McDonnell Douglas Helicopter Company

SERVICE INFORMATION NOTICE

FAA APPROVED

MANDATORY MANDATORY MANDATORY

SUBJECT: INSTALLATION OF NI-CAD BATTERY TEMPERATURE SENSING MODIFICATION KIT, PN M50037 OR M50038

MODELS AFFECTED:
369H Helicopter Serial No. 0001 thru 0005
369HE Helicopter Serial No. 0101E thru 0215E
369HS Helicopter Serial No. 0001S thru 0510S
369HM Helicopter Serial No. 0001 thru 0004;
0005M thru 0230M;
0233M thru 0235M

TIME OF COMPLIANCE: Shall be accomplished prior to 1 October 1973

PREFACE: The information given in this Service Information Notice lists a procedure for installing a battery temperature monitoring system, and an operating procedure for disconnecting the battery in event of a battery over-temperature condition. (See FAA Airworthiness Directive referenced below.) Instructions for periodic deep-cycling of the battery, and for inspecting the battery temperature sensors and warning indicators are also inc uded.

It is to be noted that installation of Modification Kit No. M50038 is applicable only to Model 369HM helicopters that are equipped with the Grimes Master Caution Control System PN80-0204-1, and that have two "SPARE" caution light windows available on the instrument console. Installation of Modification Kit No. M50037 is applicable to all other above affected helicopters.

Reference

FAA Airworthiness Directive No. 72-19-4, dated 26 February 1973
Owners Flight Manual, Model 369H, 369HE, 369HS, 369HM as applicable
500 Series - Basic HMI, Issued - October 1972; Revision No. 2, 1 July 1973
500 Series - HMI Appendix B, Issued 1 October 1972; Revision No. 1, 1 June 1973
500 Series - HMI Config Supp M, Issued 1 December 1971; Rev No. 1, 1 October 1972

PARTS LIST

For all 369H Series Helicopters (except 369HM Helicopters equipped with Grimes Master Caution Control System and with two "SPARE" caution light windows available) order Modification Kit No. M50037 which consists of the following:

Nomenclature	Part No.	Qty.
Limit Switch Assembly		
Hi-Limit Switch (160F)	3BTF3-33	1
Lo-Limit Switch (140F)	3BTF3-29	1
Wire, Teflon (Red)	MIL-W-16878, Type E, AWG22	AR
Wire, Teflon (Yellow)	MIL-W-16878, Type E, AWG22	AR
Connector Receptacle	M4SLRN	1
Sleeving, Fiberglass	No. 6, MIL-I-3190, Class H-A-I	AR
Wire Harness Assembly		
Connector Plug	M4PLSH10C	1
Wire	MIL-W-5086/2, Type 2, AWG22	AR
Tubing, Thermofit	RNF-100, 0.25ID	AR
Sleeving, Clear Plastic	No. 10, MIL-I-631 Type F, Form U, Grade A, Class I, Category 1	AR
Light, Red	MS25041-2	1
Light, Amber	MS25041-4	1
Wire	MIL-W-5086/2, Type 2, AWG22	AR
Housing	369H2075-11	1
Screw	MS51957-29	2
Screw	SFSW6C7CPL01BK	2
Washer	AN960C6	2
Lamp	#327	2

For 369HM Helicopters equipped with Grimes Master Caution Control System (PN 80-0204-1) and with two "SPARE" caution light windows available, order Modification Kit No. M50038 which consists of the following:

Nomenclature	Part No.	Qty.
Limit Switch Assembly		
Hi-Limit Switch (160F)	3BTF6-33	1
Lo-Limit Switch (140F)	3BTF6-29	1
Wire (Red)	MIL-W-16878, Type E, AWG22	AR
Wire (Yellow)	MIL-W-16878, Type E, AWG22	AR
Wire (Black)	MIL-W-16878, Type E, AWG22	AR

Nomenclature	Part No.	Qty.
Connector Receptacle	M4SLRN	1
Sleeving, Fiberglass	No. 6, MIL-I-3190, Class H-I-A	AR
Lug, Terminal	MS25036-149	1
Wire Harness Assembly		
Connector Plug	M4PLSH10C	1
Wire	MIL-W-5086/2, Type 2, AWG22	1
Tubing, Thermofit	RNF-100, 0.25ID	AR
Sleeving, Clear Plastic	No. 10, MIL-I-631, Type F, Form U, Grade A, Class I, Category 1	AR
Socket	MS17804-16-20	2
Decal	M50038-3	1
Decal	M50038-5	1
Insert	M50038-7	1

TOOLS & EQUIPMENT

Drill bit - 0.120 inch diameter	Commercial
Drill bit - 0.187 inch diameter	Commercial
Drill bit - 0.380 inch diameter	Commercial
Drill bit - 0.468 inch diameter	Commercial
Drill motor, portable	Commercial
Tap - 1/4-28 UNF	Commercial
Tap - 4-40 UNC	Commercial
Spotface tool - 1.00 inch diameter	Commercial

MATERIALS

Sealant	RTV-732 *	Dow Corning
Rust Inhibitor	WD-40 *	Rocket Chem Co Inc
Solder	QQ-S-571	Commercial
Emery cloth or paper-fine		Commercial
Paint - red		Commercial

* Primary selection - any equivalent alternate may be used

MODIFICATION PROCEDURE

a. Check that all electrical power is OFF; ensure that BATT-EXT-OFF switch is in OFF position.

b. Open or remove LH compartment floor access door.

c. Disconnect and remove battery from helicopter.

