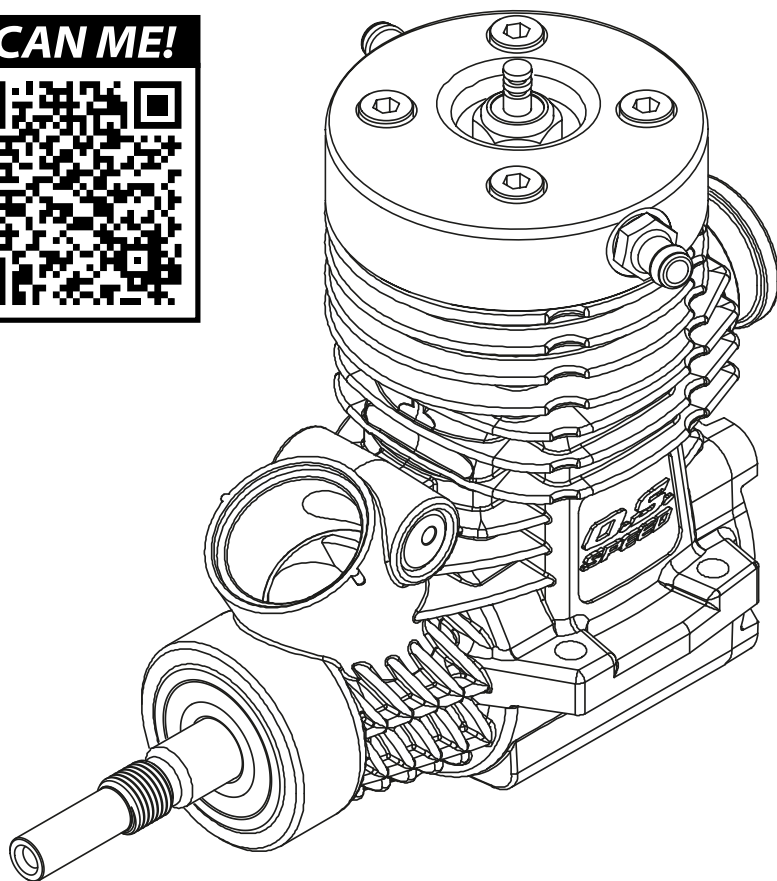


# **O.S. SPEED**

# **M-WORKS R21-M5**

**2025 IMBRA HYDRO 3.5 WORLD CHAMPION**

**SCAN ME!**



## **Manual**

April 2026 v1.1

# O.S.SPEED M-Works R21-M5 Nitro Marine Racing Engine

This is a racing engine suitable for 3.5cc RC boat racing applications such as Outrigger Hydroplane-, Offshore- & Endurance-boats. The M-Works R21-M5 engine is equipped with the 16% EU combustion chamber with smaller volume optimized for running on lower levels of nitro.

## Included

- R21-M5 racing marine engine without carburettor & flywheel
- O.S. RP6 Turbo glow plug
- O-ring for carburettor (15 mm)
- O.S.SPEED flywheel cone
- O.S.SPEED decal sheet
- PDF manual as download

## Items needed

- Flywheel (application depended)
- Gear box (application depended)
- Carburettor (application depended)
- Fuel
- After-run oil
- Exhaust system

## Fuel

This is what we recommend for hydro, offshore & endurance applications:

- 12% Nitro, 8% Klotz Benol Recin Oil + 4% Klotz Original Techniplate Synthetic Oil (or 12-16% Elkalub ME0150).
- Don't use less oil in the fuel than the recommendations! You may add some more castor/recin oil (Klotz Benol) in extreme conditions and heavy loads.

## Glow Plugs

There are two different types of turbo glow plugs from O.S.Engine. The normal one is steel colored and the O.S.Speed versions are gold plated. The main difference between them is that the gold O.S.Speed versions last a little longer and can be beneficial if it's hot temperatures. Regarding power there is basically no difference between them in marine applications.

- **RP6:** For outrigger hydroplane boats
- **RP6:** For offshore and endurance boats
- **RP7 & RP8:** For endurance boats (rarely in hot conditions)

## Combustion Chamber EU 16%

This included combustion chamber has a smaller volume that is optimized for using lower levels of nitro (16% by weight or 12% by volume).

### Recommended shims:

- **Endurance:** 0.15mm
- **Offshore:** 0.15mm
- **Hydroplane:** 0.10mm

## Exhaust System

O.S. does not have exhaust manifolds or marine 3.5cc tuned exhaust pipes, so this is a guide for what will work for different applications (not available from Minicars):

- **Endurance & Offshore Marine Pipe:**  
CMB #C30005/#C30006 or old Novarossi #50050/#50054.
- **Endurance & Offshore Marine Exhaust Adapter:**  
Old Novarossi #40043/#40045 or CMB C20007/#C20008 (check fit).
- **Outrigger Hydroplane Marine Pipes:**  
Hipex MP1-21 parabolic pipe (#MA210103), Andy Brown Parabolic .21 pipe, old Novarossi #50050/#50054 pipe or CMB #C30005.
- **Outrigger Hydroplane Marine Exhaust Adapters:**  
Hipex 180° exhaust manifold (#CL210108), old Novarossi 180° exhaust manifold or AA 180° deg wrap-around header.

