



FOUR STROKE OUTBOARD PETROL ENGINE HOMOLOGATION FILE

International Homologation File Number: 00526A		
Homologation Valid from	2012	Expiry: 31/12/2026
Valid for the following classes:	CIRCUIT: GT30 OFFSHORE:	
Manufacturer:	Mercury Marine	
Engine Model:	F30EFI	
Number Manufactured:	1000+	
At the date:	14 January 2012	
Certified by the National Authority of:	Sweden (SVERA)	
At the date:	14 January 2012	
UIM Homologation Group Inspector	Mikael Lundblad	
At the date:	14 January 2012	
UIM Certification Approval:		
At the date:		
Running Production Changes		
Change Detail	ECU update, Inlet size, Rocker arm weight, inlet valve length	Page No. 8, 11, 12, 14, 8A,
Date Approved for Use	15 July 2015	Approved by 
Change Detail		Page No.
Date Approved for Use		Approved by

PICTURES

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



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



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



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



Photo without top cover, from the front.



Photo without top cover, from the rear.



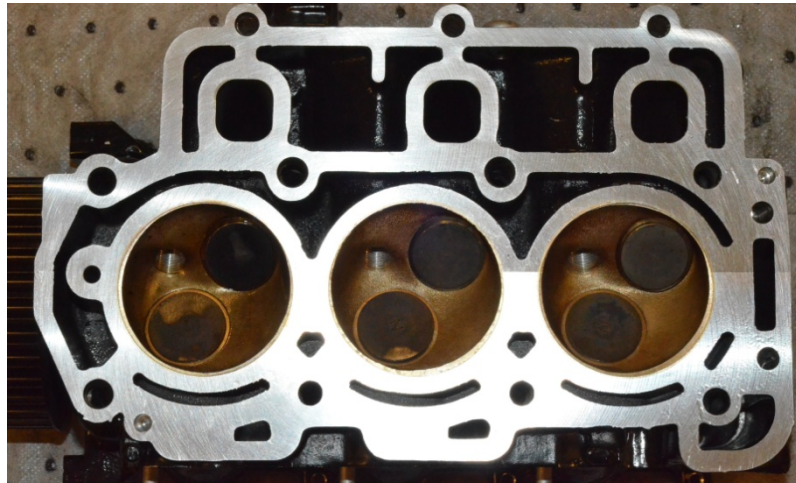
Photo without top cover, from the port side



Photo without top cover, from the starboard side.

