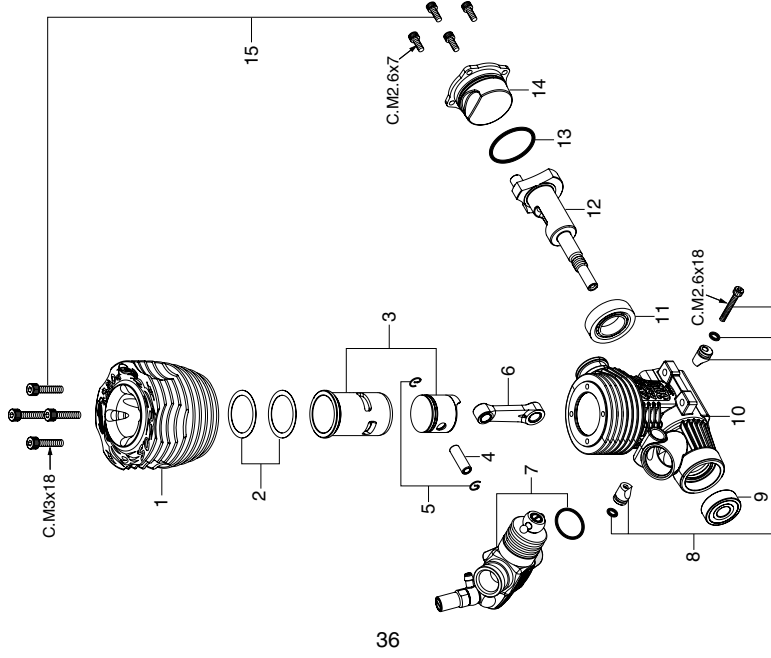
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MAX-30VG(P) ENGINE PARTS LIST

No.	Code No.	Description
1	23924000	Heatsink Head
2	23914100	Head Gasket
3	23923000	Cylinder & Piston Assembly
4	23916000	Piston Pin
5	24517000	Piston Pin Retainer (2pcs.)
6	23915000	Connecting Rod
7	23981010	Carburetor Complete (Type 21E)
8	23981740	Carburetor Retainer Assembly
9	23731000	Crankshaft Ball Bearing (Front)
10	23911000	Crankcase
11	23730020	Crankshaft Ball Bearing (Rear)
12	23912000	Crankshaft
13	23764020	Cover Gasket
14	23927000	Cover Plate
15	23763010	Screw Set
	71608001	Glow Plug No.8
	22826140	Exhaust Seal Ring
	72413000	Super Air Cleaner 203 Assembly (W/2 filter elements)
	72413200	203 Filter Elements (4pcs.)

The specifications are subject to alteration for improvement without notice.

MAX-30VG(P) ENGINE EXPLODED VIEW



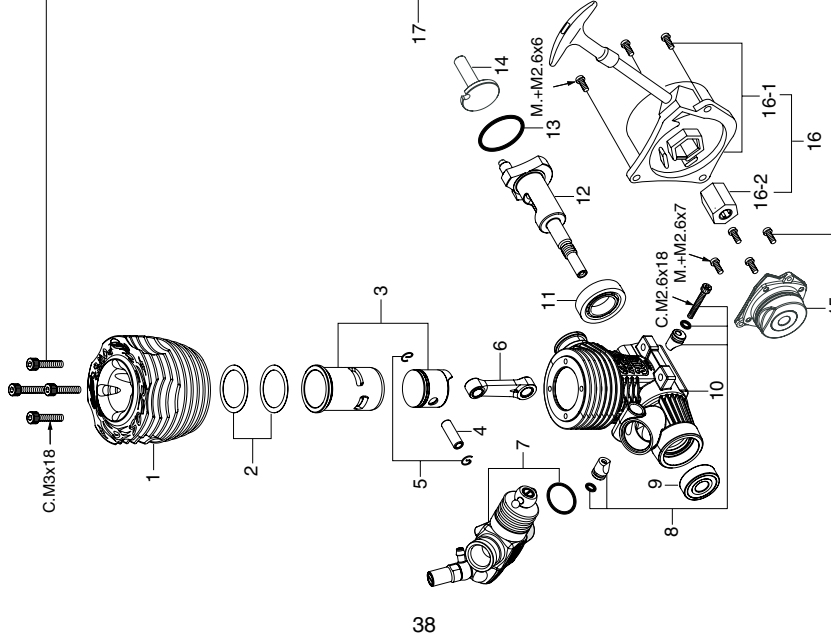
*Type of screw
 C...Cap Screw M...Oval Filler-Head Screw
 F...Flat Head Screw N...Round Head Screw S...Set Screw