## Carburettor Offshore/Endurance

O.S. used to have two carbs that can be used for Endurance and offshore applications that uses a gear reduction gearbox (**both of them have been discontinued in 2023 from O.S.**):

- O.S. 21D - #0S23882000
- O.S. 60LH - #0S29083020 (still some stock, as of December 2024)

These two carbs are basically the same, the 61H has a solid 15mm neck (but shorter neck length) and a longer throttle arm shaft that might need to be cut down in a lathe vs the 21D carb that has a shorter throttle shaft and a *split* 15mm neck.

**Slide Car Carbs:** You could also use a slide car from an O.S. 3.5cc car engine in applications where you have a gearbox! We have a main needle-delete adapter for that application (#MDM-DDCF) so you can remove the original car main needle unit and replace that with our M-Works adapter and use a O.S. remote mounted RC needle elsewhere in the boat. See the marine accessories for the O.S. remote R/C needle set and our M-Works remote R/C needle bases (available in left- & right-hand versions).

## Carburettor Hydro

For most outrigger hydroplane boats those two above mentioned carbs have too large diameter venturis and in many cases they are physically too large to fit under the cowl of the outrigger boat. So try to get hold of a Zoom 21 carb or similar specialized hydro carb (8-8.5mm venturi diameter). In outrigger boats the carb is mostly used together with an remote R/C needle and base (see accessories).

## “SG Pilot-Shaft” Crankshaft

The crankshaft is a std car-spec shaft that has a non threaded 5mm part that the clutch is mounted on a RC car application.

If you plan to mount a short flywheel in a direct-drive application such as a outrigger hydroplane, then you need to cut the outermost part off with a power tool cut-off disc (Dremel). That should be done with outermost care and if you are in any doubt of your own ability to do so, ask a friend with

more experience to help you out.

You need to disassemble the engine and remove the crankshaft before any cutting being done. Then you need to de-burr the cut-off part and clean the crank carefully before assembly!

## Marine Direct-Drive Flywheel

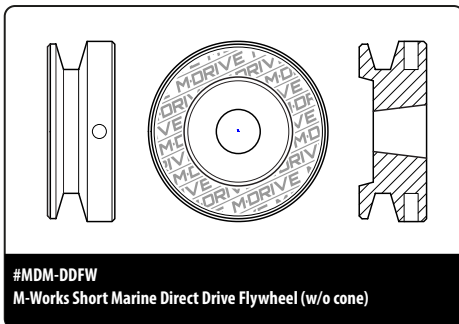
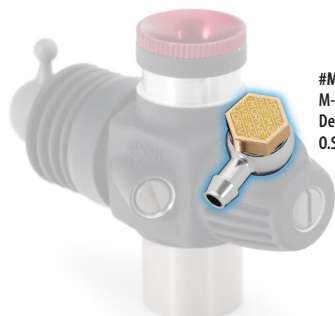
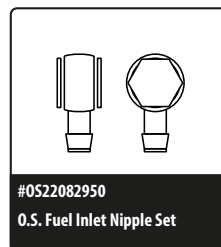
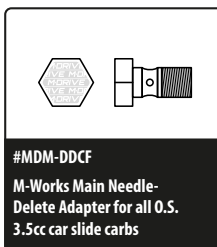
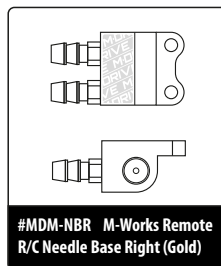
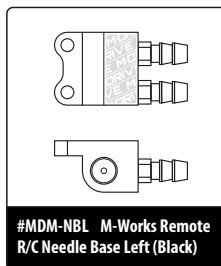
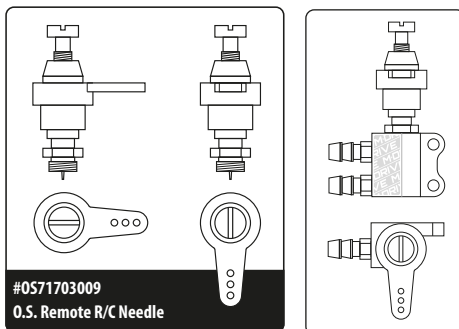
The direct-drive flywheel is optional and will fit the R21-M5 engine and most other 3.5cc car engines with a "SG-style" crankshaft. You need to cut-off the protruding 5mm part of the crank though yourself. Use the std O.S.Speed flywheel cone that is included with this engine.

