TWO STROKE OUTBOARD PETROL ENGINE HOMOLOGATION FILE

International Homologation File Number: **00475, 475A**

Homologation Valid from: **February 14th 1995** Expiry:***December 31st 2026**

Valid for the following classes: **CIRCUIT:** OSY400
OFFSHORE:

Manufacturer: Yamato Motor Co.ltd

Engine Model: Yamato 302, Yamato 321 (00475A)

Number Manufactured: 2903

At the date: October 25th 1994

Certified by the National Authority of: Japan (Maris)
At the date: October 28th 1994

UIM Comintech Inspector: William Brown
At the date: February 14th 1995

UIM Certification Approval: Union Internationale Motonatique
At the date: February 14th 1995

Homologation Extended
At the date January 25th 2017 M Lundblad

Running Production Changes

Change Detail	Page No.	Date Approved for Use	Approved by
1. Gearcase		March 20th 1996	G.Lowisin
2. Exhaust Outlet dimens.	------	March 19th 1999	G.Padovan
3. Carburetor and Cover	------	October 15th 2001	W.Klein
4. Alternative Carburetor	------	March 5th 2005	R.Trotman
5. Exhaust Outlet Positioning	--	*April 1st 2006	R.Trotman
6. Exhaust Housing, Cover/Carburetor Intake, (For purposes of noise reduction)		November 20th, 2014	M. Lundblad
7. Model 331, Cylinder Head...	------	July 13, 2020	M.Lundblad
8. Second Oversize Piston, Wiseco, (.762 mm oversize)		April 8th 2024	M.Lundblad

Homologation 00475 Manufacturer YAMATO

Carburettors		Model YAMATO 302	
Number fitted			1
Type			YAMATO
Total number of Venturis			1
Diameter of Venturis	± 0.1	mm	28
Diameter of Venturis Throttle Housing	± 0.1	mm	36
Airintake silencer standard equipment, dimensions marked on page 4			Yes · · No ·

ORIGINAL

Union Internationale Motonautique

Monte Carlo, ...

Outboard Engine Homologation Sheet No. 00475

International homologation effective from .....

Homologation valid for the following classes OSY400

.....

Manufacturer YAMATO MOTOR CO., LTD.

Engine model YAMATO 302

Number manufactured 2,903 At the date October 25, 1994

Certified by the National Authority of JAPAN

At the date October 28, 1994 Signature Terno Kameko

Certified by the U I M At the date 14/2/95

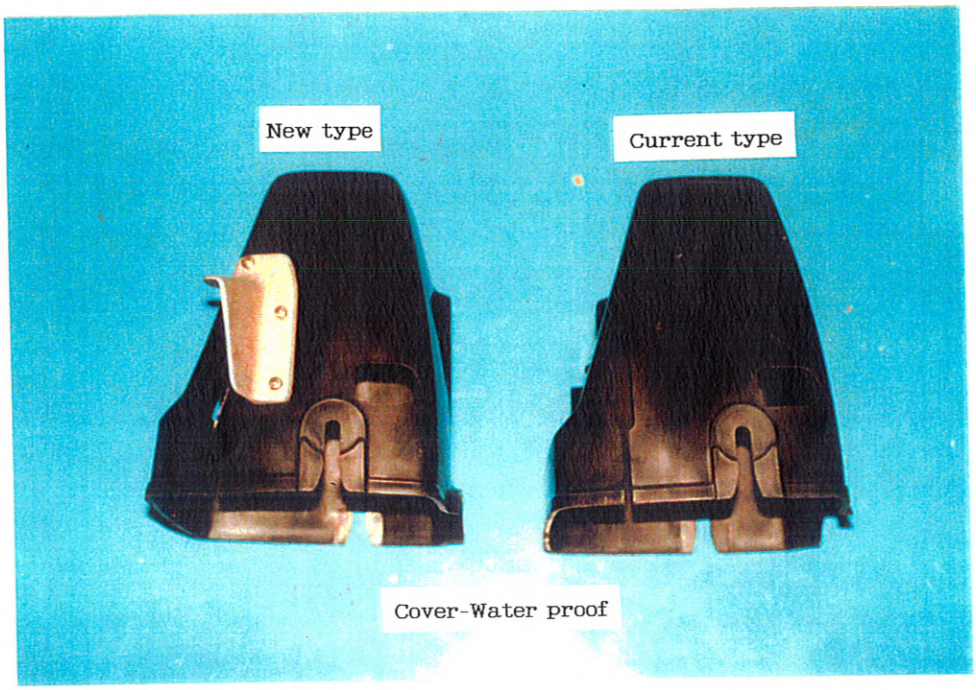
Responsible U I M Homologation Group: Signature .....

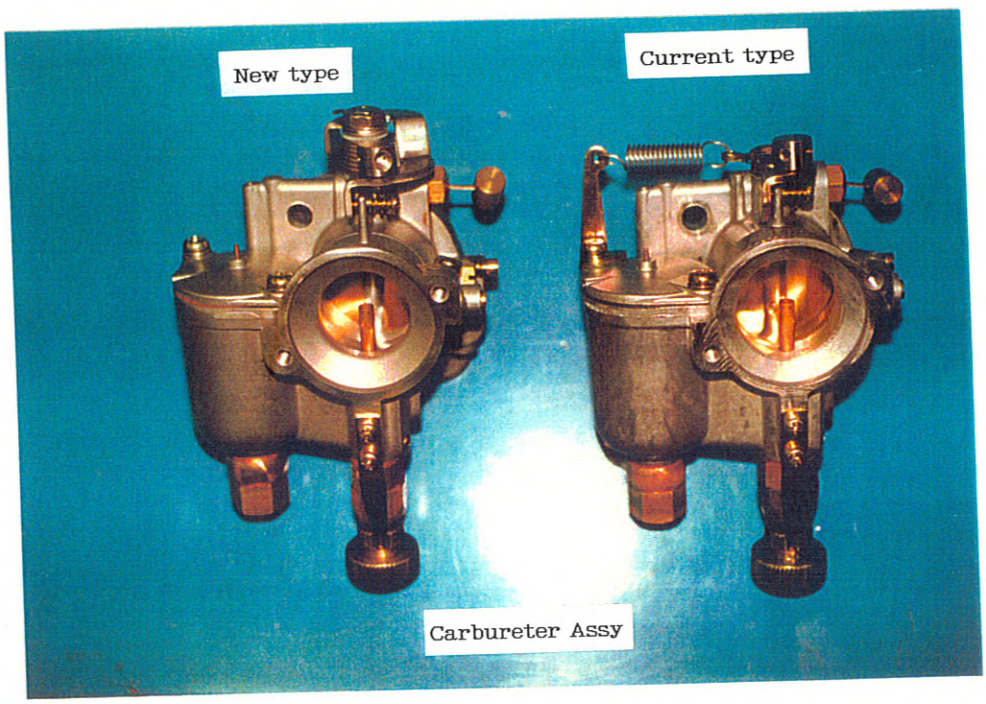
W. BROWN

Running production changes:

Change specified on page No.	Aproved at the date. Signature.
GEARCASE P.# 18	MARCH 20, 1996 Gert Sonntin
NEW EXHAUST OUTLET DIMENSION	MARCH 19, 1999 Sadovar
	U.I.M.
New carburettor type and Cover water protection (see Photos)	Oct,15 2001

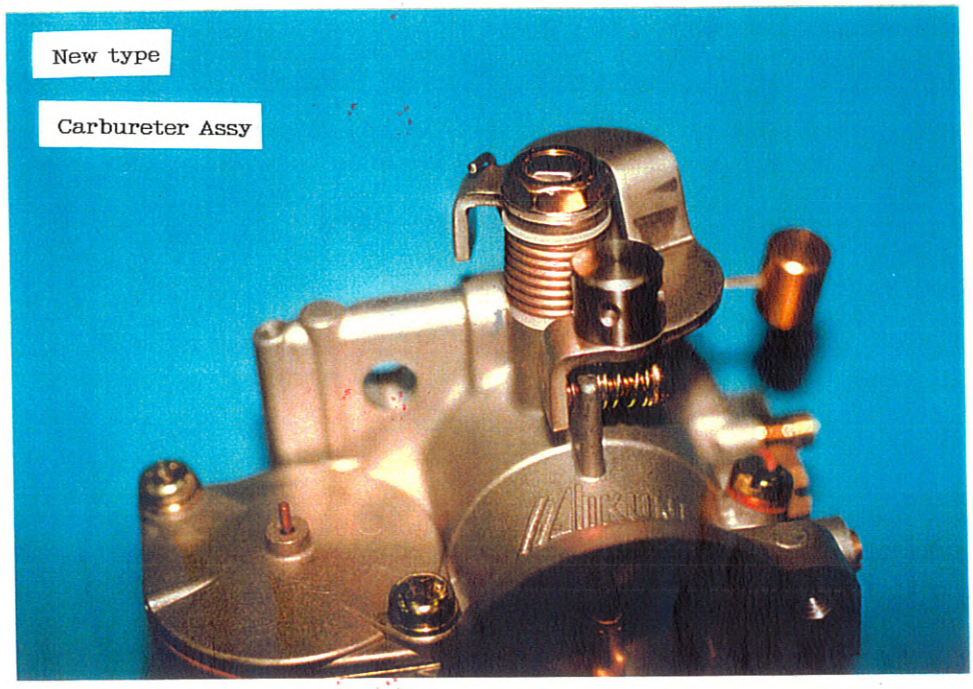
This form issued on January 1, 1988

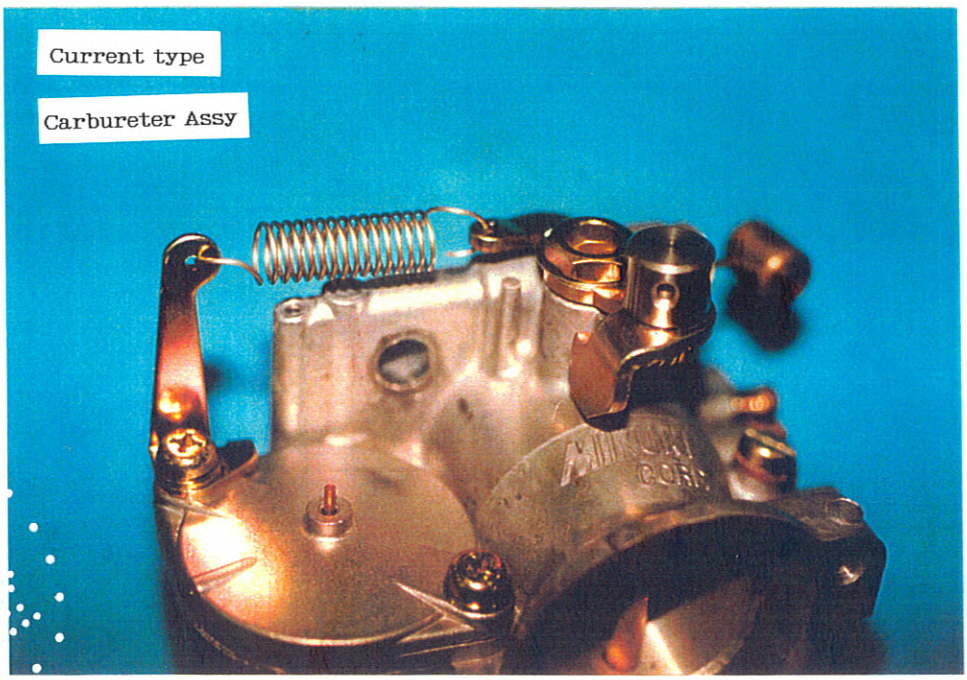




ORIGINAL

000475 URGENT





ORIGINAL

Union Internationale Motonautique

Monte Carlo, ...

Outboard Engine Homologation Sheet No. 00475

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At the date October 28, 1994 Signature Terno Ganeko

Certified by the U I M At the date 14/2/95

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Running production changes:

Change specified on page No.	Approved at the date.	Signature.
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NEW EXHAUST OUTLET DIMENSION.	MARCH 19, 1999	

U.I.M.

ORIGINAL

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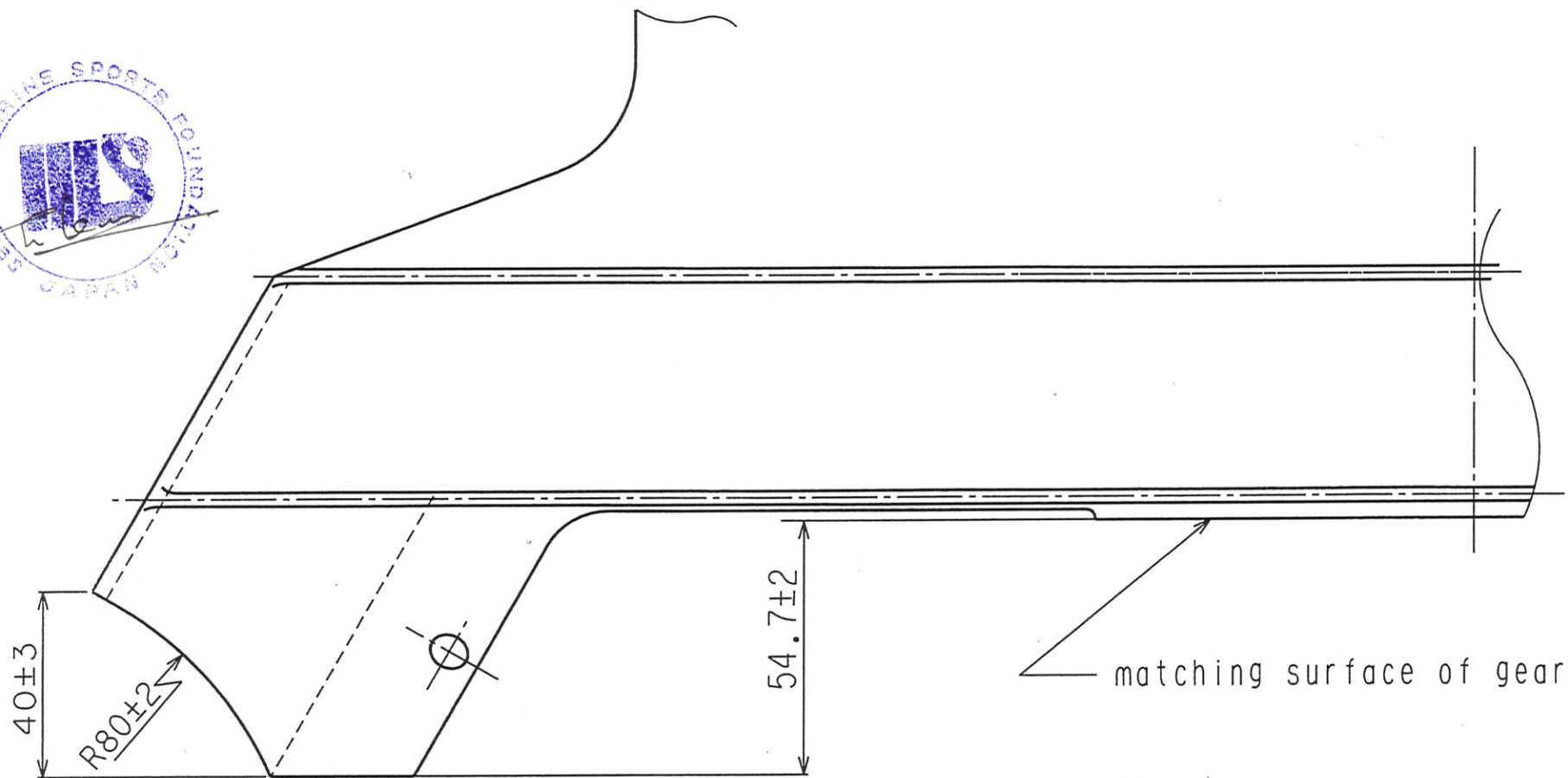
00475

U.I.M.

