



FOUR STROKE OUTBOARD PETROL ENGINE HOMOLOGATION FILE

International Homologation File Number: 00524C		
Homologation Valid from	2012	Expiry: 2025
Valid for the following classes:	CIRCUIT: GT30 OFFSHORE:	
Manufacturer:	Tohatsu Outboards	
Engine Model:	MFS30B EP(T)(S/L)	
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. 8A, 11, 12, 14
Date Approved for Use	1 April 2014	Approved by
Change Detail	Modell 30C added	Page No.20-22B
Date Approved for Use	24 April 2016	Approved by
Change Detail	Block height, crank weight	Page No.11,14
Date Approved for Use	30 March 2017	Approved by

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PICTURES

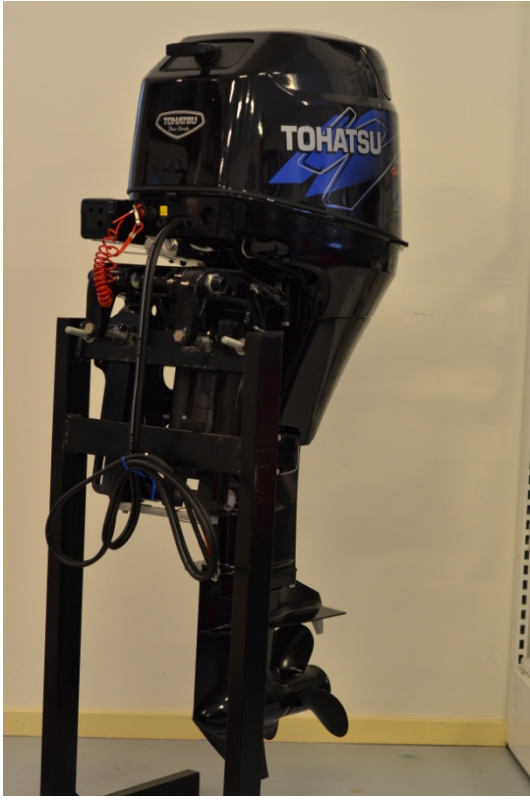
Photo of the complete engine, 45° from the front at the port side.	Photo of the complete engine, 45° from the front at the starboard side.
	
Photo of the complete engine, 45° from the rear at the port side.	Photo of the complete engine, 45° from the rear at the starboard side.
	

Photo without top cover, 45° from the front at the port side.

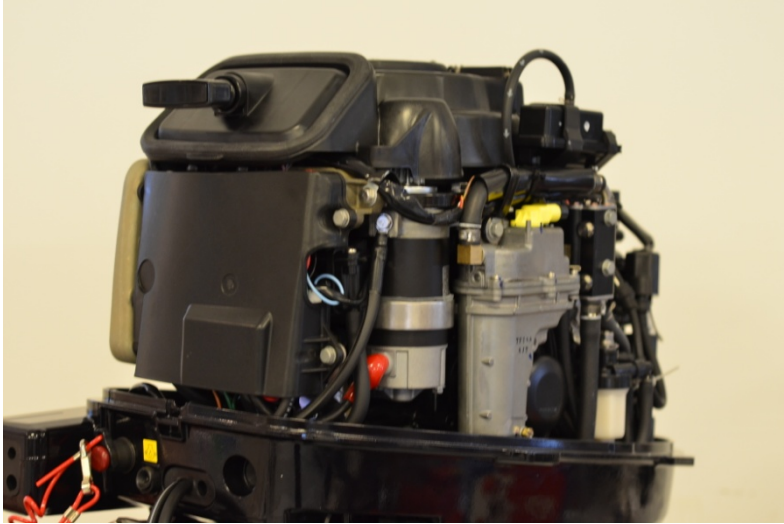


Photo without top cover, 45° from the front at the starboard side.

