



FOUR STROKE OUTBOARD PETROL ENGINE HOMOLOGATION FILE

International Homologation File Number: 00541		
Homologation Valid from:	2021 june 01	Expiry: 2031 dec 31
Valid for the following classes:	Circuit: GT15 Offshore:	
Manufacturer:	Mercury Marine	
Engine Model:	F15 EFI	
Number Manufactured:	1000+	
At the date:	January 2021	
Certified by the National Authority of:		
At the date:		
UIM Homologation Group Inspector	Mikael Lundblad	
At the date:	28 May 2021	
UIM Certification Approval:	Mikael Lundblad	
At the date:	28 May 2021	
Running Production Changes		
Change Detail		Page No.1
Date Approved for Use		Approved by
Change Detail		Page No.
Date Approved for Use		Approved by

PICTURES

Photo of the complete engine, from the rear 3/4. 	Photo of the complete engine, from the rear side. 
Photo of the complete engine, from the port side. 	Photo of the complete engine, from the starboard side. 

Photo without top cover, from the front (tiller model shown).

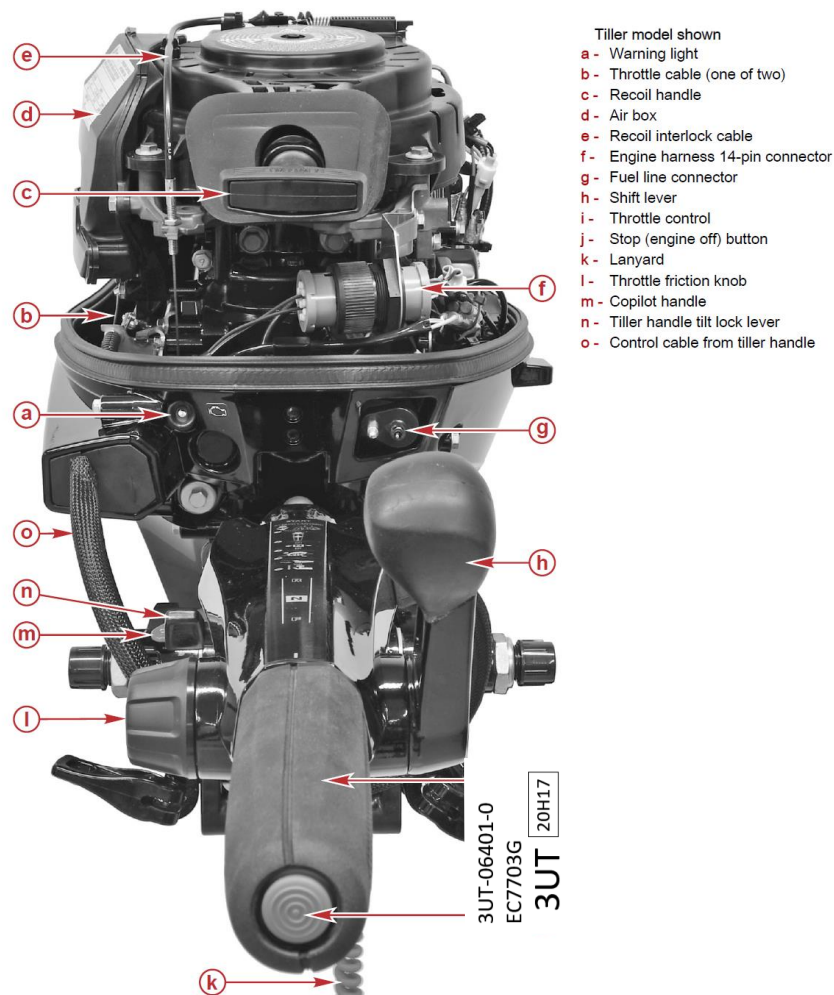


Photo without top cover, from the rear.

