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**REPORT INTO A FATAL INCIDENT
ON LOUGH DERG
CLOSE TO THE SHORE NEAR
GARRYKENNEDY
2nd AUGUST 2012**

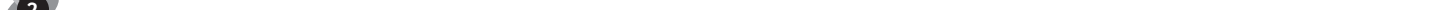
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**REPORT No. MCIB/221
(No.13 of 2013)**



Report MCIB/221 published by The Marine Casualty Investigation Board.
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	PAGE
1. SUMMARY	4
2. FACTUAL INFORMATION	5
3. NARRATIVE	8
4. ANALYSIS	11
5. CONCLUSIONS	12
6. SAFETY RECOMMENDATIONS	13
7. APPENDICES	14
8. CORRESPONDENCE RECEIVED	27

1. SUMMARY

- 1.1 On the morning of 2nd August 2012, Mr Patrick Danaher purchased fuel for his powerboat at New Line, Killaloe. That evening, the boat was seen floating partially submerged and overturned with the bow out of the water near Youghal Bay, Lough Derg. The boat had struck submerged rocks at high speed and suffered major damage to the outdrive allowing the free ingress of water into the boat. The boat was recovered that evening and Mr Danaher's body was recovered from the lake the following day.

2. FACTUAL INFORMATION

2.1 Boat Particulars

Make:	Crownline Boats Inc. USA
Model:	220CCR kW 240. 6 persons + luggage = 510 kg
Year:	2006
Hull Number:	US-JTC62533I506
CE Marked:	Yes CE 0609C
Hull:	GRP. Partial Cabin Decked forward. Full Planing
Dimensions:	Length 7m Breadth 2.6m Height at Transom 1.6m Draft Max 0.81m Dead rise 18 degrees Weight 1,816/1,905 kg
Propulsion:	Inboard Petrol Engine with Outdrive and Contra-rotating Duo-Prop 3 blade propellers
Make:	Volvo Penta
Model:	Engine 5GXI-F No. 38693094012172002 Heat trace fire suppression system fitted in engine compartment
Total hours:	1,335
Outdrive:	Transom Assembly SX-M 3869341 4151108678 Drive Unit DP-SM 1.95(M22) 3868913 4202218919 (Replacement Drive Unit)
Steering:	Steering wheel at console aft of cabin on starboard side
Lines/fenders:	Anchor stowed forward 6kg with fibre line 20m x 8mm Painter forward fibre line 6m x 12mm Two fenders one port side and one starboard side tied to hand rail uprights Painter stern fibre line 6.3m x 19mm

2.2 Safety Equipment

- Engine kill switch fitted at control console
- 2 x inflatable PFDs: make Seago Yachting UK EN 396 150-N
- 1 x life vest, blue no name or details
- 1 x buoyancy aid make: Compass CE marked

GPS unit (removed by An Garda Síochána to check for information)

Hand held VHF Cobra Marine Submersible MRHH 325 set to channel 16

1 x Apollo rocket red parachute flare Luce Rossa batch No. 1476 mfg. 02/08, replace 02/12

1 x Apollo rocket red parachute flare Luce Rossa batch 1484 mfg. 02/08, replace 02/12

1 x hand held red flare batch 2497 replace 02/12

2 x Mayday Buoyant smoke signals batch 02 mfg 02/08 replace 02/12

1 x safety heaving rope in weighted protective bag

See Appendix 7.1 Photographs P8041319 and P8041320 are of the boat. These were taken on 04/08/12 at the premises of Shannon Sailing Ltd. Dromineer where the boat was stored after the incident.

2.3 Weather Conditions

Wind SW force 3-4 (See Appendix 7.2)

2.4 Voyage Particulars

It is not known what the purpose of the trip was or the route that Mr Danaher took to arrive in the vicinity of Youghal Bay/Garrykennedy

2.5 Marine Casualty or Incident Information

There were no witnesses to the circumstances of the incident. It is not known at what time of day the incident took place

2.6 Shore Authority Involvement and Emergency Response

On the evening of Thursday 2nd August when it was realised that Mr Danaher was missing a large scale search effort commenced that included the following resources:

- RNLI
- Shannon-based search and rescue helicopter
- Coast Guard
- An Garda Síochána
- Tipperary Civil Defence
- Local people from the area

The boat was recovered on the evening of Thursday 2nd August, the evening before Mr Danaher's body was recovered. The boat was brought to the slipway at Garrykennedy and emptied of water. Subsequently it was brought to the premises of Shannon Sailing Ltd., Dromineer, by An Garda Síochána for secure storage.

An Garda Síochána found that the controls for the boat were in neutral and the key was in Mr Danaher's trouser pocket.

