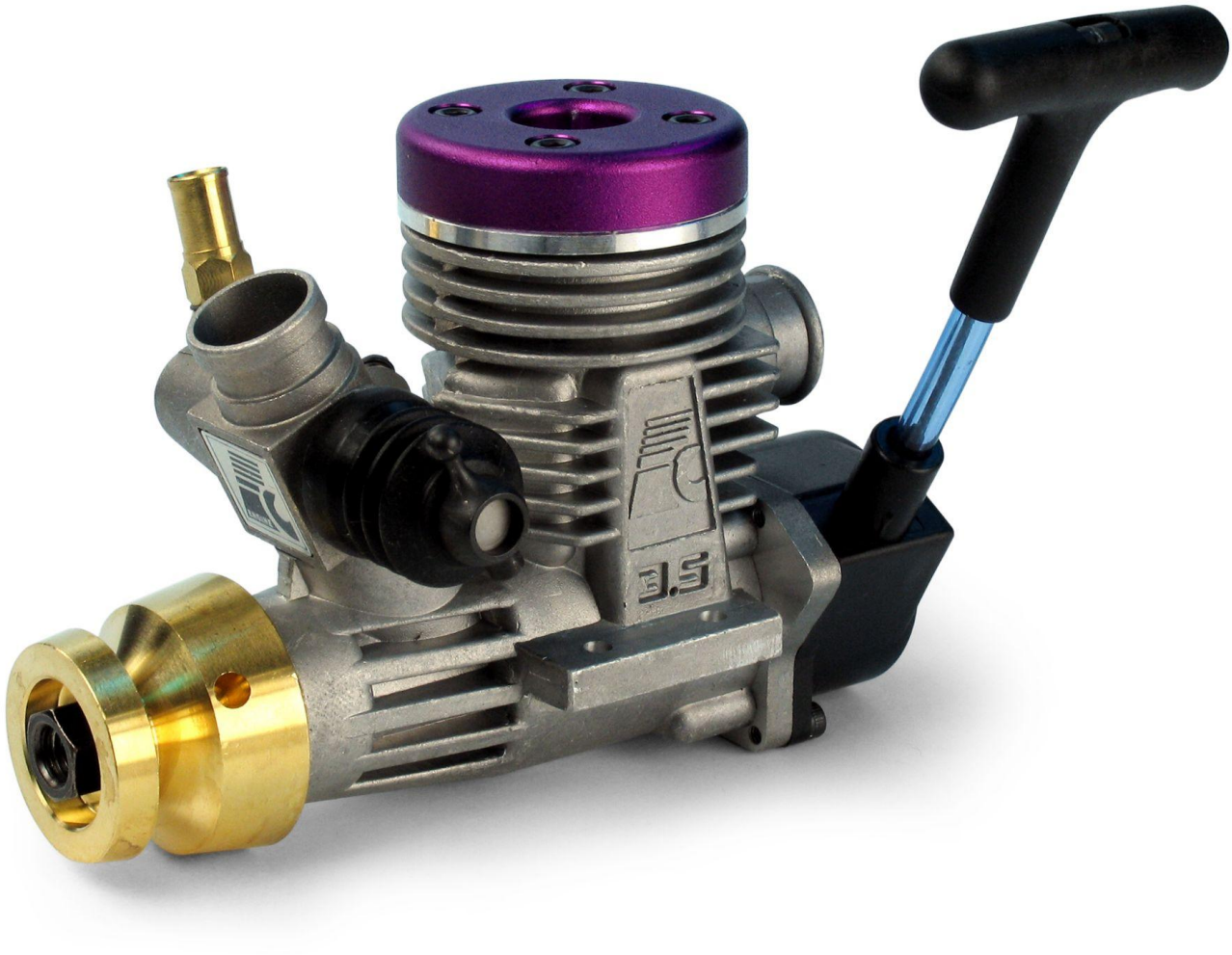
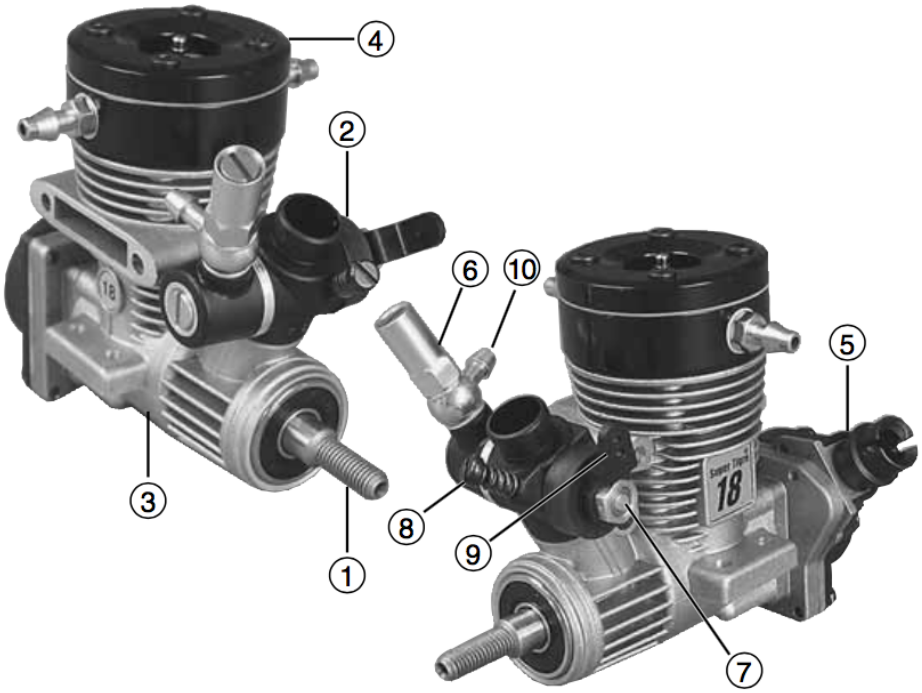
21 Marine Rear Exhaust incl. Pull-start