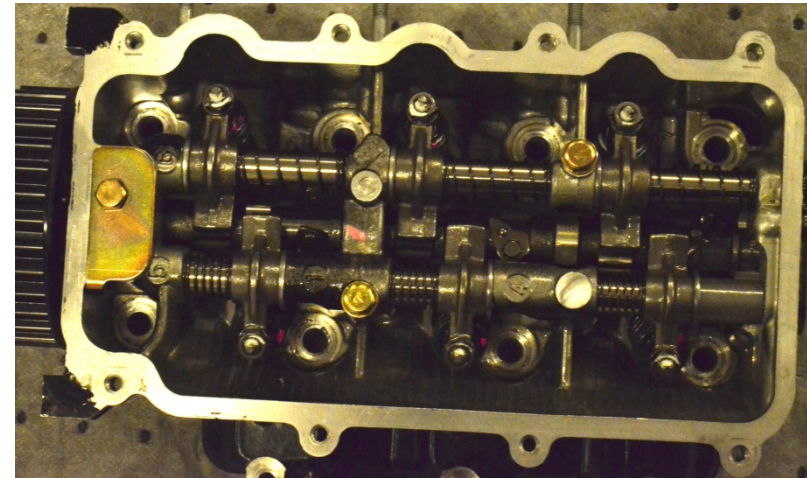


Cylinder head from the combustion chamber side

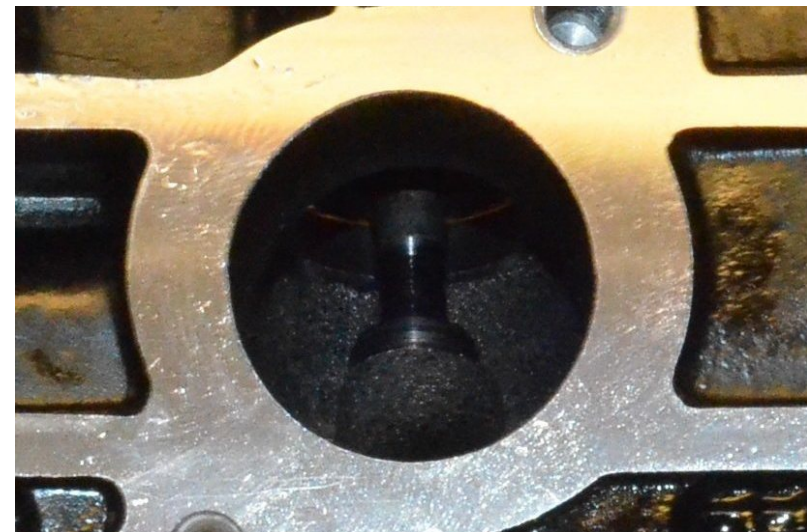
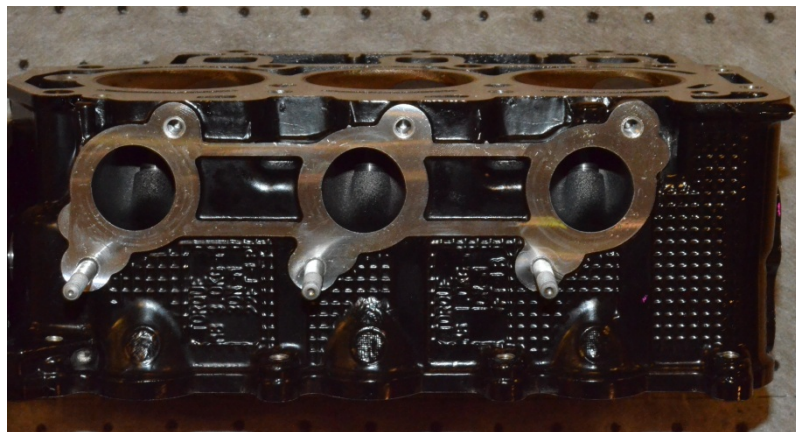


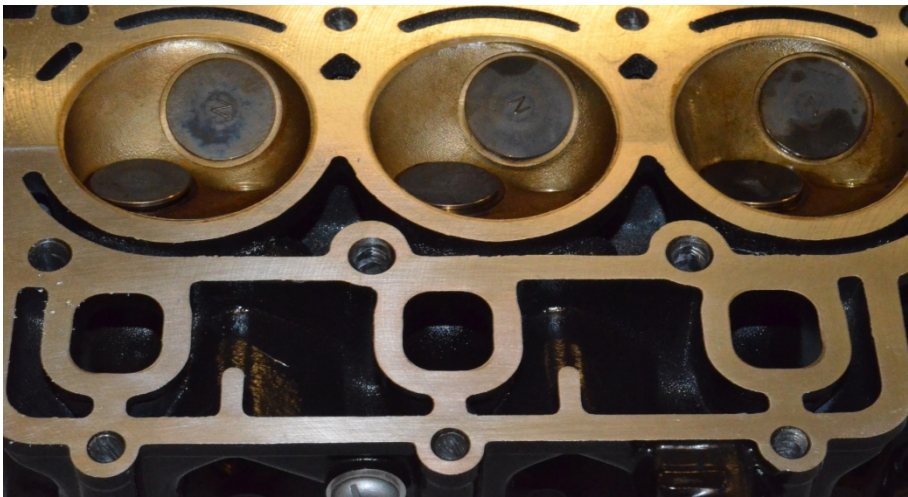
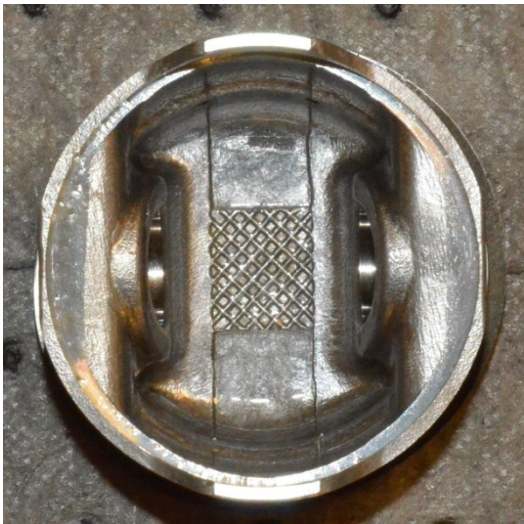
Cylinder head showing intake ports.

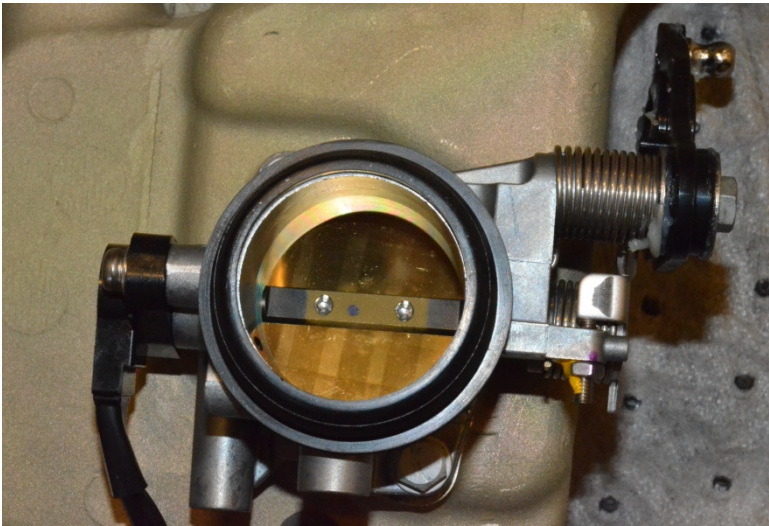
Cylinder head from the valve assembly side.



