

# SERVICE BULLETIN

ENGINE INDICATING — THERMOCOUPLE, EXHAUST GAS TEMPERATURE  
(EGT) — INTRODUCTION OF

## MODEL APPLICATION

V2500-A1, V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5,  
V2533-A5, V2525-D5, V2528-D5

## BULLETIN ISSUE SEQUENCE

V2500 Series 77-0011

## ATA NUMBER

77-21-15

77-21-02

72-50-50

Supplier Service Bulletin

HARCO Service Bulletin SB1-77-21-15-BASIC

Compliance Category

6, 7

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V2500-ENG-77-0011

P&W Distribution Code

V2500

Planning Information

Effectivity Data (For Airbus A319)

Engine Models Applicable

V2522-A5, V2524-A5, V2527M-A5  
Engines from Serial No. V10001 thru V13190.

V2522-A5, V2524-A5, V2527M-A5  
Engines from Serial No. V15001 thru V16770.

Effectivity Data (For Airbus A320)

Engine Models Applicable

V2500-A1  
Engine Serial Nos. V0001 thru V0361

V2527-A5, V2527E-A5  
Engines from Serial No. V10001 thru V13190.

V2527-A5, V2527E-A5  
Engines from Serial No. V15001 thru V16770.

Effectivity Data (For Airbus A321)

Engine Models Applicable

V2530-A5, V2533-A5  
Engines from Serial No. V10001 thru V13190.

V2530-A5, V2533-A5  
Engines from Serial No. V15001 thru V16770.

Effectivity Data (For Boeing MD-90)

Engine Models Applicable

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

Concurrent Requirements

There are no concurrent requirements.

Reason

1. Problem: Pilots have reported faulty high, low, and erratic EGT readings causing flight delays and cancellations.
2. Background: The EGT thermocouple probe has been shown to be sensitive to high humidity and moisture. This moisture can cause shorting of the EGT signal resulting in faulty high, low, or erratic EGT readings. During troubleshooting the EGT thermocouple probe fails electrical tests or is found with studs that are broken or loose.
3. Objective: A new EGT probe featuring a better moisture seal and redesigned studs that will improve the EGT indication system and durability of the EGT thermocouple

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probes. Additional changes are planned for other components in the system to further improve the EGT indication system.

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

Replace the EGT thermocouple option with an immersion thermocouple.

#### Compliance

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

Category 6

Accomplish when the subassembly (i.e. modules, accessories, components, build groups) is disassembled sufficiently to afford access to the affected part and to all affected spare parts.

NOTE: When feasible, it is recommended to replace the 4 old design EGT Thermocouples with the new design.

For V2500-A1, V2525-D5, and V2528-D5 Engines:

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
  - ..... 1 Hour.
2. At Overhaul
  - ..... Applicable (Hours Not Affected).

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### Weight and Balance

1. Weight Change  
+ 0.52 lbs (0.24 kg).
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. IAE V2500 Service Bulletin V2500-ENG-72-0063, (Engine — LP Turbine Rotor And Stator Assembly — Introduce New Tube Assemblies Required For Modified Turbine Exhaust Case).
2. IAE V2500 Service Bulletin V2500-ENG-73-0202, (Engine — Fuel And Control — P4.9 Tube Assemblies, Pressure Control And Box And Cable, TC — Replace The P4.9 Tube Assemblies To Prevent Fractures And Reposition The Exhaust Gas Temperature (EGT) Cable To Prevent Chafing).
3. V2500-A1/A5 Aircraft Maintenance Manual, Chapter/Section 77-21-15.
4. V2500-D5 Aircraft Maintenance Manual, Chapter/Section 77-21-02.
5. V2500 Engine Illustrated Parts Catalogs (S-V2500-1IA, S-V2500-2IA, S-V2500-2IB, S-V2500-3IA, S-V2500-3IB, S-V2500-5IA, S-V2500-5IB, S-V2500-6IA, S-V2500-6IB, S-V2500-7IA, and S-V2500-7IB), Chapter/Section 77-21-15.
6. V2500 Engine Illustrated Parts Catalogs (S-V2500-2SA, S-V2500-2SB, S-V2500-5SA, S-V2500-5SB, S-V2500-6SA, S-V2500-6SB, S-V2500-7SA, and S-V2500-7SB), Chapter/Section 77-21-15.
7. V2500 Engine Manual (E-V2500-1IA), Chapter/Section 72-00-50.
8. V2500 Engine Manual (E-V2500-3IA), Chapter/Section 72-00-50.
9. HARCO Service Bulletin No. SB1-77-21-15-BASIC, (Introduction Of V2500 EGT Probe Redesign).
10. Internal Reference No. — EC 11VZ005.
11. ATA Locator — 77-21-15, 77-21-02, 72-50-50.