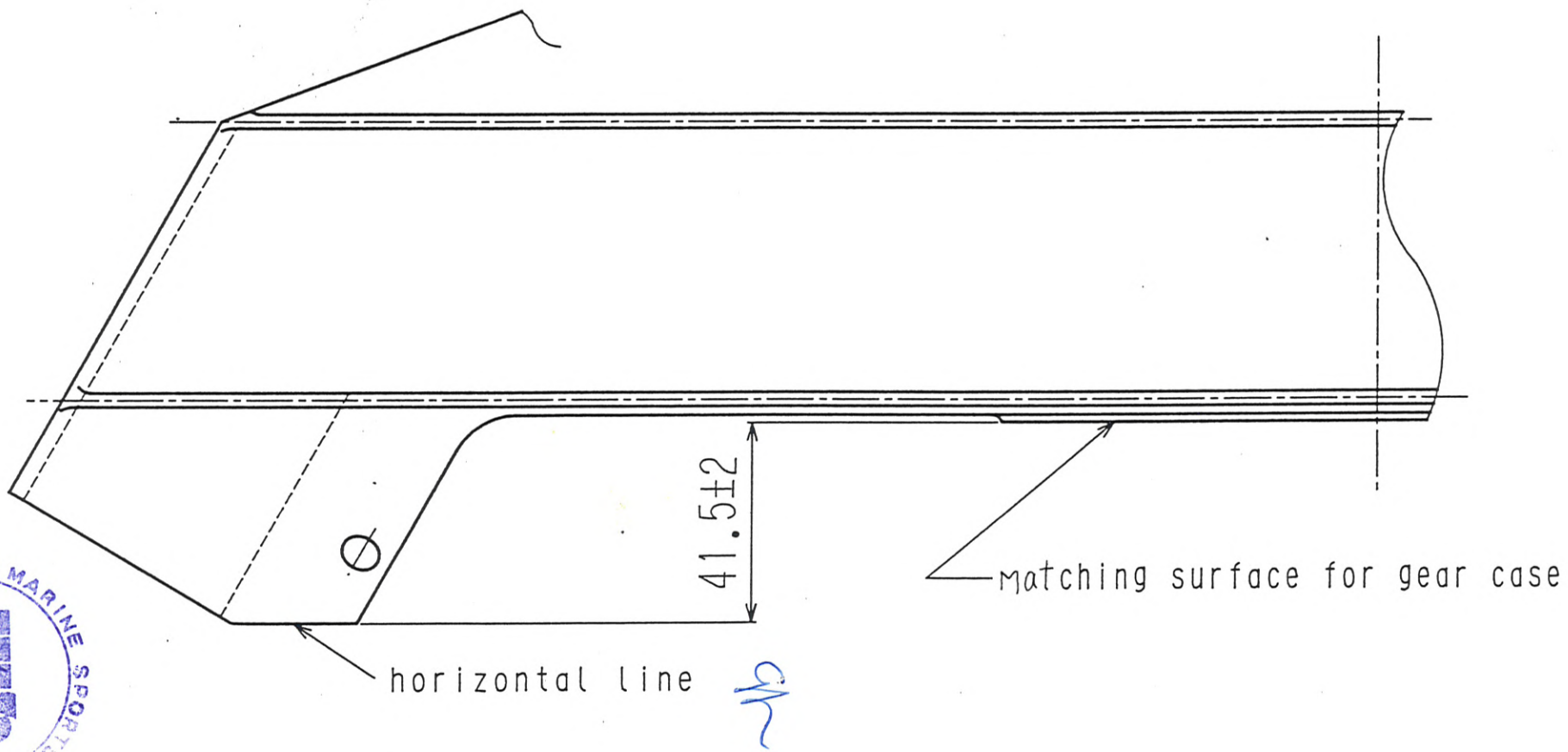
Model YAMATO 302

another type of exhaust outlet



Model YAMATO 302

another type of exhaust outlet



U.I.M.
UNION INTERNATIONALE MOTONAUTIQUE

YAMATO 302 - HOMOLOGATION SHEET N° 475

In order to facilitate measurement of the cylinder ports, the dimension from the top of the cylinder liner to the top of a port is to be used, and not the dimension from the crankshaft centre line. The production tolerances of these dimensions have not changed since the start of manufacture of model 202, so the method is valid for the 202. Two types of cylinder head, one with 18 mm. and one with 14 mm. spark plug, are available and shown on the form. These are applicable to model 202 also.
Sketches of the exhaust pipe and the gearcase tail cap are included. These are applicable to model 202 also.

Gert Lowisin

UNION INTERNATIONALE - Motonautique

Gert Lowisin
Comintech President

ORIGINAL

Union Internationale Motonautique

Monte Carlo, ...

Outboard Engine Homologation Sheet No. 00475

International homologation effective from .....

Homologation valid for the following classes OSY400

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Manufacturer YAMATO MOTOR CO., LTD.

Engine model YAMATO 302

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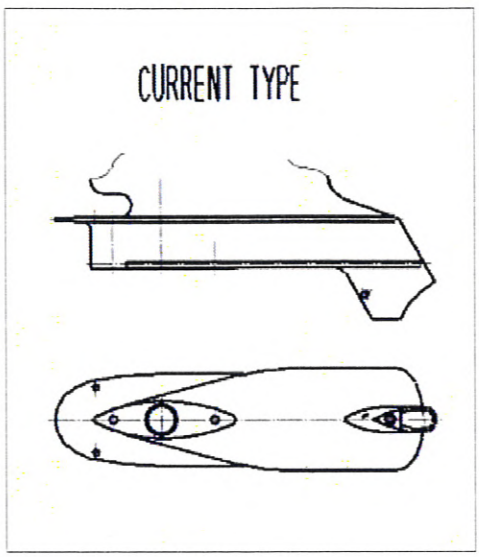
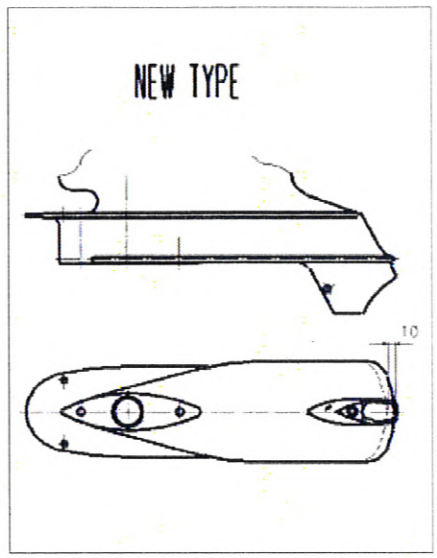
NEW EXHAUST OUTLET DIMENSION	MARCH 19, 1999 Sadoual
	U.I.M.
New carburettor type and Cover water protection (see Photos)	Oct,15 2001
ALTERNATIVE CARBURETTOR	5/3/05 Roger Tratman

