SERVICE BULLETIN

ENGINE FUEL AND CONTROL — TRANSMITTER, FUEL FLOW — SUPPLY A NEW TRANSMITTER WITH IMPROVED FUEL FLOW CALIBRATION CURVE

MODEL APPLICATION

V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5, V2525-D5, V2528-D5,

BULLETIN ISSUE SEQUENCE

V2500 Series 73-0234

ATA NUMBER

73-31-17

Supplier Service Bulletin

Crane Aerospace & Electronics ELDEC Corporation Service Bulletin No. 9-217-73-23.

Compliance Category

7

Summary

The purpose of this Service Bulletin is to provide a new fuel flow transmitter which has a fuel flow calibration curve that better matches the predicted flow of the aircraft.

Planning Information

Effectivity Data

Engine Models Applicable

V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5
Engine Serial Nos. V10001 thru V13190

V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5
Engine Serial Nos. V15001 thru V16957

V2525-D5, V2528-D5
Engine Serial Nos. V20001 thru V20285

Concurrent Requirements

There are no concurrent requirements.

Reason

1. Condition: The current fuel flow transmitter flow curve is in disagreement with the aircraft fuel usage.
2. Background: Through extensive tracking of the issue, the aircraft fuel usage is driving reduction in range because of fuel flow transmitter calibration.
3. Objective: Provide a new part number fuel flow transmitter with an improved calibration curve.

   NOTE: IF PN 9-217-46 FUEL FLOW TRANSMITTER IS REMOVED, THEN INCORPORATION OF REFERENCE 3, IAE SB 73-0113 TO BRING THE DESIGN TO THE 9-217-59 CONFIGURATION HAS TO BE ACCOMPLISHED IN ADDITION TO THIS SERVICE BULLETIN TO BRING THE FUEL FLOW TRANSMITTER TO PN 9-217-94 CONFIGURATION.
4. Substantiation: The changes introduced by this Service Bulletin were the subject of satisfactory engineering analysis and test. This Service Bulletin complies with the applicable engine certification basis.
5. Effects of Bulletin on:

   Removal/Installation: Not Affected.

   Disassembly/Assembly: Not Affected.

   Cleaning: Not Affected.

   Inspection/Check: Not Affected.

   Repair: Not Affected.

   Testing: Not Affected.
6. Supplemental Information

   None.

Description

Supply a new fuel flow transmitter.

Compliance

Category 7

Accomplish when supply of superseded parts has been depleted.

Approval Data

The part number changes and/or part modifications specified in the Accomplishment Instructions and Material Information sections of this Service Bulletin have been shown to comply with the applicable Federal Aviation Regulations and are FAA-APPROVED for the engine model(s) given.

Manpower

1. In Service

   ..... Not Applicable.

2. At Overhaul

   ..... Not Applicable.

Weight and Balance

1. Weight Change

   None.

2. Moment Arm

   No Effect.

3. Datum

   Engine Front Mount Centerline (Power Plant Station (PPS) 100)

Electrical Load Data

This Service Bulletin has no effect on the aircraft electrical load.

Software Accomplishment Summary

Not Applicable.

References

1. ATA Locator — 73-31-17.
2. Internal Reference No. — 13VI008.
3. IAE V2500-ENG-72-0565 (Engine - Provide The Requirements For Modification To The V2500 SelectOne™ Retrofit Standard).
4. IAE V2500 Service Bulletin V2500-ENG-73-0113 (Engine Fuel And Control — Fuel Flowmeter — Introduction Of Revised Fuel Flow Transmitter With Increased Electrical Receptacle Clearance).
5. Crane Aerospace & Electronics ELDEC Corporation Service Bulletin No. 9-217-73-23.

