UNISON INDUSTRIES

POWER-TO-LITE®

Ignition System Tester
Operation and Maintenance Manual
P/N 137332

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TO: Holders of Bulletin 94-2, Revision No. 9, dated March 15, 2012

SUBJ: Revision No. 10, dated Dec 31/13

HIGHLIGHTS

Pages which have been significantly revised are outlined below, together with highlights of the revision. For your convenience this manual has been reprinted in its entirety. Please replace your current bulletin 94-2 with this Revision No. 10.

Chapter/Section and Page No.	Description of Change	Effectivity
Operation/1-2 Page 1	Revised paragraph 2.A.(1) to add information about calibration.	All
Operation/1-3 Page 1	Added “A” cells and reference to test set revision level to paragraph 3.A., Internal Battery Suppy. Added “continuous” to Battery Life.	All
Maintenance/2-1 Page 1	Added “A” cells and reference to test set revision level to paragraph 1.B.(2).	All
Maintenance/2-1 Page 2	Revised paragraph 1.C.(3)(a)4 to add information about the known good sample.	All
Maintenance/2-1 Page 3	Added NOTE to paragraph 1.D. Revised paragraphs 1.D.(3)(b), 1.D.(3)(f), and 1.D.(4)(d) to remove reference to “C” cell.	All
Appendix A Page 1	Library is now at Revision 6.2. Added GE90 to CF6 and CFM56 Engine list. Added 10-631045-3 to CF6, CFM56, and GE90 Engine list.	All
Appendix A Page 2	Added 10-631045-3 to CF34 Engines. Added 10-516000-1, -2, -3 to GTCP36 Engines.	All
Appendix A Page 3	Added GTCP131 and RE100 Engine List. Added 9049820-6 to RE220 Engine list.	All
Appendix A Page 4	Added 47649-1, -2, and-3 to PW2037 Engine list. Added 44933-1 and 10-621630-3 to JT9 and PW4000 Engine list.	All
Appendix A Page 5	Corrected Rolls-Royce (Allison) 501 Engines Exciters Adapter Lead, Sensor Box, and Shorting Plug part numbers. Deleted “Use Input Simulator” from Comments column. Added 430138 and 501240-1 to AE2100/AE3007 Engine list	All
Appendix A Page 6	Moved BMW/Rolls-Royce BRR 700 Engines Series from page 1. Corrected Sensor Box PN to SRR1.	All

RECORD OF REVISIONS

REV. NO.	DATE ISSUED	DATE INSERTED	BY	REV. NO	DATE ISSUED	DATE INSERTED	BY
Basic	May 31/94	May 31/94	Unison				
Rev. 1	May 30/96	May 30/96	Unison				
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Rev. 9	Mar 15/12	Mar 15/12	Unison				
Rev. 10	Dec 31/13	Dec 31/13	Unison				

Keep this record in the front of the manual. When you get this revisions, insert revised pages in manual. Enter revision number, date issued, date inserted, and initials.

LIST OF EFFECTIVE PAGES

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INTRODUCTION

1. General

This Operation and Maintenance Manual provides operating instructions and an Illustrated Parts List for the POWER-TO-LITE® Ignition System Tester PN 137332 manufactured by Unison Industries, Norwich, NY 13815.

A. This Operation and Maintenance Manual agrees with Air Transport Association (ATA) Specification 101.

B. These instructions do not include all details or variations in equipment. They do not give all possible contingencies in relation to installation, operation, or maintenance of the unit. If more data is necessary or special problems occur, refer to Unison Industries.

C. All instructions in the manual are shop verified. Shop verified procedures are those by which the manufacturer has done all testing and troubleshooting procedures in this manual on equipment of the same configuration to that given.

D. Dimensions are given in US Standard Units. Values of the International System of Units (SI units) are given in parentheses after the US Standard Units.

E. To prevent injury to persons and/or damage to equipment, always obey approved shop procedures and safety precautions. Workmanship must agree with industry and government accepted standards for electronic ground equipment.

WARNING: IMPROPER OR UNAUTHORIZED APPLICATIONS OF INFORMATION CONTAINED IN THIS MANUAL MAY RESULT IN LOSSES OR DAMAGES TO THE USER.

All technical documentation and information contained herein, with respect to Assembly and Disassembly, Cleaning, Inspection methods and limits, Repair methods and limits, Operational limits, life limits and the like, have been developed and approved for use with parts that have been manufactured and/or approved by Unison Industries and that have been maintained in accordance with Unison Industries technical documentation and recommendations. Unison Industries has no contractual or legal obligation for, nor knowledge of, non-Unison-approved parts and repairs. Accordingly, this document is not intended to apply to non-Unison-approved parts or repairs.

When performing installation, maintenance, replacement, adjustment, inspection, or overhaul of any Unison assembly, component, or part, it is imperative that the latest revision of the appropriate manual or product support document be referenced. Contact Unison Industries to be sure you have the latest manual or support document revision before performing any work. Unison assumes no liability for any actual, consequential, or other types of damages directly or indirectly resulting from the unauthorized use of this manual for other than its stated purposes.

F. Warnings, Cautions, and Notes.

IMPORTANT SAFETY NOTICE

It is the operator's responsibility to fully know the warnings and cautions used in this manual. Death or damage to the equipment can occur if you do not monitor the warnings and cautions.

(1) Definitions.

WARNING: A PROCEDURE, CONDITION, STATEMENT, ETC., WHICH IF NOT STRICTLY MONITORED, COULD CAUSE INJURY OR DEATH.

CAUTION: A PROCEDURE, CONDITION, STATEMENT, ETC., WHICH IF NOT STRICTLY MONITORED, COULD CAUSE DAMAGE TO THE EQUIPMENT. THIS COULD ALSO CAUSE INJURY OR DEATH.

NOTE: Important condition or statement for which special data is necessary.

G. Warranty.

The POWER-TO-LITE® Ignition System Tester is warranted to the original user against any defects in material or workmanship for a period of one (1) year from the date of purchase. For further details, please contact Unison Industries to obtain a copy of our standard warranty terms.

CHAPTER 1
GENERAL INFORMATION
AND OPERATING INSTRUCTIONS

1. DESCRIPTION

The POWER-TO-LITE® Ignition System Tester, PN 137332 is manufactured by Unison Industries. It is designed as a test aid to isolate faulty high voltage ignition system components (plug, lead, or exciter) in a flight line, gate, maintenance shop, or hangar environment.

The Ignition System Tester (IPL Figure 1) is contained in a yellow rain tight case with storage space for up to three (3) remote sensor units, or two (2) sensors plus two (2) shorting plugs, and associated cables.