Mr Danaher's body was recovered from the lake on the evening of Friday 3rd August 2012 adjacent to where the boat had struck the submerged rocks. He was not wearing a PFD.

The location and recovery of Mr Danaher's body was carried out by the Killaloe Ballina Dive Recovery Unit. Personnel from the unit also examined the submerged rocks that had been struck by the boat and determined that the boat was travelling in a Westerly direction towards Garrykennedy. Several metal pieces of the propellers and outdrive were recovered from this area.

3. NARRATIVE

- 3.1 Information provided to the investigation concludes that Mr Danaher was a regular visitor to the Youghal Bay / Garrykennedy area and that he had a good knowledge of that part of Lough Derg.
- 3.2 Examination of the boat revealed that it was in good condition. It is understood that Mr Danaher maintained his boat well.
- 3.3 Information provided to the investigation concludes that Mr Danaher made regular use of the boat. This is borne out by the fact that the engine management system record shows that in the 16 months between April 2011 and the date of the incident there were 378 engine starts and the engine had accumulated 125.72-operating hours.
- 3.4 The maintenance manual calls for specific items to be attended to yearly or every 100 hours, whichever comes first. Thus, the boat was somewhat overdue for scheduled maintenance in respect of the engine and outdrive.

See Appendix 7.3 showing extracts of the information from the engine management system. This information was provided by Mr Pat McMahon of Pat McMahon Marine Ltd; who undertook the necessary analysis work on the engine management system during the Board's investigation. Mr McMahon had carried out maintenance work on the boat in the past on behalf of Mr Danaher.

- 3.5 As stated previously, from the impact marks on the submerged rocks it was concluded by the rescue teams that the boat was travelling from East to West on the lake towards Garrykennedy. The submerged rocks that the boat struck are within about 5m of the shoreline at a small headland.

See Appendix 7.4 Google® Map and aerial view of the area with a legend showing the approximate location of the impact and the recovery of Mr Danaher's body and the boat.

See Appendix 7.5 Photo PB142056 taken on 14/11/12 looking west towards Garrykennedy, showing the small headland off which the boat struck the submerged rocks.

- 3.6 The boat is capable of travelling at high speeds of up to 50 miles per hour. At high speed the hull is designed to plane as it travels along the surface of the water. At planing speed most of the surface area of the hull rises out of the water, leaving only a small amount of the hull and the outdrive in contact with the water. The outdrive and propellers protrude into the water below the hull to a depth of about 500mm.
- 3.7 After the incident there was no discernible damage to the hull of the boat. There was major damage to the outdrive and propellers where they impacted with the

rocks. This is consistent with the boat having been travelling at planing speed with the hull predominantly out of the water at the time of the impact.

- 3.8 The main impact point is at the front of the outdrive casing at propeller shaft, at a level of 226mm above the tip of the skeg and 280mm below the bottom of the hull. The impact damage to the propellers and the skeg is also evident.
- 3.9 The resulting damage centres around the outdrive unit, it was broken away from the hull at the transom shield where the drive shaft from the engine connects to the outdrive. The impact pulled the drive shaft and seals out of place, creating a hole in the transom allowing water to flow freely into the stern of the boat and into the engine compartment causing the boat to sink by the stern. There was sufficient buoyancy at the bow to prevent the boat sinking fully and it remained floating with the bow protruding out of the water until it was seen and the alarm was raised.

See Appendix 7.6 photos P8041328, P8041395 and P8161474. These were taken on 04/08/12 & 16/08/12 at the premises of Shannon Sailing Ltd. Dromineer where the boat was stored by An Garda Síochána after the incident.

- 3.10 A feature of this type of outdrive is that it can pivot up and down to vary the depth of the propellers in the water to trim the boat. The control for this action is on the control lever at the driving console. The pivot arrangement is such that two pivot pins, one on each side of the gimbal ring, screw into the pivot housing.

See Appendix 7.7 Drawing and instructions for the Volvo Penta transom shield assembly SX-M.

- 3.11 Inspection of the damaged outdrive components revealed that the pivot pin on the port side of the outdrive had been loose, and that it had not been in its correct position for some time as the threads in the pivot housing were corroded. Impact damage to the port side housing that shields the gimbal ring suggests that the pivot pin was ejected in the course of the incident.
- 3.12 On impact, the port side pivot arrangement offered little resistance to being forced backward whereas the starboard side took the impact and was fully broken away. See Appendix 7.6 Photo P8041395. The two green arrows indicate the pivot housing having moved away from the gimbal ring and the absence of the pivot pin.
- 3.13 After the incident when the boat was examined by An Garda Síochána it was found that the forward and reverse direction control lever was in the neutral position. Examination of this lever and the linkages to the outdrive revealed that this can only be achieved manually and that the control could not have gone to the neutral position of its own volition in the course of, or after the impact.

