



**INSTRUCTIONS
FOR
CONTINUED AIRWORTHINESS
SA09857AC**

ICA-200 Rev A

FAA Approved for

**Bellanca
Model
17-30A**

**Installation Manual for IStart-1
Master Drawing List No. A-00 Rev. E**

Flight Manual Supplement Nos. 6018-1Rev. IR

**IStart
Model Numbers: IStart-1**

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1. RECORD OF REVISIONS

REV	ISSUE DATE	DATE INSERTED	BY	DESCRIPTION
IR	03/02/2016		DRB	Initial Release
A	06/20/2016	06/20/2016	DRB	Title page, revised A-01, p.8

2. LIST OF EFFECTIVE PAGES

For incremental changes each revised page will have (-X) following current revision (E.g. A-1, A-2) until entire document is revised to the next letter level. Current page revision will be reflected in the table below at each change. In addition:

- Changes made to a line will be indicated by a vertical bar in the left margin next to the line.
- Changes made to a paragraph will be indicated by a vertical bar in the left margin next to the paragraph.
- Changes made to a line will be indicated by a vertical bar to the right of the page number.

TITLE/SECTION Revised	PAGES	REV NO.
Manual-All	1-11	IR
All	1-11	A

3. ABBREVIATIONS

N/A

4. INTRODUCTION

WARNING: Means a maintenance procedure, practice, condition, etc. that could result in personal injury or loss of life.

CAUTION: Means a maintenance procedure, practice, condition, etc. that could result in damage or destruction of equipment.

NOTE: Means a maintenance procedure, practice, condition, etc., or a statement which needs to be highlighted.

GENERAL ADVISORIES

NOTE: These instructions are intended for use by personnel familiar with standard aircraft avionics practices and methods of maintenance. If you do not have prior experience with or knowledge of avionics systems, do not attempt the following instructions. IStart will not be held liable for damaged items resulting from improper handling and maintenance.

WARNING

Service personnel are to obey standard safety precautions, such as wearing safety glasses, to prevent personal injury while installing or doing maintenance on this unit.

WARNING

This IStart system exhibits a high degree of functional reliability. Nevertheless, users must know that it is not practical to monitor for all conceivable system failures and, however unlikely, it is possible that erroneous operation could occur without a fault indication. The pilot has the responsibility to find such an occurrence by means of cross-checks with redundant or correlated data available in the cockpit.

CAUTION

Remove all power to the IStart unit before disconnecting or removing it. Disconnecting the unit with power connected may cause voltage transients that can damage the unit.

NOTE

Superseded Documents: The information, procedures, requirements, and limitations contained in this Instructions for Continued Airworthiness for this type design change supersede the information, procedures, requirements and limitations contained in the aircraft's maintenance manual when the type design change is installed on the Type Certificate Holder's aircraft.

4.1 Purpose

The purpose of these Instructions for Continued Airworthiness is to provide the line maintenance technician with the information necessary to ensure the continued airworthiness of the IStart-1 system.

4.2 Effectivity

This ICA is effective for Bellanca Model 17-30A aircraft modified by the installation of an IStart-1 Kit.

This maintenance plan is designed to meet the required INSTRUCTIONS for CONTINUED AIRWORTHINESS (14 CFR FAR 23.1529), for aircraft equipped with the IStart-1 system. This plan must be placed into the aircraft operator's Aircraft Maintenance Manual and incorporated into the operator's scheduled maintenance program.

4.3 Reference Documents, Table 1

This document forms a part of the overall aircraft continued airworthiness requirements and is to be used in conjunction with the following documents, as applicable. Reference applicable drawings

DOCUMENT NUMBER	TITLE
A-01 Rev E	IStart Installation drawing
A-02 Rev C	Installation Instructions for IStart

Table 1

Note: It is the responsibility of the Maintenance Technician to verify with the Vendor that the data being used is the latest revision. Current documents can be verified at www.iStartair.com

4.4 Applicable FARs

14 CFR 21.50 Instructions for Continued Airworthiness and manufacturer's maintenance manuals having airworthiness limitations sections.