It should be noted that this tester is not a substitute for the electrical performance tests found in the various Unison product maintenance manuals, as it is not authorized for acceptance testing leading to product recertifications. Again, its function is for troubleshooting only.

2. OPERATION

WARNING: DUE TO THE NATURE OF HIGH VOLTAGE IGNITION SYSTEMS, CONTACT WITH LETHAL VOLTAGES IS POSSIBLE. REFER TO SPECIFIC EXCITER MAINTENANCE MANUAL FOR SPECIFIC SAFETY INSTRUCTIONS. THE OPERATOR SHOULD USE PROPER SAFETY PRACTICES. AVOID CONTACT WITH THE SENSOR BOX AND IGNITION LEAD WHILE IGNITION SYSTEM IS ENERGIZED.

WARNING: ENSURE THAT THE IGNITION SYSTEM IS OFF WHILE CONNECTING AND DISCONNECTING LEADS AND SENSORS FOR TESTING. FAILURE TO DO SO COULD RESULT IN LETHAL ELECTRICAL SHOCK FROM THE IGNITION EXCITER OUTPUT.

A. Power On.

(1) The Ignition System Tester may be powered from its own internal battery supply, or from an external power source of 115 V @ 47 to 420 Hz. The test set will be calibrated at the factory using battery power. Prior to using the test set with AC power, the test set will need re-calibration using AC power. Whenever the test set changes power source, a calibration will need to be performed prior to use with the selected power source. The tester will automatically switch to the 115 VAC source when it is connected to the external power source.

NOTE: If the display indicates "BATTERY LOW", tester use can continue until new batteries are installed. Install new batteries before next use.

(2) Momentarily press the "POWER ON/OFF" button to turn the Ignition System Tester on. To turn off the tester, momentarily press the "POWER ON/OFF" button again. Should the internal processor not detect any operator activity for a period of 5 minutes, the Ignition System Tester will turn itself off to save battery life.

B. General Operation.

(1) Before testing the ignition system inspect the physical condition of the Ignition Components. Check to assure the engine ignition leads are in good condition and all connections are properly torqued. Be sure that the outer shield is in good condition, without any cracks at the connector braze joints.

CAUTION: PREMATURE AUTO-TURN OFF OF THE TESTER COULD RESULT FROM SEVER RFI CAUSED BY THE LOOSE CONNECTION OF HIGH TENSION LEADS. BE SURE THAT ALL HIGH TENSION CONNECTIONS ARE SECURE AND ARE PROPERLY CONNECTED.

CAUTION: DO NOT USE LUBRICANT ON THE DISCHARGE SENSOR THREADS. LUBRICANT WILL INTERFERE WITH PROPER EXCITER DISCHARGE AND CAN EFFECT THE POWER-TO-LITE® TESTER READINGS, AND OR RESULT IN DAMAGE TO THE TESTER.

CAUTION: TO AVOID DAMAGE TO THE SENSOR THREADS THE OPERATOR MUST CHECK THE MATING THREADS OF THE DISCHARGE LEAD TO BE CONNECTED FOR DAMAGE OR LUBRICANT. ANY DISCHARGE LEADS WITH DAMAGED THREADS SHOULD BE REPLACED AND ANY LUBRICANT SHOULD BE REMOVED BEFORE CONNECTING THE SENSOR. DAMAGED THREADS WILL RESULT IN UNREPAIRABLE DAMAGE TO THE SENSOR AND/OR THE EXCITER.

NOTE: Use of thread lubricant is not authorized with the POWER-TO-LITE® Tester. Evidence of lubricant will result in voiding any POWER-TO-LITE® warranty.

(2) For exciters with two outlet terminals, connect the shorting plug to the outlet not under test.

(3) Connect the remote sensor to the end of output lead, or to the exciter, using the appropriate test lead. Be sure all connections are wrench tight.

(4) Connect the sensor lead from the sensor to the Ignition System Tester with the coax lead which is provided.

(5) Turn on the tester by pressing the "POWER ON/OFF" button.

(6) When display reads "ENTER P/N TO TEST?", enter the exciter P/N under test using the tester keypad (i.e. 45570, then "ENTER"). Proceed as instructed by the Ignition System Tester's Display.

(7) Energize ignition, then press "ENTER" on keypad.

(8) When measurement is completed, the actual values and the PASS, HIGH, or LOW results will be displayed on the Ignition System Tester's LCD display.

(9) Press "ENTER" to return to "ENTER P/N TO TEST?" screen.

NOTE: Pressing "ENTER" again at this point will allow you to retest the same part number exciter.

C. Operational Hints.

(1) Should you wish to retest the same part number at the screen "ENTER P/N TO TEST?" hit enter to reaccept the same PN.

(2) Premature auto-turn off of the tester could result from severe RFI caused by the loose connection of High Tension leads. Be sure that all high tension connections are secure and are properly grounded.

(3) The initial sign-on screen can be short cycled by pressing the "TEST" button on the keypad.

D. Keypad.

The following functions are available on the keypad:

(1) TEST - will set the Ignition System Tester for entry of a new part number (ENTER PART NUMBER?).

(2) PROGRAM - is used to "PROGRAM/EDIT" data for testing exciters; "LIST" part numbers programmed in both the protected and the user libraries; "REMOVE" part numbers from the user library.

NOTE: Edit will not change data for exciters found in the protected library of exciter parameters. Only exciters programmed into the user library may be edited. Clone entire program library from one tester to another via DATA I/O connector with optional cable. (PN 137332-COM1)

(3) CLEAR - is used to redo an entry from the start (i.e. if you mistype a digit in a part number, hitting the "CLEAR" button will allow you to re-enter).

(4) ENTER - is pressed after typing a part number or typing a program data point.

3. SPECIFICATIONS AND CAPABILITIES

A. Leading Particulars

Tester Dimensions (approx.) ..... 7.0 in. high X 17.5 in. long X 11.5 in. deep
(177.8 mm high X 444.5 mm long X 292.1 mm deep)

Approximate Weight ..... 18 lbs (8.1 kg)
(with three sensors and cables)

Power Source

Internal Battery Supply ..... 6 X 1.5 Volt Alkaline “A” or "C" Cells, depending on the test set revision level

Battery Life ..... >24 hours of continuous operation

External Power ..... 115 Volts at 47 to 420 Hz.

137332-PCBL Power Cable Hookup ..... 115 Volts HI (Pin 1)

115 Volts LO (Pin 2)

Power Gnd. (Pin 3)

NOTE: Unless otherwise specified, "new" power cables are supplied with NEMA 5-15 plugs.