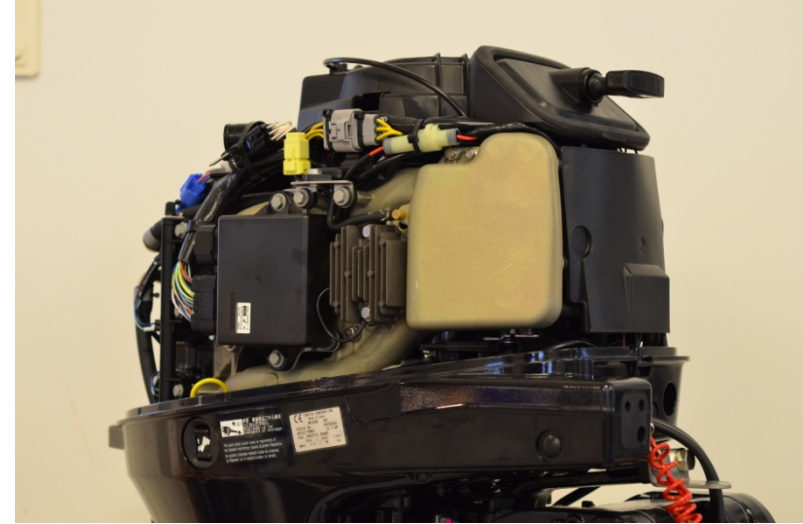


Photo without top cover, 45° from the rear at the port side

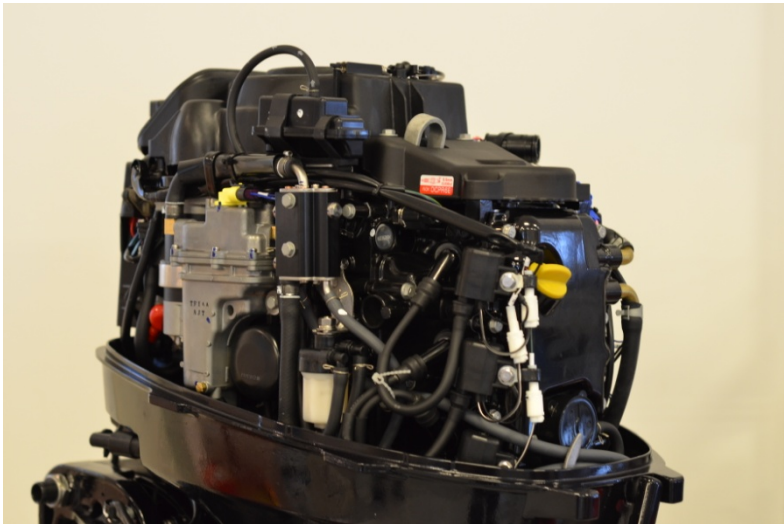
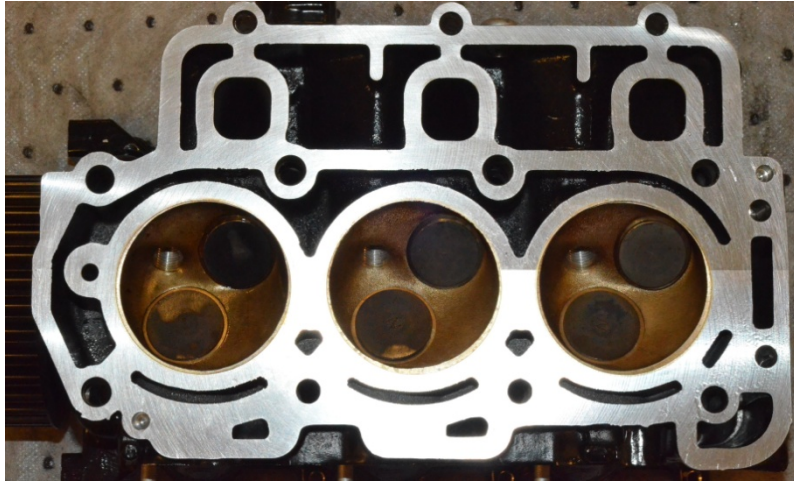


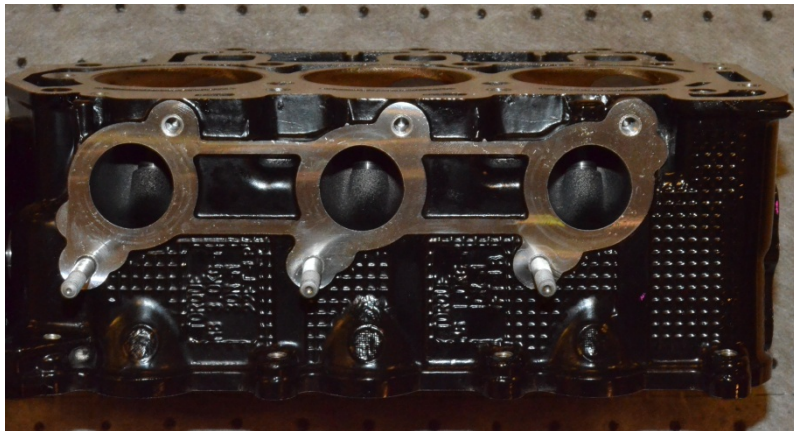
Photo without top cover, 45° from the rear at the starboard side.



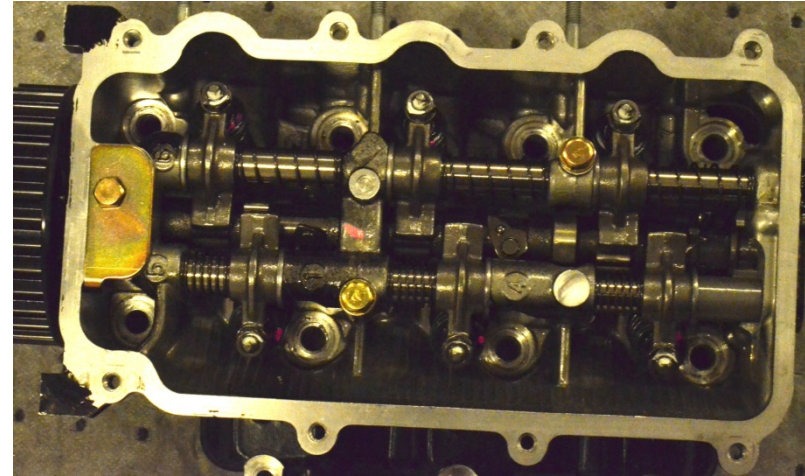
Cylinder head from the combustion chamber side



