Appendix 4.0

NOISE REDUCTION ON POWER-DRIVEN SMALL VESSELS

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A4.1 Small Vessels Noise Abatement Mechanism

Explanatory Note

Explanatory notes relating to the fitting of "Noise Abatement Mechanisms" on power-driven small vessels, as required by Part VI, Section 37, of the *Small Vessel Regulations* of the *Canada Shipping Act*.

Noise reduction in power-driven small vessels can be achieved in a number of ways; the following examples illustrate some acceptable solutions to addressing the issue.

- Outboard motors have addressed the issue by directing the exhaust gases through the propeller hub or below the cavitation plate.
- Inboard-outboard installations (I/Os) have addressed the issue by directing the exhaust gases through the propeller hub or below the cavitation plate.

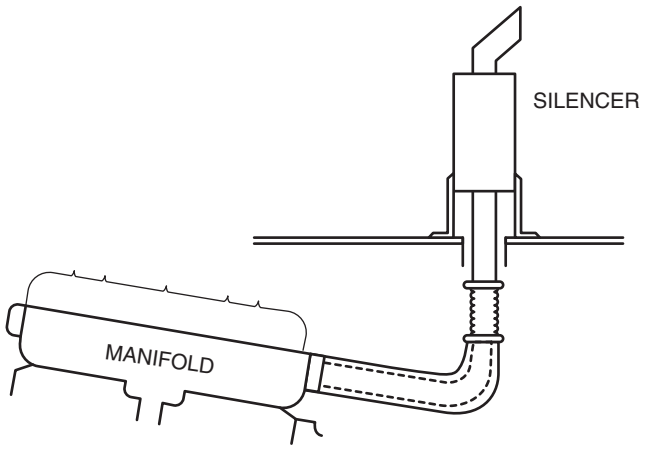
The installation of the following components in a wet exhaust line would be complying with the regulation:

- A muffler is an expansion chamber within the exhaust line specifically designed to reduce engine exhaust noise.
- A waterlock is a device intended to prevent back flooding of cooling water into the exhaust manifold with a side benefit of some noise reduction.
- A diverter, used to direct exhaust gases below the waterline, is acceptable.

Guidance Notes and Explanation Showing Some Possible Installations

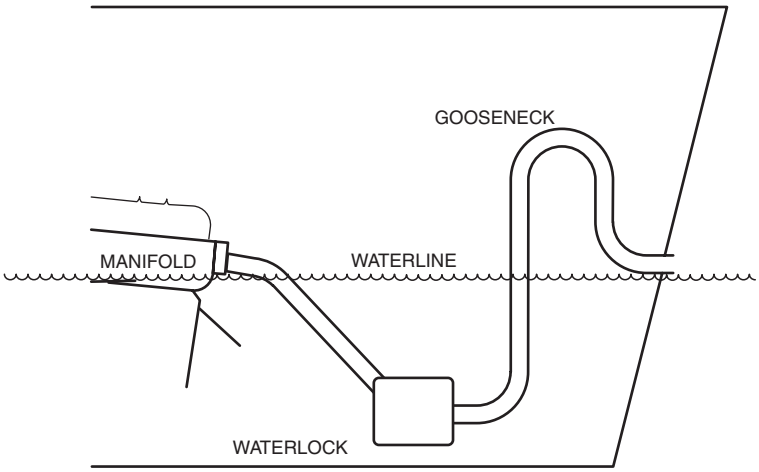
The following is provided for guidance only relating to acceptable engine exhaust noise muffling arrangements. It is not intended as an installation guide or to cover all possible installations. Engine manufacturer's recommendations should be followed with respect to specific installations.