Operator Interface

Display ..... 2 Line X 20 Character Back-lite LCD

Keypad ..... 20 Key sealed membrane

Spark Rate Measurement ..... up to 250 counts at 1, 10, or 60 second gate time

Energy Measurement ..... up to 30 Joules

CHAPTER 2
MAINTENANCE

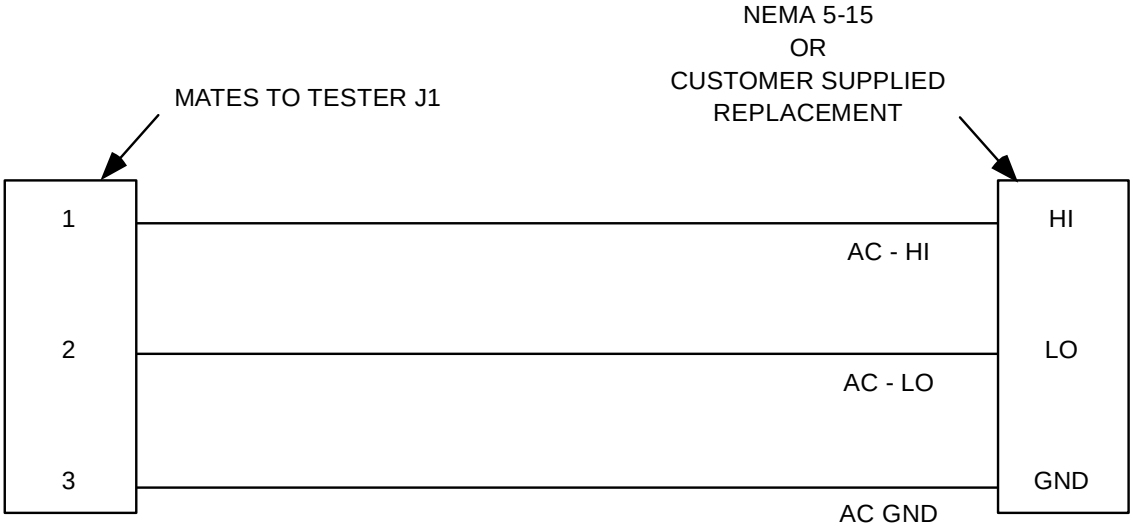
1. SERVICING

A. AC Power Cable - Schematic and Setup.

(1) The 137332-PCBL power cable is used to power the tester from the shop or flight line power source, instead of from battery power.

NOTE: This does not provide for battery charging.

(2) As supplied, the cable has a connector to mate the tester at one end and a NEMA 5-15 at the other end. A customer supplied connector which mates his shop power outlet, can be supplied or the NEMA 5-15 can be replaced (see Figure 1 below).



Power Cable Schematic
Figure 1

B. Battery Replacement.

(1) Access batteries by removing the battery cover on the front panel.

(2) Batteries should be replaced with six (6) 1.5 volt “A” or "C" size Alkaline cells, depending on the test set revision level.

CAUTION: BE SURE TO OBSERVE POLARITY WHEN INSERTING NEW BATTERIES INTO HOLDER.

(3) Replace battery cover and tighten screws to assure the gasket seals between the cover and the main plate.

C. Programming Libraries.

(1) The POWER-TO-LITE® Ignition System Tester utilizes two program libraries, a protected library and a user library.

(2) A protected library contains programs for exciters which are factory set by Unison Industries. This library can only be altered by the factory or by a "Tester to Tester" program transfer (see para C.(3)(b)). A hard copy of the latest version of this library is included at the end of this manual (see Appendix A).

(3) The user library can be entered and edited by the individual customer using the keypad, or by a "Tester to Tester" program transfer using the optional 137332-COM1 cable (see para C.(3)(b)).

(a) Editing the User Library by use of the keypad.

Use the following procedures to edit the user libraries by use of the tester's keypad:

1 To enter or edit a user program, first press the "PROGRAM" button. The "PROGRAM" Menu will appear on the tester's LCD display.

2 Press 1, "PROGRAM/EDIT P/N". This will access the next menu, which will allow programming via the tester's keypad. The display will give a prompt for a part number entry. Part Numbers can include any digit from 0 to 9; letters A, B, C; and a period, slash, or dash of up to 16 digits total in length (i.e. 10-12345-7/A).

3 The tester will then search the libraries for the entered part number. If the entered part number is in the Protected Library, a message on the LCD display will indicate this and the edit will be aborted. If it is a user program, the operator will then be prompted to enter spark rate and Joules low and high limits. Enter each digit as the cursor indicates.

4 The tester will then need to sample a known good exciter to establish internally used constants for that part number. A known good sample is an exciter with a known storage tank capacitance and a known gap breakdown voltage. These values are used to calculate the amount of stored energy in the unit. During the programming of the exciter, this calculated value will be used as the benchmark in joules for any exciter by which all other exciters of the same part number are measured. The operator will enter the energy of the exciter to be used for the program. If the exact value of the exciter is not available, less accurate, but usable results are obtained by assuming the energy to be nominal.

5 Fire the exciter into the sensor as in a normal test. The program will then be saved to the User Library and the tester will return to the "TEST" mode.

D. Calibration Check And Maintenance.

NOTE: The test set will be calibrated at the factory using battery power. Prior to using the test set with AC power, the test set will need re-calibration using AC power. Whenever the test set changes power source, a calibration will need to be performed prior to use with the selected power source.

(1) The POWER-TO-LITE® Ignition System Tester, PN 137332 tester is calibrated before shipment from the factory. Below are several checks which can be used to routinely verify proper performance of the tester and it's associated sensors.

(2) Should the tester or sensors be found faulty, or if any of the following checks fail, it is most likely due to an internal components problem. As there are no user internal adjustments, the tester should be returned for repair at Unison. Please contact Unison's Norwich NY facility (telephone 607-335-5159) for return information and procedures.

(3) Power Up Check.

(a) Remove the battery compartment cover.

(b) Remove the six batteries from the tester's battery compartment.

(c) With the supplied power cable PN 137332-PCBL, connect the tester to a 115 VAC outlet or power source.

(d) Push the "POWER ON/OFF" button.

(e) Look for the correct operation of the display during the tester's sign-on message. The message should read "Unison Industries POWER-TO-LITE® Flight Line Tester Ver. X.X (release date)".

(f) Disconnect the tester from the 115 VAC power source and install six new batteries, or refer to Para D.(4) to continue with the automatic power off check.

(4) Automatic Power Off Check.

(a) Set up the tester as in Para's D.(3)(a) through (d).

(b) Leave the tester on without pushing any buttons. The tester should turn itself off after approximate five minutes.