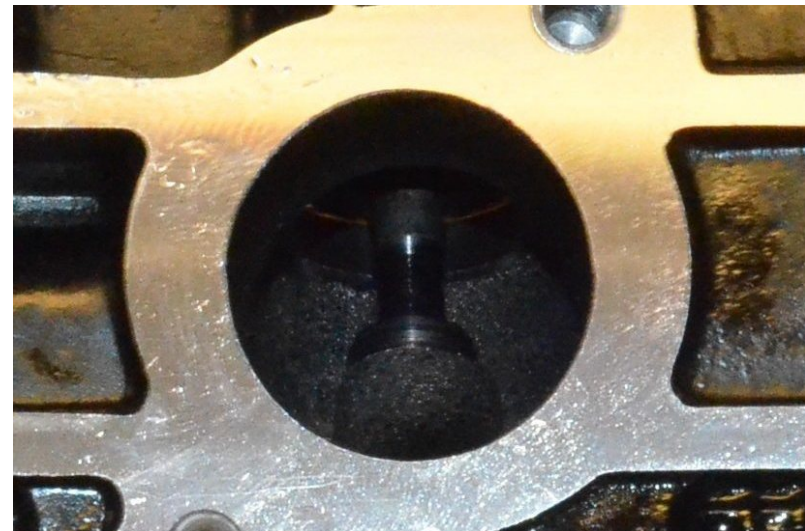
Cylinder head showing intake ports.

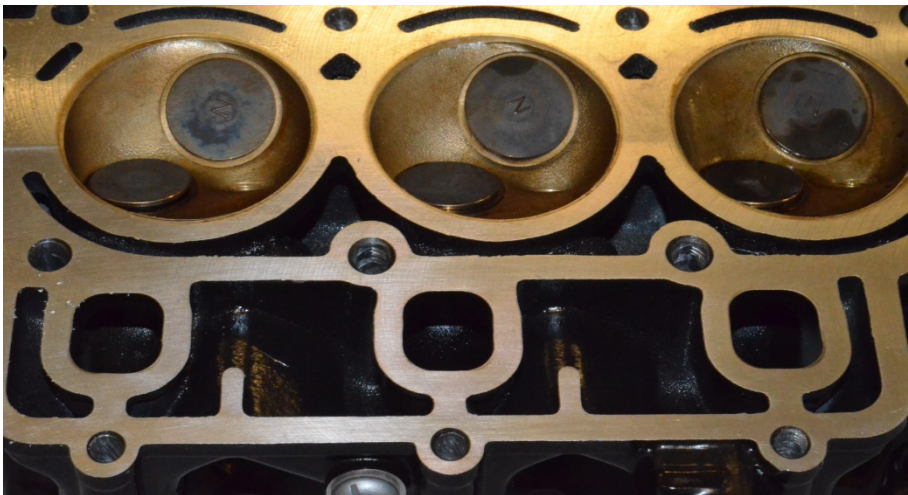
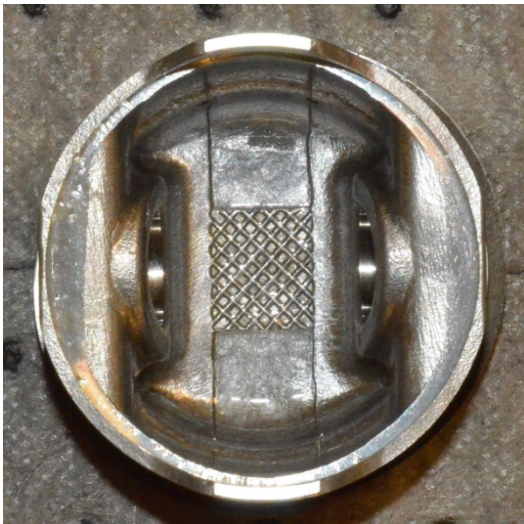


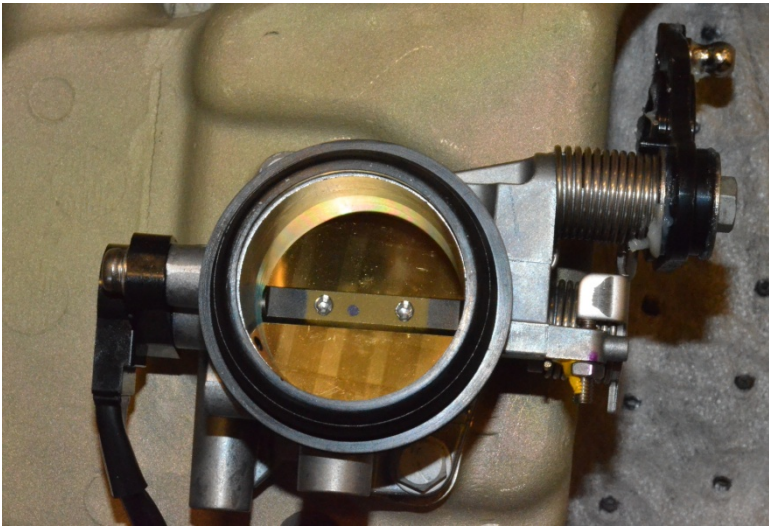
Cylinder head from the valve assembly side.