Other Publications Affected

1. V2500 Engine Illustrated Parts Catalogs (S-V2500-2IA, S-V2500-2IB, S-V2500-5IA, S-V2500-5IB, S-V2500-6IA, S-V2500-6IB, S-V2500-7IA, S-V2500-7IB), Chapter/Section 73-31-17.
2. V2500 Engine Illustrated Parts Catalogs (S-V2500-2SA, S-V2500-2SB, S-V2500-2NA, S-V2500-2NB, S-V2500-5SA, S-V2500-5SB, S-V2500-5NA, S-V2500-5NB, S-V2500-6SA, S-V2500-6SB, S-V2500-6NA, S-V2500-6NB, S-V2500-7SA, S-V2500-7SB, S-V2500-7NA, S-V2500-7NB), Chapter/Section 73-31-17.
3. V2500 Engine Illustrated Parts Catalogs (S-V2500-3IB, S-V2500-3IC), Chapter/Section 73-31-17.

Interchangeability of Parts

Old and new parts are directly interchangeable.

Information in the Appendix

Alternate Accomplishment Instructions (No)

Progression Charts (Yes)

Added Data (Yes)

Revision to Table of Limits (No)

Inspection Procedures (No)

Material Information

Material — Price and Availability

1. Part prices were not available at the time of Service Bulletin publication. Contact the vendor for firm quotations.
2. There is no kit provided to do this Service Bulletin.
3. Part availability information is provided in material data Instructions — Disposition.

Industry Support Program

Not Applicable.

The material data that follows is for each engine.

For V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5 Engines:

New PN	Qty	Estimate of Unit Price ($)	Keyword	Old PN	Instructions — Disposition
9-217-94	1	*	TRANSMITTER, FUEL FLOW	9-217-59 (73-31-17-01-100)	(1)(L)(S)(S1)(V)

The material data that follows is for each engine.

For V2525-D5, V2528-D5 Engines:

New PN	Qty	Estimate of Unit Price ($)	Keyword	Old PN	Instructions — Disposition
9-217-94	1	*	TRANSMITTER, FUEL FLOW	9-217-59 (73-31-17-01-100)	(1)(L)(S)(S1)(V)

Instructions/Disposition Code Statements:

Parts Modification Conditions

Estimated part prices are provided when they are available at time of publication. The Estimate of Unit Price is only for planning purposes and does not constitute a firm quotation. An asterisk (*) is shown where part pricing information was unavailable. For Price and availability of parts contact the vendor, (Crane Aerospace & Electronics ELDEC Corporation) referenced in Vendor Services or Special Components/Materials section.

(1) The new part can be obtained by returning the old part to the vendor for calibration and reidentifying to the new part number.

Spare Parts Availability

(L) The old part will be supplied until the supply is fully used.

(S) Procure the part directly from the Supplier (Crane Aerospace & Electronics ELDEC Corporation) referenced in Vendor Services or Special Components/Materials section.

(S1) Old and new parts are fully and freely interchangeable.

(V) This is the Crane Aerospace & Electronics ELDEC Corporation part number.

Vendor Services or Special Components/Materials

Vendor Special Components/Materials

Vendor Designation	Name	Vendor Name & Address
9-217-94	TRANSMITTER, FUEL FLOW	Crane Aerospace & Electronics ELDEC Corporation P.O. Box 97027 Lynnwood, WA 98046-9727 USA Phone: +1-425-743-8272 or +1-425-743-8473 Fax: +1-425-743-8371 Internet: http://www.craneae.com
Vendor Manufacturer's Code: 08748 See Illustrated Parts Catalog Vendor Manufacturer's Code List		

NOTE: EXCEPT FOR WORK OR SUPPLIES TO BE PERFORMED OR FURNISHED BY INTERNATIONAL AERO ENGINES (IAE), IT IS UNDERSTOOD THAT INTERNATIONAL AERO ENGINES (IAE) DOES NOT ENDORSE THE WORK PERFORMED BY THE COMPANY OR COMPANIES NAMED HEREIN OR ANY OTHER COMPANY, AND DOES NOT ACCEPT RESPONSIBILITY TO ANY DEGREE FOR THE SELECTION OF SUCH COMPANY OR COMPANIES FOR THE PERFORMANCE OF ANY WORK OR PROCUREMENT OF SUPPLIES.

Tooling — Price and Availability

Special tools are not required to accomplish this Service Bulletin.