14 CFR 23.1529 Instructions for Continued Airworthiness.

5. GENERAL WIRING INSTRUCTIONS.

5.1 Wire Separation

Whenever it becomes necessary to repair or replace a wire or group of wires, maintain the same wire separation that was used to install the system. Any wire added to or removed from the aircraft should satisfy separation requirements and wiring standards, in accordance with FAA Advisory Circular AC 43.13-1B, Chapter 11, Section 8, Paragraphs 11-96 (w), (z) and (dd).

5.2 Wire Routing

The IStart wiring harness contains nine individual wires. In a typical installation the Blue Thermistor and Brown Injector control must pass through the firewall to the engine compartment. The Orange P lead and the Green Starter circuit wires may be connected at the magneto or start switch. The Red Pump In Power and White (via a switch and fuse assembly) Controller Power wires will be connected to the circuit breaker used to supply power to IStart. The Grey Pump Out wire is connected to the pump side of the boost pump switch. The Yellow wire is connected to the panel LED and lastly the Black ground wire to any convenient ground source. IStart Drawing A-001 on page 8 shows this wiring. Whenever it becomes necessary to repair or replace a wire or group of wires, maintain the same wire routing that was used to install the system. Ensure that wires are separated from mechanical control cables and are not able to come closer than 1/2 inch to such controls when light hand pressure is applied to wires or controls. Wires should have been routed using proper bend radii, drip loops, slack and firewall penetrations to allow for easy access for maintenance repairs and inspection. Route wires in such a manner that it complies with regulatory safety requirements. (Ref: AC 43.13-1B, Chapter 11, Sections 8, Paragraphs 11-96 (b), (q-y) and (aa-gg) and Section 9).

5.3 Securing Wire Bundles

Whenever it becomes necessary to repair or replace a wire or group of wires, clamps of the proper size, type, and material should be used. Secure repaired or replaced wiring in the same manner that it was installed in the aircraft. (Ref: AC 43.13-18, Chapter 11, Sections 8, Paragraphs 11-96 (a-p) and Sections 9 and 11).

5.4 Wire Termination

Whenever it becomes necessary to terminate wires, care should be taken to ensure enough slack in wiring for proper servicing, repair, and fit. When stripping wires for termination, be sure not to nick or cut strands of wire. Check that proper crimping tools are used, and insure they are set to the proper setting for a correct crimp. Utilize the correct size terminals and/or splices according to wire gauge when crimping. If soldering is necessary, be sure a cold solder joint does not exist and that shrink tube of the proper size is installed over the wire and connection point.

NOTE

It is expected that the skilled technicians performing the inspections, tests, and troubleshooting of the IStart-1 system will adhere to the safety practices and operational procedures given in the basic aircraft manufacturers Maintenance Manuals.

6. SYSTEM DESCRIPTION

The IStart System addresses the problems of different fuel requirements caused by the widely variable conditions an operator faces during starting.

Using fuel from the existing aircraft system, a computer controlled fuel injector supplies fuel for Priming, Cranking and Idling after start. Sensors detect rpm, starter engagement, electrical power application and automatically and independently operates the electric boost pump. A Status light on the instrument panel alerts the pilot when to begin Cranking and when to advance the Mixture. Once the Mixture control has been advanced to Rich, IStart is automatically deactivated.

IStart only operates on the ground during starting and has no taxi or in-flight function. IStart has safety features which will not allow a pilot to taxi with the system in operation. Procedurally, the operator also moves the IStart power switch OFF as a secondary safety. From the pilot's perspective, IStart is a simple, quick and reliable starting system for all environmental conditions.

7. CONTROL AND OPERATION INFORMATION

All system pilot control functions are from the instrument panel mounted on-off switches.