Cylinder head showing intake ports - detail



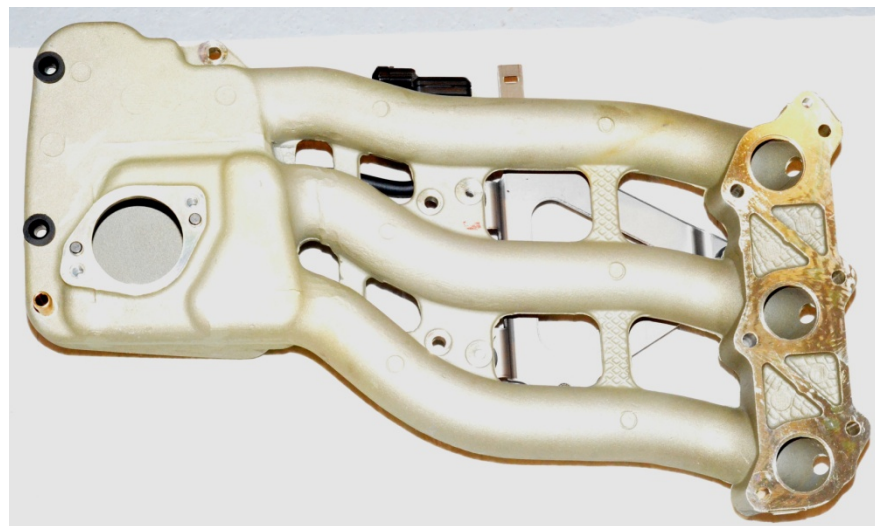
Cylinder head showing exhaust ports.	Cylinder head showing exhaust ports - detail
	
Piston viewed from the top	Piston viewed from the bottom
	

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

Intake silencer air intakes



Intake manifold



Intake manifold - Close up



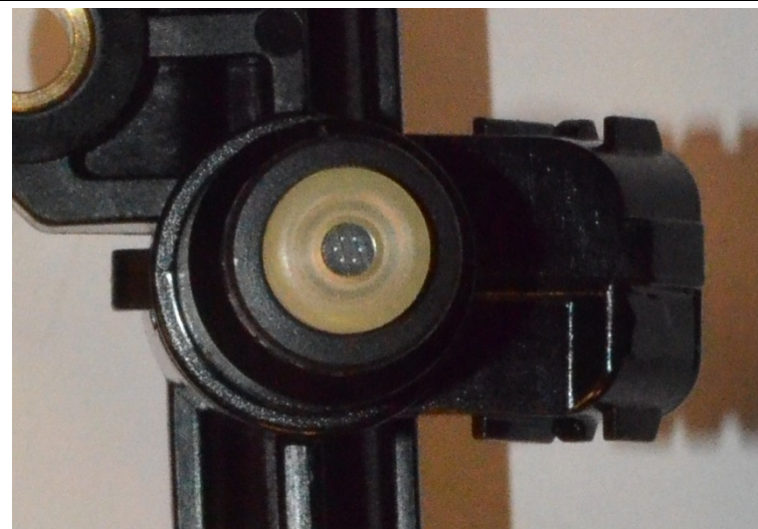
Intake manifold - Close up



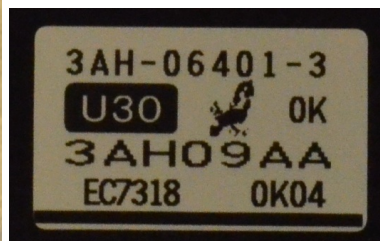
Fuel Injector Rail



Fuel Injector - Close up



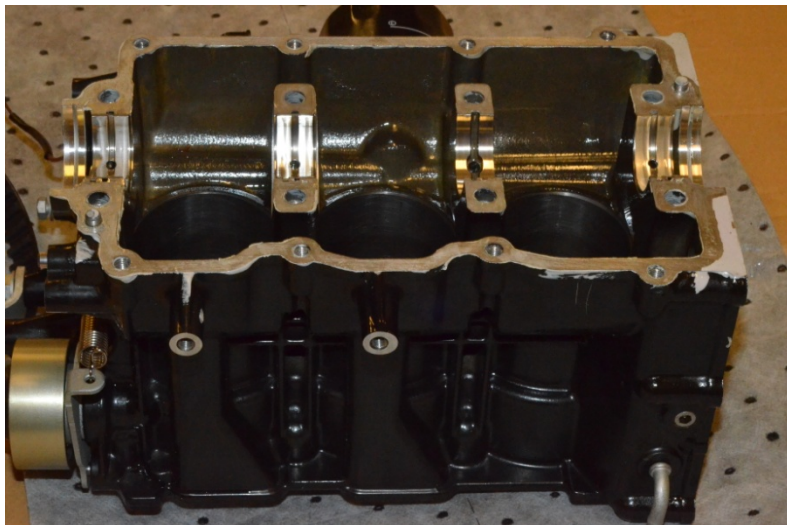
ECU box Front (see also page 8A)