### Other Publications Affected

1. V2500 Engine Illustrated Parts Catalogs (S-V2500-1IA, S-V2500-2IA, S-V2500-2IB, S-V2500-3IA, S-V2500-3IB, S-V2500-5IA, S-V2500-5IB, S-V2500-6IA, S-V2500-6IB, S-V2500-7IA, and S-V2500-7IB), Chapter/Section 77-21-15.

2. V2500 Engine Illustrated Parts Catalogs (S-V2500-2SA, S-V2500-2SB, S-V2500-5SA, S-V2500-5SB, S-V2500-6SA, S-V2500-6SB, S-V2500-7SA, and S-V2500-7SB), Chapter/Section 77-21-15.
3. V2500 Component Maintenance Manuals (CMM\_MM) (MECH-V2500-1/A and MECH-V2500-3/A) Chapter/Section 77-21-15 Cleaning and Inspection to add the new part.

#### Interchangeability of Parts

Old and new parts are directly interchangeable however, to achieve the full benefit of this change it is recommended that the EGT probes be incorporated in full sets.

If an airline is experiencing EGT indication issues it is highly recommended to switch the EGT probe from the old design to the new design on wing and not wait until the next shop visit.

#### Information in the Appendix

Alternate Accomplishment Instructions (No)

Progression Charts (Yes)

Supplement (Yes)

Added Data (Yes)

Revision to Table of Limits (No)

Inspection Procedures (No)

## Material Information

### Material — Price and Availability

Modification kit is not required.

For price and availability of spares, refer to the supplement of this service bulletin.

### Industry Support Program

Not Applicable.

The material data that follows is for each engine.

### For V2500-A1 Engines:

FIG- ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR — DISP
	77-21-15					
01-100		4	THERMOCOUPLE OPTION	—	2A2159	(L)(O1)
		REF	.THERMOCOUPLE OR	—	2A2160	(L)
		REF	.THERMOCOUPLE	—	2A2224	(L)
01-100	2A4328	4	THERMOCOUPLE, IMMERSION	—		(2)(B)(I)

The material data that follows is for each engine.

### For V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5 V2525-D5, V2528-D5 Engines:

FIG- ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR — DISP
	77-21-15					
20-100		4	THERMOCOUPLE OPTION	—	2A2159	(L)(O1)
		REF	.THERMOCOUPLE OR	—	2A2160	(L)
		REF	.THERMOCOUPLE	—	2A2224	(L)
20-100	2A4328	4	THERMOCOUPLE, IMMERSION	—		(2)(B)(I)

### Instructions/Disposition Code Statements:

Parts Modification Conditions

(2) The new part is a replacement part only, and cannot be obtained by modification of the old part.

#### Spare Parts Availability

(B) The new part will be available on March 15, 2013.

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

(NP) The part is an item that is usually not procured as a spare item.

(O1) Thermocouple Option, PN 2A2159, consists of Thermocouple, PN 2A2160 or PN 2A2224.

#### Cleaning and Inspection Information

(I) The cleaning and inspection requirements are the same for the old and new part. The applicable manuals will be revised.

#### 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

### ON WING

NOTE: Service bulletin incorporation on engines installed on aircraft may be desirable and should be individually evaluated.

NOTE: Refer to Reference 9, HARCO Service Bulletin No. SB1-77-21-15-BASIC, INTRODUCTION OF V2500 EGT PROBE REDESIGN.