Reidentified Parts

Not Applicable.

Other Material Information Data

Not Applicable.

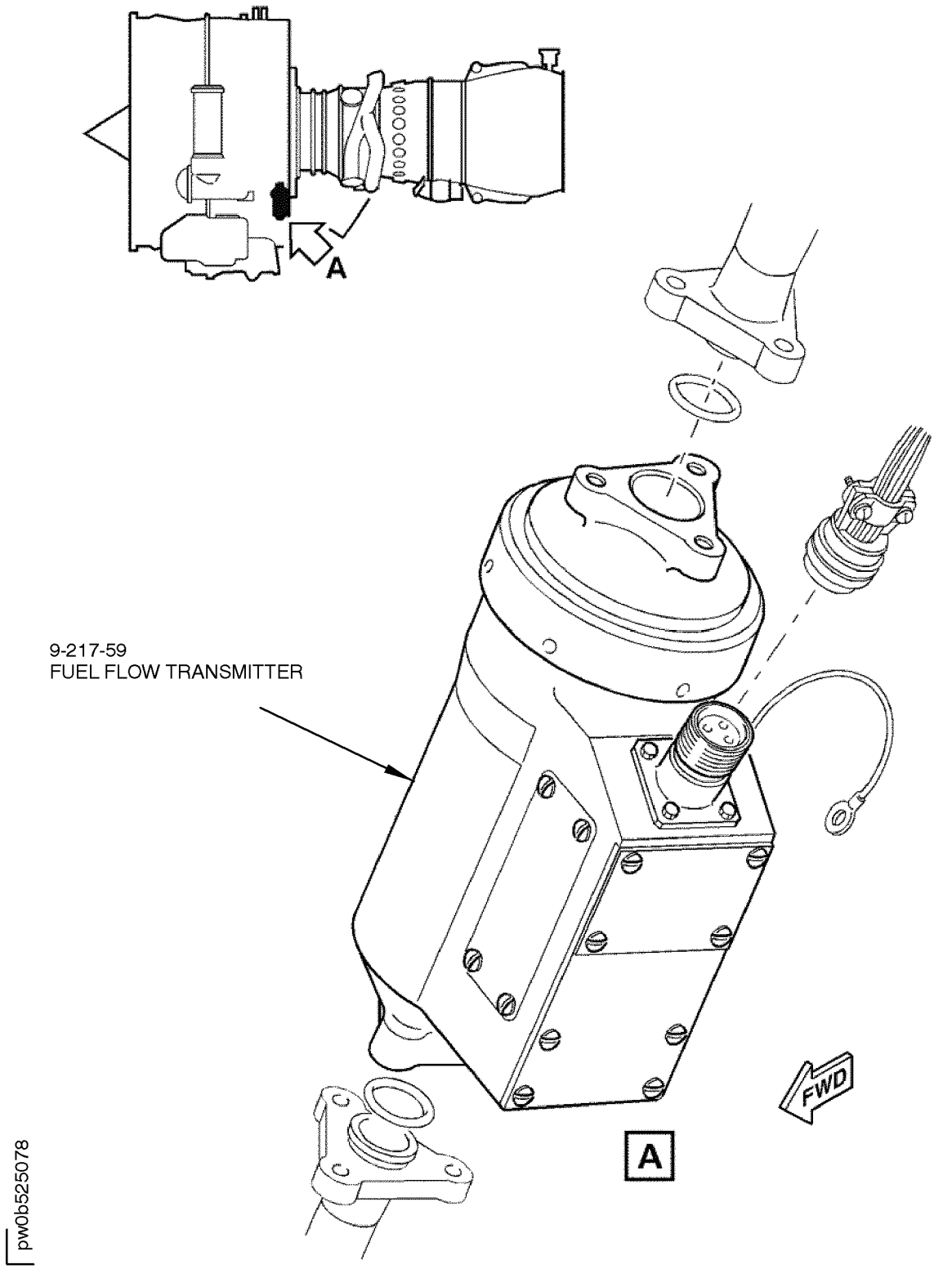
Accomplishment Instructions

1. Replace the Fuel Flow Transmitter, PN 9-217-59 with PN 9-217-94, or send the Fuel Flow Transmitter, PN 9-217-59 back to the vendor identified in the Vendor Services or Special Components/Materials section. The Fuel Flow Transmitter, PN 9-217-94 will be returned. See Figure 1 for location of part.