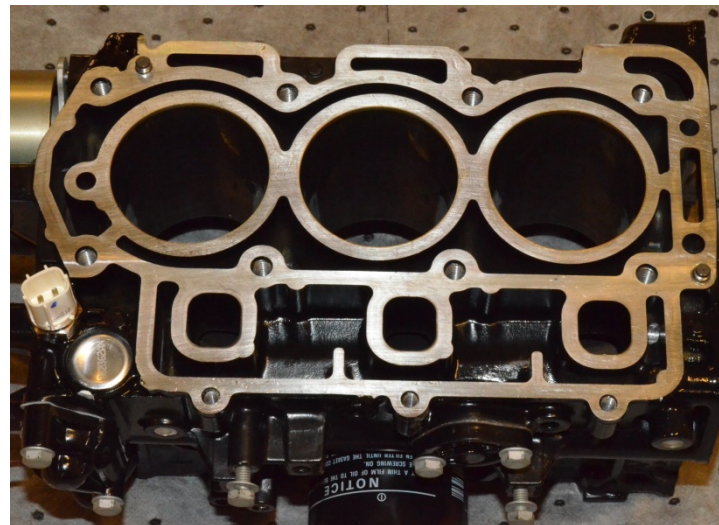
ECU box back



Cylinder block, viewed 45° from front starboard side.



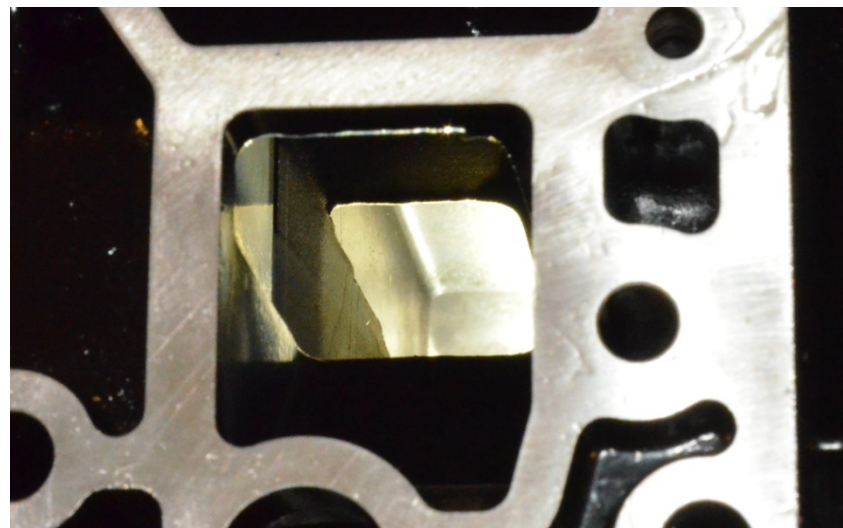
Cylinder block, viewed 45° from rear, port side

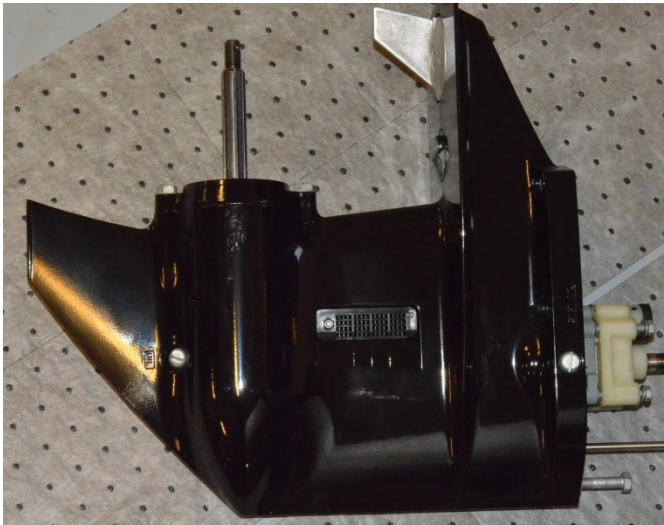
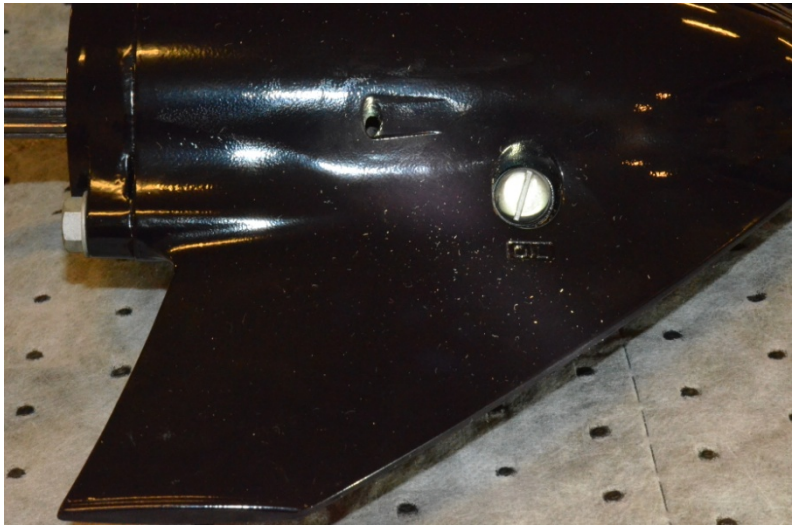


