

## 1.0 Purpose

The purpose of this document is to provide the method for testing the functionality of the Growth Innovations Adjustable Pitch Propeller (GIAPP) assembly in a simulated use and field use environment.

## 2.0 Scope

This document applies to the Growth Innovations Adjustable Pitch Propeller assembly.

## 3.0 Relevant Documentation

- 3.1 Growth Innovations Adjustable Pitch Propeller Final Design Report Fall 2005. (Current Standing Revision)
- 3.2 Applicable Test Protocol.

## 4.0 Equipment

- 4.1 Testing trough
- 4.2 Appropriate motor
- 4.3 Shift Linkage
- 4.4 GIAPP assembly
- 4.5 Timing device
- 4.6 Appropriate boat
- 4.7 Pole (for boat movement)
- 4.8 Paddles (2)
- 4.9 Life Vests
- 4.10 Gas

## 5.0 Safety Considerations

- 5.1 The GIAPP is a high speed assembly. Stand clear of test area during simulated use.
- 5.2 The motor will get hot during operation. Refrain from touching the motor during operation.

## 6.0 Preparation

- 6.1 Secure the testing platform and water trough in anticipation of high levels of vibration and generated forces during testing.
- 6.2 Fill the water trough with water.

## 7.0 Procedure (Simulated Use)

- 7.1 Fasten the motor to the test stand.
- 7.2 Fasten the GIAPP and associated shift linkage to the motor shaft.
- 7.3 Fill the testing trough with water.
- 7.4 (BY HAND) Manually check for free rotation of the rotating segment of the GIAPP and rotation of the blades via use of the shift linkage.

- 7.5 Lower the GIAPP and motor shaft into the trough to a suitable height.
- 7.6 Turn on the motor and allow five (5) minutes for warm up at idle.
- 7.7 Observe the motor shaft and GIAPP assembly for any irregular movement or vibration during warm up.
- 7.8 Engage the full forward position by using the shift linkage.
- 7.9 Increase the throttle position to full throttle for 5 minutes.
- 7.10 Observe the flow of water in the trough to ensure that the proper directional thrust is generated.
- 7.11 Return the throttle position to idle for one minute.
- 7.12 Engage the full reverse position using the shift linkage.
- 7.13 Repeat steps 7.9 – 7.11
- 7.14 Repeat steps 7.8 – 7.13 until the total full throttle time is one hour.
- 7.15 Disassemble the GIAPP and note damage and wear to the internal components (if any).
- 7.16 Reassemble the GIAPP and note any difficulties on the appropriate note sheets.

## **8.0 Procedure (Field Use)**

- 8.1 Fasten the GIAPP and shift linkage to the motor shaft of the test motor.
- 8.2 Allow a one minute warm up for the motor.
- 8.3 Observe the GIAPP for irregular vibration.
- 8.4 Run the motor at full speed (forward and reverse) through deep open water sections of the test facility.
- 8.5 Run the motor at low speed (forward and reverse) through weeded areas to verify the weedless capabilities of the GIAPP.
- 8.6 Upon returning to the dock, remove the GIAPP from the motor and disassemble it noting any wear or damage to the components.
- 8.7 Approximate runtime for the field use segment of this test should be a minimum of one hour.

## **9.0 Acceptance Criteria**

- 9.1 Refer to applicable test protocol.