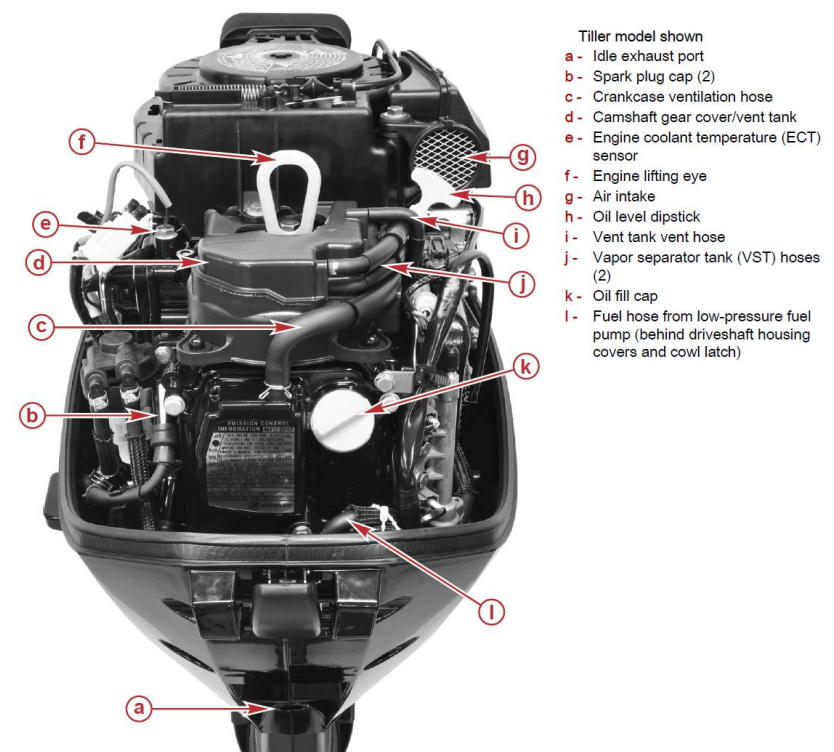
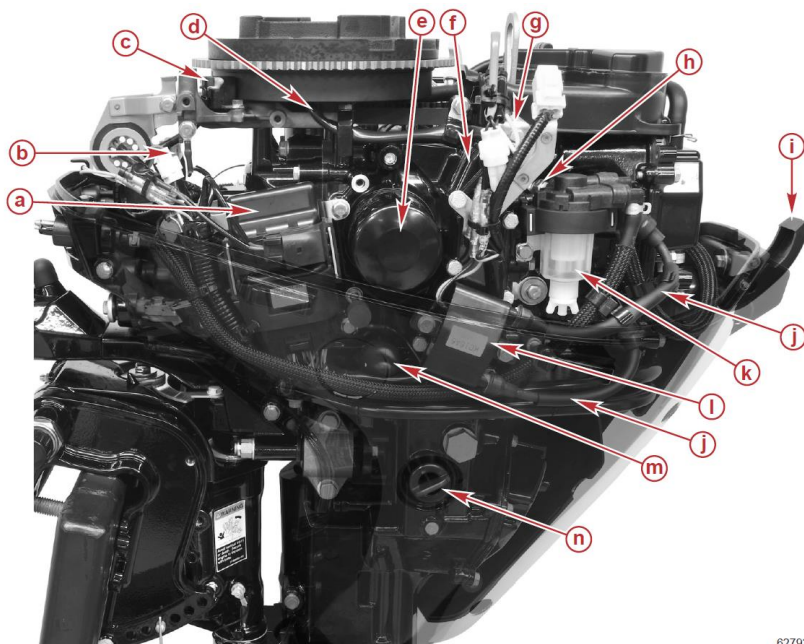