MAX-30VG(P)-X ENGINE PARTS LIST

No.	Code No.	Description
1	23924000	Heatsink Head
2	23914100	Head Gasket
3	23923000	Cylinder & Piston Assembly
4	23916000	Piston Pin
5	24517000	Piston Pin Retainer (2pcs.)
6	23915000	Connecting Rod
7	23981010	Carburetor Complete (Type 21E)
8	23981740	Carburetor Retainer Assembly
9	23731000	Crankshaft Ball Bearing (Front)
10	23911000	Crankcase
11	23730020	Crankshaft Ball Bearing (Rear)
12	23912010	Crankshaft
13	23764020	Cover Gasket
14	23612050	Starting Shaft
15	23611800	Rear Adaptor
16	73009000	N3 Recoil Starter Assembly
16-1	73009100	N3 Recoil Starter Body
16-2	73008200	One-way Clutch
17	23911300	Screw Set
	71608001	Glow Plug No.8
	22826140	Exhaust Seal Ring
	72413000	Super Air Cleaner 203 Assembly (W/2 filter elements)
	72413200	203 Filter Elements (4pcs.)

The specifications are subject to alteration for improvement without notice.

MAX-30VG(P)-X ENGINE EXPLODED VIEW



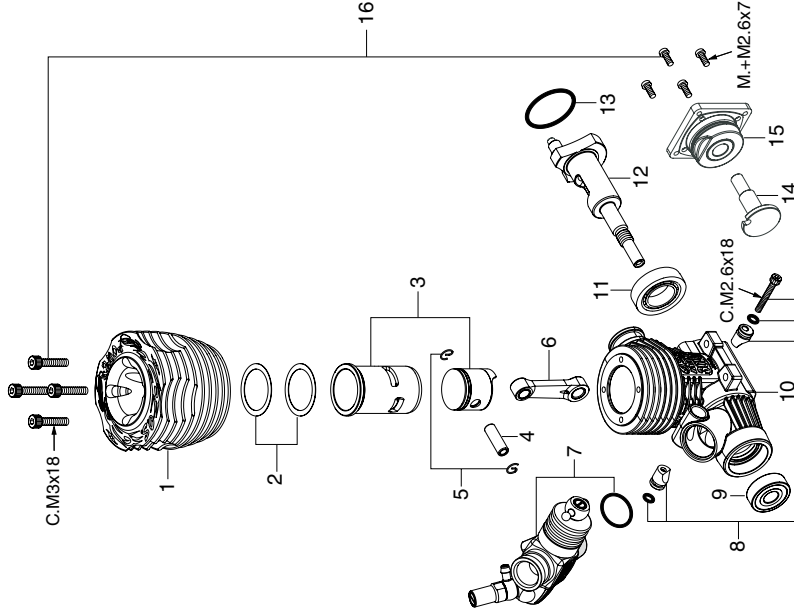
* Type of screw
 C...Cap Screw M...Oval Fillister-Head Screw
 F...Flat Head Screw N...Round Head Screw S...Set Screw

MAX-30VG(P) SR ENGINE PARTS LIST

No.	Code No.	Description
1	23924000	Heatsink Head
2	23914100	Head Gasket
3	23923000	Cylinder & Piston Assembly
4	23916000	Piston Pin
5	24517000	Piston Pin Retainer (2pcs.)
6	23915000	Connecting Rod
7	23981010	Carburetor Complete (Type 21E)
8	23981740	Carburetor Retainer Assembly
9	23731000	Crankshaft Ball Bearing (Front)
10	23911000	Crankcase
11	23730020	Crankshaft Ball Bearing (Rear)
12	23912010	Crankshaft
13	23764020	Cover Gasket
14	23912210	Starting Shaft (For Roto Start)
15	23917210	Rear Adaptor (For Roto Start)
16	23911300	Screw Set
	71608001	Glow Plug No.8
	73008200	One-way Clutch
	72413000	Super Air Cleaner 203 Assembly (W/2 filter elements)
	72413200	203 Filter Elements (4pcs.)