CAUTION: IF AN AIRLINE IS EXPERIENCING EGT INDICATION ISSUES IT IS HIGHLY RECOMMENDED TO SWITCH THE EGT THERMOCOUPLES FROM THE OLD DESIGN TO THE NEW DESIGN ON WING AND NOT WAIT TILL THE NEXT SHOP VISIT.

1. Open cowl doors and remove 4 old Exhaust Gas Temperature (EGT) Thermocouples from the Turbine Exhaust Case per Reference 3 AMM Task 77-21-15-000-010-A for V2500-A1/A5 Engines or Reference 4 AMM Task 77-21-02-020-801 for V2500-D5 Engines.
2. Install the 4 new EGT Thermocouples, PN 2A4328 into Turbine Exhaust Case per one of the following tasks:

CAUTION: DO NOT USE LUBRICATION ON THE THREADS OF THE THERMOCOUPLE CONNECTIONS. ENGINE OIL CAN CONTAMINATE THE EGT HARNESS INSULATION MATERIAL AND RESULT IN ERRATIC OR UNRELIABLE EGT INDICATION.

- A. Refer to Reference 3 AMM Task 77-21-15-400-010-A for V2500-A1/A5 Engines with the following requirements:

- (1) While securing the thermocouple harness leads to the EGT thermocouple, torque the alumel connection nut (larger stud) to between 18 and 22 lbf in (2,034 – 2,486 Nm). See Figure 1 for alumel stud.
- (2) While securing the thermocouple harness leads to the EGT thermocouple, torque the chromel connection nut (smaller stud) to between 15 and 18 lbf in (1,695 – 2,034 Nm). See Figure 1 for chromel stud.

CAUTION: DO NOT USE LUBRICATION ON THE THREADS OF THE THERMOCOUPLE CONNECTIONS. ENGINE OIL CAN CONTAMINATE THE EGT HARNESS INSULATION MATERIAL AND RESULT IN ERRATIC OR UNRELIABLE EGT INDICATION.

- B. Refer to Reference 4 AMM Task 77-21-02-420-801 for V2500-D5 Engines with the following requirements.

- (1) While securing the thermocouple harness leads to the EGT thermocouple, torque the alumel connection nut (larger stud) to between 18 and 22 lbf-in (2,034 – 2,486 Nm). See Figure 1 for alumel stud.
- (2) While securing the thermocouple harness leads to the EGT thermocouple, torque the chromel connection nut (smaller stud) to between 15 and 18 lbf-in (1,695 – 2,034 Nm). See Figure 1 for chromel stud.

NOTE: There is no need to record a new group part number on any fielded engines. The new group part number is for new production engines only.

3. Close cowl door per Reference 3, AMM Task 77-21-15-400-010-A for V2500-A1/A5 Engines and Reference 4, AMM Task 77-21-02-420-801 for V2500-D5 Engines.



4. Recording Instructions

- A. A record of accomplishment is required.

OFF WING

1. Remove the 4 old Exhaust Gas Temperature (EGT) Thermocouples from the Turbine Exhaust Case per Reference 7 or 8 Engine Manual (EM) Task 72-00-50-050-001 for V2500- A1/A5/D5 Engines
2. Install the 4 new EGT Thermocouples, PN 2A4328 into Turbine Exhaust Case per one of the following tasks:

CAUTION: DO NOT USE LUBRICATION ON THE THREADS OF THE THERMOCOUPLE CONNECTIONS. ENGINE OIL CAN CONTAMINATE THE EGT HARNESS INSULATION MATERIAL AND RESULT IN ERRATIC OR UNRELIABLE EGT INDICATION.