Photo without top cover, from the port side

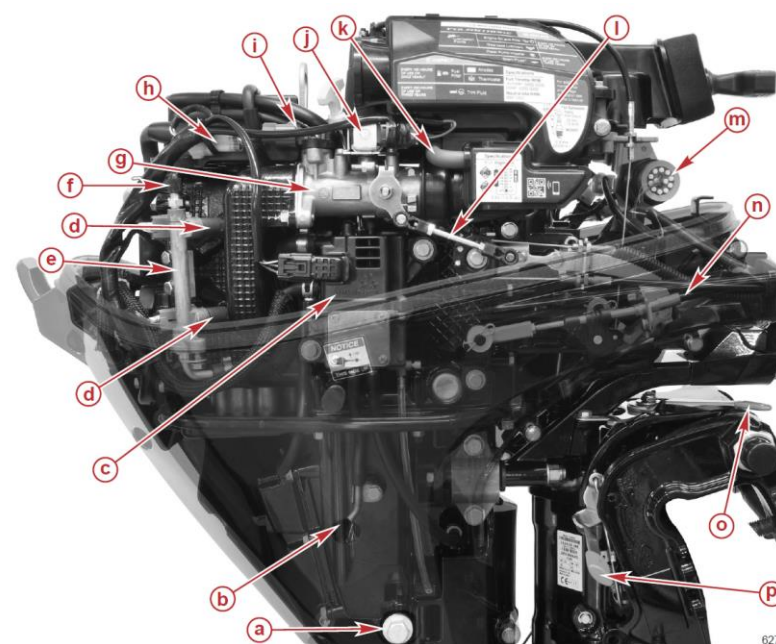


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Tiller model shown, with air box and recoil starter removed

- a - Engine control module (ECM)
- b - Diagnostic connector
- c - Crankshaft position sensor (CPS)
- d - Stator output wires
- e - Oil filter
- f - Thermostat housing
- g - Electrical bracket
- h - Spark plug (2)
- i - Cowl latch
- j - Spark plug wire (2)
- k - Fuel filter
- l - Ignition coil
- m - Oil pressure switch
- n - Flush connector

Photo without top cover, from the starboard side.

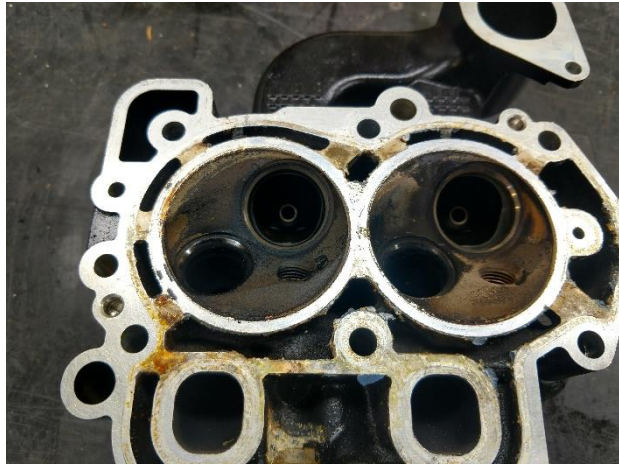


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Tiller model shown, remote control model similar

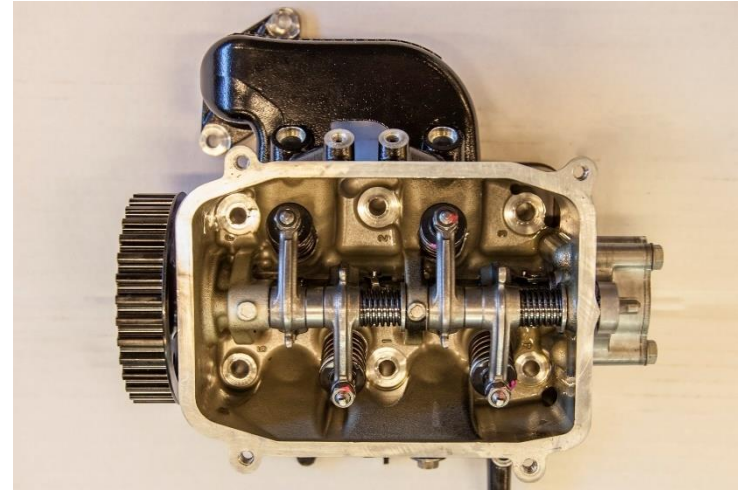
- a - Oil drain screw
 - b - Water pump indicator
 - c - Vapor separator tank (VST) assembly
 - d - Fuel injector (2)
 - e - Fuel rail
 - f - Fuel rail service port with cap
 - g - Throttle body
 - h - Throttle position sensor (TPS) connector
- NOTE: The TPS is behind (on the port side of) the throttle body.*
- i - Temperature and manifold absolute pressure (TMAP) sensor
 - j - Idle air control (IAC) valve
 - k - Throttle bypass (to IAC valve)
 - l - Throttle link
 - m - 14-pin connector from operator controls
 - n - Shift cable
 - o - Copilot handle
 - p - Tilt lock