Important: Please fully read this instruction manual before operating your engine. These instructions have been written so that you may get the greatest satisfaction from the operation of your new engine.

ENGINE PARTS:



1. Crankshaft
2. Carburetor
3. Crankcase
4. Water Jacket
5. Pull Start (some models)
6. High speed Needle
7. Low speed needle (variants located on other side)
8. Idle stop screw (variants located at the back of the carburetor)
9. Throttle arm (variants can have slider)
10. Fuel inlet

ITEMS NEEDED TO OPERATE YOUR ENGINE

• Exhaust System
• Engine Cable Coupler
• Super Start 12V Starting Handle
• Glow Igniter
• Boat Fuel
• Access to a 12V battery

For best performance use fuel specifically formulated for nitro marine engines. 15% to 20% nitro content fuels are best suited for your marine engine.

WARNING

• Never free rev your marine nitro engine with the boat out of the water. You could damage the engine.

• As a rule of thumb, you have about 1 minutes of out-of-the-water operation before your engine starts to overheat. It is best to get the boat into the water and underway as soon as possible.

• Watch out for the moving prop when carrying your boat! Never run while handling the boat.

• Never operate the engine without proper water cooling.

• Never “bench break-in” your new marine engine. It is best to install the engine in a boat and break the engine in with the boat in operation.

ENGINE BREAK IN

It can be somewhat difficult to tune and break in a marine glow engine, as tuning and break-in are best done with the boat on the water. Take your time and do not hurry the break in. If you operate the engine too lean in the early break-in stages, you could damage it.

NEEDLE SETTINGS

Following carburetor setting of .21 marine engine for reference –

HSN : turning the needle clockwise to close , then turning counterclockwise 2 1/2 turns .

LSN : flush with throw arm , then turning counterclockwise 2 turns

NOTE: Due to atmosphere changes the factory needle setting could be too rich or too lean. It is important to note that as long as the engine is running rich during the initial break-in, it is safe from any damage. If you live near or at sea level, you might want to open (turn out, counterclockwise) the HSN 1/2 turn before attempting to operate the engine.

• Run 1: Run the boat at the richest setting your boat will continue to operate at for a full tank of fuel

.