7.1 Modes of Operation

7.1.1 Power Up- IStart delivers fuel to prime based on engine temperature.

7.1.2 Cranking- After sensing starter engagement, fuel may be delivered.

7.1.3 Idling- Fuel is delivered at a predetermined rate to idle at approximately 1000 rpm.

7.1.4 Shutdown- When the pilot moves the Mixture to RICH, IStart shuts down. IStart cannot be activated again while the engine is rotating.

8. SERVICING INFORMATION

Servicing of the IStart is "On-Condition" but should be checked during any 100 hr inspection / annual inspection as a minimum. The following inspections shall occur during the 100 hr / Annual Inspection Program at a minimum. These inspections include:

- a. Checking component installations against this document. Drawing in section 11.1.
- b. Unless otherwise specified, mechanical fasteners shall be inspected for proper installation in accordance with AC 43.13-1B, Change 1, Chapter 7, Paragraphs 7-37, 7-41, 7-50, 7-64, 7-66, 7-87, 7-103, and 7-124, as applicable.
- f. Inspect all brackets, hoses, fittings and support structures for wear, cracking, corrosion and security.
- g. Inspect wiring and connectors for corrosion, damage, loose pins, broken shielding, frayed wiring, cracking.

NOTE: For replacement of any of the IStart wiring, cables or associated components, reference the documents in the appropriate drawing or document associated with the action performed.

9. MAINTENANCE INSTRUCTIONS

Servicing of the IStart is "On-Condition" but should be checked at a minimum during any 100 hr / annual inspection as noted in Section 8 above. For further testing refer to system operational checkout in section 10.

10. TROUBLESHOOTING INFORMATION

After maintenance tests and basic troubleshooting guidelines are listed below.

