

1. Purpose

- (1) Understand the main specifications, improvements, improvement objectives etc. of the motor for boat racing and understand its features.
- (2) To understand the structure and role of each part, to acquire knowledge of the structure of the whole motor.

2. Features of the motor

With an outboard motor developed exclusively for boat racing

Yes, it has the following features so that you can race fairly and safely

- Lightweight compact
- Excellent maintenance and handling
- Low performance difference
- Difficult to break

3. Motor specifications and specifications

(1) Motor specifications

The motor adopts 2 strokes which are mechanically lightweight and compact, mechanically. The 300 type motor had four kinds of specifications depending on the location conditions of the boat race site and customer's request but it was improved and improved based on the industry's request, and it was unified into 321 type as a sound reduction type in 2012, It became 331 type (output reduction motor) in December 2014.

① Development objective of 331 type motor

It was developed based on the 321 type motor as an output reduction motor for the purpose of reduction of injuries from the update of record time in each boat race field in recent years and the occurrence situation of daily contact accidents. The output is about **1 horsepower reduction** compared with 321 type.

② CHANGES FROM TYPE 321

a. Cylinder head

Increase the volume of the combustion chamber of the cylinder head and reduce the compression ratio from 8.6: 1 to 8.3: 1.

The shape of the stamping table is different as how to distinguish from the appearance.

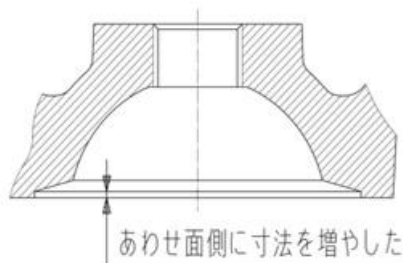


図3. 1



図3. 2



図3. 3

a. **b. EXHAUST PIPE**

- b. To obtain the desired power characteristics, the length is the same as the 321 type, and the tip diameter is smaller.
- c. Also, as a big difference in external appearance, there is no concave shape (escape during machining and attachment) like a 321 type at the tip portion, and it is a round shape

d. **c. CYLINDER CASE**

As measures against distortion, we reinforced the rigidity of the cylinder case by filling the base.



図3. 4

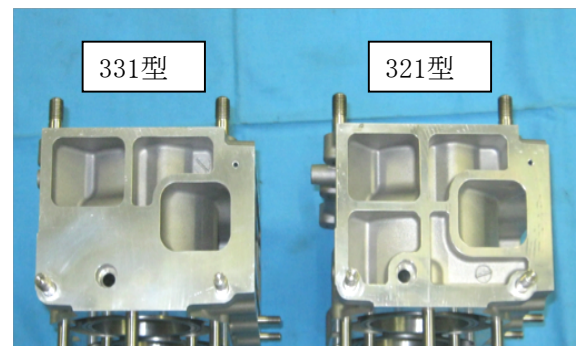


図3. 5

d. Fasteners

In order to avoid interference between the intake silencer and the fastening bracket (carburetor link) knob small screw, fixation of the link bar by the pan head screw was changed from the front to the upper.

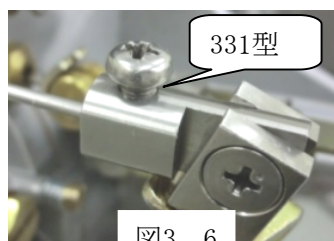


図3. 6



図3. 7

Type 321

There were two kinds of intake silencer of the noise reduction motor (301 type), standard type and large type made by FRP, but with 321 type, based on FRP's large intake air silencer, the material was changed to polypropylene, cost reduction, In addition to stabilizing the quality, it was unified into one type. In addition, we organized various optional parts that differed for each boat race site, and made uniform the performance by unifying the specifications of the motor. For marine and noise reduction performance, it is equivalent to the 301 type large intake air silencer specification.