- 3.14 After the incident, An Garda Síochána found the ignition key for the engine in Mr Danaher's trouser pocket.
- 3.15 The engine management system analysis carried out by Mr Pat McMahon after the incident shows that in the course of the incident, the engine did not shut down on overspeed.
- 3.16 Thus it is the conclusion of the Board that after the impact and as the boat was filling with water, Mr Danaher did put the control lever to neutral and shut down the engine.
- 3.17 It is not known if Mr Danaher attempted to access the PFDs or the safety equipment after the incident. When his body was found he was not wearing a PFD.
- 3.18 Information provided to the investigation concludes that Mr Danaher had been socialising in Garrykennedy on the evening before the incident.
- 3.19 The Post Mortem Report recorded the cause of the death of Mr Danaher as drowning with the comment that the ethanol levels of post mortem blood and urine were within the toxic range. The toxicology report shows that the ethanol level in Mr Danaher's blood was 265mg% and his urine level was 367mg%.

4. ANALYSIS

- 4.1 Examination of the boat revealed that it was in good condition. It was somewhat overdue for maintenance but the investigation found no evidence that this was a factor in the incident.
- 4.2 The boat was travelling at high speed very close to the shoreline. The outdrive impacted with submerged rocks. The force of the impact caused the transom shield to break away from the transom of the boat and to pull the drive shaft and seals out of place. This allowed the free ingress of water into the boat causing it to sink.
- 4.3 Examination of the outdrive revealed that the pivot pin on the port side of the outdrive had been loose and not correctly in place before the incident. The degree of damage to the outdrive as a consequence of the impact indicates to the Board that, even if the pivot pin had been correctly in place, it would not have been able to sustain the force of the impact. Thus it would not have prevented the damage to the outdrive and the subsequent breaching of the transom of the boat.

5. CONCLUSIONS

- 5.1 The boat and its machinery were in good condition and did not contribute to the incident.
- 5.2 The displacement of the outdrive port side pivot pin was not significant in the incident.
- 5.3 At the time of the incident the boat was being driven at high speed close to the shoreline. The post mortem results show that the ethanol levels in Mr Danaher's blood and urine were within the toxic range. However, the influence of alcohol may have affected his ability to:
 - effectively apply his local knowledge and experience
 - make rational decisions in respect of the speed of the boat and its course
 - recognise the danger of driving the boat in such close proximity to the small headland and the submerged rocks adjacent to the headland.
- 5.4 Mr Danaher did bring the control lever to the neutral position and shut down the engine at the time of the incident.
- 5.5 Mr Danaher was not wearing a PFD and no distress signals were activated following the impact.

6. SAFETY RECOMMENDATIONS

- 6.1 That the Minister should ensure owners and operators of recreational craft should be aware of and follow the Department of Transport, Tourism and Sport's Code of Practice for the Safe Operation of Recreational Craft Directive, specifically with relation to the influence of alcohol on the operation of power craft.

7. LIST OF APPENDICES

	PAGE
7.1 Photos of the Boat	15
7.2 Met Éireann Weather Report	16
7.3 Data from Engine Management System	20
7.4 Google Map and Aerial View of Shoreline	21
7.5 Photo of Lough Derg	22
7.6 Photos Showing Damage to Boat	23
7.7 Details for Volvo Penta Transom Shield Assembly SX-M	26

Appendix 7.1 Photos of the Boat.



Photo 8041319 & 8041320. Taken on 04/08/12 at the premises of Shannon Sailing Ltd., Dromineer where the boat was stored after the incident

Appendix 7.2 Met Éireann Weather Report



MET ÉIREANN
The Irish Meteorological Service

Glasnevin Hill,
Dublin 9, Ireland.

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Baile Átha Cliath 9, Éire.
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Ms Assumpta Dowd
Marine Casualty Investigation Board
Leeson Lane
Dublin 2

27/8/2012

Our Ref. WS3018/2_14723
Your Ref. MCIB/221

Re: Estimate of weather conditions in the Youghal Bay, Lough Derg area, on the 2nd August 2012, between 0 and 6 hours.

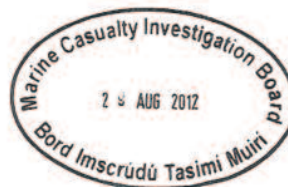
Dear Ms Dowd,

Please find enclosed the above report.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Evelyn Murphy'.