Oil pump



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. (updated 00524C)	+/- 0.25	149.0	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 00524A)	+/- 1.00	Ø 26.7	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 00524A)	min	72.1	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	pcsors
Type of injectors		Fuel	
Diameter of throttle bore	max	Ø 40.2	mm

COOLING SYSTEM

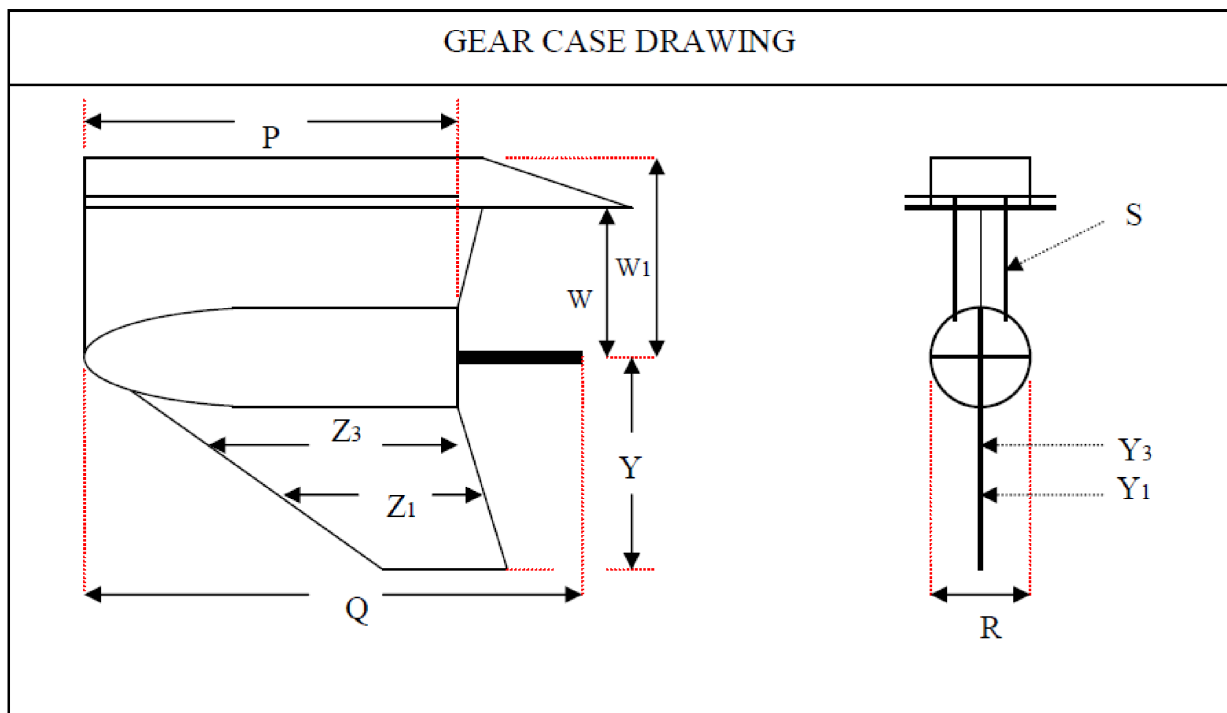
Type	Water
Method	Thermostat controlled
Pump	Impeller
Number of impeller blades	6

SPARK PLUG

Brand	NGK
Model	DCPR6E

WEIGHTS	Tolerance	Measurement	Unit
Inlet valve (bare)	min	27.5	g
Exhaust valve (bare)	min	23.5	g
Inlet rocker arm (updated 00524A)	min	46.0	g
Exhaust rocker arm (updated 00524A)	min	46.0	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 (uppdated 00524C)	min	4000.0	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



FOUR STROKE OUTBOARD PETROL ENGINE

NOTES

- 1) Photo of Tohatsu Diagnostics (3AC Diagnostics) in use to check correctness of ECU