Cylinder head from the combustion chamber side



Cylinder head showing intake port

Cylinder head from the valve assembly side



Cylinder head showing exhaust ports



Piston viewed from the top



Piston viewed from the bottom



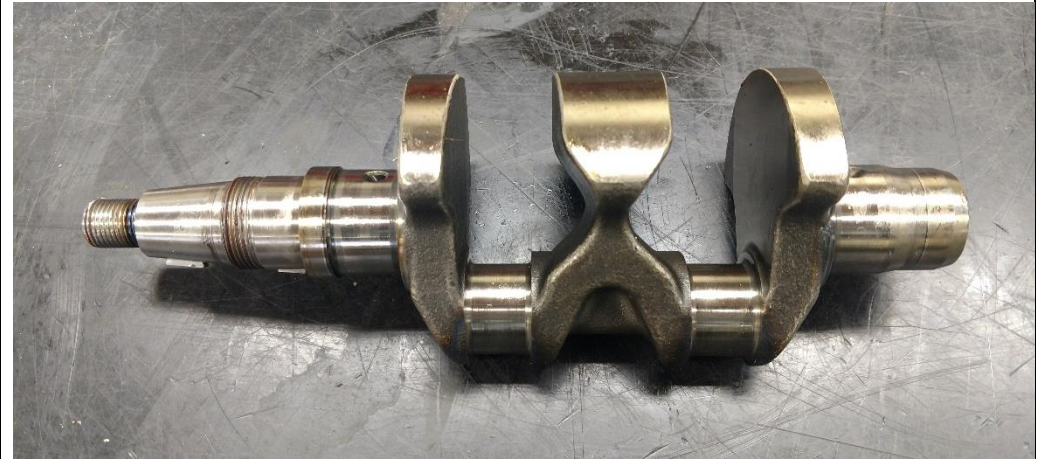
Piston, oblique view



Crankshaft



Connecting rod



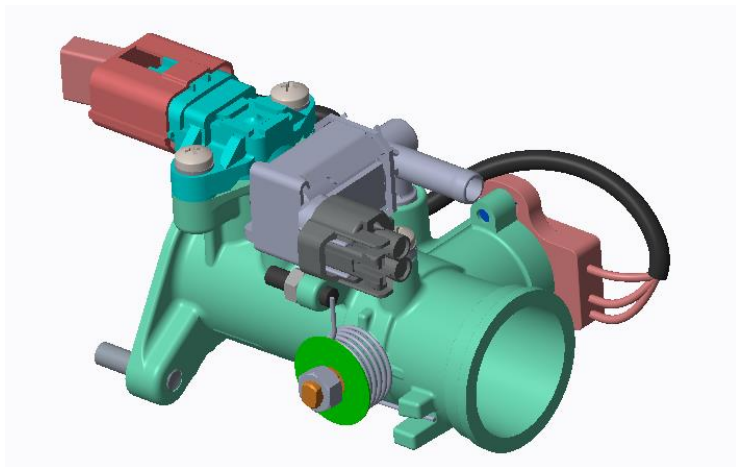
Intake silencer



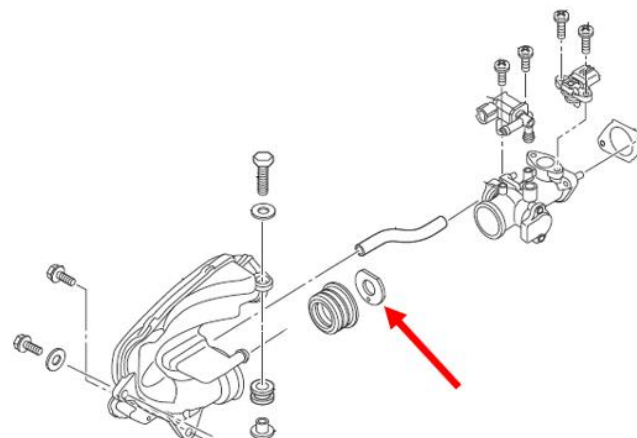
Throttle body assembly



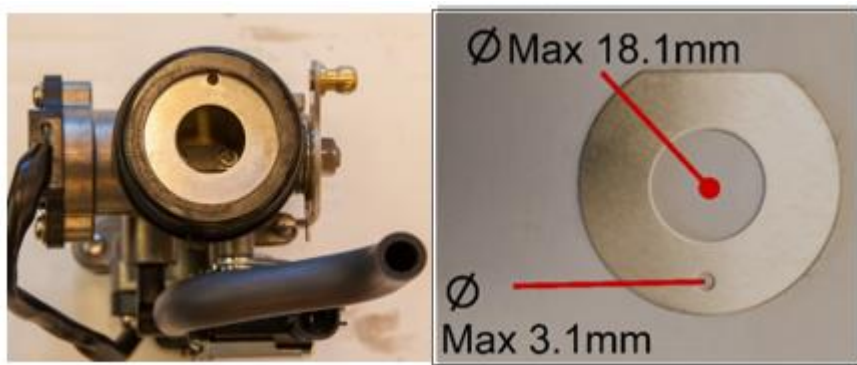
Throttle restrictor placement in assembly