(c) Disconnect the tester from the 115 VAC power source.

(d) Install six new batteries in the tester and replace the battery compartment cover.

(5) Sensor Input Calibration.

(a) DC Calibration.

WARNING: USE CAUTION DURING ALL PROCEDURES. DANGEROUSLY HIGH VOLTAGE IS IN AND AROUND THE TESTER AND THE TEST EQUIPMENT. HIGH VOLTAGE CAN CAUSE SHOCKS, BURNS OR DEATH.

1 Connect a DC power supply to the connector marked "SENSOR INPUT", (+) to the center pin and (-) to the shell.

2 Apply 20.0 VDC ± 0.05.

3 Select part number C99, then "ENTER" to start the test.

NOTE: The test sample time will be approximate 60 seconds.

4 At the end of the sample, the display must indicate 0 to .2 SPS and 19.5 to 20.5 JOULES.

5 Disconnect the calibration set up.

(b) Exciter/AC Calibration.

1 With a known good sensor and high tension test lead, connect the Ignition System Tester to a known good ignition exciter as shown in Figure 2.

2 Do a normal exciter test for the ignition exciter which is being used.

3 The tester display should indicate PASS for both SPS and JOULES.

4 Disconnect the calibration set up.

(6) Sensor Check.

(a) With a known good high tension test lead, connect the sensor to be checked to a known good ignition exciter and then to the Ignition System Tester as shown in Figure 2.

(b) Do a normal exciter test for the ignition exciter which is being used.

(c) The tester display should indicate PASS for both SPS and JOULES.

(7) High Tension Test Lead and Shorting Plug Check.

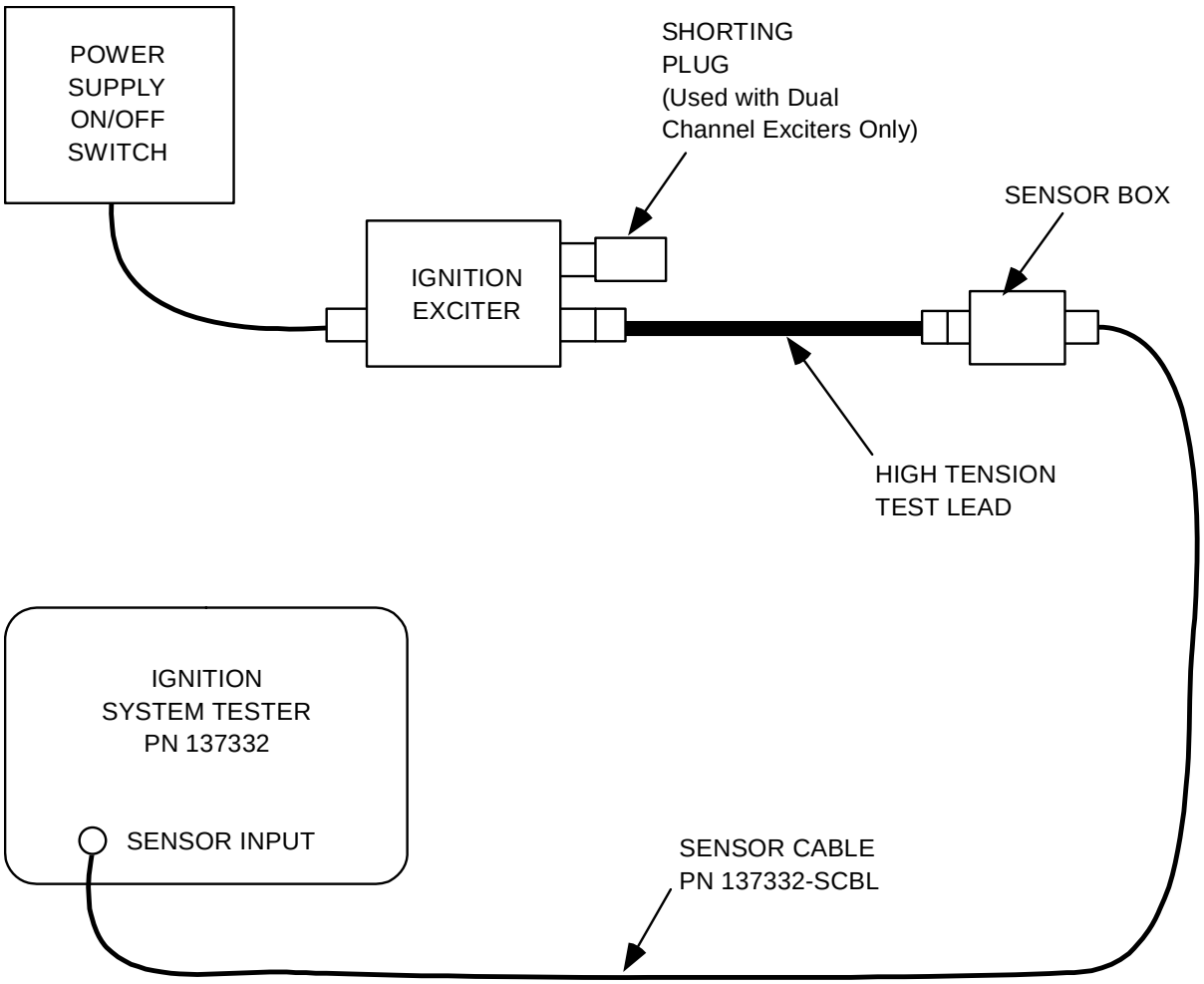
(a) Use an ohmmeter to check the center conductor and outside braid resistance of the high tension test lead. The resistance value should be less than one ohm.

(b) Use an ohmmeter to check the contact to outer shell resistance of the shorting plug. The resistance value should be less than one ohm.

(8) Routine Maintenance.

(a) All cables, test leads, shorting plugs, and sensor boxes should be inspected regularly for physical damage. Threads on the adaptor leads and sensor high tension connectors should be kept clean, with protective caps installed when not in use. Also check the center pin/buttons of the high tension connector for pitting, arcing, or damage. The brazed joint between the conduit and the connector ferrule of the adaptor lead should be checked also. If there is any damage of the above items, they should be removed from service.

(b) Check weather seals and gaskets for damage. (Such as the battery cover gasket and the main panel seal.)