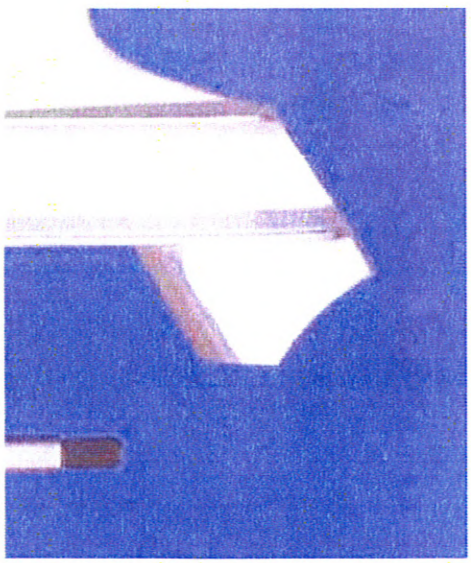
This form issued on January 1,

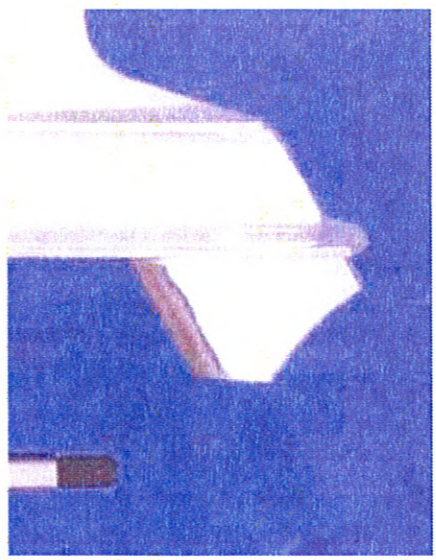
5. Exhaust Outlet Positioning

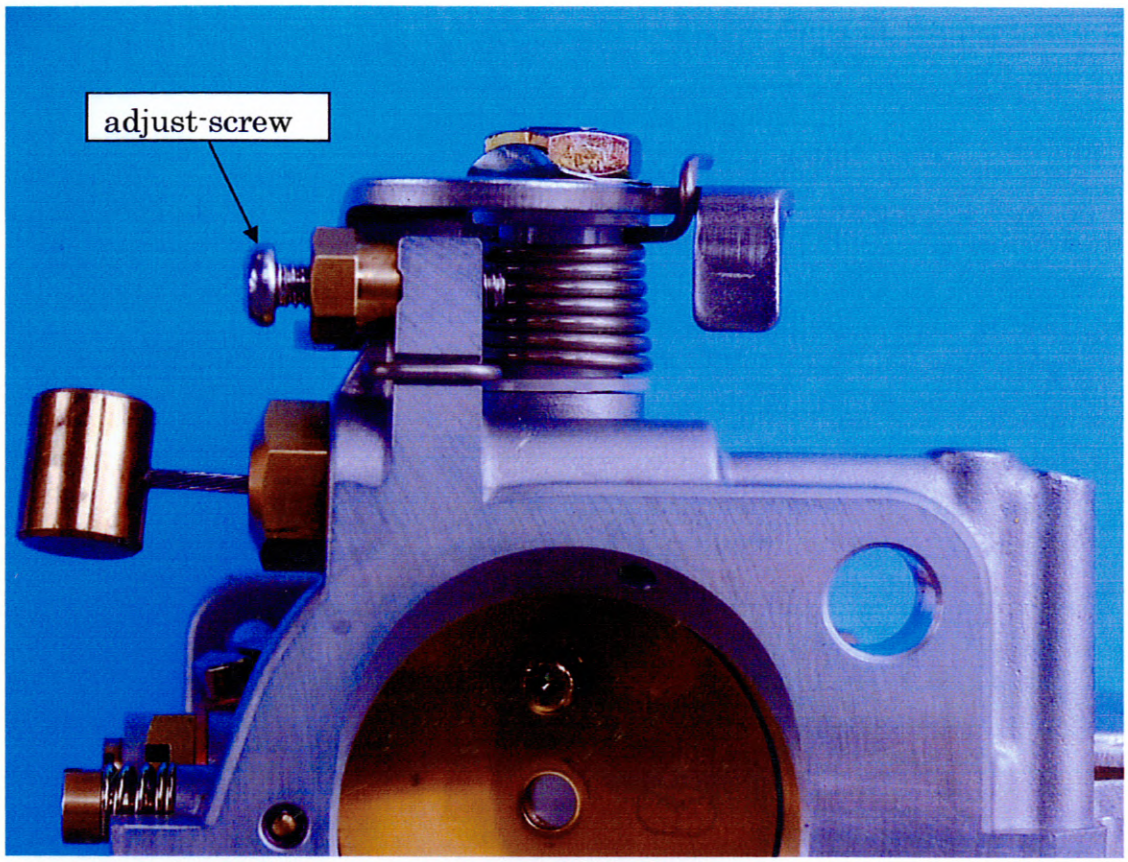
Running Production Change





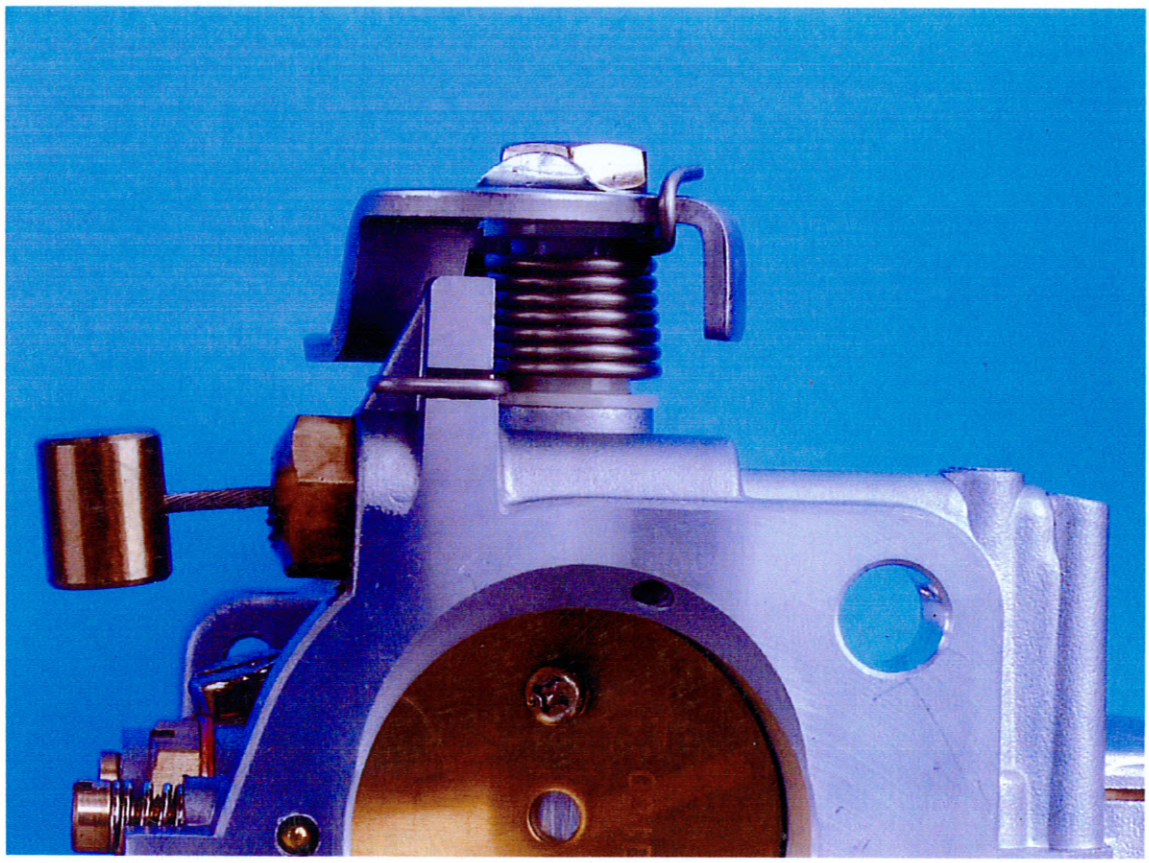




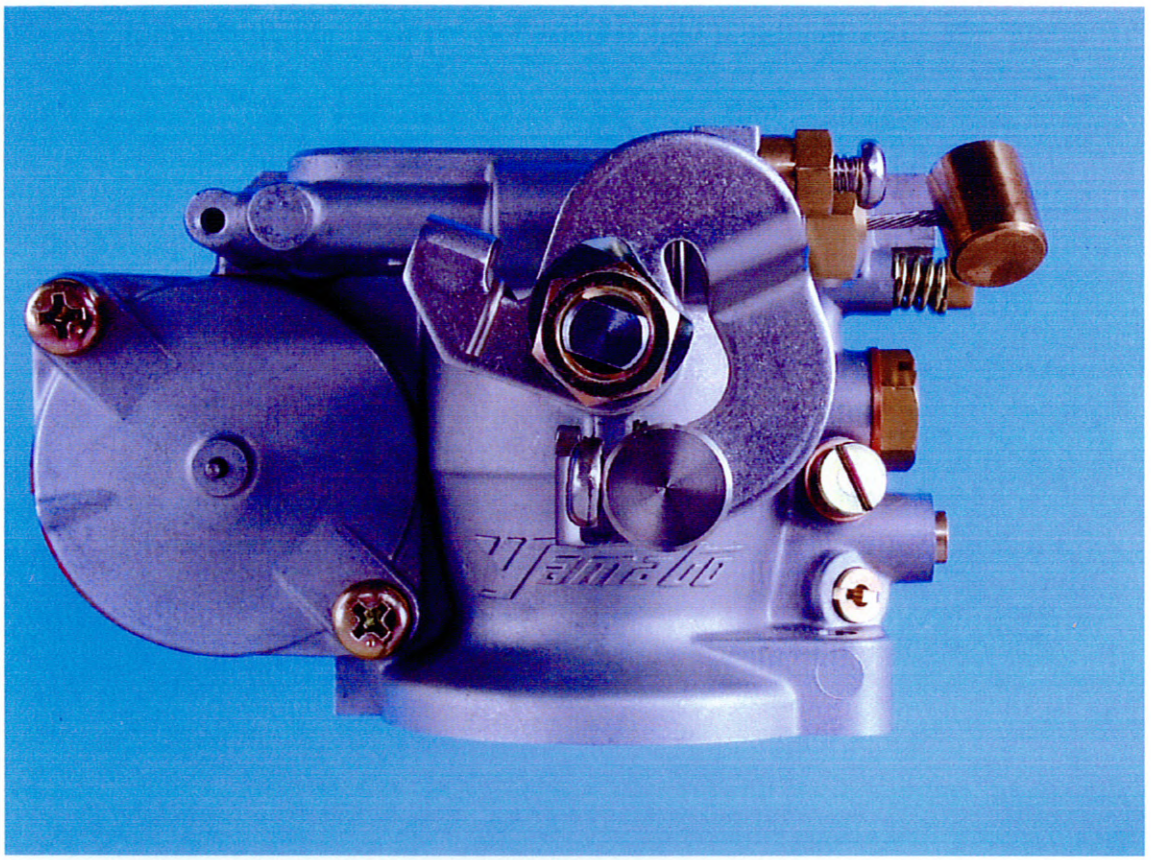


NEW CARBURETOR

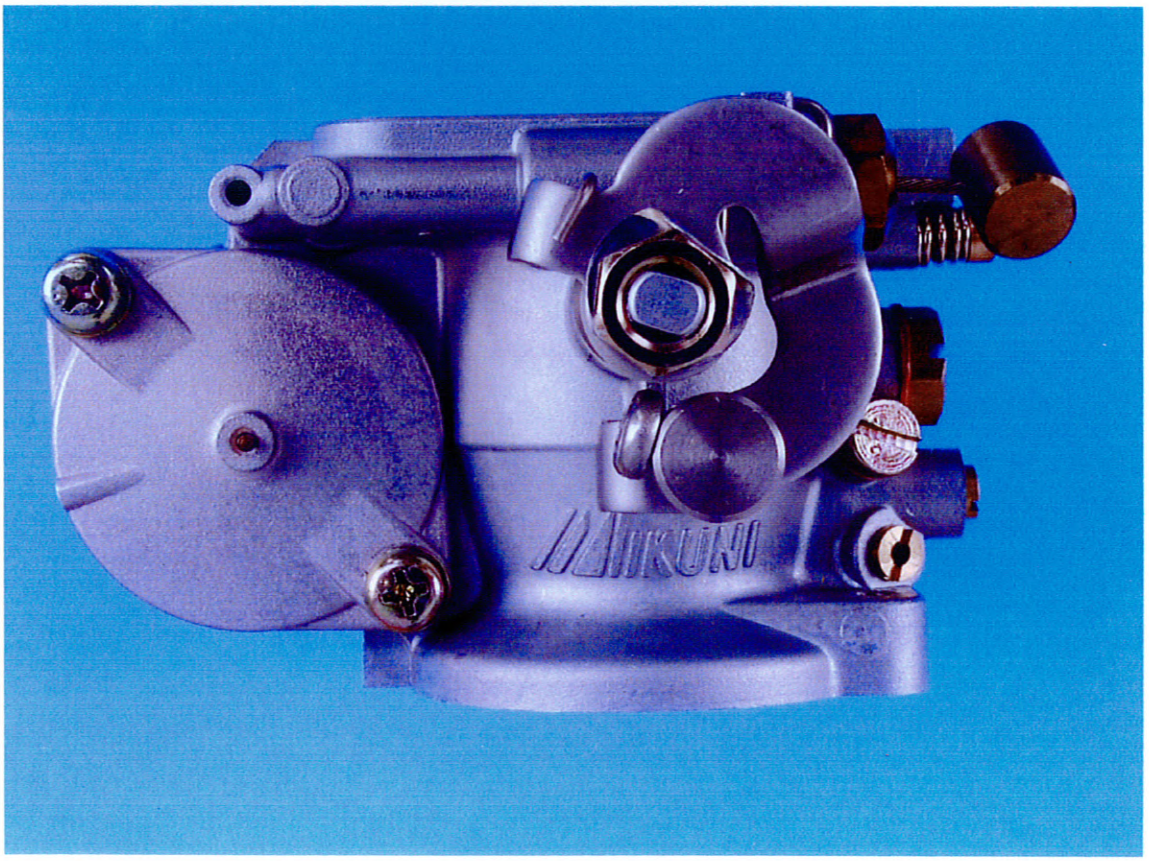
An adjust-screw is installed to adjust the positioning of the butterfly at full throttle operation.



CURRENT CARBURETOR



NEW CARBURETOR "TYPE YAMATO"



CURRENT CARBURETOR "TYPE MIKUNI"

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ORIGINAL

Homologation No. 00475 Engine model YAMATO 302. 1.(-17)

Photo of the complete engine, taken 45° from the front side.

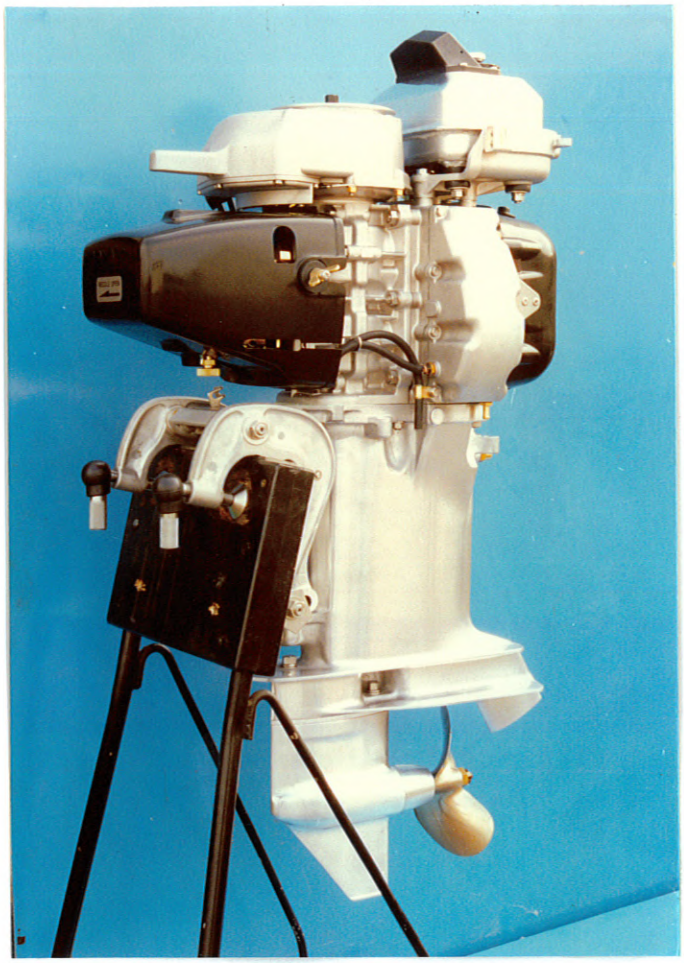
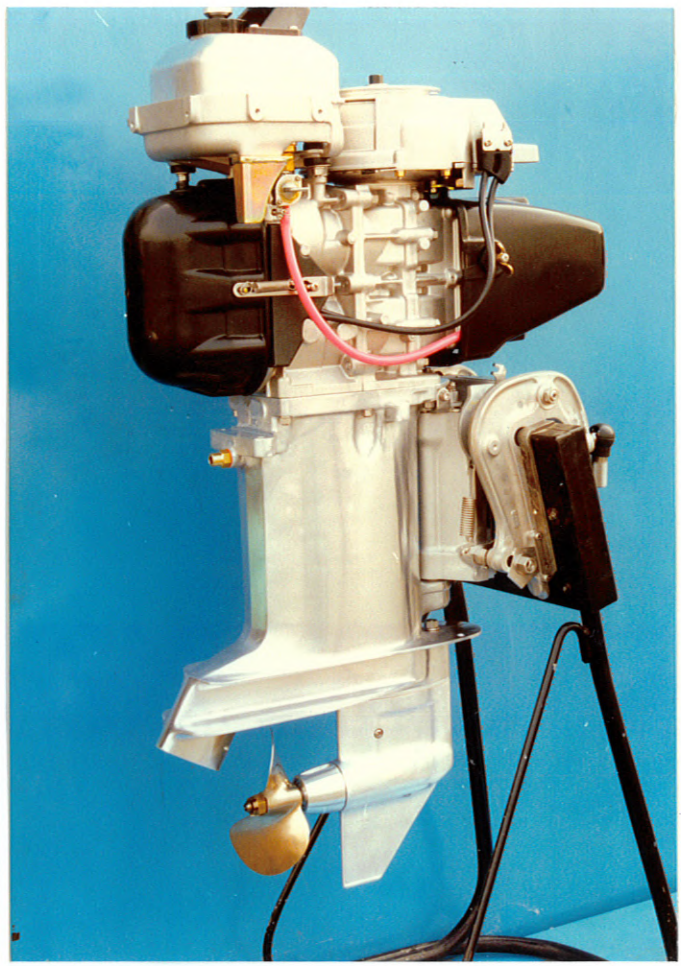


Photo of the complete engine, taken 45° from the rear side.



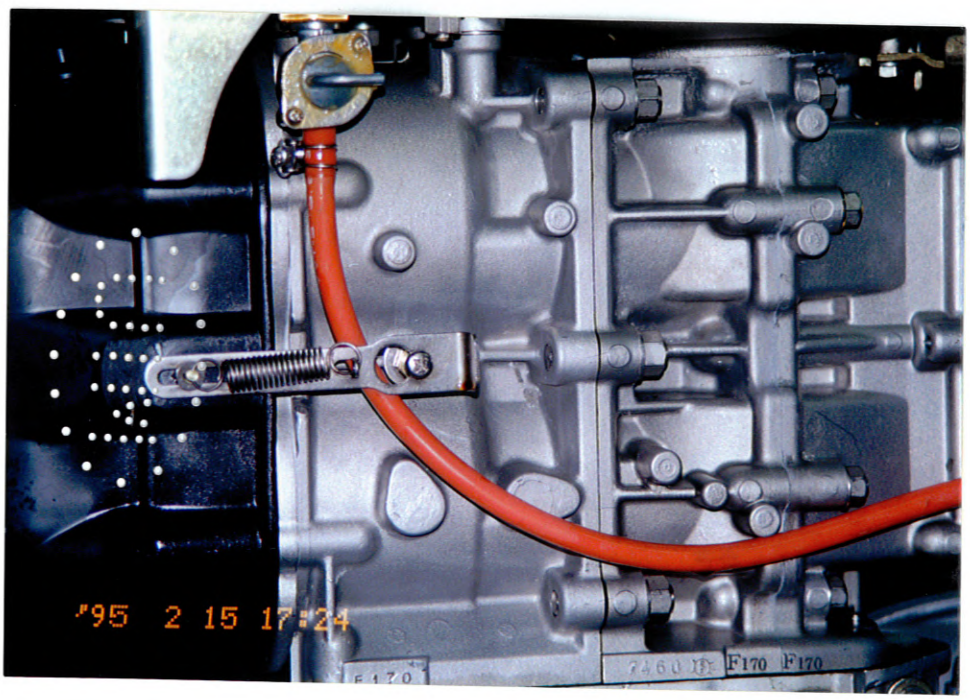
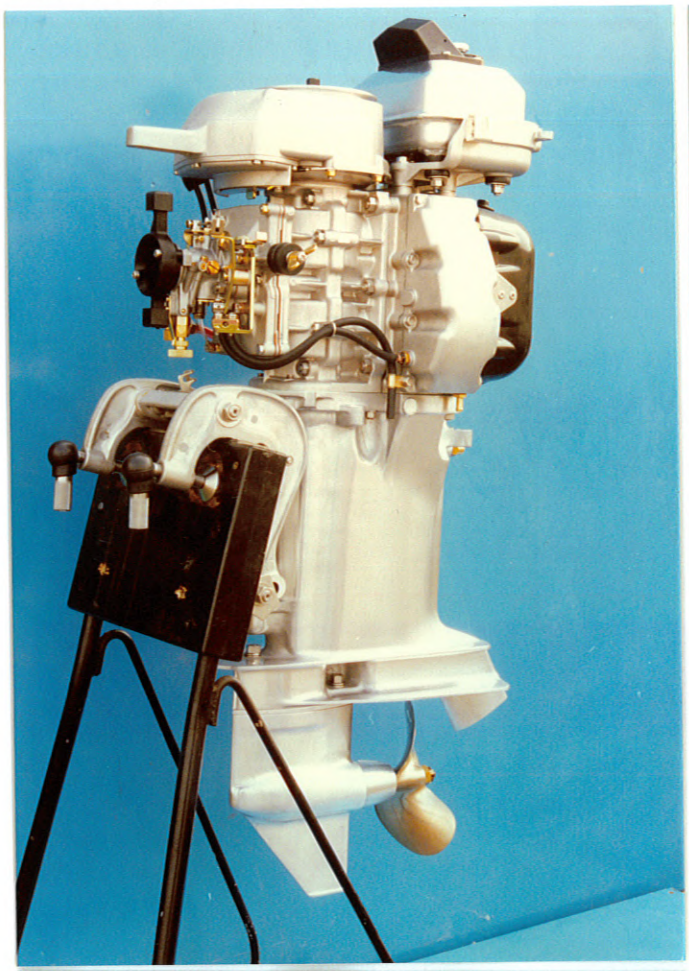
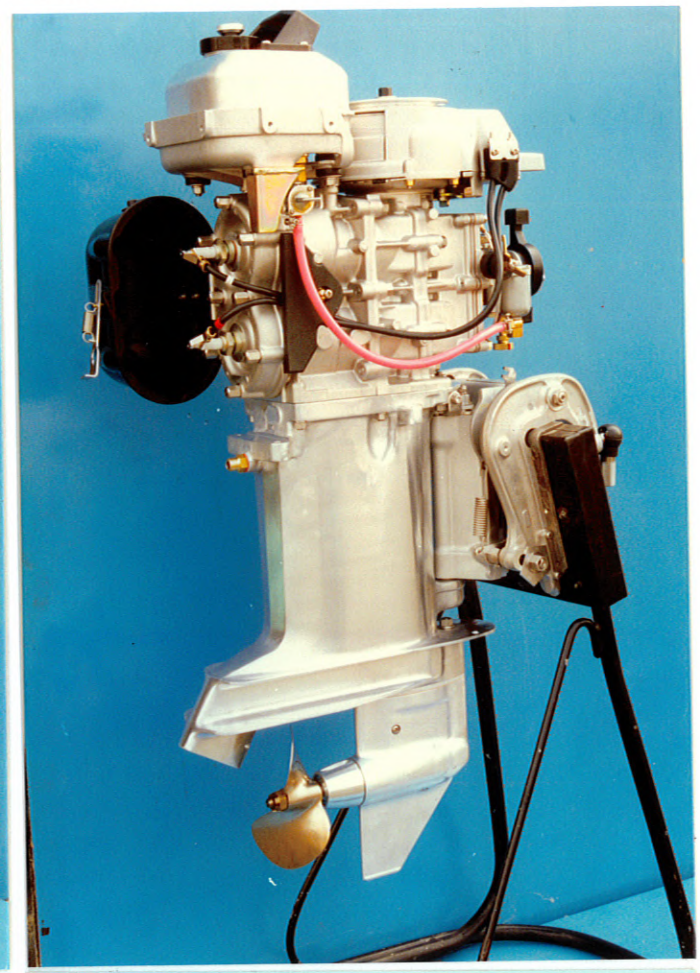