Throttle restrictor



Valve - Intake Exhaust

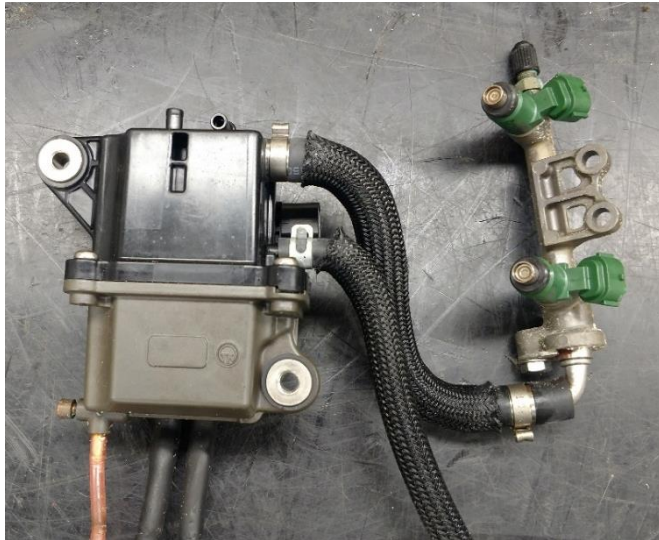


Cam Shaft





Fuel module and fuel injectors

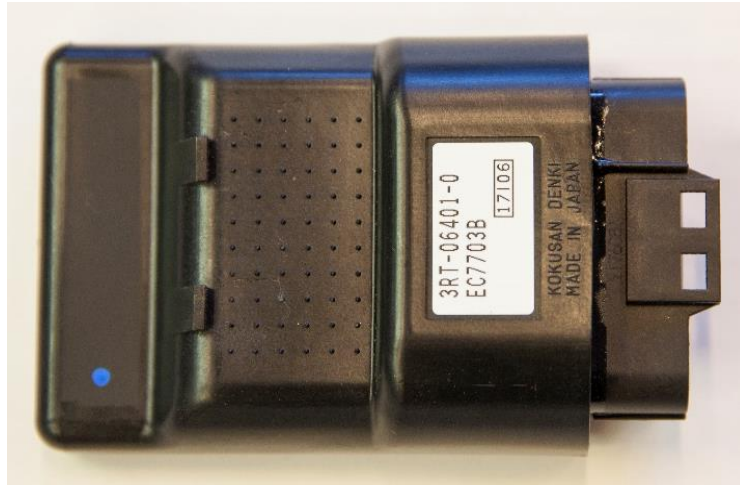


ECU box Front

Fuel Injector - Close up



ECU box back



Oil pump



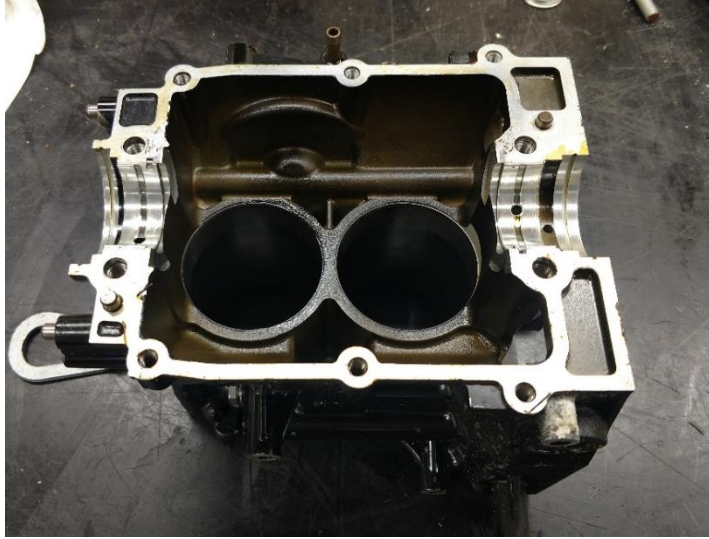
Internal exhaust pipe



Cylinder block, viewed from crankcase side.



Cylinder block, viewed 45° from rear, port side



Gear house



Gear house - Exhaust cooling



Gear House Skag



Gear house skag - Close up from bottom side



MEASUREMENTS

ENGINE FUEL

Type:	Petrol Unleaded
Minimum octane required:	90 RON

ENGINE TYPE

Number of cylinders:	2 Cylinders
Cylinder arrangement:	In line

ENGINE BLOCK	Tolerance	Measurement	Unit
Bore	+/- 0.10	61.0	mm
Stroke	+/- 0.10	57.0	mm
Capacity per cylinder	max	166.5	cc
Total Capacity	max	333	cc
Cylinder block material		Aluminium	
Cylinder liner material		Steel	
Distance from crankshaft centreline to block deck face.	+/- 0.50	139.9	mm

3UT-06401-0
EC7703G
3UT
20H17

CYLINDER HEAD	Tolerance	Measurement	Unit
Cylinder head material		Aluminium	
Volume of combustion chamber (without volume of spark plug hole)	min	15,5	cc
Compression ratio	Nom	10.0	
Thickness of cylinder head	+/- 0.20	100.7	mm
Inlet Port:			
Size of port at cylinder head/manifold face	+/- 0.50	33.0	mm