Sensor Check Setup
Figure 2

Table 1
Commercial Tools, Fixtures and Equipment

Item	Part/Model Number	Airline Part Number	Nomenclature	Application
NOTE: You can use equivalent tools, fixtures, and equipment for all items.				
1			DC Power Supply Commercial Purchase	Tester Calibration Check
2	Model 580		Micro-Ohmmeter Keithley Instruments, Inc. 28775 Aurora Rd. Cleveland OH 44139	High Tension Test Lead Check

2. TROUBLESHOOTING

Table 1
Faults and Remedies

Problem	Possible Cause	Remedy
Premature autoturn-off of the tester	Severe RFI because of loose connection of high tension leads	Secure all high tension lead connections and make sure they are grounded properly
No sparks per second or energy values while ignition is firing	Loose sensor lead or shorting plug connection	Secure sensor lead or shorting plug connections
	Faulty sensor lead	Replace lead
Tester will not power up	Poor connection between batteries	Clean battery connections
	Dead batteries	Replace batteries

3. REPAIRS

Due to the nature of this tester, there are no procedures for disassembly or repair. When disassembly or repair is necessary, return the unit to the manufacturer.

CHAPTER 3
ILLUSTRATED PARTS LIST

1. INTRODUCTION

The Illustrated Parts List (IPL) gives part numbers and illustrations for the POWER-TO-LITE® Ignition System Tester, PN 137332, in this Operation and Maintenance Manual. This tester is manufactured by Unison Industries.

2. ILLUSTRATED PARTS LIST

A. Figure Number Column.

The figure numbers given in the Detailed Parts Lists agree with the figure numbers on the illustrations. The Detailed Parts Lists follow the illustrations. To find a part number when the part number is not known, find the correct illustration for that unit. Make a note of the figure number for that illustration. Find the figure number on the Detailed Parts Lists. The vendor part number is given in the part number column.

B. Part Number Column.

Part numbers in this column are Unison Industries part numbers. When a vendor part number is given in the part number column, the manufacturer's part number is given after the nomenclature in the nomenclature column. The contractor specification control drawing numbers are given after the nomenclature for all vendor items identified by such drawings. A vendor code will not be given for government standard parts; i.e., MS, NAS, etc.

C. Nomenclature Column.

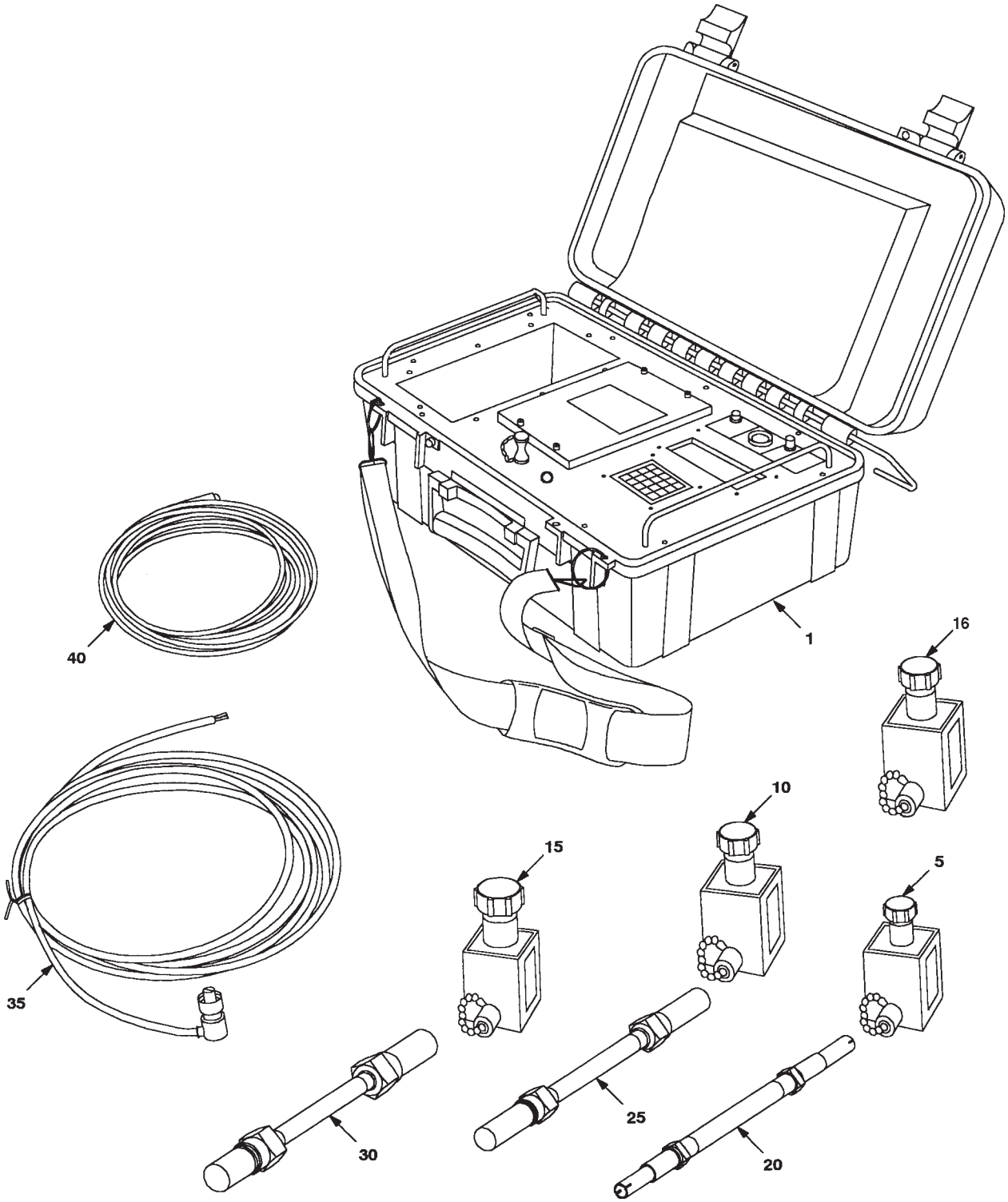
This column gives the titles and modifiers of a part which agrees with the manufacturer's drawing title and other data. Vendor approved code numbers in the Nomenclature column identify the manufacturer of a part that is purchased by the contractor who makes the equipment.

D. Effectivity Code Column.

When the Detailed Parts Lists gives more than one configuration of the basic part number, an Effectivity Code is given which shows the different configurations.

E. Units Per Assembly Column.

This column gives the total quantity of the specified part necessary in its immediate assembly. Other possible conditions in relation to the part are given in this column by these abbreviations: AR= As Required, NHA= Next Higher Assembly, REF= Reference.