• Run 2: Repeat run one

• Runs 3 – 6: Lean the HSN 1/16 to 1/8 turn between each run. If you notice the engine start to sag the closer you get to the 6th run, you are getting the engine too lean. Do not over lean the engine. Richen the engine back up 1/8 turn and finish breaking in the engine at that setting. It is important to remember that it might not take 6 runs to get to the proper break-in needle setting, but you still want to run the engine for at least 6 runs before trying to tune it further.

Get to know the sounds and sights of your nitro marine engine:

• Rich needle setting means less than maximum RPM. The engine will operate with a break in the exhaust note. Also take note that when rich, your engine is going to use more fuel than normal and you're going to end up with a lot of oil and smoke coming out of the exhaust pipe.
If the engine RPM speeds up as the boat goes around the corner, your engine is likely rich. It is also a good idea to look at the glow plug element after the first few runs. If it looks new and shiny, your engine is running rich. I also like to change the glow plug after the first 5 runs or so. As your engine is breaking in, microscopic particles from inside the engine are coming loose and washing out with the extra oil from exhaust. As the particles pass through the engine some of them attach to the element, reducing the coil's ability to light properly.

• Lean needle setting means lots of RPM followed by lean sags in the exhaust note. Fuel consumption will be minimised and you will not see much oil or smoke exit the exhaust pipe. If the engine RPM drops off in the corner, your engine is likely running too lean. Again it's a good idea to inspect the glow plug element. A lean engine run will show a plug with a distorted coil, broken coil, or missing coil. It's also important to note that a lean needle setting will minimize the dependability of the engine. TIP: Most of the time if the engine quits during a run, the engine was lean.
If you suspect your engine is running lean, bring the boat to shore as soon as possible and richen the HSN.

• The perfect needle setting means good RPM and a clean, clear sound. You'll see some light oil and smoke from the exhaust pipe and a tanned, slightly dull but not distorted glow plug element. TIP: At the risk of a slower operating boat, it is best to err on the rich side of the needle setting. Your engine will last a lot longer and provide
you with winning performance race after race. 5

GLOW PLUGS:
Basic guidelines to follow:

• You want to tune your engine to the hottest plug you can and not burn the plug element out. This will provide you with the most speed and coolest operation.
• Hotter plugs advance the timing in the engine and should be used with lower nitro fuels. Be warned this can cause pre-detonation.
• Colder plugs retard the timing in the engine and are typically used with higher nitro fuels.

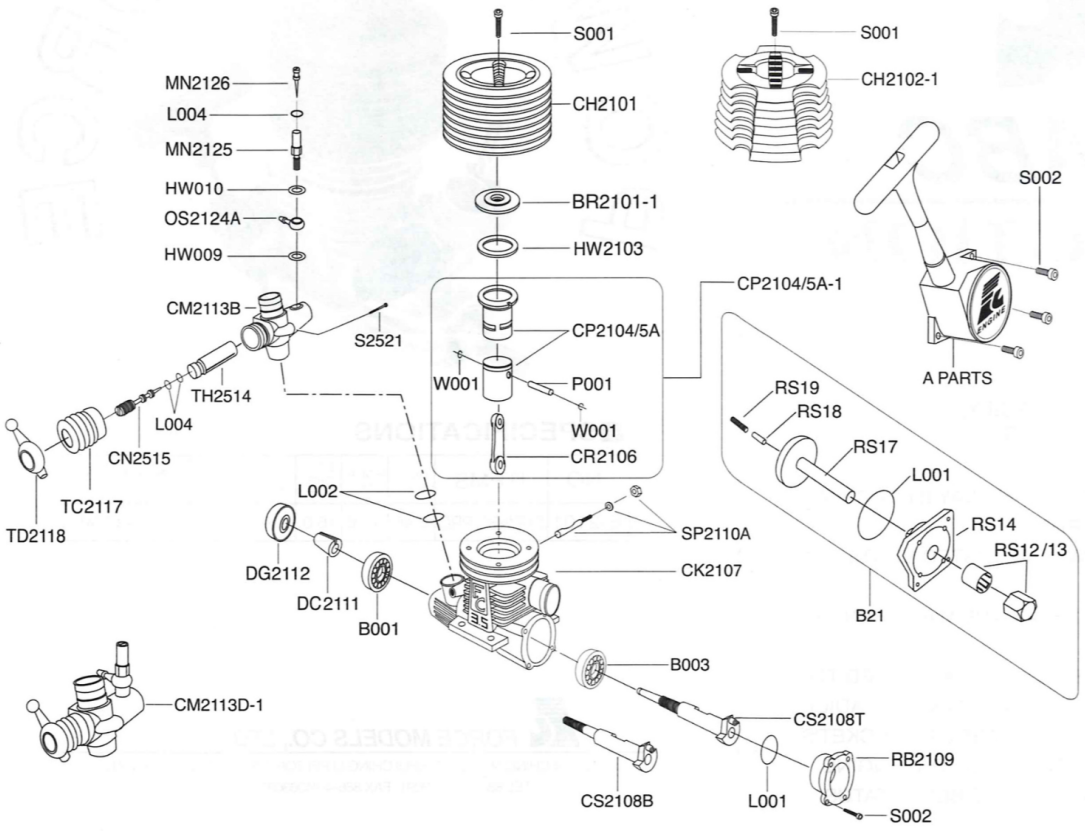
We recommend Force Glowplugs B5 Medium (FORGP02) or B4 HOT (FORGP01)