Cylinder head showing intake ports - detail



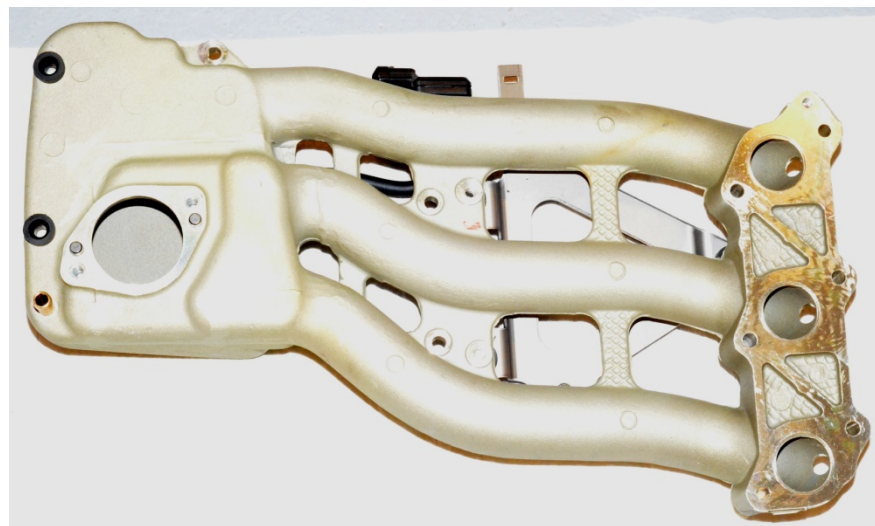
Cylinder head showing exhaust ports.	Cylinder head showing exhaust ports - detail
 A photograph of a brass cylinder head with three combustion chambers. Each chamber has a circular exhaust port at the bottom. The head is mounted on a dark base.	 A close-up photograph of a single exhaust port in the cylinder head, showing the internal passage and the surrounding brass casting.
Piston viewed from the top	Piston viewed from the bottom
 A photograph of a piston viewed from the top. The crown is flat with two semi-circular intake ports. The letters "UP" are stamped on the crown, and "A" is stamped on the side.	 A photograph of a piston viewed from the bottom. The skirt is visible, and the central area of the crown shows a cross-hatched pattern.

Piston, viewed 45° from the wrist pin.	Crankshaft.
	