Internal diameter of valve seat insert	+/- 0.20	28.0	mm
Surface finish of port		Cast	
Exhaust Port:			
Size of port at cylinder head/manifold face	+/- 0.50	20 x 22	mm
Internal diameter of valve seat insert	+/- 0.20	21.0	mm
Surface finish of port		Cast	

Inlet Valves:

Diameter of stem	+/- 0.02	5.48	mm
Diameter of head	+/- 0.1	31.8	mm
Overall length of inlet valve	min	72.5	mm

Exhaust Valves:

Diameter of stem	+/- 0.02	5.46	mm
Diameter of head	+/- 0.1	24.7	mm
Overall length of exhaust valve	min	72.5	mm

Valve Springs:

Diameter of wire	max	2.4	mm
Inside diameter of coil	+/- 0.2	16.0	mm
Free length	max	32.85	mm
Number of working turns	+/- 0.5	6.8	turns

CAMSHAFT

Tolerance **Measurement** Unit

Inlet:

Tappet clearance for checking timing	+/- 0.02	0.15	mm
Total valve lift	+/- 0.10	6.71	mm
Total inlet opening angle (measured at flywheel in degrees at 1,0 mm lift)	+/- 5°	205	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	3.59	mm

Exhaust:

Tappet clearance for checking timing	+/- 0.02	0.20	mm
Total valve lift	+/- 0.10	6.86	mm
Total inlet opening angle (measured at flywheel in degrees at 1,0 mm lift)	+/- 5°	210	degrees
Duration inlet opening angle 3mm under max lift (measured at flywheel in degrees)	+/- 2°	141.5	degrees
Base circle diameter of lobe	+/- 0.02	20.0	mm
Total lift of lobe	+/- 0.05	3.73	mm