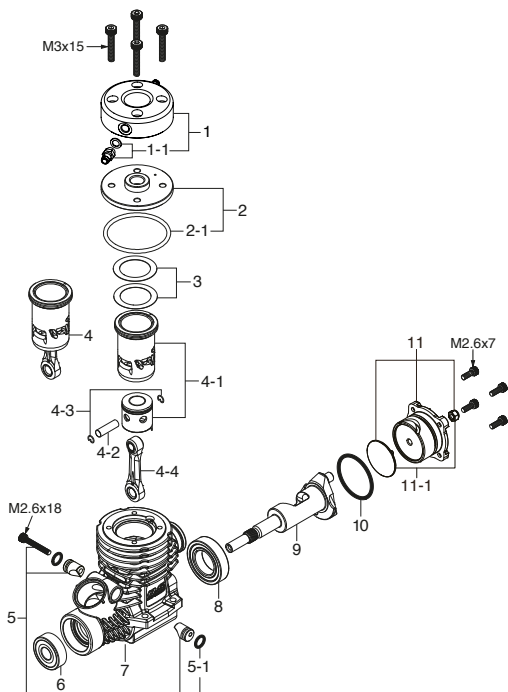
## Maintenance

- Blow air in the cooling tube so any excess water is pushed out.
- After each day of use, empty the fuel tank in the boat so there is just a little fuel left.
- Start the engine - let it get warm, run the engine on shore until it stops/ runs out of fuel.
- Try to start it again.
- If possible, remove the engine from the boat and clean it and remove any water residue.
- Remove the glow plug and inspect it.
- Remove the rear cover (make sure the piston is not at the bottom stroke). Check if there is any signs of wear or corrosion.
- You may clean the inside of the engine with alcohol and add a few drops of a good quality after-run oil such as OptiFuel #OP101909K.
- Please do not use any spray lube (such as WD40) inside the engine as the silicone ramp in the crankshaft may come lose.
- Note that the backplate steel plate and the ball bearings can rust if you leave moisture in the engine when not in use.

## Marine Accessories:

M-Works & O.S. option parts available from Minicars dealers.





Part No.	M-Works & O.S. Accessories
MDM-DDFW	Flywheel Short Direct-Drive (without cone)
MDM-DDCF	Fuel inlet main needle delete adapter M5x0.5 (for O.S. 3.5 slide carbs)
MDM-NBL	Needle Base Left (Black) - for O.S. Remote R/C Needle set
MDM-NBR	Needle Base Right (Gold) - for O.S. Remote R/C Needle set
OS71703009	O.S. Remote R/C Needle Set

No.	Part No.	Description
1	MW-M21H	Water Cooling Head Large Volume w, Stainless Nipples
1-1	MDM-NM5	Nipple M5x0.8 Stainless Steel with washers (2)
2	OS2C604120	Inner Head / Combustion Chamber 16% EU - Low Nitro
2-1	OS2DA04180	O-Ring Inner Head (Black)
3	OS2A004160	Head Gasket Set (0.1/0.15mm)
4	OS2D903010	Cylinder Liner, Piston & Rod - Built-Up Set
4-1	OS2D903000	Cylinder Liner & Piston Set
4-2	OS22016000	Piston Pin
4-3	OS2AP17000	Piston Pin Retainer O.S.SPEED (6)
4-4	OS2D981000	Connecting Rod w/ piston pin retainers (3)
5	OS23981740	Carburettor Retainer Assembly
5-1	OS24881824	O-Ring (2)
6	OS23731000	Ball Bearing Front - ID7 x OD19 x T7 mm
7	OS2D901000	Crank Case
8	OS23731000	Ball Bearing Rear/Inner - ID14 x OD? x T? mm
9	OS2D902000	Crankshaft DLC Coated Tungsten Balanced
10	OS23107100	Cover Plate O-Ring
11	OS2DA07000	Cover Plate
11-1	OS2DA07010	Thrust Plate with M3 nyloc nut

Part No.	Size	Description
OS71642060		Glow Plug Turbo RP6
OS71642070		Glow Plug Turbo RP7
OS71642080		Glow Plug Turbo RP8
OS71642740		Glow Plug Turbo RP6 - O.S.SPEED (Gold)
OS71642750		Glow Plug Turbo RP7 - O.S.SPEED (Gold)
OS79871020	M2.6x7 mm	Cover Plate Retainer Socket Head Screw (10)
OS79871055	M2.6x18 mm	Carburettor Retainer Socket Head Screw (10)
OS79871150	M3x15 mm	Cylinder Head Retainer Socket Head Screw (10)

## R21-M5 Specifications:

Displacement:	3.49 cc
Bore:	16.08 mm
Stroke:	17.20 mm
Exhaust Ports:	1+2
Inlet Ports:	9
Crank Dia:	14 mm
Crankshaft:	DLC coated, balanced, silicone ramp, 4.5mm tungsten balance weights
Practical RPM Range:	6000-43000
Carburettor Neck Dia:	15 mm
Weight (w/o Carb):	256 g