Figure A4–1 Typical Dry Exhaust System



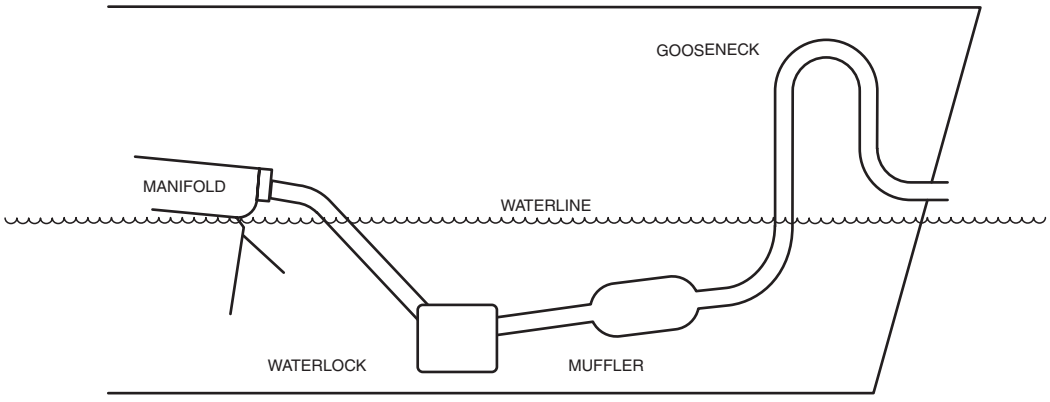
DRY EXHAUSTS should be equipped with a muffler (silencer) generally as indicated in Figure A4–1. The muffler should be sized as large as practical and designed to ensure maximum sound attenuation with minimum back pressure. Dry exhaust systems may be used for propulsion and generator engines of any size.

Figure A4–2 Typical Waterlock System without muffler



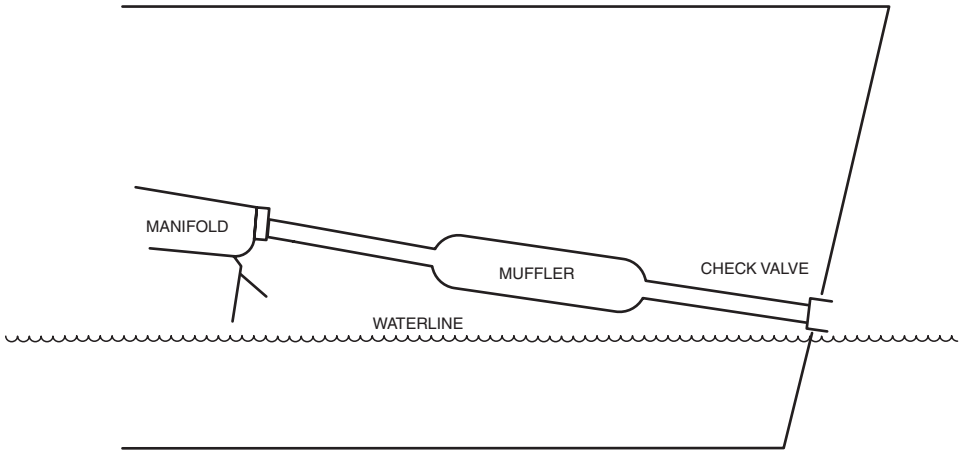
WET EXHAUST Systems may make use of water locks and wet mufflers, or both. Water locks alone may provide sufficient sound attenuation, and are thus suitable for generator engines and smaller propulsion engines. With all wet exhaust systems, care must be taken to ensure water cannot back-siphon into the engine. Depending on the relative height of the waterline an anti-siphon valve or siphon break may be required (not shown in figures).

Figure A4–3 Typical Waterlock System with Muffler



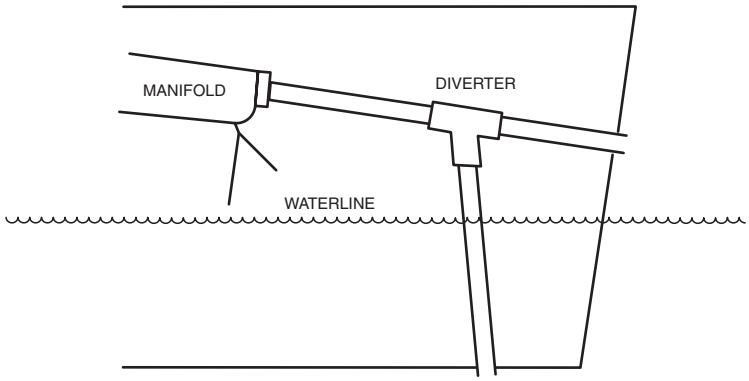
For **LARGER ENGINES** a waterlock may be supplemented with a specially designed muffler.

Figure A4–4 Typical High Performance System



For **HIGH PERFORMANCE** applications an effective muffler should be fitted. Depending on the relative height of engine to waterline, a check valve to prevent backflow of water into the engine may be required. Check valves may be at the transom, integral with the muffler or both.

Figure A4–5 Typical High Performance System with Diverter



For **COMPETITION CRAFT** a diverter may be installed, allowing exhaust gases to pass without restriction where conditions permit. Where conditions require sound attenuation, the diverter is used to divert the exhaust gases through an alternate exhaust system fitted with a muffler or passing through an underwater penetration in the hull.