The specifications are subject to alteration for improvement without notice.

MAX-30VG(P) SR ENGINE EXPLODED VIEW



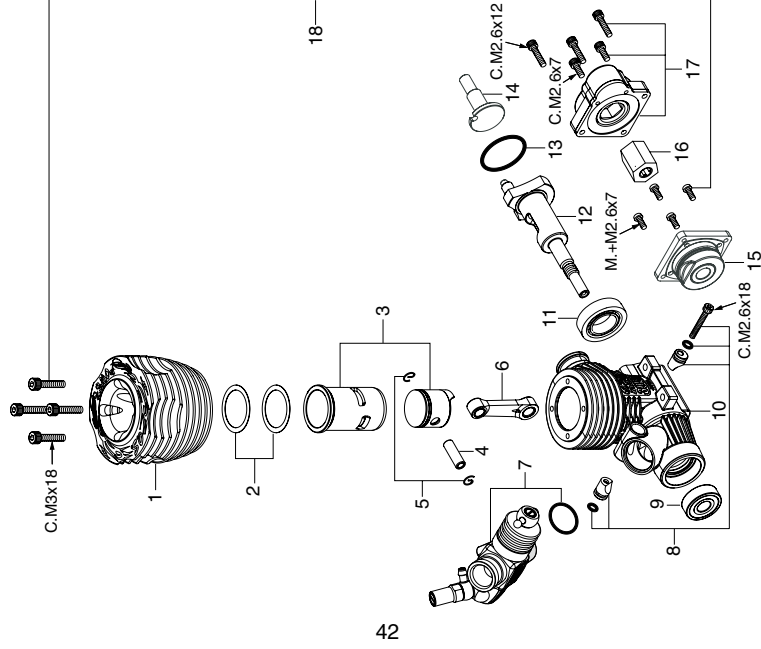
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 F...Flat Head Screw N...Round Head Screw S...Set Screw

MAX-30VG(P) ES ENGINE PARTS LIST

No.	Code No.	Description
1	23924000	Heatsink Head
2	23914100	Head Gasket
3	23923000	Cylinder & Piston Assembly
4	23916000	Piston Pin
5	24517000	Piston Pin Retainer (2pcs.)
6	23915000	Connecting Rod
7	23981010	Carburetor Complete (Type 21E)
8	23981740	Carburetor Retainer Assembly
9	23731000	Crankshaft Ball Bearing (Front)
10	23911000	Crankcase
11	23730020	Crankshaft Ball Bearing (Rear)
12	23912010	Crankshaft
13	23764020	Cover Gasket
14	23912210	Starting Shaft (For Roto Start)
15	23917210	Rear Adaptor (For Roto Start)
16	73008200	One-way Clutch
17	73009200	ES Starter Assembly
18	23911300	Screw Set
	71608001	Glow Plug No.8
	72413000	Super Air Cleaner 203 Assembly (W/2 filter elements)
	72413200	203 Filter Elements (4pcs.)

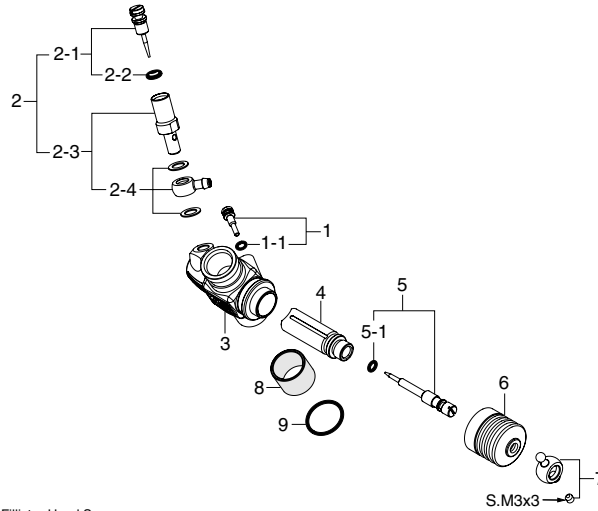
The specifications are subject to alteration for improvement without notice.