   NOTE: IF PN 9-217-46 FUEL FLOW TRANSMITTER IS REMOVED, THEN INCORPORATION OF REFERENCE 3, IAE SB 73-0113 TO BRING THE DESIGN TO THE 9-217-59 CONFIGURATION HAS TO BE ACCOMPLISHED IN ADDITION TO THIS SERVICE BULLETIN TO BRING THE FUEL FLOW TRANSMITTER TO PN 9-217-94 CONFIGURATION.

2. Recording Instructions

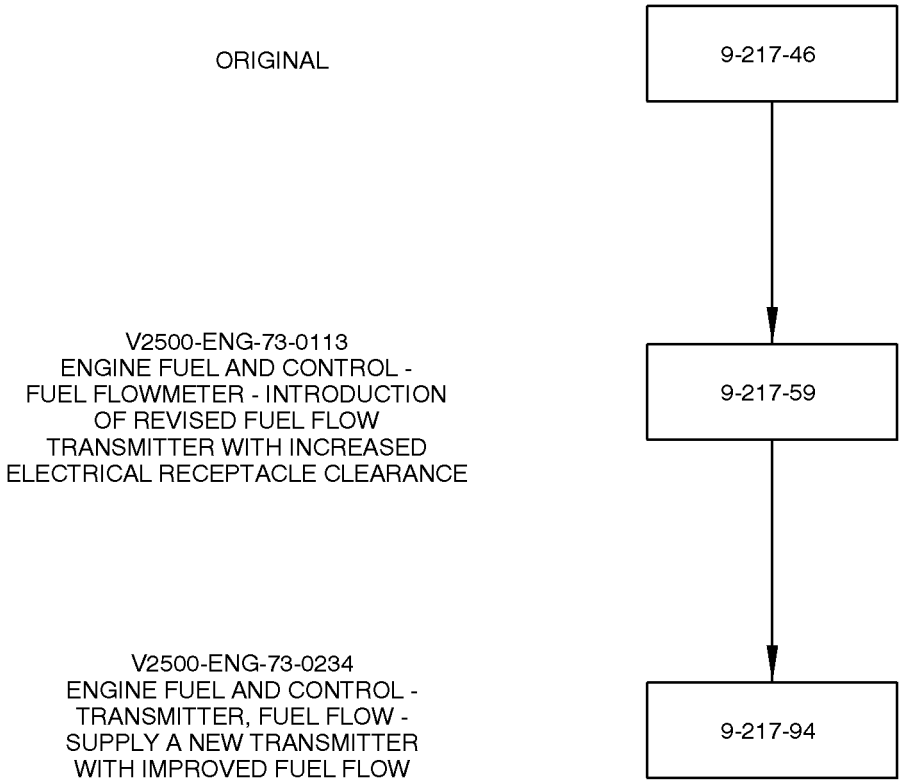
   A. A record of accomplishment is required.



LOCATION OF THE FUEL FLOW TRANSMITTER
73-31-17
FIGURE 1

Appendix

Parts Progression To Show the Changed Part in Relation to Other Parts



FAMILY TREE — FUEL FLOW TRANSMITTER
CHART A

Added Data

Added Data

Internal Reference Information

Revision No.	Reference Document	Origination
Original	EC13VI008	BP/CMS

Number values shown in parentheses adjacent to U.S. values are International System of units (SI) equivalents.

Reference 5, Crane Aerospace & Electronics ELDEC Corporation Service Bulletin No. 9-217-73-23, follows:

CRANE AEROSPACE & ELECTRONICS **ELDEC Corporation**

SERVICE BULLETIN

ENGINE FUEL AND CONTROL — FUEL FLOW TRANSMITTER

MODIFICATION OF 9-217-59 TO 9-217-94 FUEL FLOW TRANSMITTER

1. Summary

The ELDEC part number 9-217-59 Fuel Flow Transmitter (flowmeter) is identical in form and fit to a 9-217-94 flowmeter. The scale error test points and tolerances of the 9-217-94 are slightly different, to more accurately agree with the predicted fuel use of the aircraft.