Photo of connection to ECU

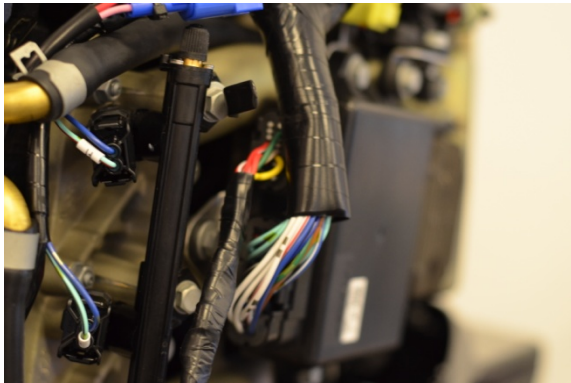
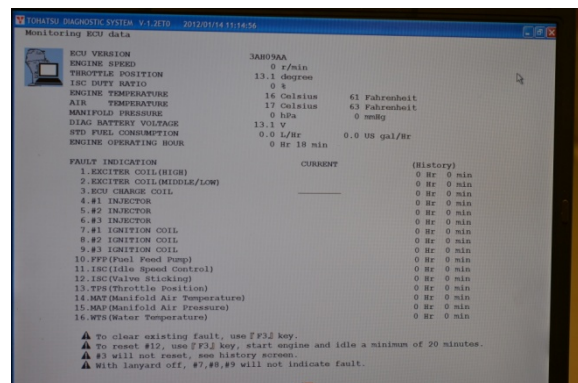
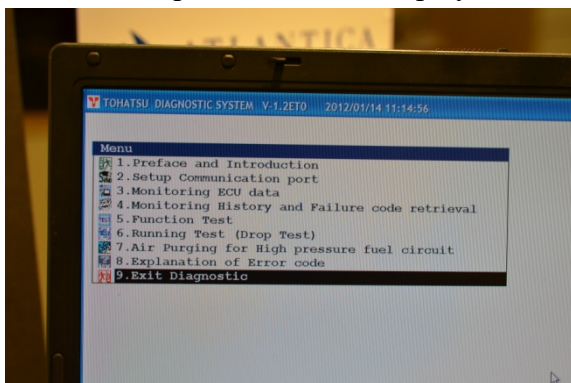