Evelyn Murphy B.Sc. M.Sc. Meteorologist
(Research & Applications Div)
Ph 01- 8064290 Fax 01 – 8064247
Email: evelyn.murphy@met.ie



Appendix 7.2 Met Éireann Weather Report



MET ÉIREANN
The Irish Meteorological Service

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Dublin 9, Ireland.

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Fax: +353-1-806 4247
E-mail: met.eireann@met.ie

27/8/2012

Our Ref. WS3018/2_14723
Your Ref. MCIB/221

**Estimate of weather conditions in the Youghal Bay, Lough Derg area, on
the 2nd August 2012, between 0 and 6 hours.**

Winds: generally Light but with stronger gusts, Force 3 and gusting occasionally to between 15 and 24 knots

Weather: a few clear spells but mostly rather cloudy and mostly dry

Visibility: good, greater than 20 km (i.e. no fog or mist evident)

Temperatures: air temperatures were 11°C or 12°C

Evelyn Murphy B.Sc. M.Sc. Meteorologist
Research & Applications Division
Met Éireann



Appendix 7.2 Met Éireann Weather Report



MET ÉIREANN
The Irish Meteorological Service

Glasnevin Hill, Cnoc Ghlas Naíon Tel: +353-1-806 4200
Dublin 9, Ireland. Baile Átha Cliath 9, Éire. Fax: +353-1-806 4247
www.met.ie E-mail: met.eireann@met.ie

Beaufort Scale of Wind					
Force	Description	Speed*		Specification -sea	Wave height** (metres)
		knots	km/hr		
0	Calm	<1	<1	Sea like mirror	
1	Light air	1-3	1-5	Ripples	0.1 (0.1)
2	Light breeze	4-6	6-11	Small wavelets	0.2 (0.3)
3	Gentle breeze	7-10	12-19	Large wavelets, crests begin to break	0.6 (1)
4	Moderate breeze	11-16	20-28	Small waves becoming longer, frequent white horses	1 (1.5)
5	Fresh breeze	17-21	29-38	Moderate waves, many white horses, chance of spray	2 (2.5)
6	Strong breeze	22-27	39-49	Large waves, white foam crests, probably some spray	3 (4)
7	Near gale	28-33	50-61	Sea heaps up, streaks of white foam	4 (5.5)
8	Gale	34-40	62-74	Moderately high waves of greater length	5.5 (7.5)
9	Strong gale	41-47	75-88	High waves, dense streaks of foam, spray may reduce visibility	7 (10)
10	Storm	48-55	89-102	Very high waves, long overhanging crests, visibility affected	9 (12.5)
11	Violent storm	56-63	103-117	Exceptionally high waves, long white foam patches cover sea	11.5 (16)
12	Hurricane	64+	117 & over	Air filled with foam and spray, sea completely white	14 (-)

*Speed = mean speed at a standard height of 10 metres.
**Wave height is only intended as a guide to what may be expected in the open sea.
Bracketed figures indicate the probable maximum wave height.

Wave Heights / State of Sea

The wave height is the vertical distance between the crest and the preceding or following trough. The table below gives a description of the wave system associated with a range of significant wave heights. The Significant wave height is defined as the average height of the highest one-third of the waves. (It is very close to the value of wave height given when making visual observations of wave height.)

Sea State (Descriptive)	Significant Wave height in meters
Calm	0 – 0.1
Smooth(Wavelets)	0.1 – 0.5
Slight	0.5 – 1.25
Moderate	1.25 – 2.5
Rough	2.5 – 4
Very rough	4 – 6
High	6 – 9
Very high	9 – 14
Phenomenal	Over 14

Individual waves in the wave train will have heights in excess of the significant height. The highest wave of all will have a height about twice the significant height

Visibility Descriptions of visibility mean the following:

Visibility (Descriptive)	Visibility in nautical miles (kilometres)
Good	More than 5 nm (> 9 km)
Moderate	2 – 5 nm (4 – 9 km)
Poor	0.5 – 2 nm (1 – 4 km)
Fog	Less than 0.5 nm (< 1km)