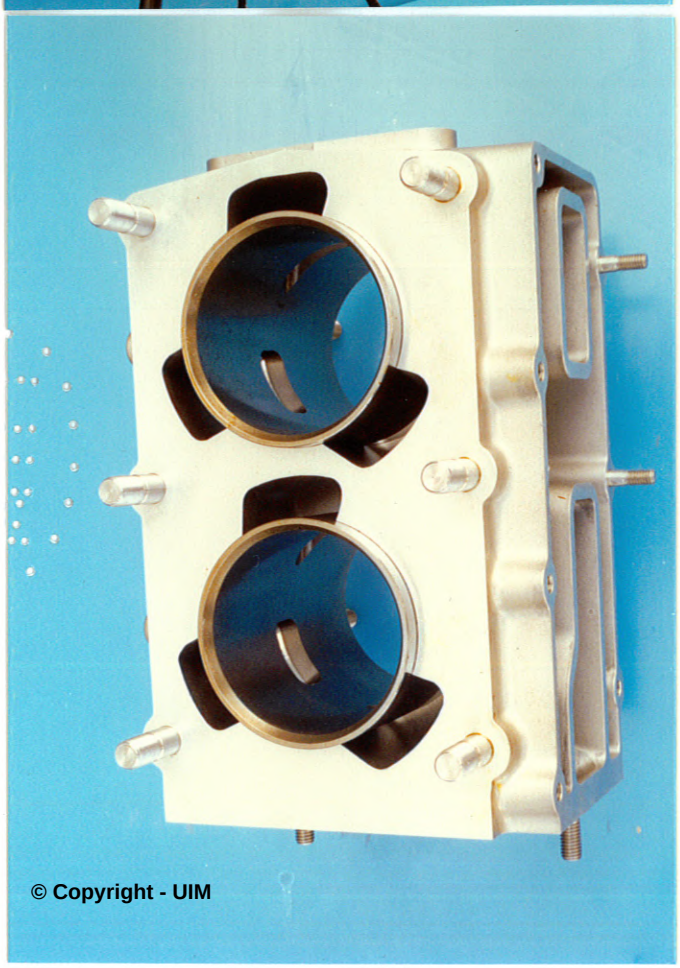
Photo of the details of starboard side cylinder without cylinder side cover - black triangle rubber plate.

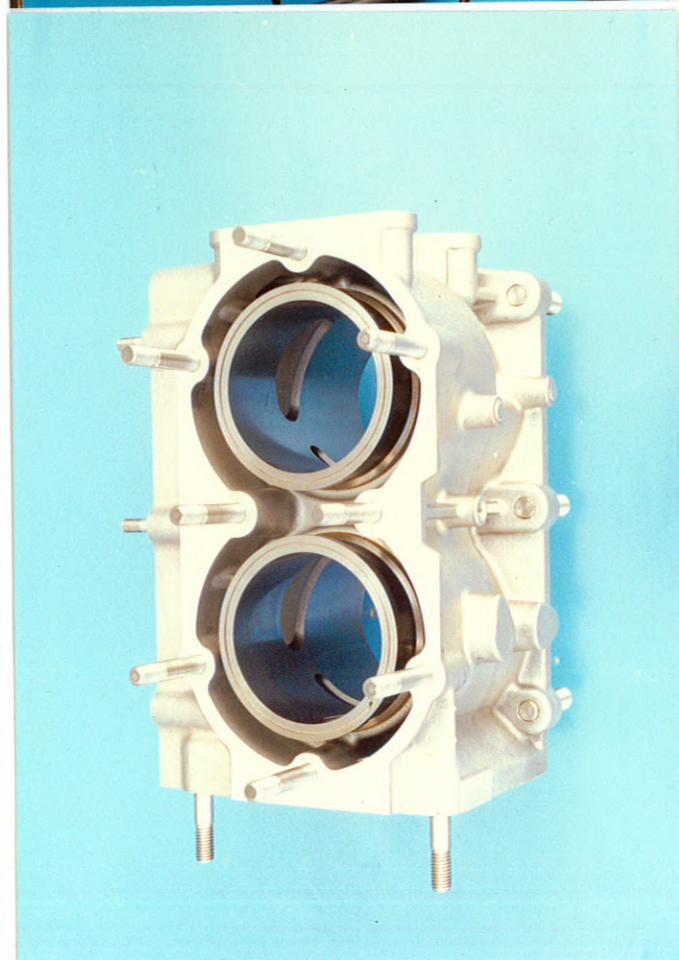
ORIGINAL

Homologation No. 00475 ..... Engine model YAMATO 302 ..... 2.(-17) -







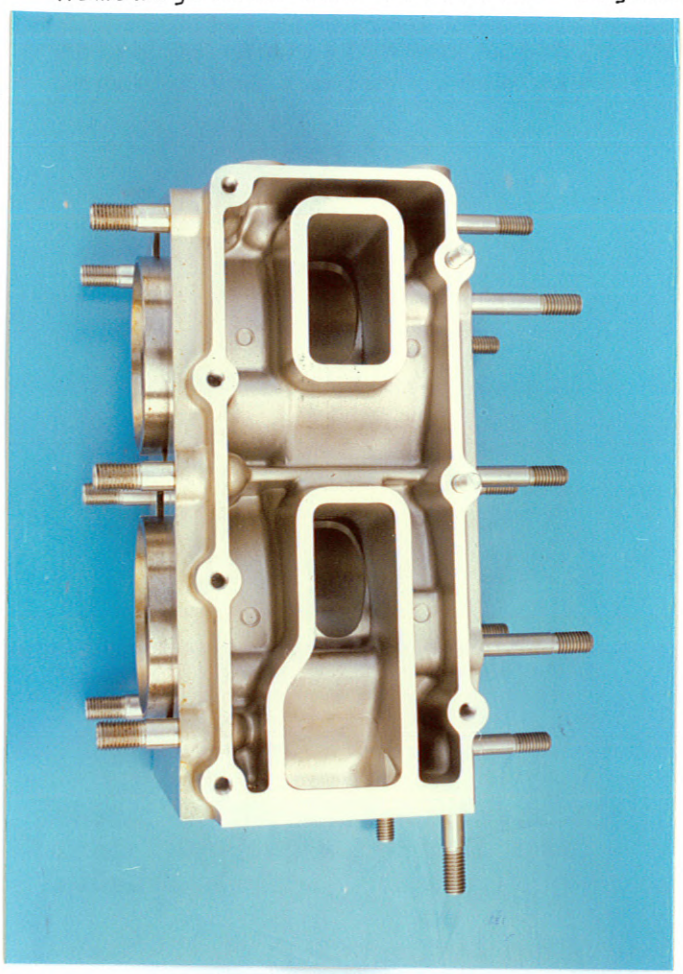


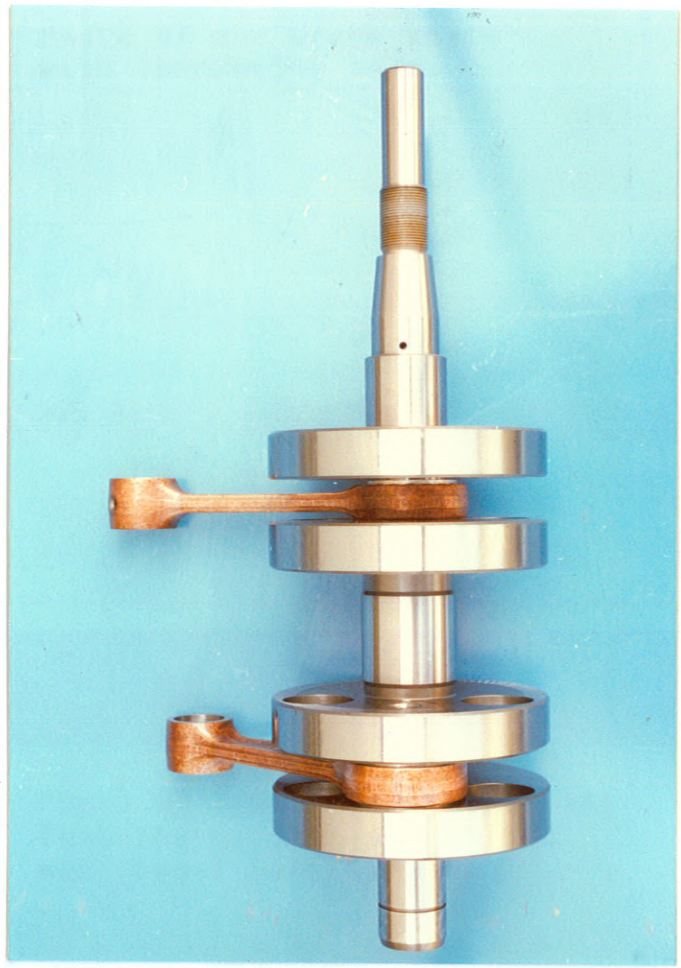
ORIGINAL

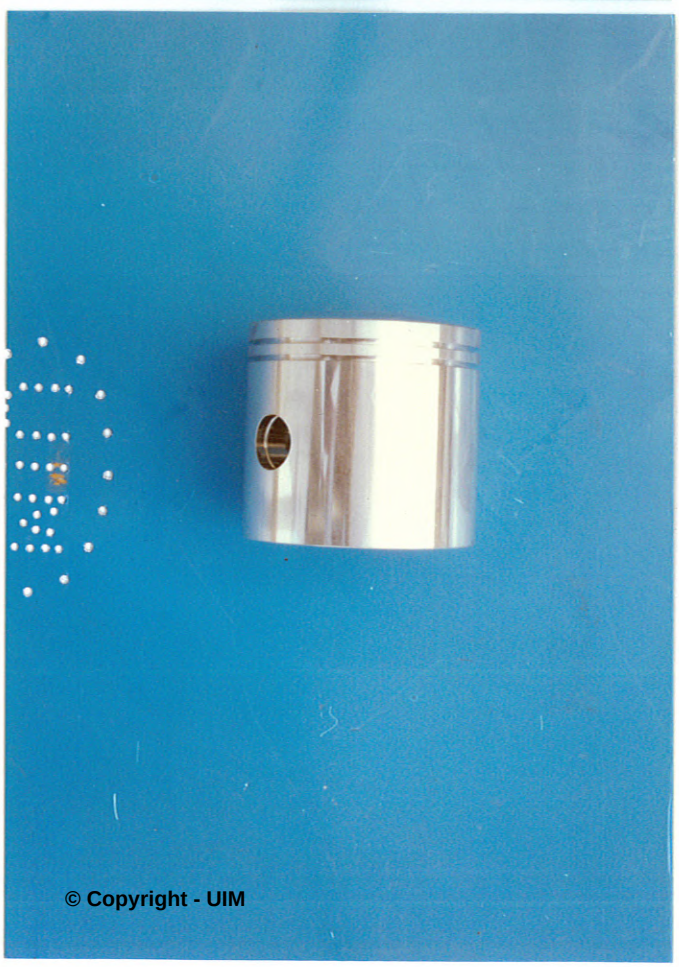
00475

Homologation No. ..... Engine model YAMATO 302

3.(-17)







00475 ORIGINAL

Homologation No. ..... Engine model YAMATO 302 4.(-17)

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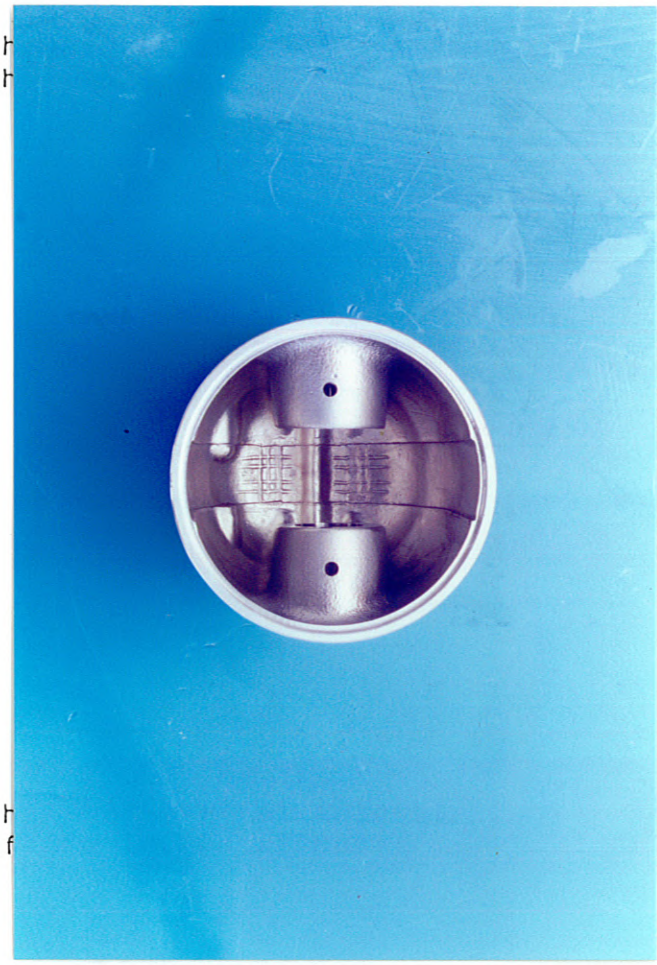