10.1 SYSTEM OPERATIONAL CHECKOUT AFTER MAINTENANCE

CHECK OUT

FUNCTION

1. Apply aircraft power

RESULTS

Boost pump runs, Status light flashes

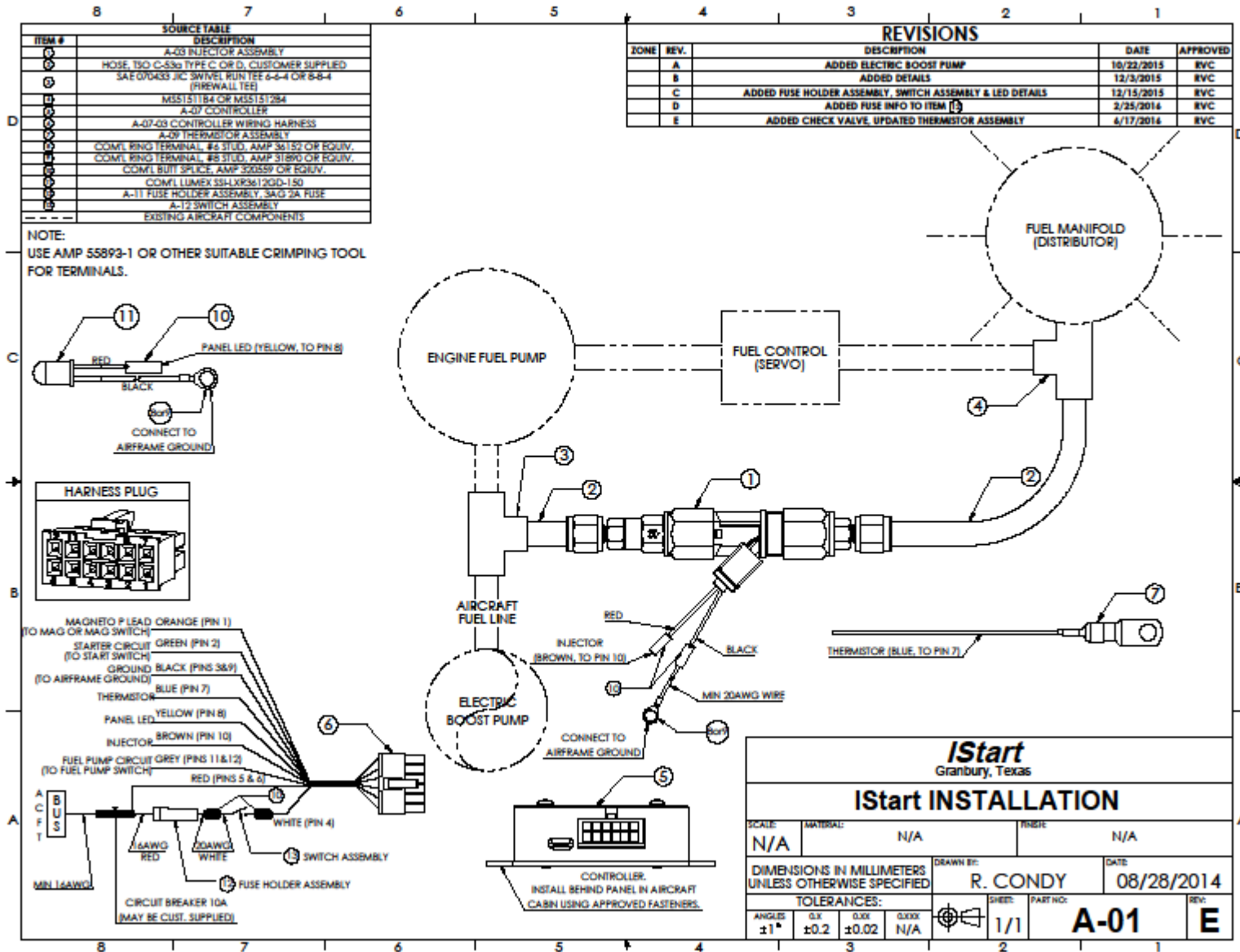
IStart-1 System Troubleshooting Guide	
Symptom	Action
No Status light	Check 2A fuse and Power (white) wire integrity.
Status light on Steady after turning on IStart	Thermistor (Blue) wire is grounded or broken.
Status light On but pump doesn't run	Check IStart 10A/Boost pump CB in. Check Boost Pump Power (Red) wire and Boost Pump Supply (Gray) wire integrity.
Engine cranks but doesn't start	Remove the IStart fuel line at the distributor and verify fuel delivery when the Power switch is turned ON.
No fuel delivered at the distributor when power is applied	Remove the IStart fuel line at the inlet to the Injector Assembly and verify fuel delivery when the Power switch is turned ON.
No fuel delivered at the distributor when power is applied	Using a meter, verify that 12/24V is present at the injector (brown wire) when turning IStart power ON. If power is present, suspect a clogged injector. Return to IStart for inspection.
Engine cranks but doesn't start	Verify that the boost pump continues to run after starter release.
Fuel pump does not run after starter release	Suspect a inoperative Controller. Return the Controller Assembly (A-07) to IStart for inspection.
No troubleshooting actions are successful	Contact IStart for assistance. www.istartair.com