Appendix 7.2 Met Éireann Weather Report

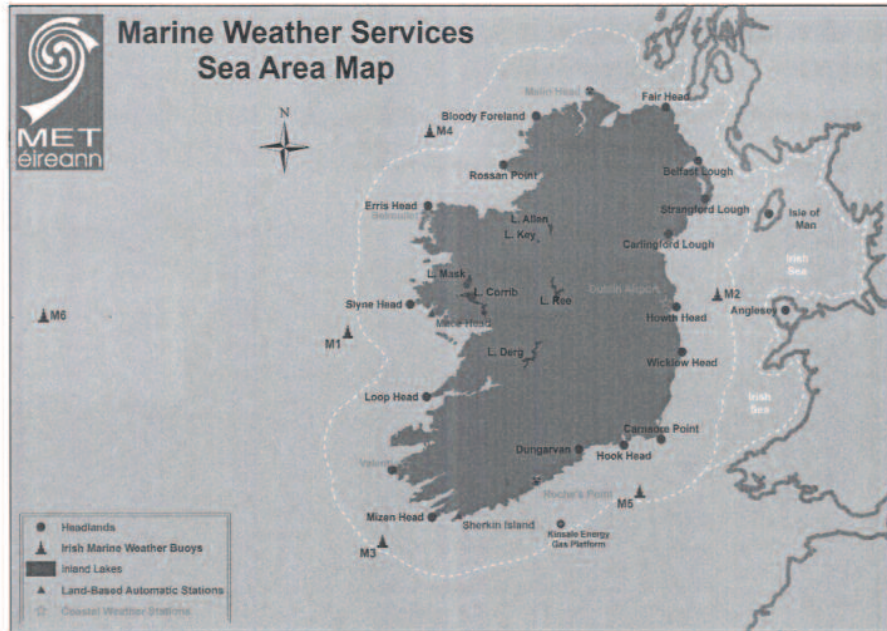


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http://www.met.ie/marine/marine_map.asp

Appendix 7.3 Data from Engine Management System.

Pat McMahon Marine
 Cloonfadda, Killaloe, Co. Clare.
 Mob. +353 (0)87 237 7039
 e-mail: patmcmahonmarine@gmail.com

Outdrive replaced due to extensive damage to lower leg 19/6/08

engine replaced due to frost damage april 2011

04/17/2011 19:34:02

1. VEHICLE CONFIGURATION

Cust. Name: pat danaher
 Engine Make: volvo penta 5.0l fuel inj
 Engine Serial No:
 Model Year: re engine april 2011
 System Type: Volvo EGC IAC Engine

Total Engine Starts	1335	#
Knock Average Volts	0.00	VDC
Engine Operating Hours	665.72	hrs

Relevant section of engine data from engine management system / history taken on 17th April 2011 at engine replacement. Provided by Pat McMahon Marine.