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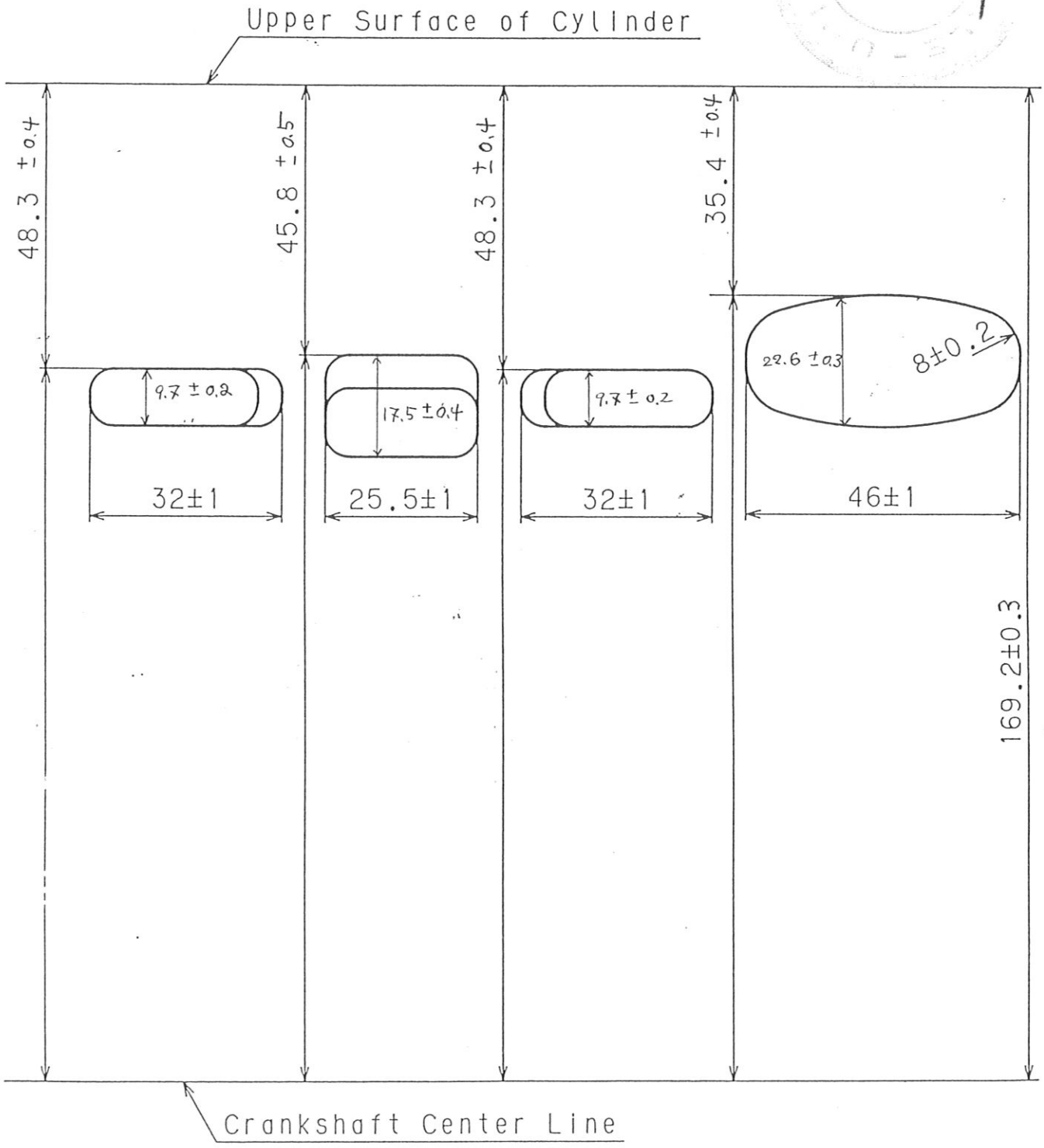
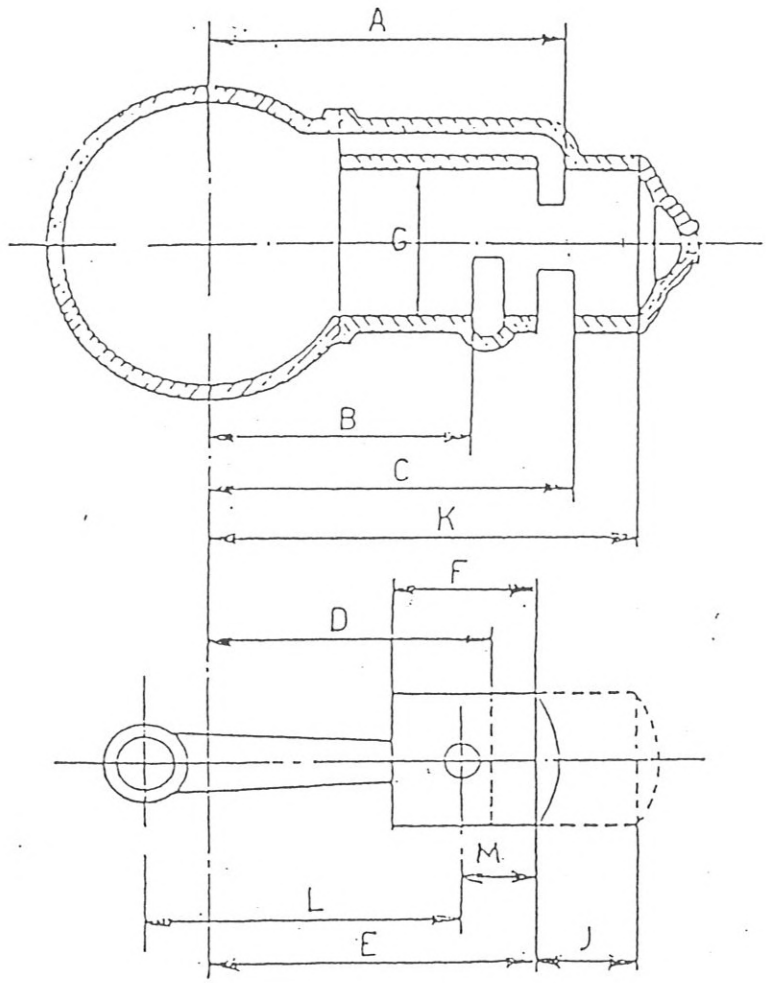
Homologation No. ..... Engine model YAMATO 302

Spread-out sketch of the cylinder-wall with location and dimension measurements of the scavenging ports noted.
- All port width dimensions are chordal measurements.



Homologation No. 00475 Engine Model YAMATO 302 6.(-17)

ORIGINAL



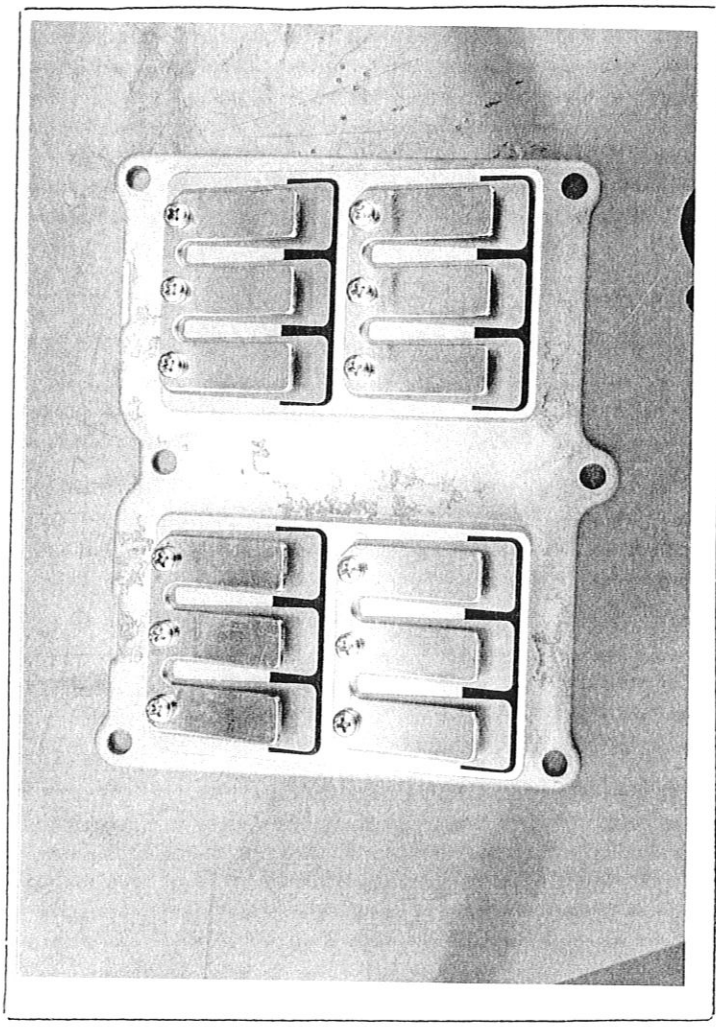
Homologation . . . . . Manufacturer . YAMATO . . . . . Model YAMATO 302

Cycle 2 stroke				2 stroke
Number of cylinders				2
Cylinder arrangement				In Line
		Tolerances		
G	Bore	± 0.1 / 0.0	mm	~~66.0~~ 66.97 Maximum
J	Stroke	± 0.05	mm	58.0
	Capacity per cylinder		cm3	198.5
	Total cylinder capacity		cm3	397
	Material of cylinder block			Al. Alloy
	Material of sleeves			Cast Iron
	Material of cylinder head			Al. Alloy
	Volume of combustion chamber (+ volume one spark plug hole when the piston is at top dead center.)	minim.	cm3	27.0 (14mm PLUG) 27.5 (18mm PLUG)
	Material of piston			Al. Alloy
	Number of rings & thickness			2 × 1.5 mm
	Type of ring			Plain
A	Distance from crankshaft centreline of top edge of transfer ports (NOT FOR PORT MEASUREMENT)	± 0.8	mm	120.9 / 123.4
B	Distance from crankshaft centreline to lower edge of inlet ports	±	mm	Reed Valve
C	Distance from crankshaft centreline to top edge of exhaust ports (NOT FOR PORT MEASUREMENT)	± 0.8	mm	133.8
F	Thickness of piston (less baffle = at port opening corner.)	± 0.6	mm	60
K	Distance from crankshaft centreline to top face of block at centreline of cylinders. .	± 0.8	mm	169.2
L	From big end centreline to crosshead end centreline of connecting rod	± 0.2	mm	107
M	Distance from the gudgeon pin centreline to the top of the piston (= port opening corner)	± 0.4	mm	33
	Number and size (x) of inlet ports 1.0 from cylinder wall	±	mm	Reed Valve
	Number and size (x) of exhaust ports 1.0 from cylinder wall	±	mm	1 × 46
	Number and size (x) of transfer ports 1.0 from cylinder wall	±	mm	1 × 25.5 2 × 32

ENGINE

x see sketch on page 5.

Homologation No. 00475 ORIGINAL Engine Model YAMATO 302 8.(-17



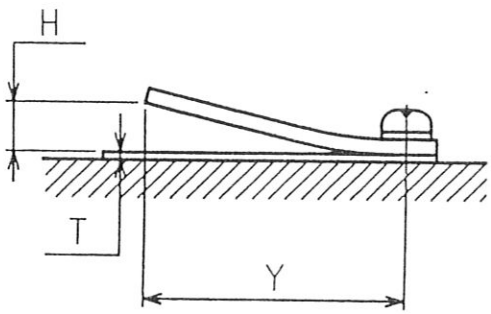


Photo of the complete rotary valve arrangement

Homologation No. 00475 ORIGINAL Engine Model YAMATO 302 8.1-17

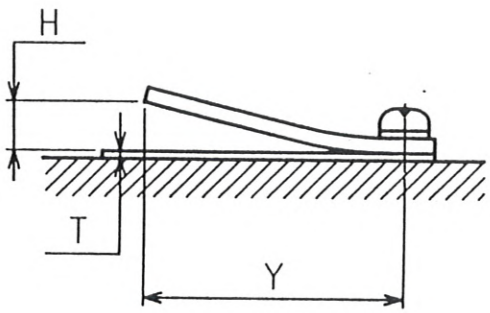


Photo of the complete rotary valve arrangement

Homologation No 00475 ..... Engine Model YAMATO 302 (appendix)

ORIGINAL

Photo of the combustion chamber for 14mm plug

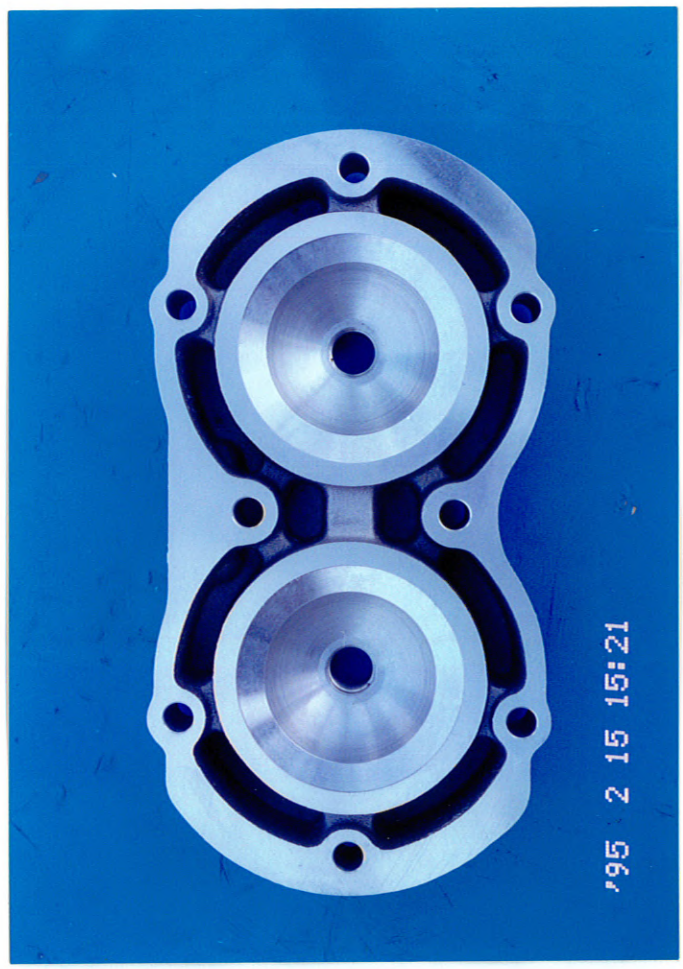
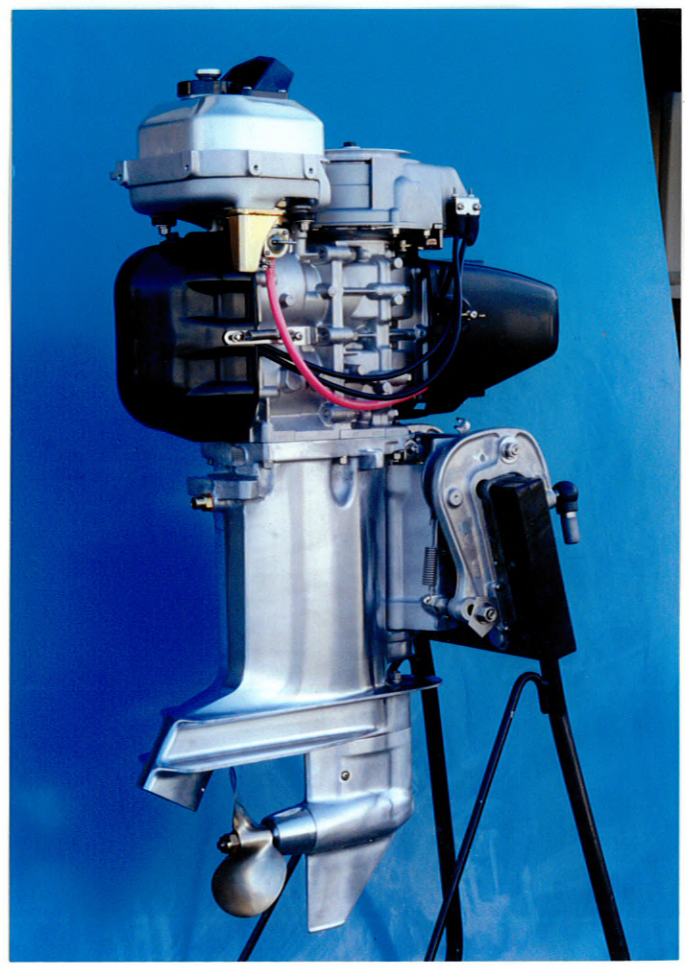