Connecting rod and crankshaft.	Throttle house
	

Intake silencer air intakes



Intake manifold



Intake manifold - Close up



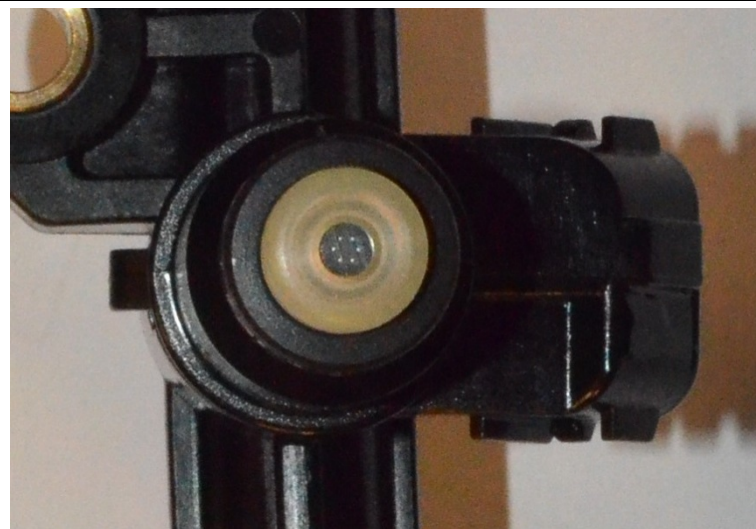
Intake manifold - Close up



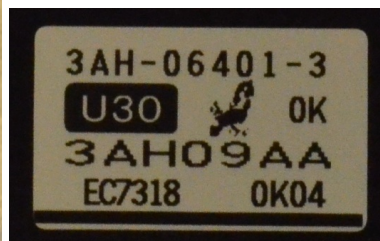
Fuel Injector Rail



Fuel Injector - Close up



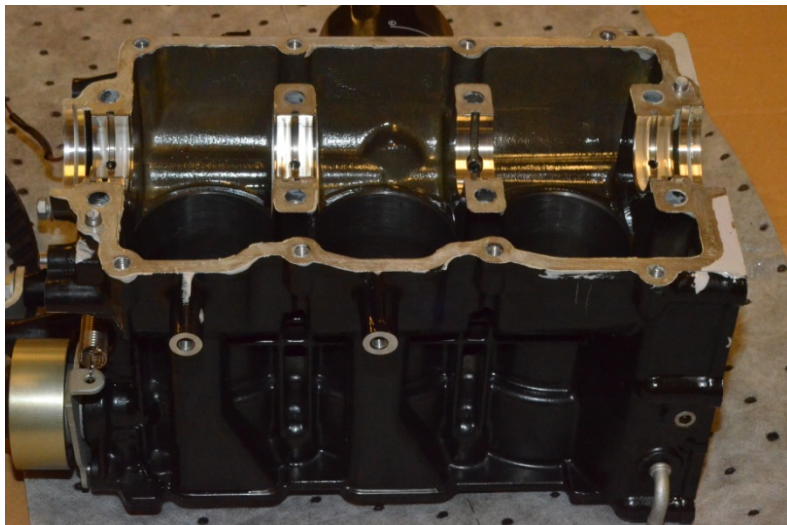
ECU box Front (see also page 8A)



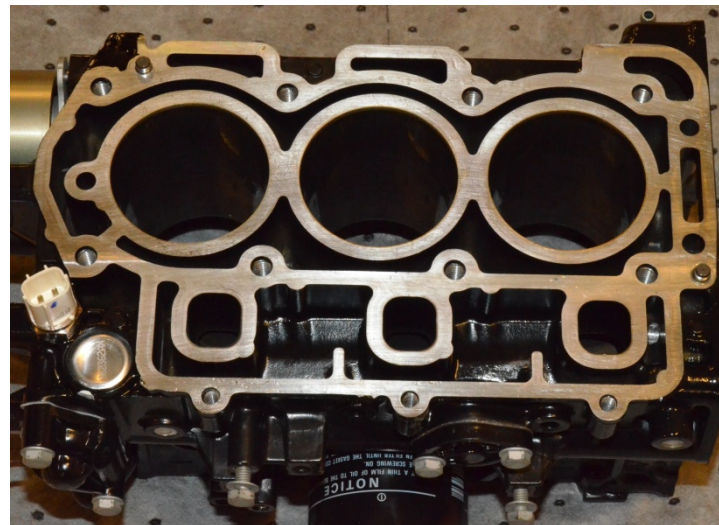
ECU box back



Cylinder block, viewed 45° from front starboard side.



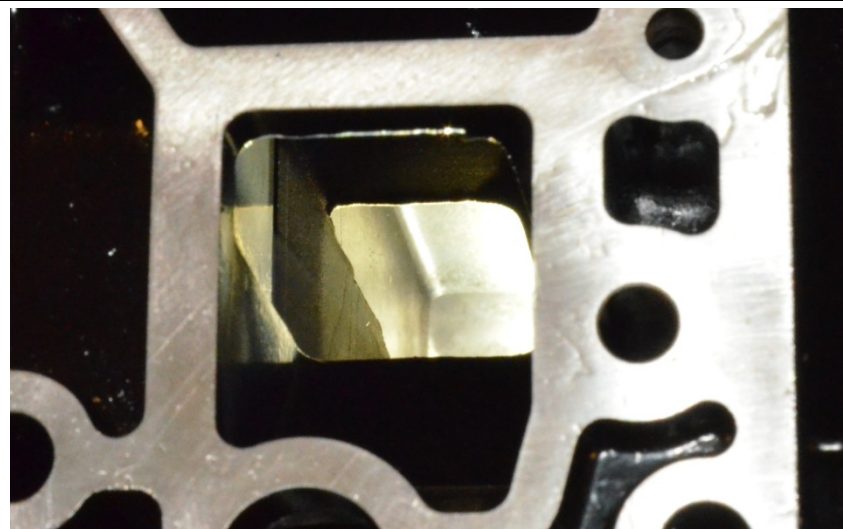
Cylinder block, viewed 45° from rear, port side