Table 2

11. COMPONENT REMOVAL INFORMATION

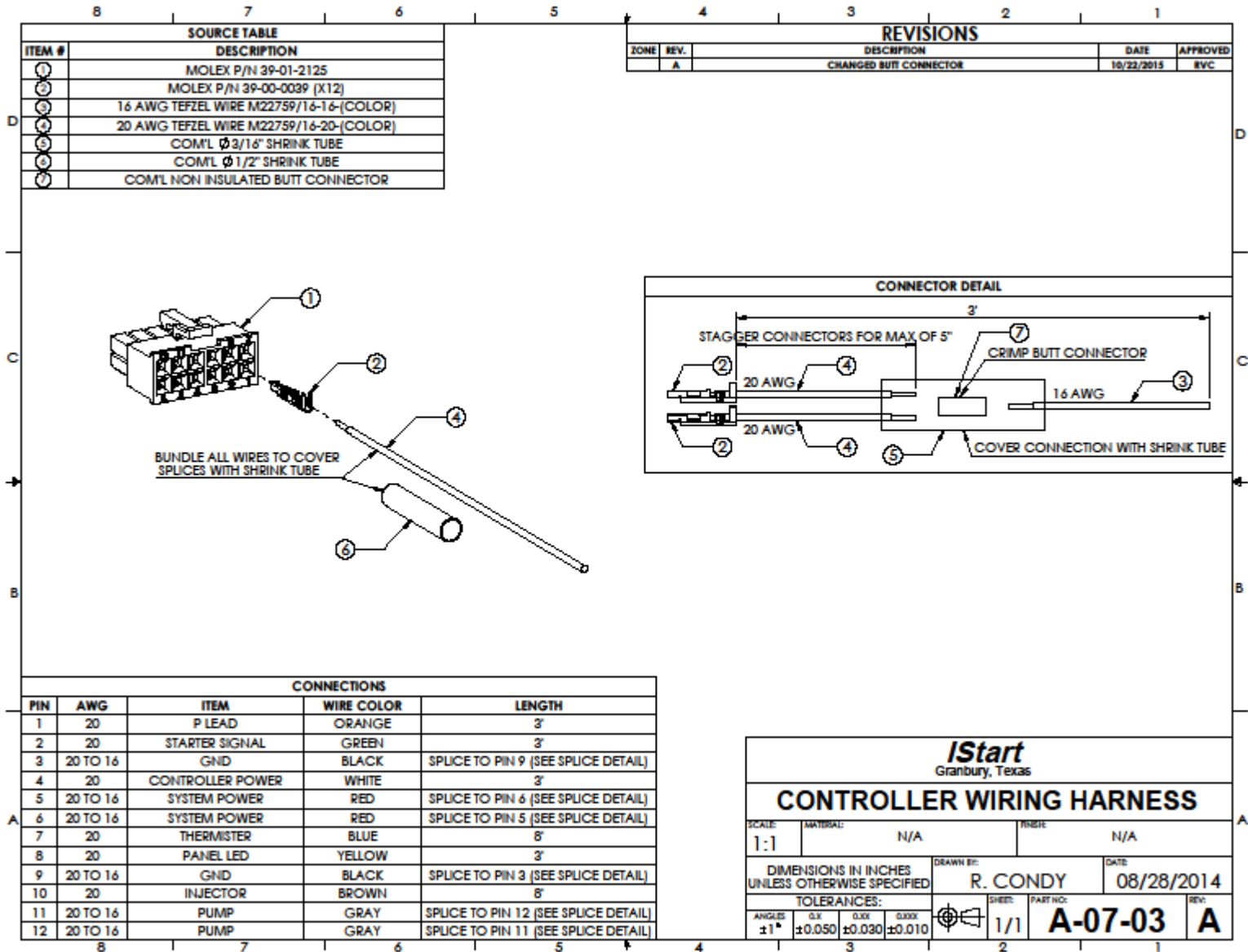
All components can be removed with common tools and practices. See section 14 List of Common/Special Tools.

11.1 IStart Installation Drawing No. A-01



11.2 WIRING INSTALLATION FOR CABLE HARNESS

Drawing No. A-07-03



11.3 IStart Component Removal

Prior to beginning any work on the IStart system, remove power from the aircraft and pull the associated IStart circuit breaker.