DIACOM MARINE SERVICE REPORT

08/18/2012 12:31:52

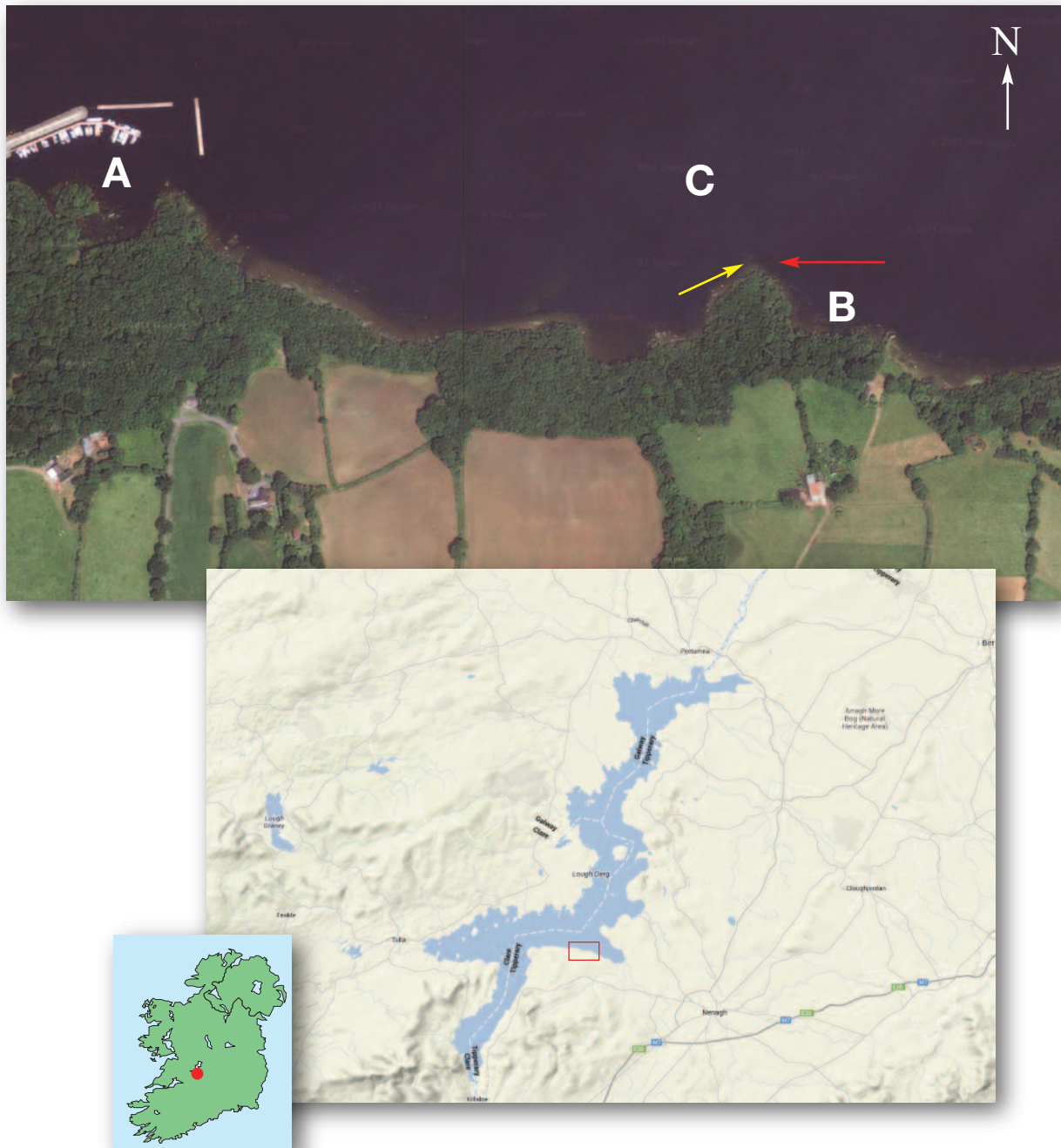
1. VEHICLE CONFIGURATION

Cust. Name: pat danaher 4
 Engine Make: volvo penta 50l gxi
 Engine Serial No:
 Model Year: 2005
 System Type: Volvo EGC IAC Engine

Spark Advance	0.00	VDC
Total Engine Starts	1713	#
Knock Average Volts	0.00	VDC
Engine Operating Hours	791.44	hrs

Relevant section of engine data from engine management system/history taken on 18th August 2012 after the incident. Provided by Pat McMahon Marine.

Appendix 7.4 Google Map and Aerial View of Shoreline.



A - Pier at Garrykennedy

B - Youghal Bay lies to the East of Garrykennedy.

C - Approximate area where Mr Danaher's body and the boat were recovered.

Red Arrow: Direction of Boat before impact.

Yellow Arrow: Submerged rocks located just off small headland.

The small headland is approximately 800m East of Garrykennedy.

Appendix 7.5 Photo of Lough Derg.



Lough Derg looking West towards Garrykennedy showing small headland off which boat struck submerged rocks. Photo taken 14/11/12.

Appendix 7.6 Photos Showing Damage to Boat.



Photo P8041328. Taken on 04/08/12 at the premises of Shannon Sailing Ltd. Dromineer where the boat was stored after the incident.

The yellow arrows on above photo and photo on next page indicate area where outdrive pulled away from the transom stern allowing water to flow into the boat causing it to sink.

Appendix 7.6 Photos Showing Damage to Boat.



Photo P8041395. Taken 04/08/12 at the premises of Shannon Sailing Ltd. Dromineer where the boat was stored after the incident.

The two green arrows indicate the pivot housing having moved away from the gimbal ring.

Appendix 7.6 Photos Showing Damage to Boat.