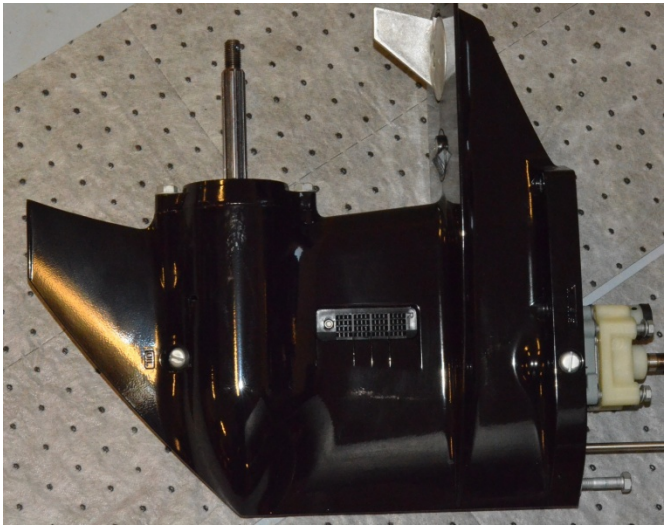
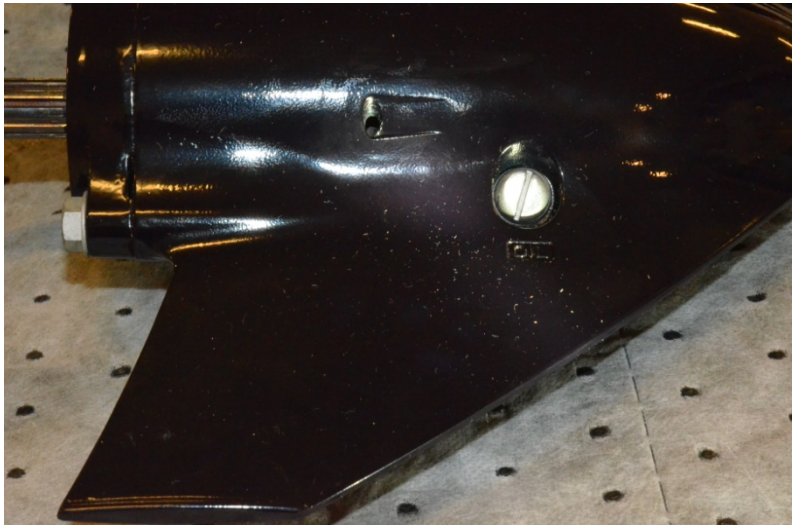


Oil pump



Internal exhaust pipe



Gear house	Gear house - Exhaust cooling
	
Gear House Skeg	Gear house skeg - Close up from bottom side
	

MEASUREMENTS

ENGINE FUEL

Type:	Petrol Unleaded
Minimum octane required:	90 RON

ENGINE TYPE

Number of cylinders:	3 Cylinders
Cylinder arrangement:	In line

ENGINE BLOCK

	Tolerance	Measurement	Unit
Bore	+/- 0.10	61.0	mm
Stroke	+/- 0.10	60.0	mm
Capacity per cylinder	max	176.2	cc
Total Capacity	max	528.6	cc
Cylinder block material		Aluminium	
Cylinder liner material		Steel	
Distance from crankshaft centreline to cylinder block deck face.	+/- 0.50	149.5	mm

CYLINDER HEAD

	Tolerance	Measurement	Unit
Cylinder head material		Aluminium	
Volume of combustion chamber (without volume of spark plug hole)	min	18,2	cc
Compression ratio	max	9.6	
Thickness of cylinder head	+/- 0.20	95.0	mm

Inlet Port:

Size of port at cylinder head/manifold face (updated 00526A see page 8A)	+/- 0.50	Ø 27.2	mm
Internal diameter of valve seat insert	+/- 0.20	25.0	mm
Surface finish of port		Cast	

Exhaust Port:

Size of port at cylinder head/manifold face	+/- 0.50	20 x 22.0	mm
Internal diameter of valve seat insert	+/- 0.20	21.7	mm
Surface finish of port		Cast	

Inlet Valves:

Diameter of stem	+0.00/-0.02	5.48	mm
Diameter of head	max	27.2	mm
Overall length of inlet valve (updated 00526A see page 8A)	min	72.5	mm

Exhaust Valves:

Diameter of stem	+0.00/-0.02	5.46	mm
Diameter of head	max	24.2	
Overall length of exhaust valve	min	72.5	mm

Valve Springs:

Diameter of wire	max	2.4	mm
Inside diameter of coil	min	15.8	mm
Free length	max	36.0	mm
Number of working turns	+/- 0.5	6.4	turns

CAMSHAFT/SHAFTS

Tolerance Measurement Unit

Inlet:

Tappet clearance for checking timing	+/- 0.02	0.15	mm
Total valve lift	+/- 0.10	7.21	mm
Total inlet opening angle (measured at flywheel in degrees at 0,1 mm lift)	+/- 5°	298	degrees
Duration inlet opening angle 3mm under max lift (measured at flywheel in degrees)	+/- 2°	142	degrees
Base circle diameter of lobe	+/- 0.02	20.0	mm
Total lift of lobe	+/- 0.05	4.28	mm

Exhaust:

Tappet clearance for checking timing	+/- 0.02	0.20	mm
Total valve lift	+/- 0.10	7.24	mm
Total inlet opening angle (measured at flywheel in degrees at 0,1 mm lift)	+/- 5°	296	degrees
Duration inlet opening angle 3mm under max lift (measured at flywheel in degrees)	+/- 2°	140	degrees
Base circle diameter of lobe	+/- 0.02	20.0	mm
Total lift of lobe	+/- 0.05	4.28	mm