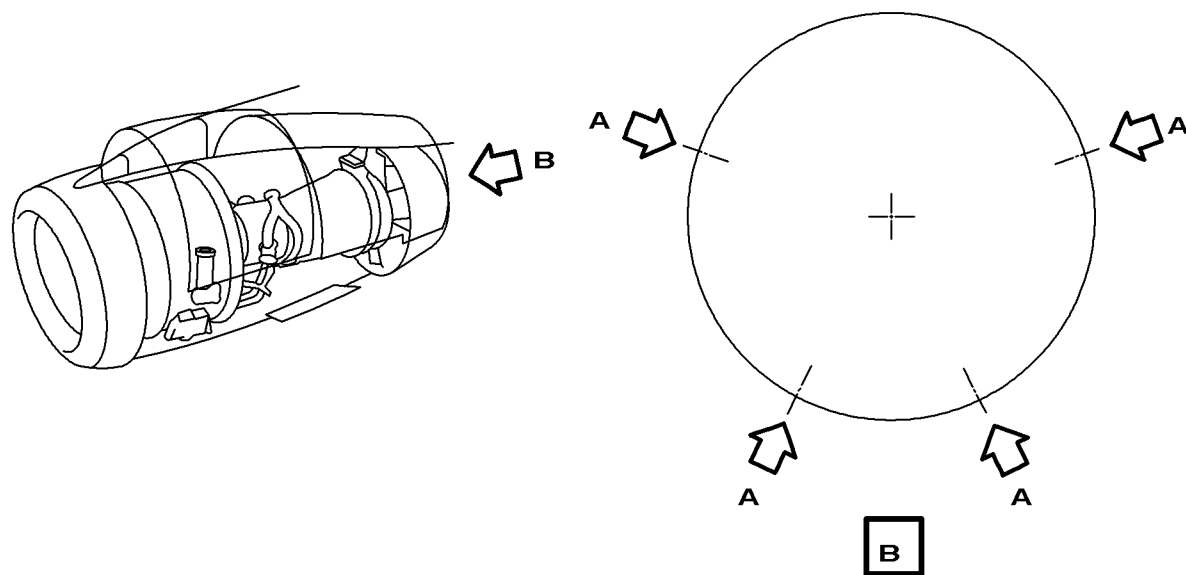
- A. Refer to Reference 7 or 8 EM Task 72-00-50-450-001 for V2500-A1/A5/D5 Engines with the following requirements:

- (1) While securing the thermocouple harness leads to the EGT thermocouple, torque the alumel connection nut (larger stud) to between 18 and 22 lbf in (2,034 – 2,486 Nm). See Figure 1 for alumel stud.
- (2) While securing the thermocouple harness leads to the EGT thermocouple, torque the chromel connection nut (smaller stud) to between 15 and 18 lbf in (1,695 – 2,034 Nm). See Figure 1 for chromel stud.

NOTE: There is no need to record a new group part number on any fielded engines. The new group part number is for new production engines only.