MAX-30VG(P) ES ENGINE EXPLODED VIEW



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

21E CARBURETOR EXPLODED VIEW



* Type of screw

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

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

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21E CARBURETOR PARTS LIST

No.	Code No.	Description
1	22848160	Mixture Control Screw
1-1	27881820	"O" Ring (2pcs.)
2	23618190	Needle Valve Assembly
2-1	23618197	Needle Assembly
2-2	46066319	"O" Ring (2pcs.)
2-3	23618194	Needle Holder Assembly
2-4	23818176	Fuel Inlet
3	23981110	Carburetor Body
4	23981210	Slide Valve
5	23981500	Metering Needle Assembly
5-1	27881820	"O" Ring (2pcs.)
6	23981520	Dust Cover
7	23781400	Ball Link (No.3)
8	23781110	Thermo Insulator
9	29015019	Carburetor Rubber Gasket

The specifications are subject to alteration for improvement without notice.

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■ **O.S. Glow Plug**

● **No.8**
(71608001)

● **A5**
(71605100)



■ **Super Air Cleaner 203 Assembly**

(72413000)

Off-road Type

● 203 Filter Element (4pcs.)
(72413200)



■ **Tuned Silencer T-2070**

(For 21-30)

Joint tube type
(72106120)

■ **Exhaust Seal Ring**

(22826140) (2pcs.)



■ **Dust Cap Set**

∅3 (5pcs.) (73300305)

∅8 (3pcs.) (73300812)

∅16 (3pcs.) (73301612)

∅18 (3pcs.) (73301812)



■ **Thermo Insulator**

(23781110)



■ **Cap Screw Set**

(10pcs.)

M2.6x7

(79871020)

M2.6x18

(79871055)



■ **Oval Fillister-Head Screw Set**

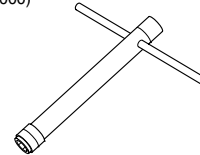
(10pcs.)

M2.6x7

(79860071)

■ **Long Socket Wrench With Plug Grip**

(71521000)

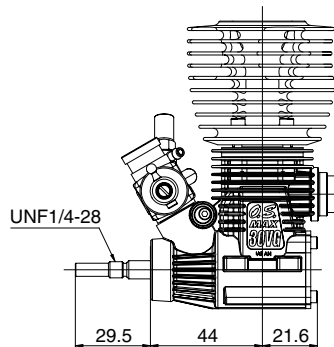
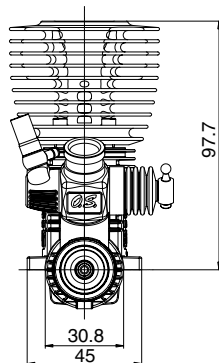
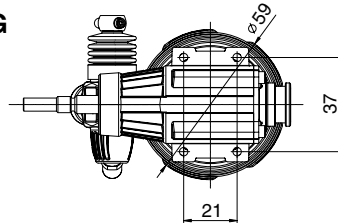


The specifications are subject to alteration for improvement without notice.

MAX-30VG(P) THREE VIEW DRAWING

SPECIFICATIONS

■ Displacement	5.0 cc (0.298 cu.in.)
■ Bore	18.5 mm (0.728 in.)
■ Stroke	18.2 mm (0.717 in.)
■ Practical R.P.M.	4,000-36,000 r.p.m.
■ Power output	3.0 ps / 3.04 hp / 28,000 r.p.m.
■ Weight	360 g (12.7 oz.)