This service bulletin describes a procedure to modify a 9-217-59 flowmeter to a 9-217-94 flowmeter.

2. Planning Information

A. Effectivity

This service bulletin applies to all ELDEC 9-217-59 flowmeters used on V2500-A5 and V2500-D5 engines.

B. Concurrent Requirements

None.

C. Reason

(1) Condition

The 9-217-59 flowmeter calibration curve does not agree with the predicted fuel use of the aircraft.

(2) Background

Extensive tracking has shown that the aircraft fuel usage calculated from 9-217-59 fuel flow causes a reduction in aircraft range.

(3) Objective

The service bulletin provides a new part number fuel flow transmitter with an improved calibration curve, by modification of the existing 9-217-59 flowmeter to part number 9-217-94.

D. Description

The 9-217-59 flowmeter is tested, and calibrated if necessary, to meet the requirements of the 9-217-94 flowmeter, then the identification plate is removed and replaced with a 9-217-94 identification plate. The serial number and date of manufacture of the unit are not changed.

E. Compliance

Category 7: Accomplish when the supply of superseded parts has been depleted.

F. Approval

IAE Engineering Change number 13VI008 gives approval for the modification in this service bulletin.

G. Manpower

Approximately 1 manhour plus testing time is required to modify each 9-217-59 flowmeter to 9-217-94.

H. Weight and Balance

Not affected.

I. Electrical Load Data

Not changed.

J. Software Accomplishment Summary

Not applicable.

K. References

IAE 13VI008 Engineering Change
ELDEC 73-38-01 Component Maintenance Manual

L. Other Publications Affected

ELDEC 73-38-01 Component Maintenance Manual

M. Interchangeability or Intermixability of Parts

The 9-217-59 and 9-217-94 flowmeters are fully interchangeable. Interchangeability and intermixability of the parts in the flowmeter is controlled by ELDEC.

3. Material Information

A. Material — Price and Availability

Units returned to ELDEC will be modified at the cost of labor and parts; contact ELDEC for a quotation (see paragraph 5.A).

Units must be in serviceable condition before the modification can be incorporated. Any necessary repairs to units that are out of warranty will be done at the cost of labor and materials. Contact ELDEC for a quotation (see paragraph 5.A).

ELDEC estimates a turnaround time of 14 days for units returned for this modification.

B. Industry Support Information

Warranty of the flowmeter is not affected by incorporation of this modification.

C. Material Necessary for Each Component or Spare

(1) Material Supplied by ELDEC

P/N (Vendor)	Description	Qty	Unit List Price	Special Instructions/ Disposition
9-217819-101	Nameplate	1	N/A	Scrap and Replace
KT96-03	Screw, Drive	4	N/A	Scrap and Replace

(2) Material Supplied by the Operator

N/A

D. Re-identified Parts

The parts shown are changed by this service bulletin. Subassembly parts are indented with bullets. The quantity shown for indented parts is the quantity used on the next higher assembly.

New P/N	Description	Old P/N	Qty	Disposition
9-217-94	Fuel Flow Transmitter	9-217-59	1	Test and Re-identify
• 9-217819-101	Nameplate	• 9-217819-101	1	Scrap, Replace, and Reidentify

E. Tooling — Price and Availability

No special tooling is required for this modification.

4. Accomplishment Instructions (See Figure 1)

Return the removed flowmeter to ELDEC for incorporation of this modification. See Section 5.B, Shipping Address. ELDEC will do the steps given below.

A. Testing

(1) Test the flowmeter as given in paragraphs 3.A through 3.C.(2) in TESTING AND FAULT ISOLATION of the ELDEC 73-38-01 Component Maintenance Manual.