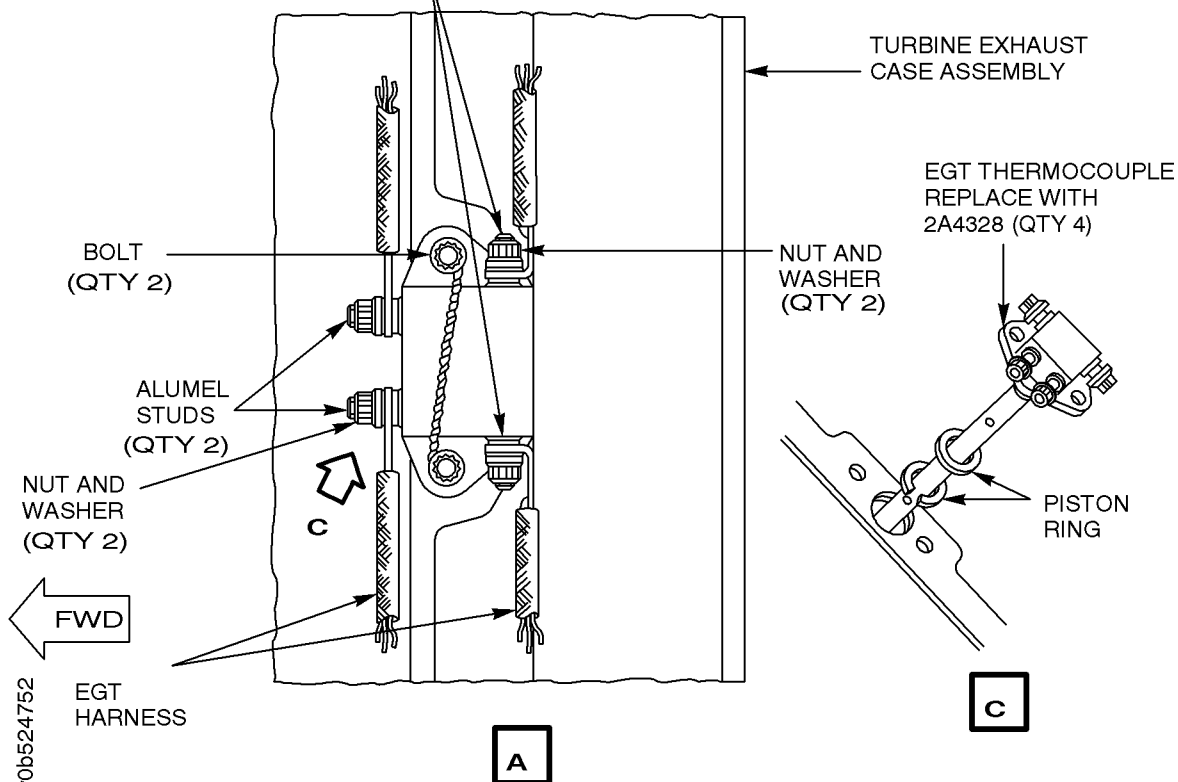
3. Recording Instructions

- A. A record of accomplishment is required.



CHROMEL STUDS

VIEW FROM REAR OF ENGINE



DETAIL AT 4 POSITIONS

LOCATION OF FOUR EGT THERMOCOUPLES  
FIGURE 1

Appendix

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

# MODIFICATIONS

## BASELINE

V2500-ENG-72-0063  
ENGINE - LP TURBINE ROTOR AND  
STATOR ASSEMBLY - INTRODUCE NEW  
TUBE ASSEMBLIES REQUIRED FOR  
MODIFIED TURBINE EXHAUST CASE

V2500-ENG-77-0011  
ENGINE INDICATING - THERMOCOUPLE,  
EXHUAUST GAS TEMPERATURE (EGT) -  
REPLACEMENT OF

(1)

4T4050

(1) (2)

2A2159

(1) (2)

2A4328

(1) - V2500-A1 ENGINES  
(2) - V2500-A5 / D5 ENGINES

pw0b524753

## FAMILY TREE — EXIT GAS TEMPERATURE (EGT) THERMOCOUPLE FOR V2500-A1/A5/D5 ENGINES

Ref. Catalog Sequence No. 77-21-15, Fig. 1 Item 100

### CHART A

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IAE PROPRIETARY INFORMATION

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Not Subject to the EAR per 15 C.F.R. Chapter 1, Part 734.3(b)(3).

## Supplement

V2500 All

### 1. Modification Kit

A. There is no kit provided to do this Service Bulletin.

### 2. Material Cost

**NOTE:** The prices shown are for estimating purposes only and as such are given in good faith without commercial liability for advanced planning purposes only. Refer to IAE Spares and/or current Price Catalog for current prices.

A. The estimated price of new material to do this Service Bulletin using new replacement parts is \$15,428.00.

B. There is no kit provided to do this Service Bulletin.

### 3. The new part will be available on March 15, 2013.

### 4. New Production Parts

New Production Part Number	Description	Unit Price US Dollars
2A4328	Thermocouple, Immersion	3857.00

## Added Data

### Internal Reference Information

Revision No.	Reference Document	Origination
Original	EC11VZ005	CMS/PS

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

Reference 9, HARCO Service Bulletin No. SB1-77-21-15-BASIC, follows:



## Letter of Transmittal

This Original Issue of Service bulletin SB1-77-21-15-BASIC requires a change to the V2500 EGT Probe part number.

The old HARCO part numbers for the V2500 EGT Probe HAD19795 (IAE P/N 2A2160) will be replaced with the new HARCO part number 30030-000 rev. C (IAE P/N 2A4328).