Photo of the complete engine taken 45° from the rear side (without cylinder side cover - black triangle rubber)

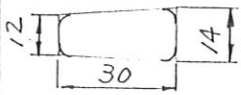


ORIGINAL

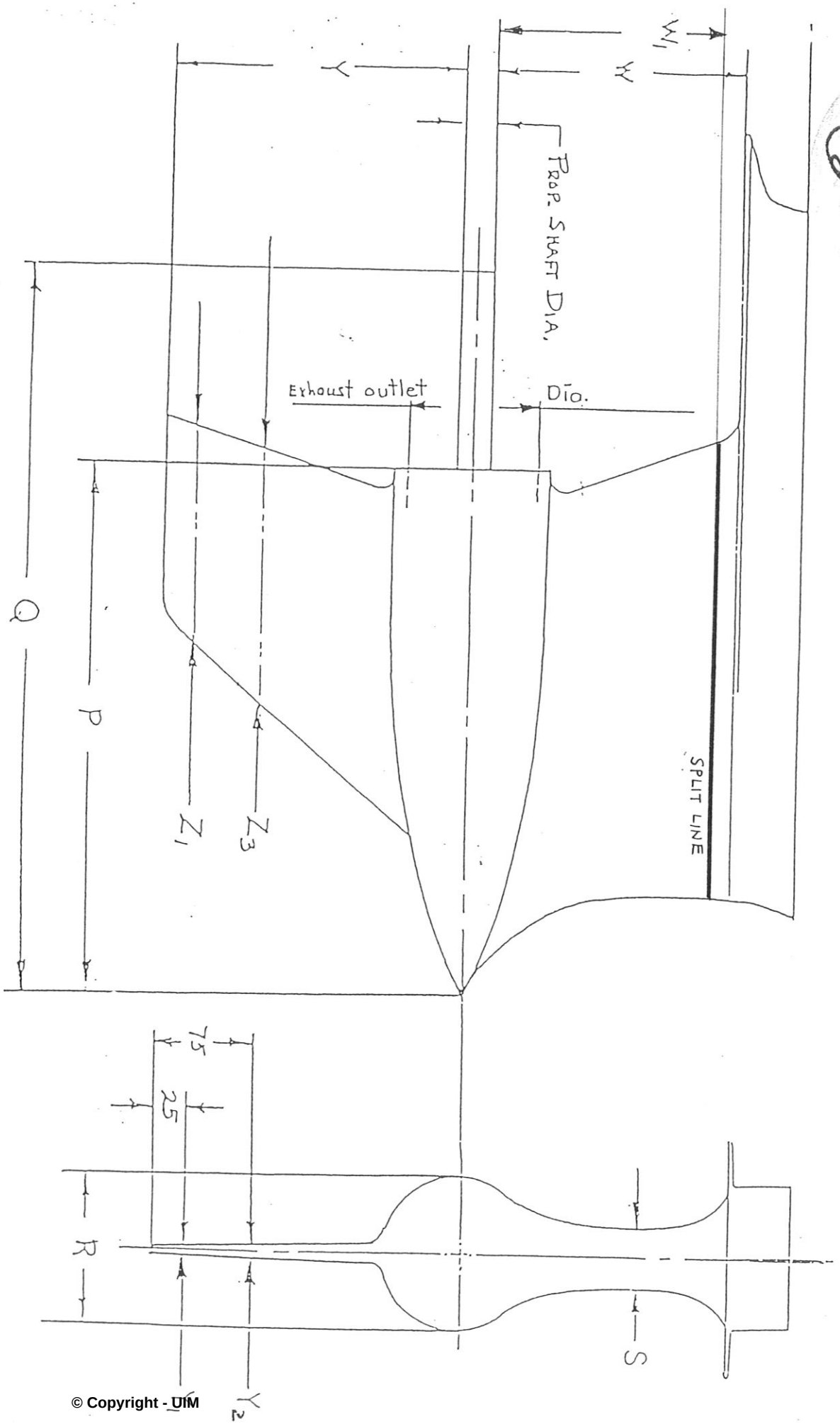
Handkerchief

9.(-17)

Homologation 00475 . . . . . Manufacturer . YAMATO . . . . . Model YAMATO 302

			Tolerances		
Reed valve	T	Reed Thickness			0.3
	H	Lift	± 0.5	mm	7.0
		Reed Material			Stainless steel
	Y	Checking distance	± 1.0	mm	33.3
		Number and size of inlet ports	± 0.6		12
		Reed valve design, see photo on page 8			
Rotary valve	d	Diameter of disc	±		
		Valve opening time before TDC	± °		
		Valve closing time after TDC	± °		
		Dimension of intake opening in cylinder block or crankcase	±	mm	
		Rotary valve design , see photo on page 8			
		Valve Material			
Weight		Piston with rings, wrist pin and fastenings	minim.	gr	260
		Connecting rod with bearings in both ends and thrust washers	minim.	gr	No Answer
		Flywheel with rotating attachments	minim.	gr	1,500
		Crankshaft with connecting rods and pistons (ASSEMBLY) (ASSEMBLED, NO MAIN BEARINGS)	minim.	gr	5,420
Carburettors		Number fitted			1
		Type			MiKuni
		Total number of Venturis			1
		Diameter of Venturis	± 0.1	mm	28
		Diameter of Throttle Housing	± 0.1	mm	36
		Airintake silencer standard equipment, dimensions marked on page 4			Yes (No)
Injection		Make			
		Type of pump			
		Number of injectors			
		Type of injectors			
		Number of Throttle Bores & Diameter			

Homologation No. 00475 ORIGINAL Engine Model. YAMATO 302 10.(-17)



Handkerchief

00475

11.(-17)

Homologation ..... Manufacturer ..YAMATO..... Model YAMATO 302

			Tolerances		
Ignition		Type			Transistor Magneto
		.....			.....
		.....			.....
		.....			.....
Cooling		Type			Water
		Method			Ram
		Pump			None
		Number of pump rotor blades			N A
Exhaust system		Where are the exhaust outlets located?			Under the cavitation Plate
		Dimension of exhaust outlets..... (See attched sketch)	±	mm	Max Width 22 Max Length 51
		Exhaust outlet dia. in the rear end of torpedo	±	mm	NA
		Internal exhaust pipe standard equipment ..... Dimensions marked on the picture page 4			(Yes) ...No....
Supercharger		Type			.....
		.....			.....
		.....			.....
		Gear ratio			14:15
Underwater unit	P	Longitudinal length of gear case torpedo	± 2	mm	204.5
	Q	Longitudinal dimension of gear case including the propeller shaft	± 2	mm	272
	R	Transversal dimension of gear case	± 2	mm	57
	S	Thickness of union leg	± 2	mm	34
	Z_1	Skeg chord length, 25mm above bottom	± 2	mm	71
	Z_2	Skeg chord length, 75mm above bottom	± 2	mm	112.5
	W_1	Distance from propellershaft to the upper flange	± 1	mm	88
	W	Distance from propeller shaft to anti-cavitation plate (see sketch page 10)	± 1	mm	80
	Y_1	Thickness of skeg, 25mm above bottom	± 1	mm	4.5
	Y_2	Thickness of skeg, 75mm above bottom	± 1	mm	5.5
	Y	Skeg depth from propeller shaft gear case tale. cap	± 2	mm	111
		Dia. of ~~propellershaft bearing & seal retainer~~ only required for gearcase without propeller exhaust. (See attched sketch)	±	mm	Mini. 41.5
		Propeller shaft Diameter	±1.0		16

Homologation . . . . . 00475 Manufacturer . YAMATO MOTOR CO Model . . . . . 12.(-17) 302

Notes

Notes. . . . . .

(1)

Four sheets of sketches , exhaust pipe cylinder head , exhaust outlet and tail cap of the gear case are attached to this homologation sheet to describe in detail.

(2)

Two types of the cylinders are available. The sketches of them are also attached to this homologation sheet to show the difference of the cylinders. The reason to use the nozzle is to prevent small piece of something from blocking the water flow. As far as the dimension of the nozzle is same as the sketch , there is no horse power difference between Type 1 and Type 2 cylinder.

(3)

Two types of cylinder head are available, one with 18mm. spark plug, one with 14mm. spark plug. Refer to sketch on P.17 and to photographs.

(4)

Gearcase is available with and without oil filler and drain plugs.

U.I.M.
UNION INTERNATIONALE MOTONAUTIQUE

YAMATO 302 - HOMOLOGATION SHEET N° 475

In order to facilitate measurement of the cylinder ports, the dimension from the top of the cylinder liner to the top of a port is to be used, and not the dimension from the crankshaft centre line. The production tolerances of these dimensions have not changed since the start of manufacture of model 202, so the method is valid for the 202. Two types of cylinder head, one with 18 mm. and one with 14 mm. spark plug, are available and shown on the form. These are applicable to model 202 also.
Sketches of the exhaust pipe and the gearcase tail cap are included. These are applicable to model 202 also.

Gert Lowisin

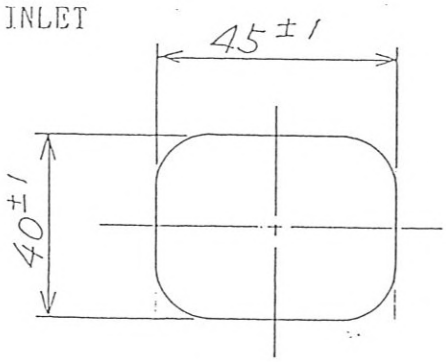
UNION INTERNATIONALE - Motonautique

Gert Lowisin
Comintech President

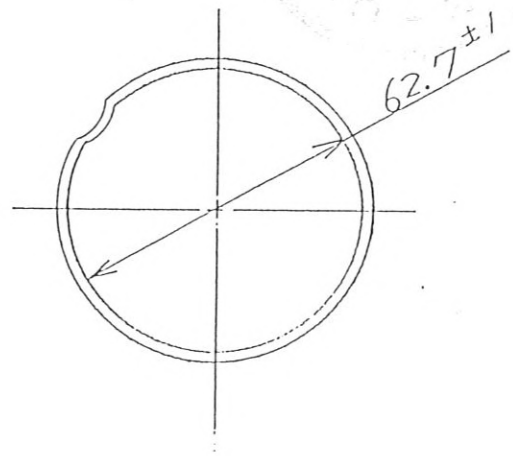
HOMOLOGATION 00475 ENGINE MODEL YAMATO 302 13 (- 17)

SIZE OF EXHAUST PIPE

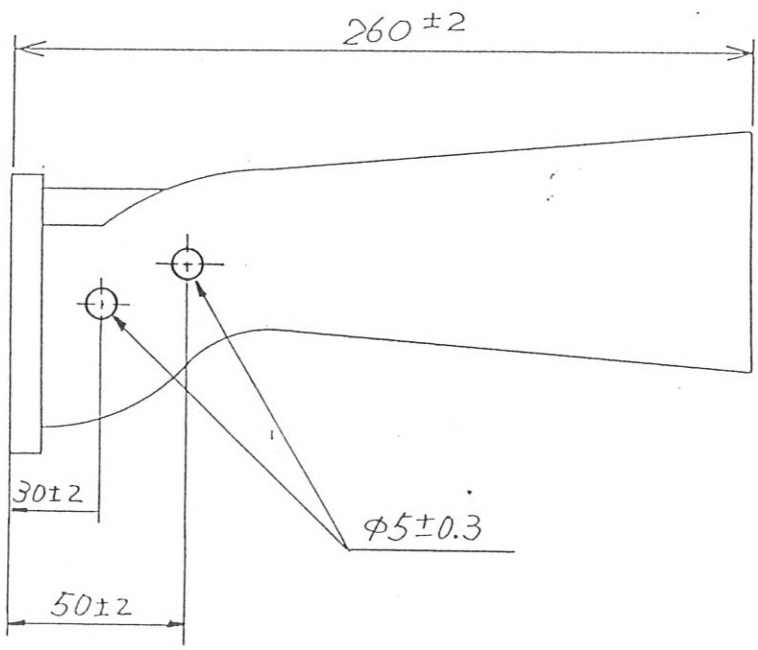
INLET



OUTLET



LENGTH



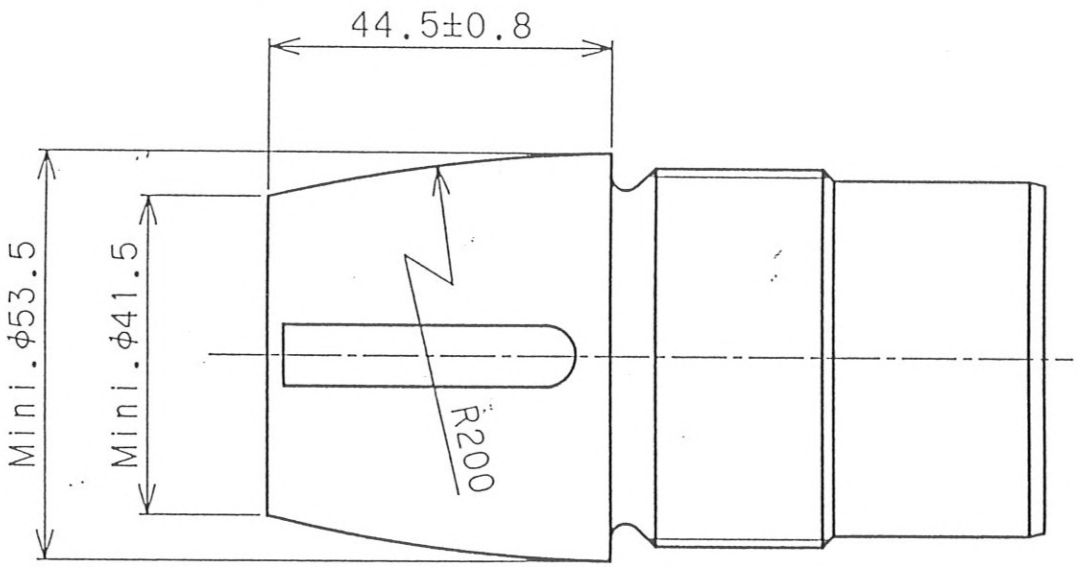
HOMOLOGATION No. 00475 ENGINE MODEL YAMATO 302. 14 (-17)

