# Annex 4N

# F2C Engine Extra Air Intake Processing Guide

## 4N.1 Method for Testing F2C Engine Crankcase Leakage

### Evaluation method

The proposed evaluation method is to use a small adjustable flow 12V diaphragm vacuum pump connected to adaptors that can form a seal with the engine crankcase at the front, as well as through the rear (with exhaust port, top of case and prime nipple sealed), so that a vacuum reading can be established whilst allowing the crankshaft to be rotated.

After the adaptor is secured to the front of the engine and ensured that it is sealing well (as well as the sticky tapes for the exhaust port and the top of the crankcase), the vacuum pump is turned on and the speed or air bleed valve (for finer adjustment) is adjusted to achieve a steady reading of about 8.0 or 10.0 inch Hg (28 or 34 kPa) on the vacuum gauge.

The crankshaft is then slowly rotated through 720 degrees and the highest and lowest gauge reading recorded.

The adaptor is then removed and secured to the rear of the crankcase, ensuring the taped up exhaust port and top of crankcase are sealing perfectly, then the same measuring process is repeated.

| **Vacuum Measurements** (~8 or 10 in-Hg as datum) | **Inch-Hg** | **Pass** | **Crankshaft Disassemble** |
|---|---|---|---|
| Evaluation from Front | High - Low | = or <1.0 | >1.0 |
| Evaluation from Rear | High - Low | = or <1.0 | >1.0 |
| Average of high and low | Front - Rear | = or <1.0 | >1.0 |

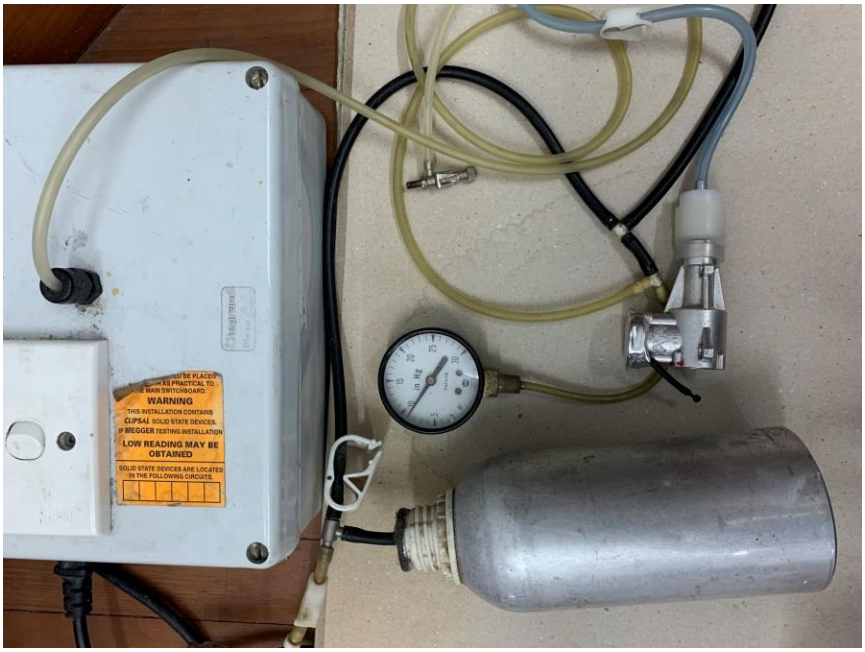
## 4N.2 Suggested Equipment List:

1. Variable output 12 volts DC power supply that can sustain a continuous draw of 10 watts or more.
2. DC 12V Diaphragm vacuum pump, 55 kpa (16.5 in.Hg) vacuum or higher rating.
3. >300 ml hard plastic or metal canister as a vacuum reservoir.
4. Dial face 5 cm vacuum gauge 0-100 kPa in 2 kPa graduations (2 inch 0-30 in.Hg in 0.5 or 1 in.Hg graduation. Preferred as it is easier to read).
5. Fine graduation needle valve as fine adjustment bleed valve.
6. Derlin adaptor holder ~16.8 mm OD and 15-20 mm length, with 8.0 diameter x 10 mm depth hole drilled at one end and an air tight pressure nipple machined or fastened into the other end. Exact OD of the adaptor will depend on the diameter and wall thickness of the silicon rubber tube available.
7. 20 mm OD silicon rubber tube with wall thickness approximately 1.8 mm.
8. Small diameter silicon tubing as appropriate.
9. T-joint tubing connectors of appropriate size.
10. “Duck” brand waterproofing tape for sealing top and exhaust opening of crankcase (consists of butyl rubber mastic adhesive on heavy aluminium foil, will conform to uneven surfaces).

*cont/…*

**4N.3 Photos relating:**

Vacuum measuring jig with adaptor attached to front and rear of crankcase respectively:

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