PISTONS

Material of piston	Aluminium		
Type and thickness of rings	Square	1.25	mm
	Square	1.50	mm
	Oil scraper	2.50	mm

CONNECTING ROD

	Tolerance	Measurement	Unit
Length of rod from big end to small end (centre to centre)	+/- 0.10	95.9	mm

CRANKSHAFT

	Tolerance	Measurement	Unit
Number of main bearing journals		2	
Diameter of main bearing journals	+0.00/-0.02	35.99	mm
Diameter of connecting rod journals	+0.00/-0.03	29.98	mm
Surface finish of crankshaft		Cast	

TYPE OF BEARINGS

Piston Pin	Plain bearing
Connecting Rod journal	Plain bearing
Main journal	Plain bearing

FUEL INJECTION

	Tolerance	Measurement	Unit
Make		Keihin	
Type of pump, model no.		Electric, TFIAA AJT	
Total number of injectors		3	pcs
Type of injectors		Fuel	
Diameter of throttle bore	max	Ø 40.2	mm

COOLING SYSTEM

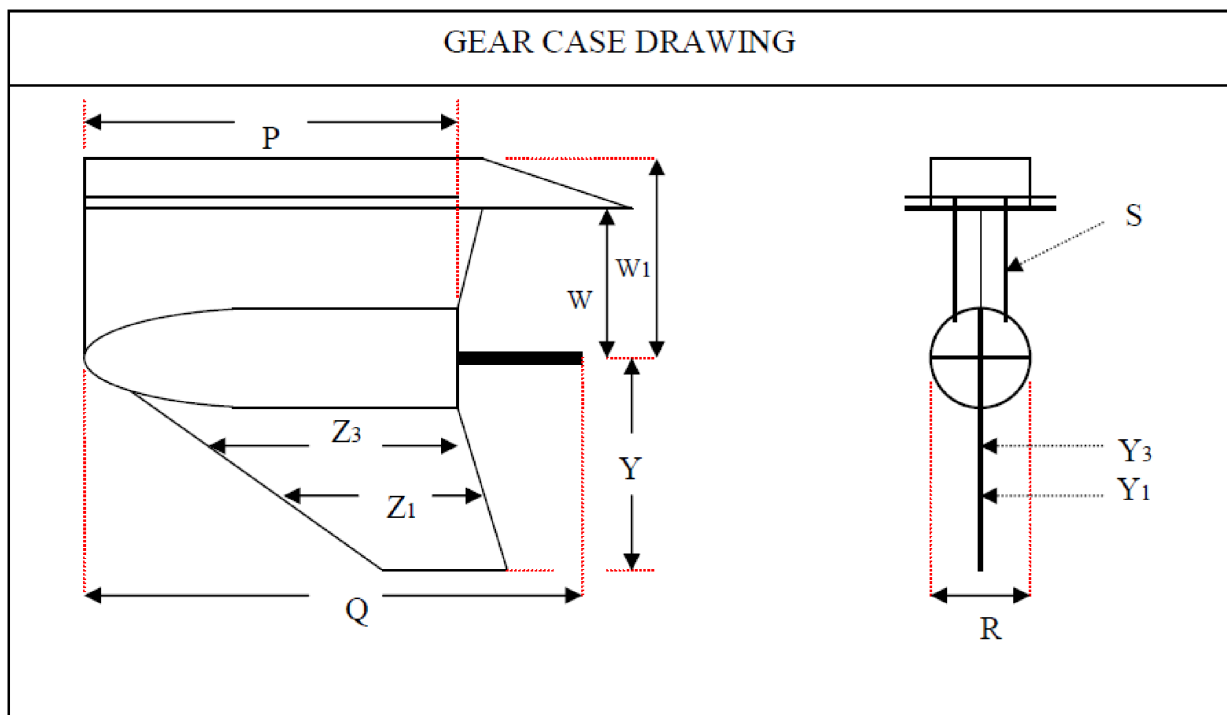
Type	Water
Method	Thermostat controlled
Pump	Impeller
Number of impeller blades	6

SPARK PLUG

Brand	Champion
Model	RA8HC

WEIGHTS	Tolerance	Measurement	Unit
Inlet valve (bare)	min	27.5	g
Exhaust valve (bare)	min	23.5	g
Inlet rocker arm (updated 00526A see page 8A)	min	47.0	g
Exhaust rocker arm (updated 00526A see page 8A)	min	47.0	g
Inlet/ Exhaust camshaft	min	620.0	g
Piston (with rings)	min	140.0	g
Piston Pin	min	38.0	g
Connecting Rod (with bearings)	min	164.0	g
Crankshaft	min	4300.0	g
Flywheel (bare)	min	2900.0	g