¥UIMF 003

ORIGINAL

Model YAMATO 302

Dimension of gearcase tale cap



HOMOLOGATION No 00475 ENGINE MODEL YAMATO 302 '15 (-17)

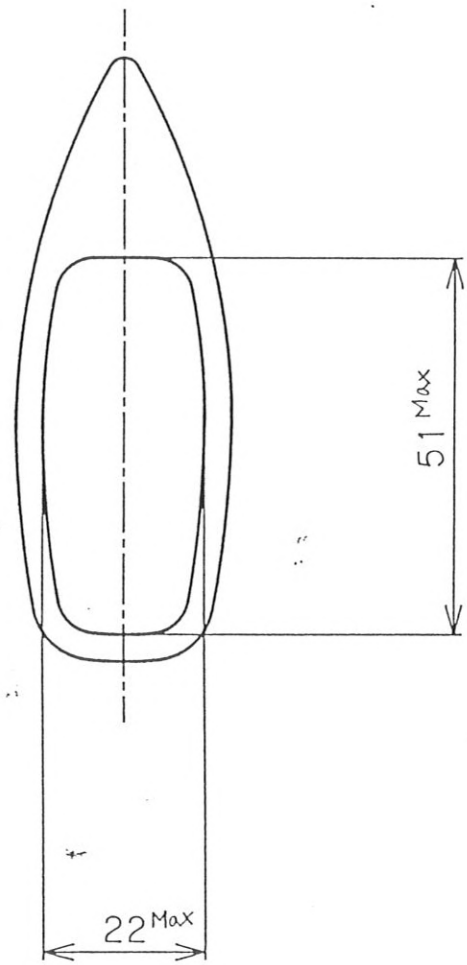
¥UIM¥ 002

ORIGINAL

Handkerckhof

Model YAMATO 302

Dimension of exhaust outlet

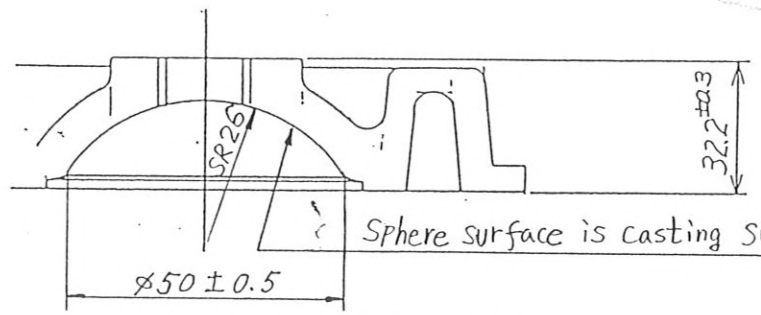


HOMOLOGATION No 00475 ENGINE MODEL YAMATO 302 16 (-17)

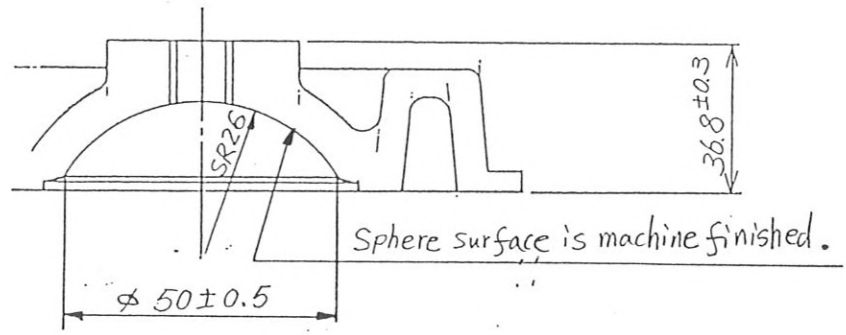
ORIGINAL

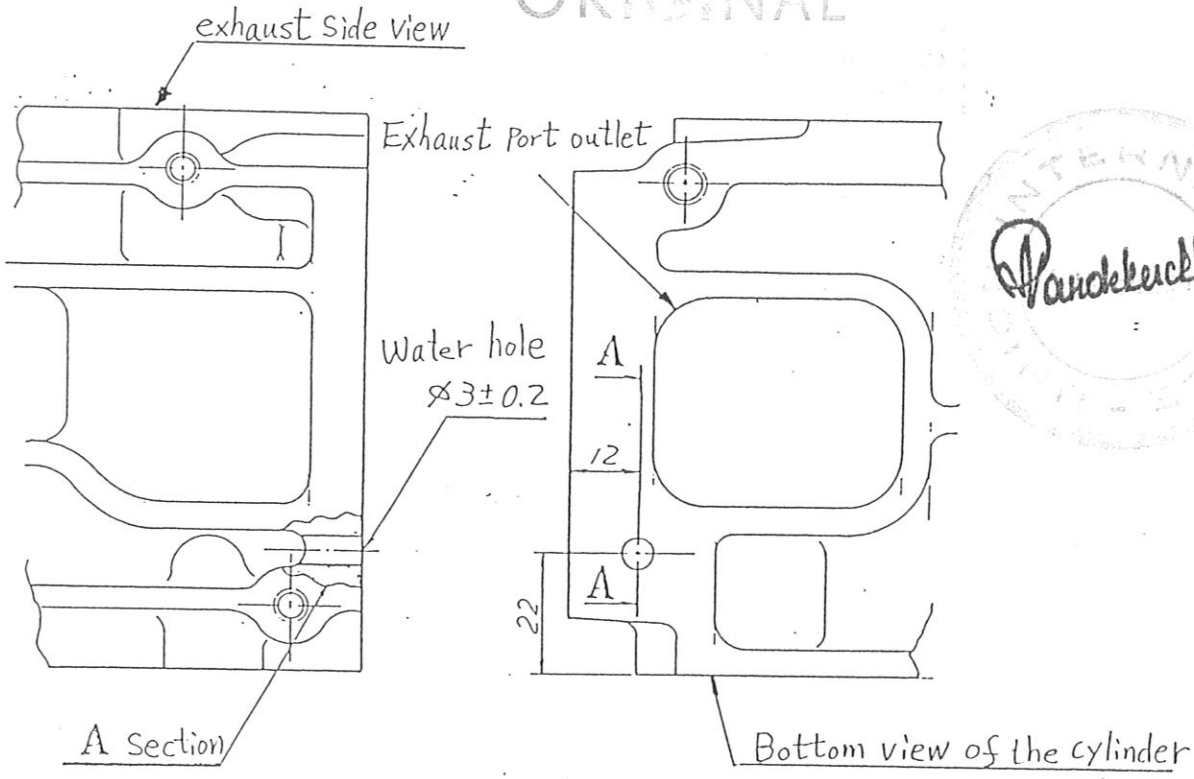
SIZE OF CYLINDER HEAD

18mm

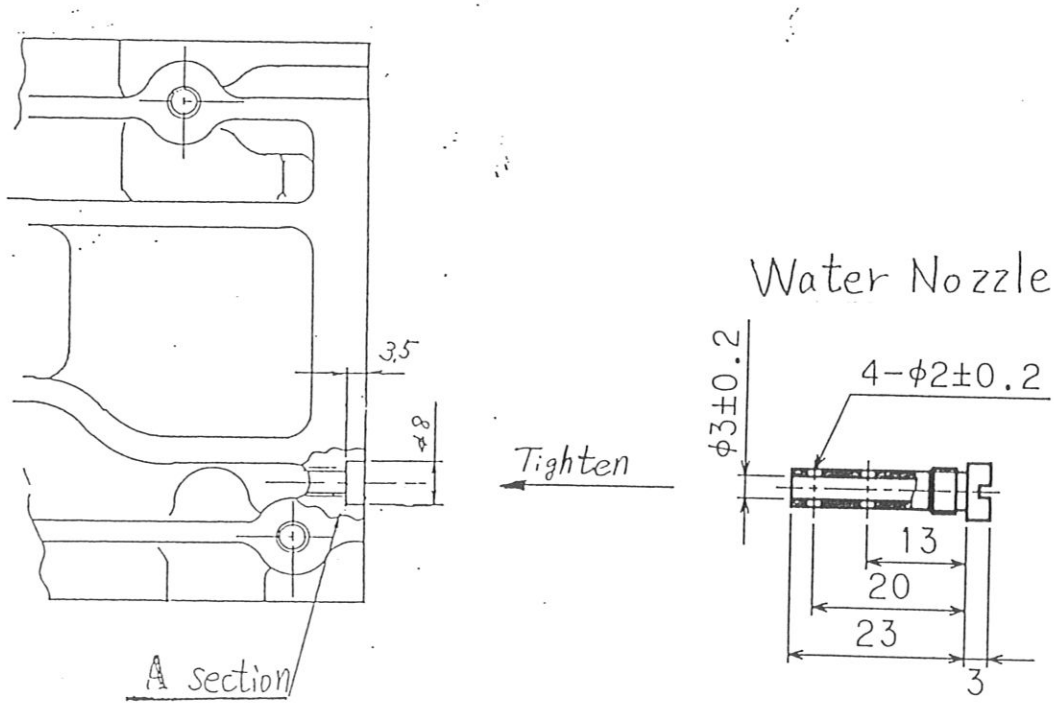


14mm





Type I cylinder



Type II cylinder

TWO STROKE OUTBOARD PETROL ENGINE HOMOLOGATION FILE

F International Homologation File Number: **00475**

Homologation Valid from: **February 14th 1995** Expiry**:*December 31st 2026**

Valid for the following classes: **CIRCUIT:** OSY400
OFFSHORE:

Manufacturer: Yamato Motor Co.ltd

Engine Model: Yamato 302

Number Manufactured: 2903

At the date: October 25th 1994

Certified by the National Authority of: Japan (Maris)

At the date: October 28th 1994

UIM Comintech Inspector: William Brown

At the date: February 14th 1995

UIM Certification Approval: Union Internationale Motonatique

At the date: February 14th 1995

Running Production Changes

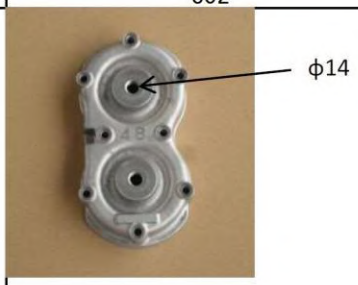
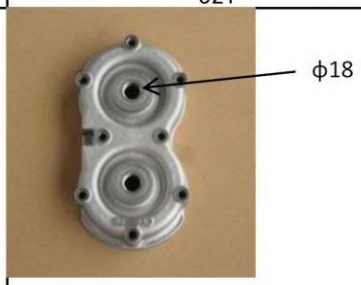
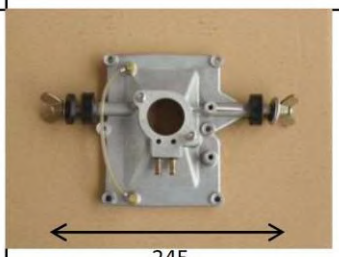
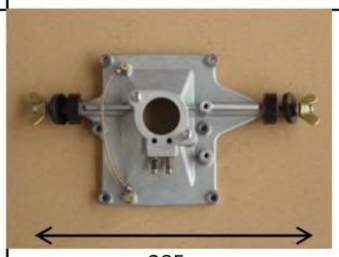
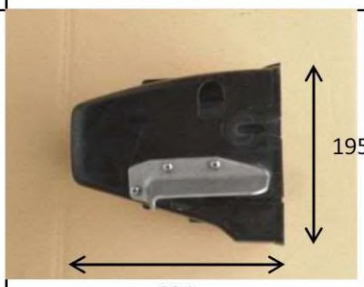
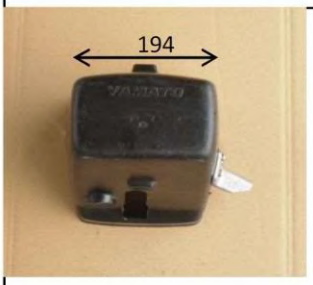
Change Detail	Page No.	Date Approved for Use	Approved by
1. Gearcase	P 18	March 20th 1996	G.Lowisin
2. Exhaust Outlet dimens.	------	March 19th 1999	G.Padovan
3. Carburetor and Cover	------	October 15th 2001	W.Klein
4. Alternative Carburetor	------	March 5th 2005	R.Trotman
5. Exhaust Outlet Positioning	--	*April 1st 2006	R.Trotman
6. Exhaust Housing , Cover/Carburetor Intake (For purposes of noise reduction) See Notes	----------	November 20th, 20140	M. Lundblad

TWO STROKE OUTBOARD
PETROL ENGINE

NOTES

…Running Production Change No. 6 (see front page)

The running production change, Yamato no. 321, reduces engine noise by adding a cover that attaches to the air intake of the carburetor and a baffle in the exhaust housing which splits the exhaust flow into two flows with separate exhaust openings.