POWER-TO-LITE® Ignition System Tester, PN 137332
Figure 1

DETAILED PARTS LIST - 1

Figure & Item Number	Part Number	Airline Part No.	Nomenclature 1 2 3 4 5 6 7	Eff. Code	Units Per Assy
1 -1	137332		POWER-TO-LITE® FLIGHT LINE IGNITION TESTER		REF
*5	137332-S2		. SENSOR BOX, Type 2		1
*6	137332-S2HO		. SENSOR BOX, Type 2 High Output		1
*10	137332-S3		. SENSOR BOX, Type 3		1
*15	137332-S4		. SENSOR BOX, Type 4		1
*16	137332-S5		. SENSOR BOX, Type 5 PW901A		1
*17	137332-S6		. SENSOR BOX, Type 5 ALF502 - 2 Hole Flange		1
*20	137332-C2		. HIGH TENSION TEST LEAD, Type 2		1
*25	137332-C3		. HIGH TENSION TEST LEAD, Type 3		1
*30	137332-C4		. HIGH TENSION TEST LEAD, Type 4		1
*31	137332-C3C4		. HIGH TENSION TEST LEAD, Type 3 to 4		1
35	137332-PCBL		. POWER CABLE (AC Source Connector by Customer)		1
40	137332-SCBL		. SENSOR CABLE, 10 Foot		1
*45	137332-GCBL		. PERSONAL SAFETY GROUND CABLE, 10 Foot (No longer required)	NP	1
*–50	137332-SRR1		. SENSOR BOX, Rolls-Royce RB211 (0.75-20 Thread)		1
*–55	137332-SCF6		. SENSOR BOX, CF6 (Use for Plug End of High Tension Lead on CF6-6, -50, -80A, -80A1, -80A2, -80A3, and -80C2)		1
*–60	137332-CRR1		. HIGH TENSION TEST LEAD (0.75-20 Connector, both ends)		1

– Item not illustrated
* Optional Accessories

DETAILED PARTS LIST - 1 (continued)

Figure & Item Number	Part Number	Airline Part No.	Nomenclature 1 2 3 4 5 6 7	Eff. Code	Units Per Assy
*–65	137332-CRR2		. HIGH TENSION TEST LEAD (0.687-24 Connector / 0.750-20 Connector)		1
*–70	137332-CRR3		. HIGH TENSION TEST LEAD (0.687-20 Receptacle/ 0.750-20 Connector)		1
*–75	137332-CRR4		. HIGH TENSION TEST LEAD (0.687-24 Receptacle/ 0.750-20 Connector)		1
*–76	137332-CAUG		. DELETED		
*–80	137332-STOR		. REMOVABLE EXTERNAL ZIPPER STORAGE POUCH (Obsolete)	NP	1
*–85	137332-COM1		. COMMUNICATION LEAD FOR TESTER TO TEST PROGRAMMING		1
*–86	137332-DISK		. LIBRARY UPDATE DISK (Required Item 85)		1
*–90	Bulletin No. 94-2		. OPERATION AND MAINTENANCE MANUAL		1
–95			. DELETED		
*-100	9400235-2		. SHORTING PLUG, Type 2		1
*-105	9400235-3		. SHORTING PLUG, Type 3		1
*-110	9400235-4		. SHORTING PLUG, Type 4		1

– Item not illustrated
* Optional Accessories

NOTES: _____

APPENDIX A

1. PROTECTED LIBRARIES

The POWER-TO-LITE® Ignition System Tester, PN 137332, contains protected libraries programmed by the manufacturer. Refer to table A1 for the protected library limits. All part numbers are Unison part numbers except where otherwise indicated.

Table A1
Protected Library Limits (Version 6.2)

Engine & PN	SPS/ LL	SPS/ HL	Energy/ LL	Energy/ HL	Adapter Lead PN	Sensor Box PN	Shorting Plug	Comments
General Electric T700 Engines								
44525	2.8	4.7	1.9	2.4	C2	S2	None	Using input simulator
48987	2.4	4.5	0.9	1.1	C2	S2	None	Using input simulator
General Electric CF6, CFM56, and GE90 Engines								
45570-1	0.8	1.7	4.9	7.8	C3	S3	None	Pre Rev. “E” Units
45570-1-CAB	0.8	1.7	4.9	7.8	-	S4	None	“Use On–Engine Discharge Lead” Pre Rev. “E” Units
45570-1A	0.8	1.7	4.9	7.8	C3	S3	None	Rev. “E” Units Only
45570-1A-CAB	0.8	1.7	4.9	7.8	-	S4	None	Rev. “E” Units Only Use On-Engine Discharge Lead
9040875-1	0.7	1.5	9.0	12.0	C3	S3	None	
9040875-1-CAB	0.7	1.5	9.0	12.0	-	S3 or S4*	None	“Use On–Engine Discharge Lead”
10-617980-1	1.3	2.7	7.6	9.0	C3	S3	None	
10-617980-1CAB	1.3	2.7	7.6	9.0	-	SCF6 or S4*	None	“Use On–Engine Discharge Lead & CF6 Sensor”
10-631045-1	0.8	1.7	5.9	9.0	C3	S3	None	
10-631045-1CAB	0.8	1.7	5.9	9.0	-	SCF6 or S4*	None	“Use On–Engine Discharge Lead & CF6 Sensor”
10-631045-2	0.8	1.7	5.9	9.0	C3	S3	None	
10-631045-2CAB	0.8	1.7	5.9	9.0	-	SCF6 or S4*	None	“Use On–Engine Discharge Lead & CF6 Sensor”
10-631045-3	0.8	1.7	5.9	9.0	C3	S3	None	“Use On–Engine Discharge Lead & CF6 Sensor”
10-631045-3CAB	0.8	1.7	5.9	9.0	-	S4	None	“Use On–Engine Discharge Lead & CF6 Sensor”

* Sensor Box Part Number dependent on the lead installed on the engine.

Table A1
Protected Library Limits (Version 5.4) (continued)