(2) Do the Increasing and Decreasing Flow Rate Tests as instructed in paragraphs 3.C.(2) and 3.C.(3).

NOTE: Do not use the 9-217-59 flowmeter Scale Error Flow Rates and Tolerances given in Table 104 of the CMM.

(3) Use the 9-217-94 Scale Error Flow Rates and Tolerances given below.

TEST STAND FLOW SETTINGS at 70 °F (pph)			MEASURED FLOW RATE at 70 °F (pph)		RPM ** MIN / MAX LIMITS
NOMINAL FLOW RATE	LOWER FLOW RATE LIMIT	UPPER FLOW RATE LIMIT	LOWER ERROR LIMIT	UPPER ERROR LIMIT	
500	490	510	-25	42	95 / 170
1000*	990	1010	-25	25	95 / 170
2250	2227.5	2277.5	-25	13	95 / 170
3000	2970	3030	-25	5	95 / 170
6000*	5940	6060	-50	5	95 / 170
8000	7920	8080	-65	10	95 / 170
12000*	11880	12120	-155	50	90 / 145
15000	14850	15150	-195	70	90 / 120

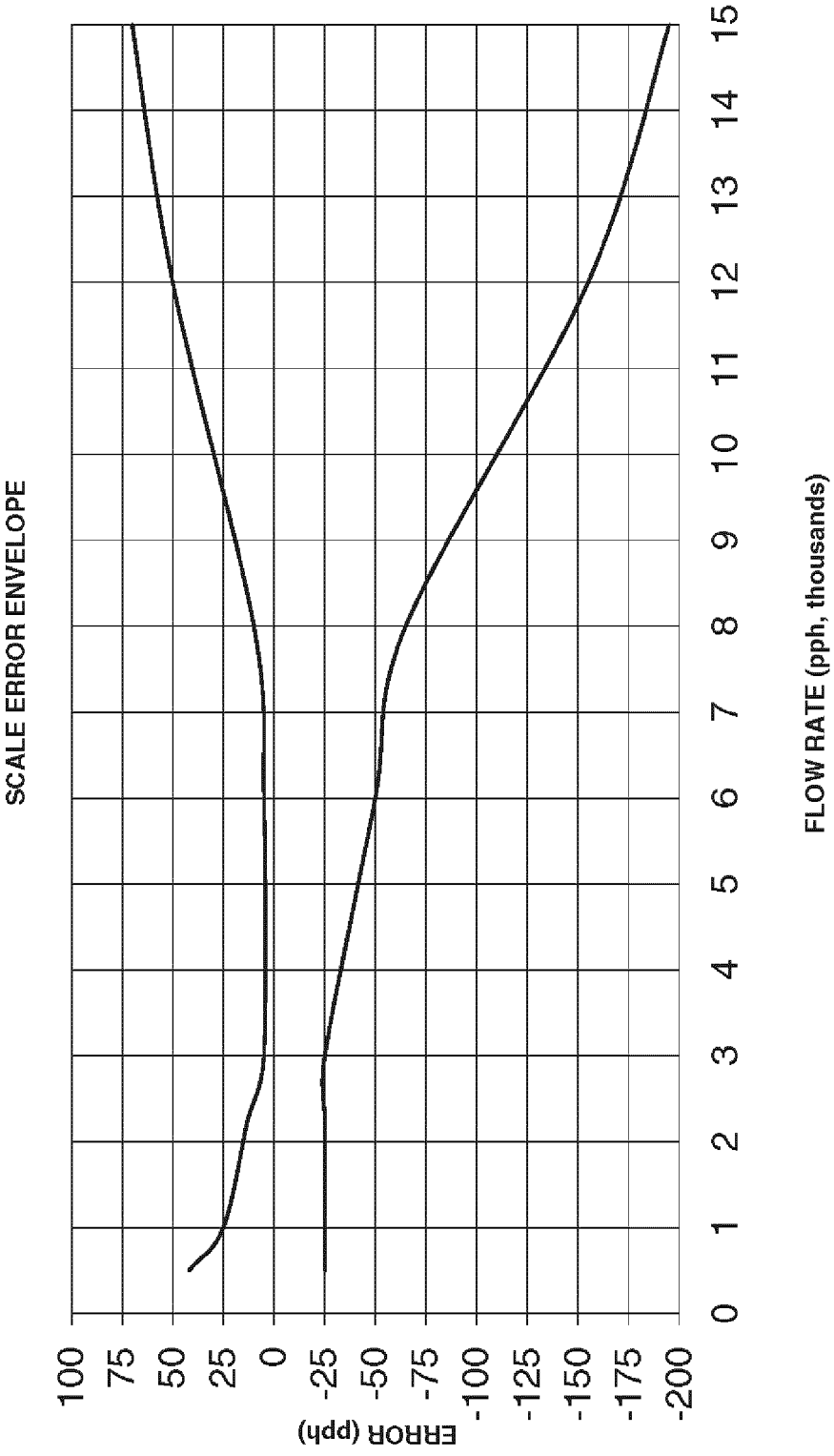
* Increasing Flow Rate Only

** RPM = 30,000 / Pulse Repetition Rate (in milliseconds)

(4) Test the drum and impeller pickoff coils as given in paragraph 3.E in TESTING AND FAULT ISOLATION of the ELDEC 73-38-01 Component Maintenance Manual.

(5) If the flowmeter test results are correct, go to step 4.C, Re-Identification.

(6) If the flowmeter test results are not correct, go to step 4.B, Disassemble, Calibrate, and Assemble the Unit.



B. Disassemble, Calibrate, and Assemble the Unit

(1) Disassemble the flowmeter as given in DISASSEMBLY of the ELDEC 73-38-01 Component Maintenance Manual.

(2) Calibrate the flowmeter as given in paragraph 4 in TESTING AND FAULT ISOLATION of the ELDEC 73-38-01 Component Maintenance Manual.

NOTE: Do not use the 9-217-59 Flow Rate Accuracy Graph given in Figure 106 of the CMM. Use the graph given above.

(3) Assemble the 9-217-59 flowmeter as given in ASSEMBLY of the ELDEC 73-38-01 Component Maintenance Manual.