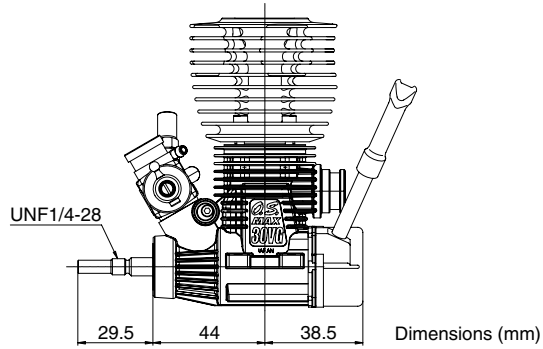
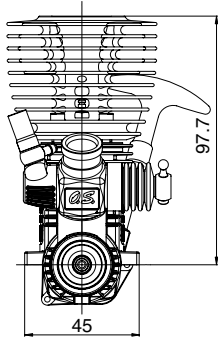
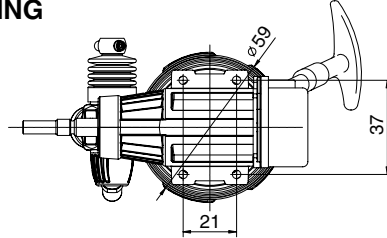


Dimensions (mm)

MAX-30VG(P)-X THREE VIEW DRAWING

SPECIFICATIONS

■ Displacement	5.0 cc (0.298 cu.in.)
■ Bore	18.5 mm (0.728 in.)
■ Stroke	18.2 mm (0.717 in.)
■ Practical R.P.M.	4,000-36,000 r.p.m.
■ Power output	3.0 ps / 3.04 hp / 28,000 r.p.m.
■ Weight	408 g (14.4 oz.)

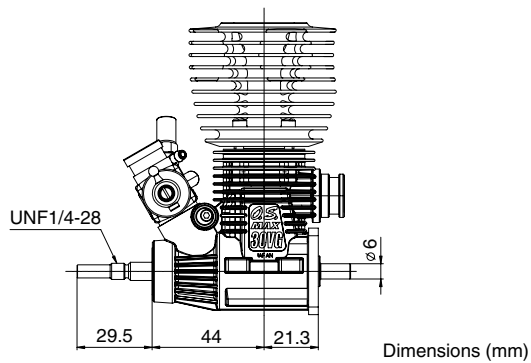
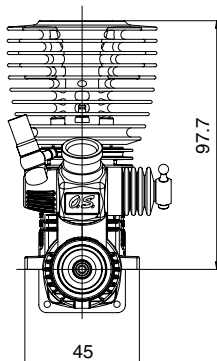
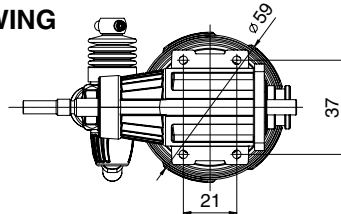


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MAX-30VG(P) SR THREE VIEW DRAWING

SPECIFICATIONS

■ Displacement	5.0 cc (0.298 cu.in.)
■ Bore	18.5 mm (0.728 in.)
■ Stroke	18.2 mm (0.717 in.)
■ Practical R.P.M.	4,000-36,000 r.p.m.
■ Power output	3.0 ps / 3.04 hp / 28,000 r.p.m.
■ Weight	399 g (14.1 oz.)

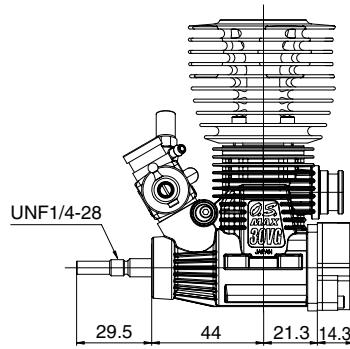
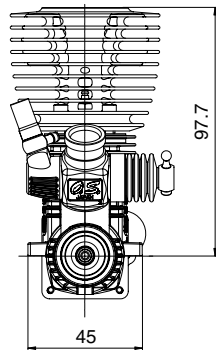
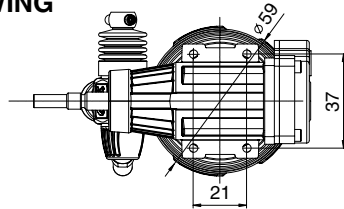


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MAX-30VG(P) ES THREE VIEW DRAWING

SPECIFICATIONS

■ Displacement	5.0 cc (0.298 cu.in.)
■ Bore	18.5 mm (0.728 in.)
■ Stroke	18.2 mm (0.717 in.)
■ Practical R.P.M.	4,000-36,000 r.p.m.
■ Power output	3.0 ps / 3.04 hp / 28,000 r.p.m.
■ Weight	436 g (15.4 oz.)



Dimensions (mm)

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