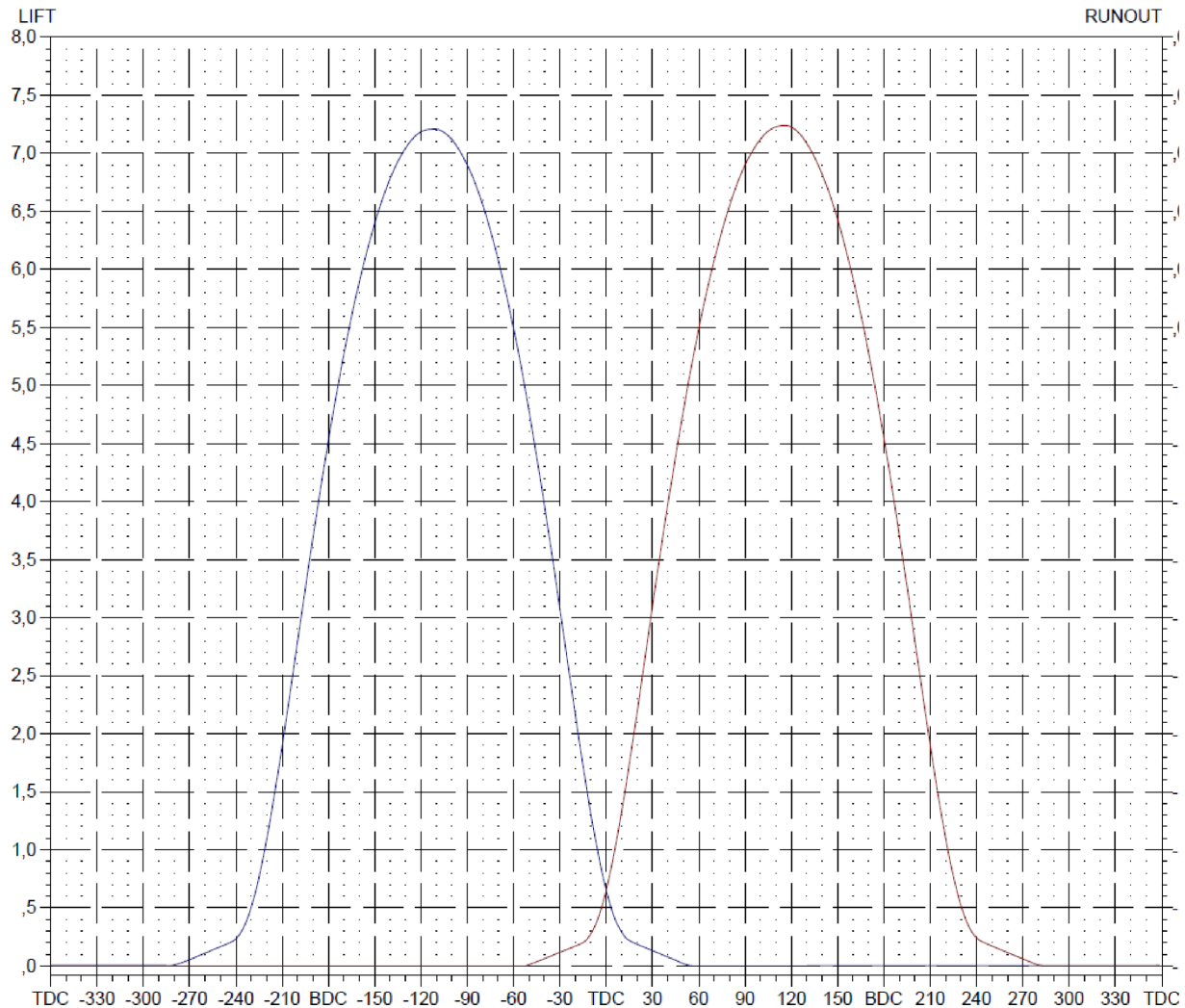
UNDERWATER UNIT	Tolerance	Measurement	Unit
Gear Ratio		12:23 (1.92)	
P Longitudinal length of gearcase torpedo	+/- 5.0	230.0	mm
Q Longitudinal dimension of gearcase including propeller shaft	max	355.0	mm
R Transverse dimension of gearcase	min	80.5	mm
S Thickness of strut	min	36.0	mm
Z1 Skeg chord length, 25mm above bottom	+/- 5.0	82.0	mm
Z3 Skeg chord length, 75mm above bottom	+/- 5.0	130.0	mm
W1 Distance from propeller shaft to upper flange	+/- 5.0	237.0	mm
W Distance from propeller shaft to anti-ventilation plate	+/- 5.0	148.0	mm
Y1 Thickness of skeg, 25mm above bottom	min	6.0	mm
Y3 Thickness of skeg, 75mm above bottom	min	9.0	mm
Y Skeg depth from propeller shaft	+/- 5.0	144.0	mm