	302	321
Cylinder Head Assy		
Intake Manifold Assy		
Air Funnel		
Cover—Waterproof Assy	 	 

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……302 321

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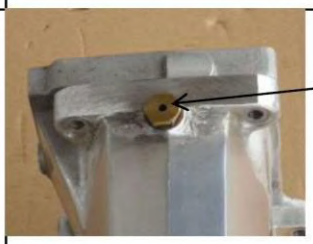
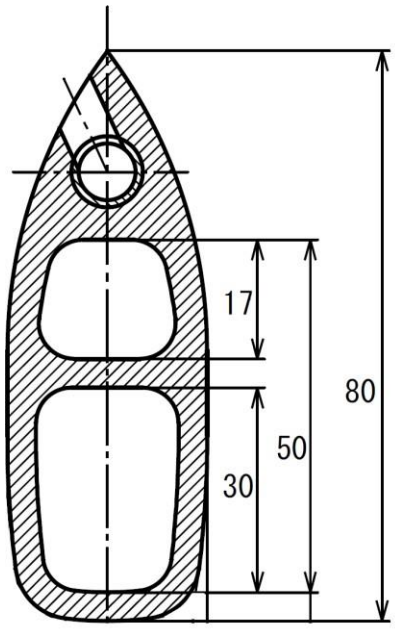
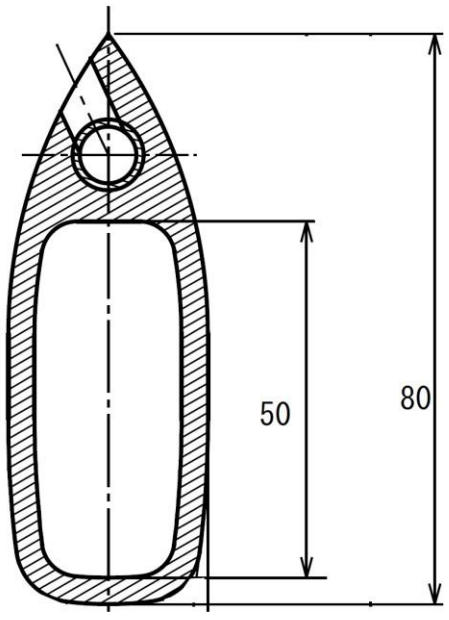
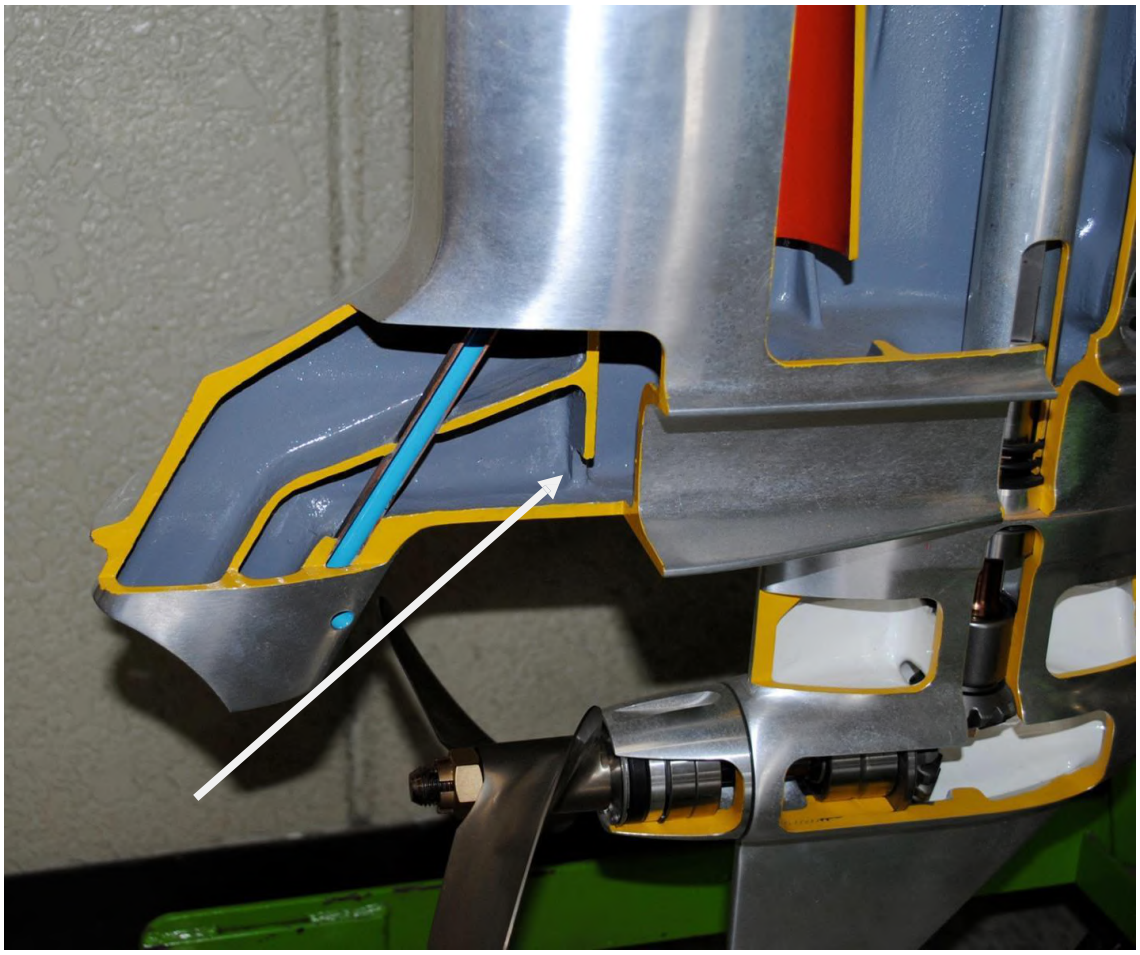
Drive Shaft Housing Assy		
		

…… 321…… 302……







There are two rectangular relief holes cast into the center exhaust baffle. The lower hole is shown above. The upper hole is approximately 25.6 mm x 25.6 mm square, cast and roughly de-burred, and is shown below.

Upper exhaust relief hole in baffle

321

321

TWO STROKE OUTBOARD PETROL ENGINE HOMOLOGATION FILE

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5. Exhaust Outlet Positioning -- Exhaust Housing ,		*April 1st 2006	R.Trotman
6. Cover/Carburetor Intake (For purposes of noise reduction) See Notes		------- November 20th, 2014	M. Lundblad
7. Model 331, Cylinder Head, Exhaust Pipe, Magneto, Throttle Screw		July 13, 2020	M. Lundblad

NOTES for Yamato Model 331, Change No. 7

Yamato Factory running production change defined by the factory as change no. 331, commonly referred to as the " Yamato 331 Model motor".

The running production change no. 7 reduces engine power by two changes, 1) lowering the compression ratio, (increasing compression volume in the head), by introducing a new cylinder head, and 2), adding a new exhaust pipe with smaller exhaust diameter opening. Two other non-performance changes are strengthening the cylinder block by adding material and changing the throttle rod screw position to remove interference.

The details of the changes may be seen on the following pages.

There also has been a non-performance change in the ignition components of the Model 331 during the production of the 331. Production of the 331 Model began in December, 2014 and the ignition components were changed in 2017 and forward. The flywheel is distinguished by being painted black and meets the specification weight.

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.

b. EXHAUST PIPE

To obtain the desired power characteristics, the length is the same as the 321 type, and the tip diameter is smaller.

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.

c. CYLINDER CASE
As measures against distortion, the rigidity of the cylinder case was reinforced by filling the base.

d. Fastener
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

e. Type 331 Large Type Intake Silencer is similar to Large 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.

FURTHER NOTES for Yamato 331.

It is the intent of the UIM to race the 331 motor with comparable power to the 302, 321 models. The following changes are permitted:

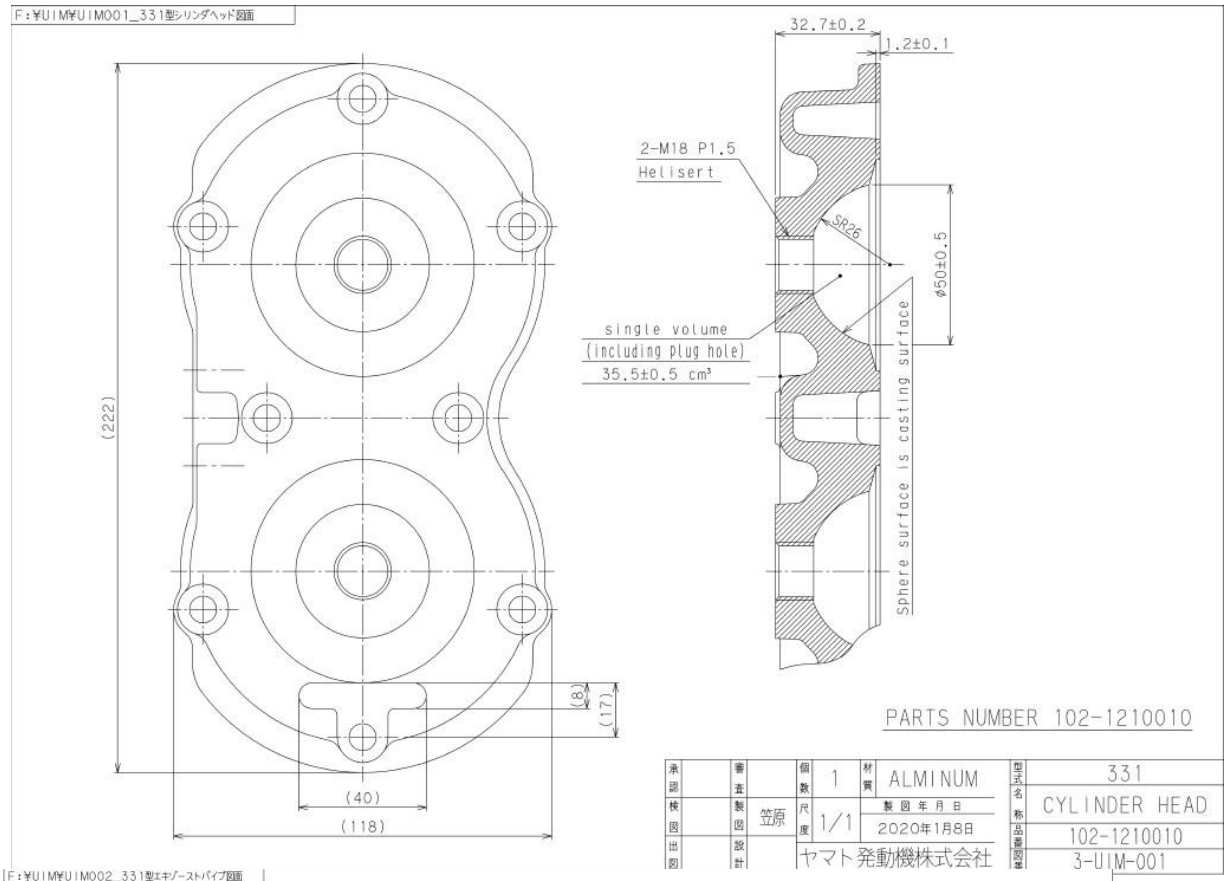
1) It is permissible to use the model 302, 321 head that meets the approved dimensions on the Model 331.The 331 power head may be used on the 321 and 302 tower housing/leg.

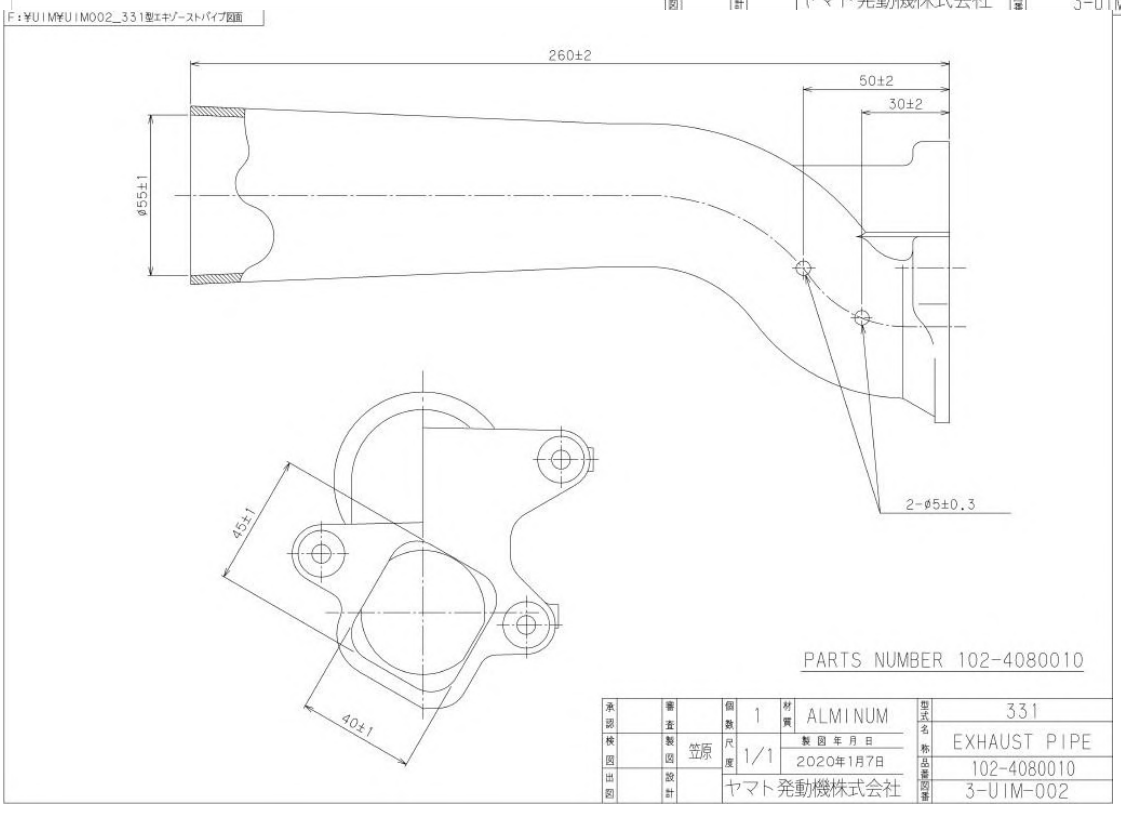
2) It is also possible to use the model 302,321 exhaust stack that meets the approved dimensions on the Model 331.

3) There will be a new cast exhaust pipe meeting the 302, 321 dimensions available from the importers in September 2020. It will be identified by having the name “Johnston” cast into the side of the exhaust pipe.

4) The Model 331 head may have the head to block surface machined to meet the Model 302, 321 dimensions. The intent is to be able to provide similar performance to the 302, 321 motors. This machined head may be used on the 302,321, and 331 model motors.

5) The maximum allowable overbore cylinder dimension for all 300 series motors is 66.68 mm.


F:¥UIM¥UIM001_331型シリンダヘッド図面
32.7±0.2
1.2±0.1
2-M18 P1.5
Helisert
SR26
ø50±0.5
single volume
(including plug hole)
35.5±0.5 cm³
Sphere surface is casting surface
(222)
(8)
(17)
(40)
(118)
PARTS NUMBER 102-1210010
承認
審査
検図
製図
笠原
出図
設計
個数 1
材質 ALMINUM
尺度 1/1
製図年月日
2020年1月8日
ヤマト発動機株式会社
型式名称 331
CYLINDER HEAD
品番図番 102-1210010
3-UIM-001


F:¥UIM¥UIM002_331型エキゾーストパイプ図面
260±2
50±2
30±2
ø55±1
2-ø5±0.3
45±1
40±1
PARTS NUMBER 102-4080010
承認
審査
検図
製図
笠原
出図
設計
個数 1
材質 ALMINUM
尺度 1/1
製図年月日
2020年1月7日
ヤマト発動機株式会社
型式名称 331
EXHAUST PIPE
品番図番 102-4080010
3-UIM-002

NOTE for Yamato Model 331, Running Production Change n°8 Second Oversize Piston, Wiseco, (.762 mm)

The second oversize pistons (.762 mm) and rings that are manufactured by Wiseco are approved for use in the 300 Series Yamato engines. The piston part no. is 12951M06675 and the ring part no, is 2628CD. The pistons are supplied by:

Cams Motor Sports

42105 Postiff Avenue

Plymouth, MI

48170 USA

mtate@camsmotorsports.com

The maximum bore size for the 300 Series Yamato engines is increased to ***66.97 mm*** to allow clearance for the Wiseco oversize pistons.

For Yamato engines that have been bored, the maximal value for the boost port height measure has been increased to 46.8 mm. It is permissible to use any washer (or none) on the wrist pin end of the connecting rod for the second oversize Wiseco pistons.


0217F
12951M06675