Engine & PN	SPS/ LL	SPS/ HL	Energy/ LL	Energy/ HL	Adapter Lead PN	Sensor Box PN	Shorting Plug	Comments
General Electric CF34 Engines								
10-631045-1	0.8	1.7	5.9	9.0	C3	S3	None	
10-631045-1CAB	0.8	1.7	5.9	9.0	-	S4	None	
10-631045-2	0.8	1.7	5.9	9.0	C3	S3	None	
10-631045-2CAB	0.8	1.7	5.9	9.0	-	S4	None	
10-631045-3	0.8	1.7	5.9	9.0	C3	S3	None	"Use On–Engine Discharge Lead & CF6 Sensor"
10-631045-3CAB	0.8	1.7	5.9	9.0	-	S4	None	"Use On–Engine Discharge Lead & CF6 Sensor"
General Electric CF6 and CFM56-2 Engines								
10-383900-16	1.3	2.7	14.5	16.0	C3	S3	None	
10-383900-16CAB	1.3	2.7	14.5	16.0	-	S3 or S4	None	"Use On–Engine Discharge Lead"
Honeywell ALF 502 Engines								
10-397650-1	1.5	12.0	3.7	5.6	C2	S2	None	Must use 24 VDC Input
Honeywell GTCP 36 Engines								
9040960-1	1.0	10.0	2.5	5.5	C3	S3	None	
9049860-10	1.3	1.7	1.0	1.4	C2	S2HO	Type 2	Test at 10 VDC only.**
10-378160-5	Values to be included in next revision							
10-516000-1	2.7	11	1.2	1.9	C2	S2	None	Test at 14 VDC only
10-516000-3	2.7	11	1.2	1.9	C2	S2	None	Test at 14 VDC only
10-516000-5	2.7	11	1.2	1.9	C2	S2	None	Test at 14 VDC only
Honeywell GTCP 85 Engines (All exciters in this engine group must be tested at 24 VDC)								
10-381175-1	1.0	12	1.4	3.0	C3	S3	None	
10-381175-2	1.0	12	1.4	3.0	C3	S3	None	
10-381175-3	1.0	12	1.4	3.0	C3	S3	None	
10-381175-4	1.0	12	1.4	3.0	C3	S3	None	
10-381175-5	1.0	12	1.4	3.0	C3	S3	None	
10-381175-6	1.0	12	1.4	3.0	C3	S3	None	
10-381175-7	1.0	12	1.4	3.0	C3	S3	None	
10-381175-8	1.0	12	1.4	3.0	C3	S3	None	
10-381175-9	1.0	12	1.4	3.0	C3	S3	None	
10-381175-10	1.0	12	1.4	3.0	C3	S3	None	
10-381750-1	1.0	12	1.4	3.0	C3	S3	None	
10-381750-2	1.0	12	1.4	3.0	C3	S3	None	
10-381750-5	1.0	12	1.4	3.0	C3	S3	None	
10-381750-6	1.0	12	1.4	3.0	C3	S3	None	
10-381750-7	1.0	12	1.4	3.0	C3	S3	None	
10-381750-8	1.0	12	1.4	3.0	C3	S3	None	
10-381750-9	1.0	12	1.4	3.0	C3	S3	None	

** Test the 9049860-10 during the MAINTENANCE mode only. The unit will fire 2.5 - 6.5 Sparks/Sec for approximately 20 seconds at 10 VDC and then fire 1.3 - 1.7 Sparks/Sec until power to the unit is turned off. Perform the test while the unit is firing 1.3 - 1.7 Sparks/Sec. The unit can be operated for 1 minute, then needs to rest for 30 minutes. Please see the Maintenance manual for all operational requirements.

Table A1
Protected Library Limits (Version 5.4) (continued)

Engine & PN	SPS/ LL	SPS/ HL	Energy/ LL	Energy/ HL	Adapter Lead PN	Sensor Box PN	Shorting Plug	Comments
Honeywell GTCP 85 Engines (All exciters in this engine group must be tested at 24 VDC) (cont.)								
10-381750-10	1.0	12	1.4	3.0	C3	S3	None	
10-381750-11	1.0	12	1.4	3.0	C3	S3	None	
10-381750-12	1.0	12	1.4	3.0	C3	S3	None	
10-381750-13	1.0	12	1.4	3.0	C3	S3	None	
10-381750-14	1.0	12	1.4	3.0	C3	S3	None	
10-381200-1	1.0	12	1.4	3.0	C3	S3	None	
10-381200-2	1.0	12	1.4	3.0	C3	S3	None	
10-381200-3	1.0	12	1.4	3.0	C3	S3	None	
10-381200-7	1.0	12	1.4	3.0	C3	S3	None	
10-381200-8	1.0	12	1.4	3.0	C3	S3	None	
10-381200-9	1.0	12	1.4	3.0	C3	S3	None	
10-381200-10	1.0	12	1.4	3.0	C3	S3	None	
10-381200-11	1.0	12	1.4	3.0	C3	S3	None	
42662	1.0	3.0	3.0	5.0	C3	S3	None	
Honeywell GTCP131 and RE100 Engines								
9049300-2	2.7	11.0	1.2	1.9	C2	S2	None	
Honeywell GTCP331 Engines								
46823	1.0	10.0	2.5	5.5	C3	S3		
10-617075-6	1.0	10.0	2.5	5.5	C3	S3	None	
9048700-8	1.0	3.0	1.0	1.6	C2	S2	Type 2	
Honeywell GTCP 660 Engines								
10-381160-2	0.8	12.0	3.0	6.0	C3	S3	None	
Honeywell T53 Engines								
43326	1.5	9.0	2.0	4.0	C2	S2	None	"Use adapter Unison PN 137332-SPEC @ Sensor"
Honeywell TSCP700 Engines								
10-387125-2	0.9	6.0	3.0	4.5	C3	S3	Type 3	
Honeywell TFE731 Engines								
9060280-1	Values to be included in next revision							
Honeywell RE220 Engines								
9049820-1	Values to be included in next revision							
9049820-6	Values to be included in next revision							
IAE V2500 Engines								
9045330-2	1.5	2.5	0.8	1.5	C4	S4	None	

Table A1
Protected Library Limits (Version 5.4) (continued)

Engine & PN	SPS/ LL	SPS/ HL	Energy/ LL	Energy/ HL	Adapter Lead PN	Sensor Box PN	Shorting Plug	Comments
Pratt & Whitney PW2037 Engines								
47649	1.0	2.5	3.0	5.0	C4	S4	None	
47649-1	1.0	2.5	3.0	5.0	C4	S4	None	If 47649-1 is not in the tester library, enter 47649 as PN.
47649-2	1.0	2.5	3.0	5.0	C4	S4	None	If 47649-2 is not in the tester library, enter 47649 as PN.
47649-3	1.0	2.5	3.0	5.0	C4	S4	None	If 47649-3 is not in the tester library, enter 47649 as PN.
Pratt & Whitney JT3 Engines								
41540	0.5	2.5	16.0	25.5	C4	S4	None	
42721	0.4	2.0	16.0	25.5	C4	S4	None	
44387	0.4	2.0	16.0	25.5	C4	S4	None	
44906	0.4	2.0	16.0	25.5	C4	S4	None	
48016	0.4	2.0	16.0	25.5	C4	S4	None	
49965-1	0.5	1.7	15.0	25.5	C4	S4	None	
Pratt & Whitney JT8D Engines								
49988	0.5	1.7	15.0	25.5	C4	S4	None	
49988-1	0.5	1.7	15.0	25.5	C4	S4	None	
42074	0.5	1.7	15.0	25.5	C4	S4	None	
49965	0.5	1.7	15.0	25.5	C4	S4	None	
49965-1	0.5	1.7	15.0	25.5	C4	S4	None	
10-353875-4.A	0.9	2.1	15.0	25.0	C4	S4	Type 4	“Intermittent with 24VDC Input”
10-353875-4.C	1.1	3.0	3.5	4.5	C4	S4	Type 4	“Continuous with 115VAC Input”
10-614500-1	0.7	4.0	10.0	24.4	C4	S4	None	
9045000-1	0.5	2.5	14.5	18.9	C4	S4	None	
Pratt & Whitney JT9D and PW4000 Engines								
44933	1.0	2.5	3.1	5.0	C4	S4	None	
44933-1	1.0	2.5	3.1	5.0	C4	S4	None	If 44933-1 is not in the tester library, enter 44933 as PN.
43925	1.0	2.5	3.0	5.0	C4	S4	None	
10-621630-1	1.0	2.5	3.4	4.6	C4	S4	None	
10-621630-2	1.0	2.5	3.4	5.1	C4	S4	None	
10-621630-3	1.0	2.5	3.4	5.1	C4	S4	None	If 10-621630-3 is not in the tester library, enter 10-621630-2 as PN.