AFTER RUN MAINTENANCE:

After you are done boating for the day, you are going to want to add some after-run oil to the engine to protect the internal parts. We recommend removing the glow plug, opening the carburetor all the way, and placing 10 to 12 drops of after-run oil down the barrel of the carburetor. Place a rag over the glow plug hole and turn the engine over with the starter. Repeat this step at least one more time to make sure the inside of the engine is fully coated.

21R PULL START ENGINE

Engine Instructions



PART LIST

TEM NO.	DESCRIPTION
B001	Ball Bearing 607Z
B003	Ball Bearing 6901 13mm
BR2101-1	Burn Room for 3,5ccm
CH2101	Cylinder Head Blue Colour
CH2102-1	Cylinder Head Blue Colour (Casting)
CK2107	Crankcase 4P
CM2113B	Composite Carburetor Main Body
CM2113D-1	Comp osite Carburetor Comp lete Set
CN2515	Throttle Needle
CP2104/5A	Cylinder Sleeve/Piston 4P
CP2104/5A-1	Cylinder Sleeve/Piston 4P (Complete Set)
CR2106	Con Rod
CS2108B	Crankshaft OS 13mm
CS2108T	Crankshaft SG 13mm
DC2111	Drive Copper Wahser
DG2112	Drive Gear
HW009	Washer
HW010	Washer
HW2103	Cylinder Head Washer (0.2m/m)
L002	Carburetor "O" Ring
L004	Main Needle Valve "O" Ring
L005	Silicone Seal for Rear Exhaust Manifold
MN2125	Main Needle Seat
MN2126	Main Needle
MN2126-1	Main Needle Set(Including 2126, L004)
OS2124A	Fuel Nipple-Brass
P001	Piston Gudgeon Pin
RB2109	Rear Back Cover
S001	Cylinder Head Bolt M3×12 (4Pcs)
S001/2/4	Cylinder Head Bolt M3×12 & Rear Cover Bolt M2.6×6 & Clutch Washer M3×6
S004	Clutch Screw M3×6
S2521	Throttle Stop Adjustment Screw
SP2110A	Carburetor Setting Pin
TC2117	Throttle Boot
TD2118	Throttle Screw Cap
TH2514	Throttle
W001	"G" Pin Snap Ring 2pcs/set
PULL STARTER ASSEMBLY	
A + B21	Recoil Start Unit Assembly
A Parts	A Parts Assembly -Plastic Part
B 21	B Parts Assembly
L001	Rear Cover "O" Ring
RS12/13	One Way Bearing Set
RS14	Connective Seat
RS17	Staring Axle
RS18	Staring Pin
RS19	Pressure Spring
S002	Rear Cover Bolt M2.6×6 (4Pcs)