Original      February 28, 2013

**HARCO LABORATORIES  
186 CEDAR STREET  
BRANFORD, CT. 06405-6011**

**SERVICE BULLETIN #**

SB1-77-21-15-BASIC

ENGINEERING CHANGE IN DESIGN

V2500 EGT Probe

P/N 30030-000 rev. C (IAE P/N 2A4328)

INTRODUCTION OF V2500 EGT PROBE REDESIGN



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**1. PLANNING INFORMATION:**

**A. SUMMARY:**

This Service Bulletin introduces the new V2500 EGT Probe. The top level part number for the V2500 EGT Probe has been changed.

**B. EFFECTIVITY:**

Original February 28, 2013

SB1-77-21-15-BASIC

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V2500 engine series incorporating the use of the below listed EGT Probe.

The old V2500 EGT Probe is as follows:

<u>Nomenclature</u>	<u>HARCO Part No.</u>	<u>IAE Part No.</u>
V2500 EGT Probe	HAD19795	2A2160

The new V2500 EGT Probe is as follows:

<u>Nomenclature</u>	<u>HARCO Part No.</u>	<u>IAE Part No.</u>
V2500 EGT Probe	30030-000 rev. C	2A4328

**C. Reason:**

<b>1. Problem</b>	:	Loose T/C Studs have been reported
<b>Cause</b>	:	The studs on the EGT Probe are subject to over-torquing during incorrect installation.
<b>Solution</b>	:	Replace old stud design with new method involving updated stud design with incorporated locking geometry.
<b>2. Problem</b>	:	Moisture has caused Insulation Resistance(IR) failure
<b>Cause</b>	:	Moisture would enter the stud box through possible leak paths around stud and into probe housing.
<b>Solution</b>	:	Replace the old formed box with a new casting that will prevent leak paths from forming

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**D. DESCRIPTION:**

This Service bulletin introduces a new Top Level part number to the V2500 EGT Probe.

**E. APPROVAL:**

The procedures given in this Service Bulletin obey the applicable Federal Aviation Regulations. The procedures are FAA-approved for the Probe that is given in EFFECTIVITY.

**F. COMPLIANCE:**

Category 7 When the supply of superseded parts is fully used.

**G. MANPOWER:**

No more man-hours are necessary. Done at complete disassembly/assembly.

**H. MATERIAL COST AND AVAILABILITY:**

See Section 3.

**I. TOOLING – PRICE AND AVAILABILITY:**

No special tools are necessary.

**J. WEIGHT AND BALANCE:**

Maximum weight: 0.45lbs.

**K. ELECTRICAL LOAD DATA:**

Not changed/Not applicable.

**L. SOFTWARE ACCOMPLISHMENT SUMMARY:**

**M. REFERENCES:**

HARCO Component Maintenance Manual 77-21-15

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**N. OTHER PUBLICATIONS AFFECTED:**

1. V2500 Engine Illustrated Parts Catalogs (S-V2500-1IA, S-V2500-2IA, S-V2500-2IB, S-V2500-5IA, S-V2500-5IB, V-2500-6IA, S-V2500-7IA, and V2500-7IB), Chapter/Section 77-21-15, to add the new parts.
2. V2500 Engine Manuals (E-V2500-1IA) Chapter/Section 77-21-15 Cleaning, Inspection, and Repair, to add the new parts.

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**2. ACCOMPLISHMENT INSTRUCTIONS:**

**A. DISASSEMBLY INSTRUCTIONS**

1. Not Applicable

**B. ASSEMBLY INSTRUCTIONS**

1. Not Applicable

The previous part number cannot be modified to obtain the new configuration

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**3. MATERIAL INFORMATION:**

<b>New Part Number</b>	<b>Qty.</b>	<b>Price</b>	<b>Part Name</b>	<b>Old Part Number</b>	<b>Old Part Disposition</b>
30030-000 rev. C	1	Call HARCO	V2500 EGT Probe	HAD19795	(A) (B) (C)

\*\*\*\* The HARCO Sales Department will give a firm price when necessary.

(A) New part is available

(B) Old part will become unavailable

(C) Use up current stock

Part Interchangeability Data

Old and new parts are interchangeable