PISTONS

Material of piston		Aluminium	
Type and thickness of rings	Square	1.0	mm
	Scraper	1.2	mm
	Oil control	2.0	mm

CONNECTING ROD

	Tolerance	Measurement	Unit
Length of rod from big end to small end (centre to centre)	+/- 0.10	88.8	mm

CRANKSHAFT

	Tolerance	Measurement	Unit
Number of main bearing journals		2	
Diameter of main bearing journals	+0.00/-0.02	33.99	mm
Diameter of connecting rod journals	+0.00/-0.02	28.98	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		Mitsubishi	
Type of pump, model no.		Electric, E00AT90172	
Total number of injectors		2	
Type of injectors		Electronic	
Diameter of throttle bore	Max	30.0	mm
Diameter of restrictor	Max	18.1	mm

COOLING SYSTEM

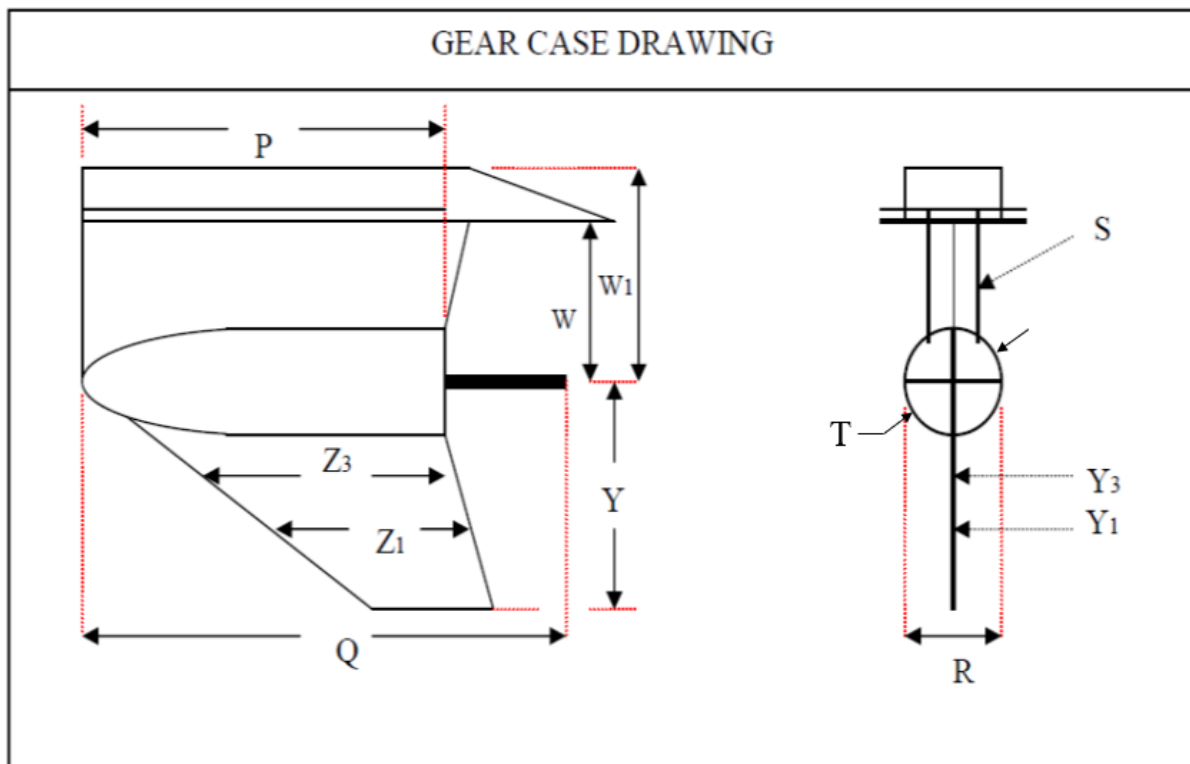
Type		Water	
Method		Thermostat controlled	
Pump		Impeller	
Number of impeller blades		8	