(4) Do step 4.A, Testing.

(5) Do step 4.C, Re-Identification.

C. Re-Identification

(1) Record the information from the old 9-217-59 nameplate.

(2) Remove the old 9-217-59 nameplate.

(3) Identify the new 9-217-94 nameplate with the data recorded in step 4.C.(1).

CAUTION: DO NOT SHOCK OR HIT THE ASSEMBLED FLOWMETER TO INSERT THE DRIVE SCREWS. THE FLOWMETER CAN BE DAMAGED OR CALIBRATION CAN BE AFFECTED.

(4) Use a press to insert the new drive screws.

5. Further Information

A. Repair Price and Status Information

Crane Aerospace & Electronics
ELDEC Corporation
ATTN: Repair Station
16706 13th Ave. West
Lynnwood, WA 98037-8597
U.S.A.

Telephone: +1-425-743-8255
Facsimile: +1-425-787-4223
email: eldecrepairadmin@craneaerospace.com

B. Shipping Address

Customers shall return the units to the address below, with a shipper of their choice.

Crane Aerospace & Electronics
ELDEC Corporation
Warranty and Repair Dept.
16706 13th Ave. West
Lynnwood, WA 98037
U.S.A.

Phone: +1-425-743-8255

For international returns that must clear customs, please use the information that follows:

Airport of Destination: SEA

Customs Broker:
UPS Supply Chain Solutions
Auburn, WA 98001
U.S.A.

Phone: +1-253-872-4241

C. Technical Information

For technical questions, please contact the Product Support Representative at:

Crane Aerospace & Electronics
ELDEC Corporation
P.O. Box 97027
Lynnwood, WA 98046-9727
U.S.A.

Phone: +1-425-743-8272
+1-425-743-8473
Fax: +1-425-743-8371
Internet: http://www.craneae.com

To ask other questions or make comments about this document, please contact Technical Publications at http://www.craneae.com/CustomerService/TechPubComments.aspx.

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