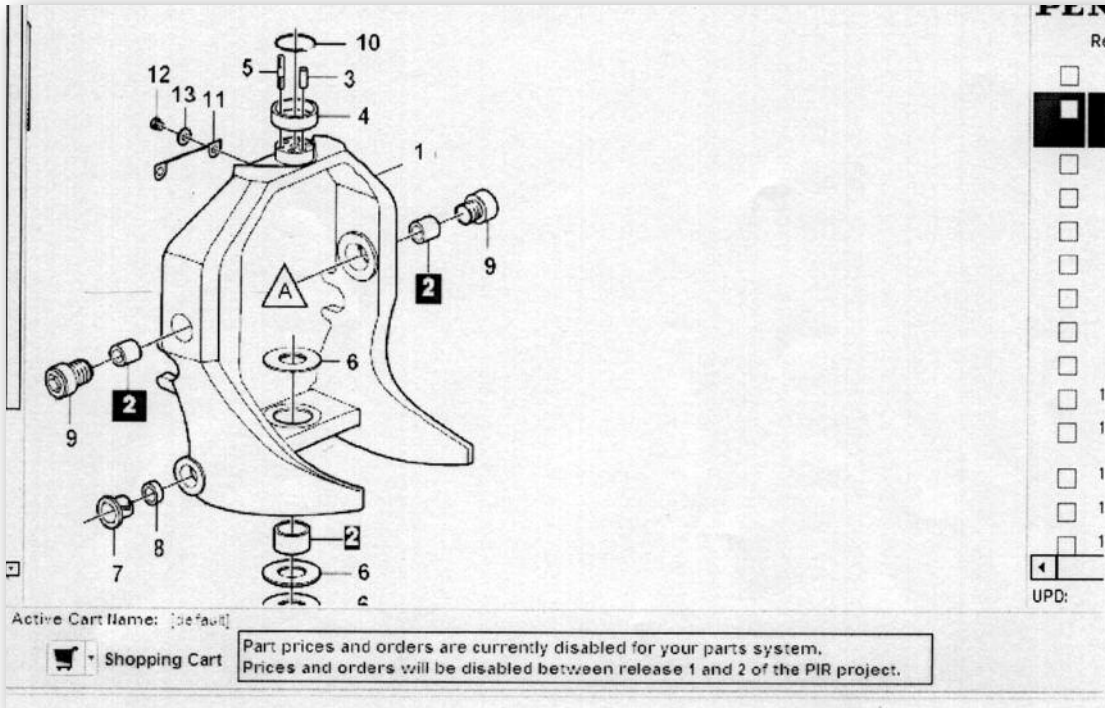


Photo P8161474. Taken 16/08/12 at the premises of Shannon Sailing Ltd. Dromineer where the boat was stored after the incident.

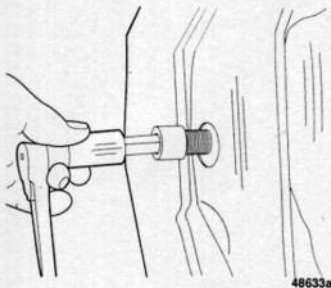
The main impact point is at the front of the outdrive casing at propeller shaft at a level of 226mm above the tip of the skeg and 280mm below the bottom of the hull.

APPENDIX 7.7

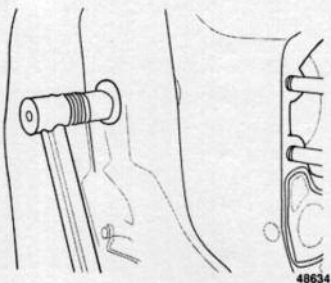
Appendix 7.7 Details for Volvo Penta Transom Shield Assembly SX-M.



Pivot Housing Installation



1. Position the pivot housing in the gimbal ring. Guide the water tube nipple through the housing, and position the bellows behind their respective openings.
2. Align one gimbal ring pivot pin hole with the hole in the pivot housing. Look inside to see if the thrust washer is still in position and not blocking the hole. Screw in the pivot pin until it seats, **but do not tighten** it at this time.



3. Align and install the other pivot pin. Tilt the housing up and down to see if it moves freely. Use a 1/2 in. hex socket and tighten the pivot screws to 105-120 ft. lb. (142-163 N.m).

Note! Hold pivot housing to keep housing from over rotating and damaging bellows and water hose while tightening pivot screws.