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NOTES

Attachment 1 - Camlift measurement



Intake

		LIFT	DUR.	OPEN	CLOSE	AREA
Lobe	I1					
Centerline	113,49 BTDC	0,50	233,41	50,18 BBDC	3,23 ATDC	540,4
.050 Lift C/L	113,48 BTDC	1,00	215,57	41,27 BBDC	5,70 BTDC	532,8
Runout	0,0025	1,27	208,13	37,55 BBDC	9,42 BTDC	529,7
Peak Open Acc.	0,01325	2,54	178,71	22,82 BBDC	24,10 BTDC	501,9
Peak Nose Acc.	-0,00725	3,81	150,46	8,66 BBDC	38,20 BTDC	456,9
Peak Close Acc.	0,01400	5,08	118,62	7,35 ABDC	54,03 BTDC	385,9
Lift @ TDC	0,653	6,35	75,76	28,94 ABDC	75,30 BTDC	262,4
		7,2074	---	PEAK CAM LIFT	---	
		7,2074	---	PEAK VALVE LIFT	---	

Exhaust

		LIFT	DUR.	OPEN	CLOSE	AREA
Lobe	E1	---	---	---	---	---
Centerline	113,49 ATDC	0,50	233,56	3,13 BTDC	50,43 ABDC	541,6
.050 Lift C/L	113,46 ATDC	1,00	215,84	5,56 ATDC	41,40 ABDC	534,5
Runout	0,0025	1,27	208,43	9,24 ATDC	37,68 ABDC	531,4
Peak Open Acc.	0,01375	2,54	178,88	23,97 ATDC	22,85 ABDC	500,9
Peak Nose Acc.	-0,00700	3,81	150,83	38,02 ATDC	8,86 ABDC	455,0
Peak Close Acc.	0,01275	5,08	118,92	54,02 ATDC	7,06 BBDC	382,5
Lift @ TDC	0,654	6,35	76,27	75,45 ATDC	28,28 BBDC	264,8
		7,2364	---	PEAK CAM LIFT	---	
		7,2364	---	PEAK VALVE LIFT	---	

Spec.	Value			
File	h:\My Documents\Pro-Service\CAM\New Folder\			
Lobes	I1, E1			
Lobe Separation	113,5	Cam Deg.		
Checking Height	0,10	mm		
Valve Overlap	524,6	Crank Deg.		
	Intake		Exhaust	
Centerline	113,49	BTDC	113,49	ATDC
Open	81,74	BBDC	33,22	BTDC
Close	35,77	ATDC	82,88	ABDC
Duration	297,5	Crank Deg.	296,1	Crank De
Area	547,4	mm Deg.	548,8	mm Deg.
Lash	0,000	mm	0,000	mm
Rocker Ratio	1,00		1,00	
Peak Cam Lift	7,2074	mm	7,2364	mm
Peak Valve Lift	7,2074	mm	7,2364	mm
Lift @ TDC	0,653	mm	0,654	mm

Spec.	Value			
Checking Height	1,00	mm		
Valve Overlap	442,7	Crank Deg.		
	Intake		Exhaust	
Centerline	113,49	BTDC	113,49	ATDC
Open	41,27	BBDC	5,56	ATDC
Close	5,70	BTDC	41,40	ABDC
Duration	215,6	Crank Deg.	215,8	Crank De
Area	532,8	mm Deg.	534,5	mm Deg.
Lash	0,000	mm	0,000	mm
Rocker Ratio	1,00		1,00	
Peak Cam Lift	7,2074	mm	7,2364	mm
Peak Valve Lift	7,2074	mm	7,2364	mm
Lift @ TDC	0,653	mm	0,654	mm

Spec.	Value			
Checking Height	1,27	mm		
Valve Overlap	435,2	Crank Deg.		
	Intake		Exhaust	
Centerline	113,49	BTDC	113,49	ATDC
Open	37,55	BBDC	9,24	ATDC
Close	9,42	BTDC	37,68	ABDC
Duration	208,1	Crank Deg.	208,4	Crank De
Area	529,7	mm Deg.	531,4	mm Deg.
Lash	0,000	mm	0,000	mm
Rocker Ratio	1,00		1,00	
Peak Cam Lift	7,2074	mm	7,2364	mm
Peak Valve Lift	7,2074	mm	7,2364	mm
Lift @ TDC	0,653	mm	0,654	mm

Updates for Homologation file 00526A

Updated ECU for EU markets

ECU box Front			
			
	Marks number to check		
Inlet Port:			
Size of port at cylinder head/manifold face	+/- 1.00	Ø 26.7	mm

Inlet Valves:

Overall length of inlet valve min 72.1 mm

WEIGHTS

	Tolerance	Measurement	Unit
Inlet rocker arm	min	46.0	g
Exhaust rocker arm	min	46.0	g

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