SPARK PLUG

Brand	NGK
Model	DCPR6E

WEIGHTS	Tolerance	Measurement	Unit
Inlet valve (bare)	min	27.0	g
Exhaust valve (bare)	min	23.0	g
Rocker arm (w/ jam nut)	min	49.0	g
Inlet/ Exhaust camshaft	min	362	g
Piston (with rings)	min	105	g
Piston Pin	min	33.0	g
Connecting Rod (with bearings and bolts)	min	113	g
Crankshaft	min	3045	g
Flywheel (bare)	min	2750	g

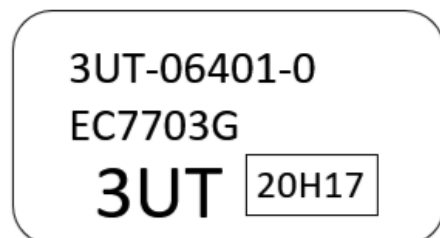
UNDERWATER UNIT	Tolerance	Measurement	Unit
Gear Ratio		13:28 (2.15)	-
P Longitudinal length of gearcase torpedo	+/- 5.0	191.0	mm
Q Longitudinal dimension of gearcase including propeller shaft	max	300.0	mm
R Transverse dimension of gearcase	min	76.0	mm
S Thickness of strut	min	32.5	mm
T Diameter of exhaust outlet	max	65.5	mm
Z1 Skeg chord length, 25mm above bottom	+/- 5.0	80.0	mm
Z3 Skeg chord length, 75mm above bottom	+/- 5.0	123.0	mm
W1 Distance from propeller shaft to upper flange	+/- 5.0	235.0	mm
W Distance from propeller shaft to anti-ventilation plate	+/- 5.0	137.0	mm
Y1 Thickness of skeg, 25mm above bottom	min	7.0	mm
Y3 Thickness of skeg, 75mm above bottom	min	13.0	mm
Y Skeg depth from propeller shaft	+/- 5.0	141.0	mm
Diameter Exhaust outlet at propeller recess	max	64.5	mm



Camlift measurement

Valve Lift Table (in Cam angle) at Nominal Lash				
INTAKE (INT#1 Lobe Index Timing @ Max Lift: 109 degrees in Crank ATDC)			EXHAUST (EXH#1 Lobe Index Timing @ Max Lift: 115 degrees in Crank BTDC)	
Crank Angle	Valve Lift [mm]		Crank Angle	Valve Lift [mm]
-140	0.00		-135	0.00
-135	0.00		-130	0.00
-130	0.03		-125	0.00
-125	0.05		-120	0.10
-120	0.13		-115	0.30
-115	0.25		-110	0.56
-110	0.46		-105	0.89
-105	0.76		-100	1.27
-100	1.12		-95	1.70
-95	1.52		-90	2.11
-90	1.96		-85	2.59
-85	2.41		-80	3.02
-80	2.87		-75	3.48
-75	3.35		-70	3.86
-70	3.81		-65	4.27
-65	4.19		-60	4.70
-60	4.52		-55	5.05
-55	4.88		-50	5.33
-50	5.21		-45	5.64
-45	5.49		-40	175.89
-40	5.77		-35	6.10
-35	5.99		-30	6.30
-30	6.17		-25	6.48
-25	6.35		-20	6.60
-20	6.50		-15	6.71
-15	6.58		-10	6.81
-10	6.65		-5	6.86
-5	6.71		0	6.86
0	6.71		5	6.86
5	6.71		10	6.83
10	6.65		15	6.78
15	6.58		20	6.68
20	6.45		25	6.55
25	6.32		30	6.40
30	6.15		35	6.22
35	5.94		40	5.99
40	5.69		45	5.77

45	5.44		50	5.46
50	5.08		55	5.16
55	4.80		60	4.80
60	4.45		65	4.42
65	4.06		70	4.01
70	3.66		75	3.61
75	3.25		80	3.20
80	2.79		85	2.74
85	2.49		90	2.29
90	1.96		95	1.83
95	1.52		100	1.40
100	1.17		105	1.02
105	0.84		110	0.69
110	0.53		115	0.41
115	0.33		120	0.18
120	0.20		125	0.05
125	0.13		130	0.00
130	0.05			
135	0.03			
140	0.00			

NOTES

Part number ECU

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