11.3.1 Controller (P/N A-03):

The Controller is located in the cabin of the aircraft behind the instrument panel. Should it be necessary to replace the Controller, unplug the harness plug. Remove the mounting fasteners. Remove the IStart Controller from the aircraft

11.3.2 Injector Assembly (P/N A-07):

The Injector Assembly is located in the engine area of the aircraft. To remove the Injector Assembly, unplug the plug from the connector on the Injector. Detach the Injector Assembly from the airframe and remove the hose from each end of the Injector Assembly. If an Injector Assembly is not to be immediately reinstalled, cap both hoses to prevent contamination of the fuel system by debris. Cap Injector Assembly fuel fittings to prevent contamination of the Injector Assembly during shipment. Reinstall or install replacement by reversal of this removal procedure.

11.3.3 Thermistor Assembly (P/N A-09):

The Thermistor Assembly is located in the engine area of the aircraft, secured under a cylinder valve cover screw. To remove the Thermistor Assembly, remove the screw securing the Thermistor Assembly to the cylinder. Cut the Blue wire to the Thermistor Assembly.

12. COMPONENT REPLACEMENT INFORMATION

12.1 Controller (P/N A-03):

Re-install the Controller in the original location. Plug the wiring harness back into controller ensuring that the locking tab is engaged.

Ensure that movement and re-installation of the controller during this process has not caused any interference with flight controls. No additional inspections are required after Controller replacement.

12.2 Injector Assembly (P/N A-07):

Re-install the Injector Assembly in the original location. Connect the fuel lines to the inlet and outlet fittings. Connect the harness plug and engage the plug lock. Ensure that the hoses are adequately supported as outlined in AC 43.13

After Injector Assembly replacement, operate the aircraft's electric fuel pump and inspect for leaks where the hoses are attached. Next, turn the aircraft's Battery Master switch on, turn the IStart power switch ON and again inspect for leaks where the hoses are attached to the Injector Assembly.

12.3 Thermistor Assembly (P/N A-09):

Re-install the new Thermistor Assembly to the cylinder with the valve cover screw and tighten. Cut the butt-splice off of the Blue harness wire and splice the wire to the Thermistor Assembly's wire with a new butt-connector. Use aircraft quality butt connector such as AMP PIDG type and appropriate stripping and crimping tools. No additional inspections are required after Thermistor Assembly replacement.

13. Parts

Replacement parts unique to the IStart system are available at www.istartair.com

14. DATA FOR STRUCTURAL FASTENERS

Fasteners conforming to AN, NAS or MS specifications required.

15. LIST OF COMMON/SPECIAL TOOLS

Quality terminal crimping tools, wire stripper and connector crimper are required to ensure consistent, reliable crimp contact connections. These tools are available from Allied Electric or other vendors:

Terminal Pin Crimper:	Allied part # 70111122 (Molex Type 4D 16-24 AWG) or equivalent
Wire stripper	Allied p/n 70225344 (Stripmaster 45-097) or equivalent
Terminal Crimper	Allied p/n 70145387 (Klein 1005) or equivalent

16. COMMUTER CATEGORY AIRCRAFT

N/A

17. RECOMMENDED OVERHAUL PERIODS

No additional overhaul time limitations. Remove and repair on-condition.

18. COMPONENT WEIGHTS AND CURRENT DRAW

1. COMPONENT	WEIGHT
Controller (A-07).....	4 oz.
Injector assembly (A-03).....	4 oz.
Wiring harness (A-07-03).....	4 oz.
Firewall fitting (SAE 070433).....	3 oz.

2. CURRENT DRAW

Nominal for 14V/24V aircraft (logic)1.0 Amps

19. AIRWORTHINESS LIMITATIONS

The Airworthiness Limitations section is FAA approved and specifies maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

There are no Airworthiness Limitations for this STC.

20. STRUCTURAL INSPECTIONS

No new structural inspections required.

21. ANNUAL INSPECTIONS

Refer to Section 8

22. REVISIONS

The Service Letter/Bulletin program will be utilized to inform aircraft operators of any changes to this ICA. Aircraft operators may contact IStart at (817) 219-0007 to verify that they have the latest revision of any of the documents included in this STC.