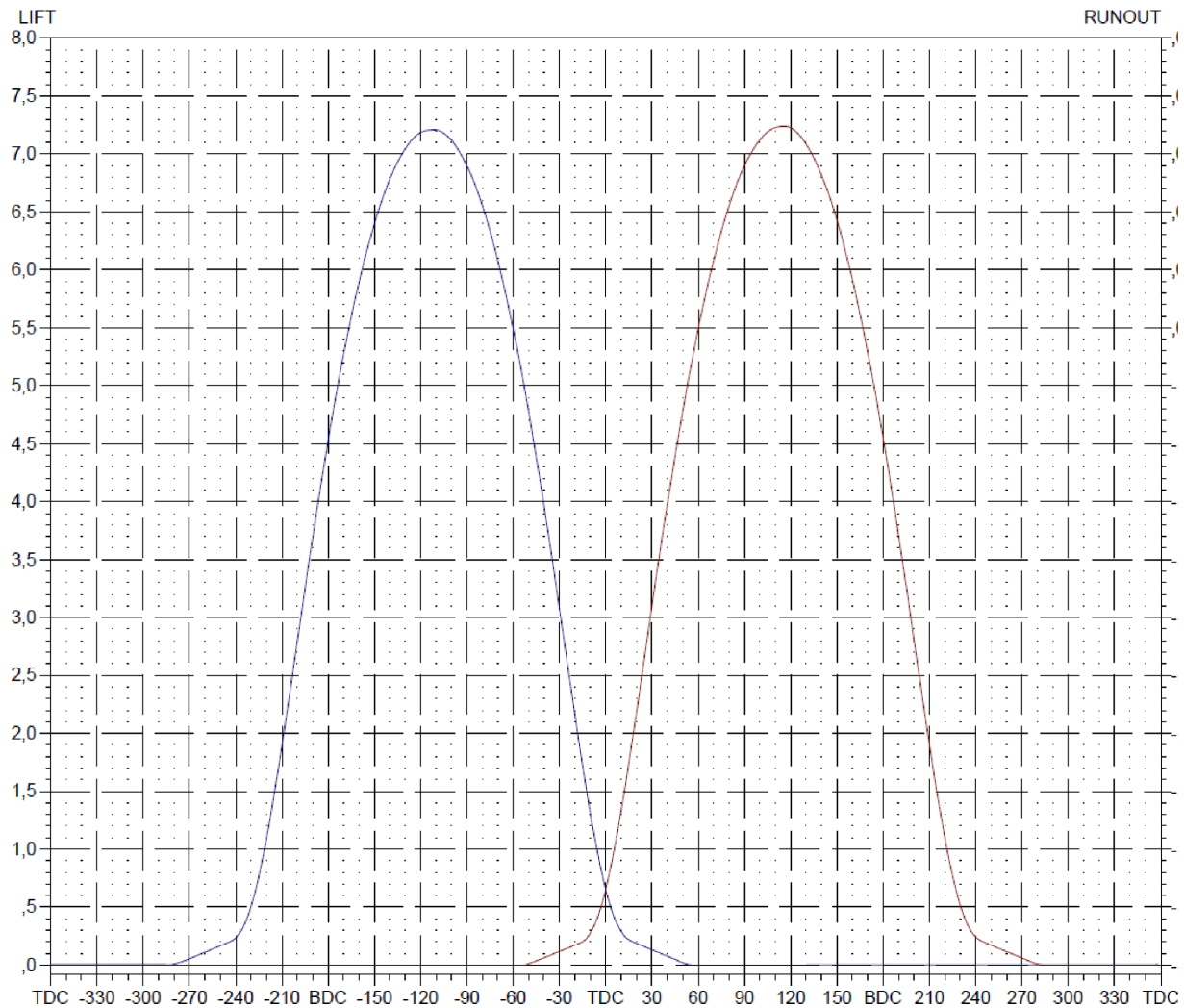
Photo of sample 3AC screen display



Info viewable are engine speed, running time, and error codes

- 2) Photo of bracket without powertrim



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

Running production change

Update of ECU. Program regarding overheat sensor has been updated.

Applies to serial no.

For EU	MFS30B 046722AB~ and up
Exept for EU	MFS30B 040191AB~ and up

ECU box Front - Lable marked with red



Part number

	Previous	New
For EU		
Exept for EU		



Marks number to check

Update from Tohatsu 30B to Tohatsu 30C

Note:

It is not allowed to use parts from Tohatsu 30B on Tohatsu 30C engine.

Part changed on the Tohatsu 30C

Item	Tolerance	Measure	Unit
Flywheel part number 3AD-06191-0	min	4 100	g



Gearhouse ratio

12:26 (2.17) -

ECU

part number 3PA-06401-0



Cylinder head part number
3NVB01001-1

Identify by reposition anode



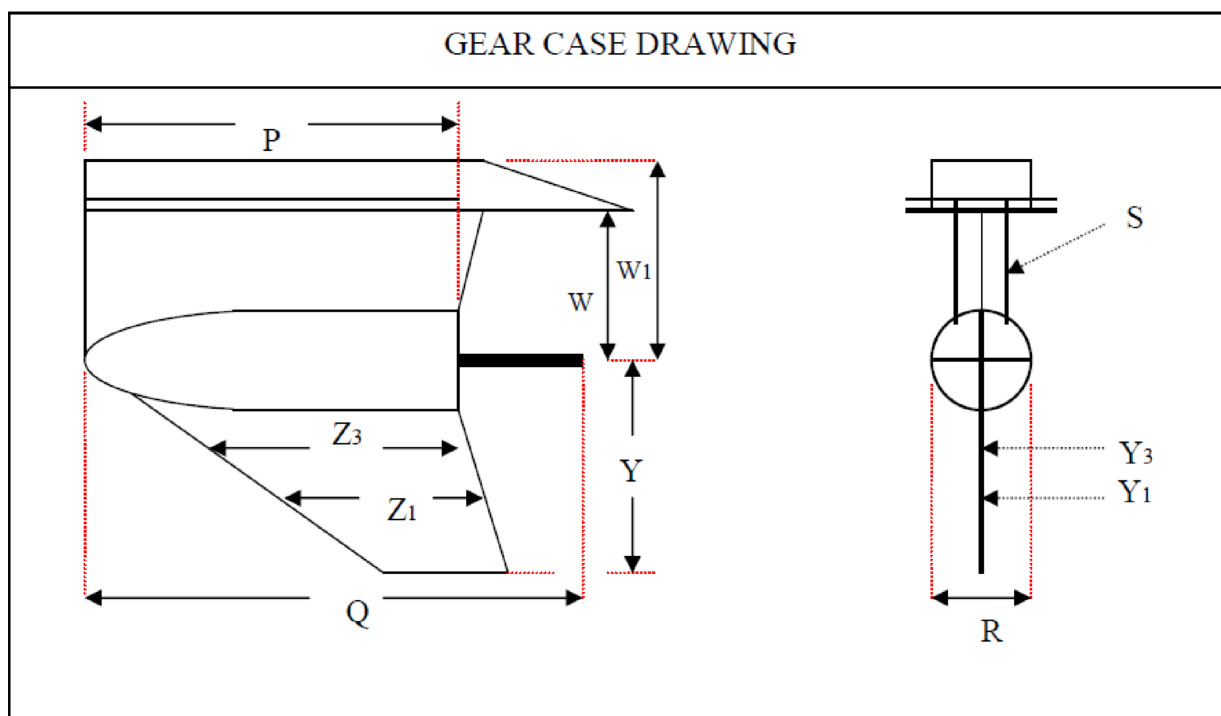
Cylinder Block part number 3NVB01100-0

Photo of Tohatsu 30C, port side.	Photo Tohatsu 30C, starboard side.
	
Photo of Tohatsu 30C front	Photo of Tohatsu 30C, back
	

Exhaust outlet interna diameter

 ± 0.75

69.50 mm



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