Table A1
Protected Library Limits (Version 5.4) (continued)

Engine & PN	SPS/ LL	SPS/ HL	Energy/ LL	Energy/ HL	Adapter Lead PN	Sensor Box PN	Shorting Plug	Comments
Pratt & Whitney Canada PW100 Engines								
9047840-2	1.0	1.2	1.1	1.4	C3	S3	Type 3	
9049400-1	1.0	1.5	1.1	1.6	C3	S3	None	After Burst Mode
9049400-1CAB	1.0	1.5	1.1	1.6	-	S5	None	(At end of On–Engine Lead)
9049400-1B	6.0	12.0	1.1	1.6	C3	S3	None	Tester must complete data collection before the Burst Mode times out.
Pratt & Whitney Canada PT6 Engines								
49930	1.0	6.0	2.8	4.6	C3	S3	Type 3	
Pratt & Whitney Canada PT6, ST6, T400, PW100 Engines								
10-381550-1	1.0	12.0	2.9	5.5	C3	S3	Type 3	
10-381550-4	1.0	12.0	2.9	5.5	C3	S3	Type 3	
Pratt & Whitney Canada PW300 Engines								
9047980-21	Values to be included in next revision							
Rolls-Royce (Allison) 501 Engines								
48950	4.0	7.5	2.8	4.8	C3	S3	Type 3	
43432	4.0	7.5	2.8	4.8	C3	S3	Type 3	
40074	4.0	7.5	2.8	4.8	C3	S3	Type 3	
40588	4.0	7.5	2.8	4.8	C3	S3	Type 3	
Rolls-Royce (Allison) AE2100/AE3007 Engines								
430035	4.5	6.8	1.6	2.4	C3	S3	None	
430035-A	2.0	4.0	1.6	2.4	C3	S3	None	Use if using 137332-IPSU
430035-B	2.9	5.8	1.6	2.4	C3	S3	None	Use if using 137332-IPSU (Rev. A)
430138	2.2	4.0	3.5	5.1	C3	S3	None	
501240-1	2.2	4.0	3.5	5.1	C3	S3	None	
Rolls–Royce Dart Engines								
43663	1.1	1.7	9.6	15.0	CRR2	SRR1	None	
43663–1	1.1	1.7	9.6	15.0	CRR2	SRR1	None	
10-383160-5	Values to be included in next revision							
Rolls–Royce BR-700 Engine								
9060440-2	1.1	2.0	8.0	12.0	CRR1	SRR1	None	
9060440-2-CAB	1.1	2.0	8.0	12.0	430973-3	SRR1	None	
Rolls–Royce RB211 Engines								
44760A	0.9	1.4	3.0	4.8	CRR1	SRR1	None	“Low Energy”
44760B	0.9	1.4	7.0	12.0	CRR1	SRR1	None	“High Energy”
430107A	0.8	1.8	3.0	4.8	CRR1	SRR1	None	“Low Energy”
430107B	0.8	1.8	7.0	12.0	CRR1	SRR1	None	“High Energy”
430152	0.8	1.8	3.8	4.8	CRR1	SRR1	None	“Low Energy”
430152A/B	2.0	4.0	9.8	12.2	CRR1	SRR1	None	“High Energy”

Table A1
Protected Library Limits (Version 5.4) (continued)

Engine & PN	SPS/ LL	SPS/ HL	Energy/ LL	Energy/ HL	Adapter Lead PN	Sensor Box PN	Shorting Plug	Comments
Rolls–Royce Spey Engines								
43663	1.1	1.7	9.6	15.0	CRR2	SRR1	None	Use CRR3 at Plug
43663–1	1.1	1.7	9.6	15.0	CRR2	SRR1	None	Use CRR3 at Plug
44302	0.8	5.0	9.5	15.0	CRR2	SRR1	None	
44302-1-CAB	0.8	5.0	9.5	15.0	CRR4	SRR1	None	Use to test 44302 with a 650076-1/-2 lead attached
44302-2-CAB	0.8	5.0	9.5	15.0	-	SRR1	None	Use to test 44302 with 650076-1/-2 and 650077-6/-7 leads attached
44302-3-CAB	0.8	5.0	9.5	15.0	-	SRR1	None	Use to test 44302 with 650076-1/-2, 650077-6/-7, and 650092 or 650093 leads attached
10-383160-5	Values to be included in next revision							
Rolls–Royce Tay Engines								
43663	1.1	1.7	9.6	15.0	CRR2	SRR1	None	
43663–1	1.1	1.7	9.6	15.0	CRR2	SRR1	None	
10-383160-3	0.75	1.66	9.7	16.0	C3	S3	None	
10-383160-5	Values to be included in next revision							
Rolls–Royce Trent 700/800 Engines								
430081	1.4	1.8	8.3	10.5	CRR1	SRR1	None	
430154	1.1	2.0	8.3	10.5	CRR1	SRR1	None	
BMW/Rolls–Royce BRR 700 Engine Series								
430047	1.1	2.0	9.5	11.9	CRR1	SRR1		
430135	1.1	2.0	9.5	11.9	CRR1	SRR1		
Sundstrand T62, APS2000 Engines								
9048900-2	1.0	12.0	0.7	1.1	C2	S2	Type 2	
Sundstrand APS3200 Engines								
9049000-1	2.0	12.0	1.3	1.7	C2	S2	Type 2	

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