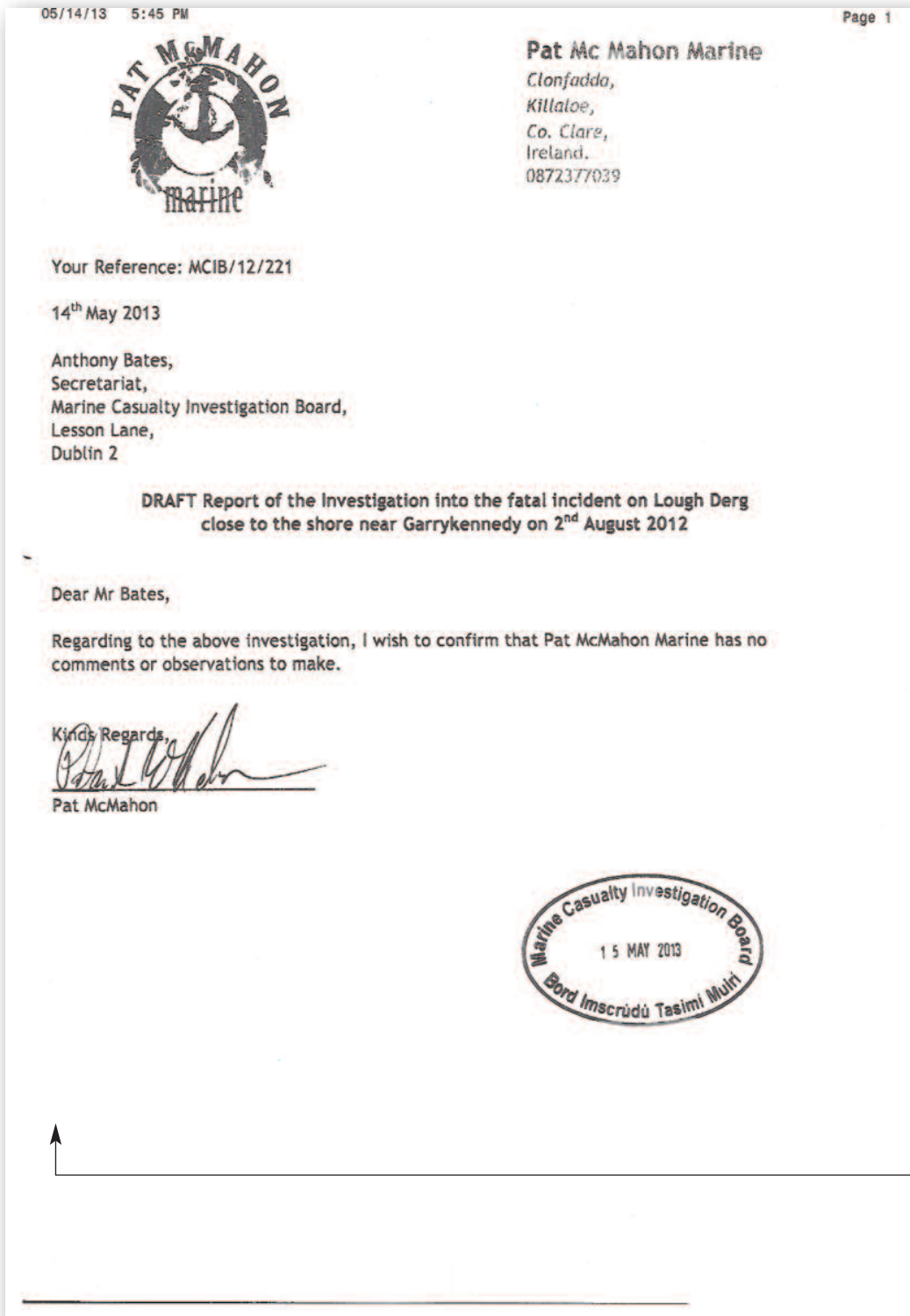
Details for Volvo Penta transom shield assembly SX-M. Provided by Pat O'Donnell Ltd the Irish supplier of Volvo Penta components on 06/09/12.

8. CORRESPONDENCE RECEIVED

	PAGE
8.1 Pat McMahon Marine and MCIB Response.	28
8.2 RNLI and MCIB Response.	29

CORRESPONDENCE 8.1

Correspondence 8.1 Pat McMahon Marine and MCIB Response.



MCIB RESPONSE:
The MCIB notes the contents of this correspondence.

Correspondence 8.2 RNLI and MCIB Response.



Lifeboats

Royal National Lifeboat Institution
Chairman: Admiral the Lord Reynolds CBE OBE DL
Chief Executive: Paul Bossler
RNLI (UK Reg) Ltd 015279377, RNLI (Sales) Ltd 0202240 and RNLI (Operations) Ltd 01845400
RNLI Companies registered in respect of: Queenstown, Dublin, Ireland, Belfast, Northern Ireland

From:
Divisional Base Ireland
Airsides, Swords, Co. Dublin, Ireland
Tel (01) 8900460
Fax (01) 8900458

Ms. Cliona Cassidy BL
Chair
Marine Casualty Investigation Board
Leeson Lane
Dublin2

18th April 2013

Dear Ms. Cassidy

DRAFT REPORT OF THE INVESTIGATION INTO THE FATAL INCIDENT ON LOUGH DERG CLOSE TO THE SHORE NEAR GARRYKENNEDY ON 2ND AUGUST 2012

Reference: MCIB 12/221 dated 17th April 2013

Thank you for inviting the RNLI to comment on the report into the incident that resulted in the tragic loss of Mr. Patrick Danaher on Lough Derg. The thoughts of all those involved in the RNLI are with the family and friends of Mr. Danaher.

The RNLI has nothing further to add to the report.

Kindest regards



Martyn Smith
RNLI Regional Operations Manager
Ireland and the Isle of Man



The RNLI is the charity that saves lives at sea
Charity number ChY 2678 in the Republic of Ireland and registered in England and Wales (209803) and Scotland (SC037796)

MCIB RESPONSE:
The MCIB notes the contents of this correspondence.