WARNING

Discharging the battery before attempting any modification is recommended to prevent any possible injury to personnel or damage to battery. If battery is not discharged, use extreme care and caution when handling and modifying the battery.

d. Remove battery cover and discharge the battery, as applicable.

e. Relocate polarity decal to upper side of battery case; carefully drill hole and cut keyway in battery case and spotface per dimensions shown (see Detail B, Figure 1 for M50037 Kit; see Detail B, Figure 2 for M50038 Kit).

f. Remove bus bar shown; drill and tap bus bar two places (see Detail A, Figure 1 for M50037 Kit; see Detail A. Figure 2 for M50038 Kit).

g. Paint red stripe on bus bar to identify Hi-Limit switch (160F sensor); reinstall bus bar.

h. Install connector receptacle (with wiring attached) at new hole in battery case. Seal back of connector and wiring terminals with RTV-732 sealant or equivalent. Cover wiring 0.25 inch beyond ends of terminals with sealant.

i. Install limit switches on bus bar; tighten limit switches to 10 ± 5 inch-pounds torque. Solder red and yellow wires to limit switches; check that Hi-Limit switch (160F sensor) with red wire is installed at identifying red stripe on bus bar. Also install jumper and ground wires for M50038 Kit. Refer to applicable wiring diagram.

j. Seal limit switches with RTV-732 sealant or equivalent.

k. Clean and inspect battery; spray thin film of WD-40 or equivalent over entire surface of battery and inside connector receptacles.

l. Deep-cycle battery, if previously discharged (refer to Basic HMI and battery manufacturer's instructions).

m. Perform the following for M50037 Kit installation.

For helicopters NOT equipped with Grimes Master Caution Control System:

1. Disconnect and remove engine out warning horn from instrument panel center fairing. Refer to Basic HMI.
2. Remove outer and inner covers from warning horn unit.

3. Position and nest 369H2075-11 housing box assembly on instrument panel center fairing as shown in Figure 1. Match drill two 0.187 inch diameter attachment holes through box and center fairing. Match drill 0.380 inch diameter wiring hole through box and center fairing. Install box assembly on center fairing with two screws and washers.

4. Install red and amber warning lights on -11 housing cover as shown.

5. Route leads of warning light wiring harness through center fairing and box assembly; solder wire leads and jumper wire to lamp terminals as shown (see Figure 1 and wiring diagram).

6. Install engine out warning horn unit on housing cover; route existing horn wiring through box assembly and center fairing. Install cover on box assembly.

7. Reconnect horn wiring; reinstall instrument panel center fairing.

For Model 369HM helicopters equipped with Grimes Master Caution Control System, but NOT having "SPARE" caution light windows available:

1. Using -11 housing plate as template, match drill two 0.468 inch diameter holes in instrument console at location visible to pilot, OR

   Fabricate and install bracket on instrument panel at location visible to pilot; install housing box assembly on bracket.

2. Install red and amber warning lights with housing plate on instrument panel, or on housing cover, as applicable.

3. Route leads of warning light wiring harness to instrument console or through box assembly; solder wire leads and jumper wire to lamp terminals as shown.

4. Install cover on box assembly, as applicable.

n. Perform the following for M50038 Kit installation only.

NOTE

Modification Kit No. M50038 applicable only if two "SPARE" caution light windows are available on instrument console. Otherwise install M50037 Kit. See Preface.

1. On caution light assembly on instrument console, remove existing left-hand "SPARE" window. Remove lettering from window using fine emery. Install M50038-3 decal between window and transparent lens and reassemble to window frame (see View C, Figure 2).

2. Remove existing right-hand "SPARE" window and discard. Install M50038-5 decal between M50038-7 insert and transparent lens and reassemble to window frame.

3. Crimp sockets to wiring leads of wiring harness and connect to terminals of master caution control as shown (see Figure 2 and wiring diagram).

o. Route warning light wiring harness with existing wiring to battery area; secure harness to structure with tie-straps as required.

p. Install and reconnect battery.

q. Install wiring harness connector to connector receptacle in battery case.

r. Check installation of modification kit for discrepancies; perform operational check of the system.

s. Secure compartment floor access door; as applicable, reinstall instrument panel side fairing.

t. Record installation of Modification Kit M50037 and M50038 per this Service Information Notice in Compliance Record of helicopter Log Book.

NOTE

The following will be added to the approved Rotocraft Flight Manual as soon as possible.

BATTERY OVER-TEMPERATURE INDICATION AND PROCEDURE. An amber caution light on the instrument panel comes on when the battery temperature reaches 140F; a red warning light comes on when the battery temperature reaches 160F.

a. When the AMBER lamp is lit:
   1. Turn battery switch off.

NOTE

When the AMBER light goes out, the battery has cooled to below 110F.

   2. The battery is to remain off-line during remainder of flight; inspect battery in accordance with manufacturer's instructions upon landing.

b. When the RED warning light is lit:

   1. Turn battery switch off.

   2. Land as soon as possible; manually disconnect battery and remove from helicopter. If no physical damage to the helicopter is apparent, flight may be continued.

NOTE

The following Periodic Inspections will be incorporated in the next revision to Appendix B of the HMI.

a. Every 100 hours, remove and clean battery; charge battery by the deep-cycle method.

b. Every 200 hours, remove and test battery temperature limit switches (sensors) for proper operation and accuracy per the following:

1. Perform an operational check of the temperature sensing system; replace inoperative lamps as required.
2. Inspect electrical circuit for security, physical damage and continuity.
3. Remove sensors from battery installation and test as follows:

   (a) Using container, oil or water, thermometer and heat source, check sensors for proper heat range:

   Lo-Limit Sensor - Closes on temperature rise @ 140F ±8F; opens on temperature decrease @ 110F ±8F

   Hi-Limit Sensor - Closes on temperature rise @ 160F ±8F; opens on temperature decrease @ 130F ±8F

WEIGHT & BALANCE DATA

Weight and balance not affected.

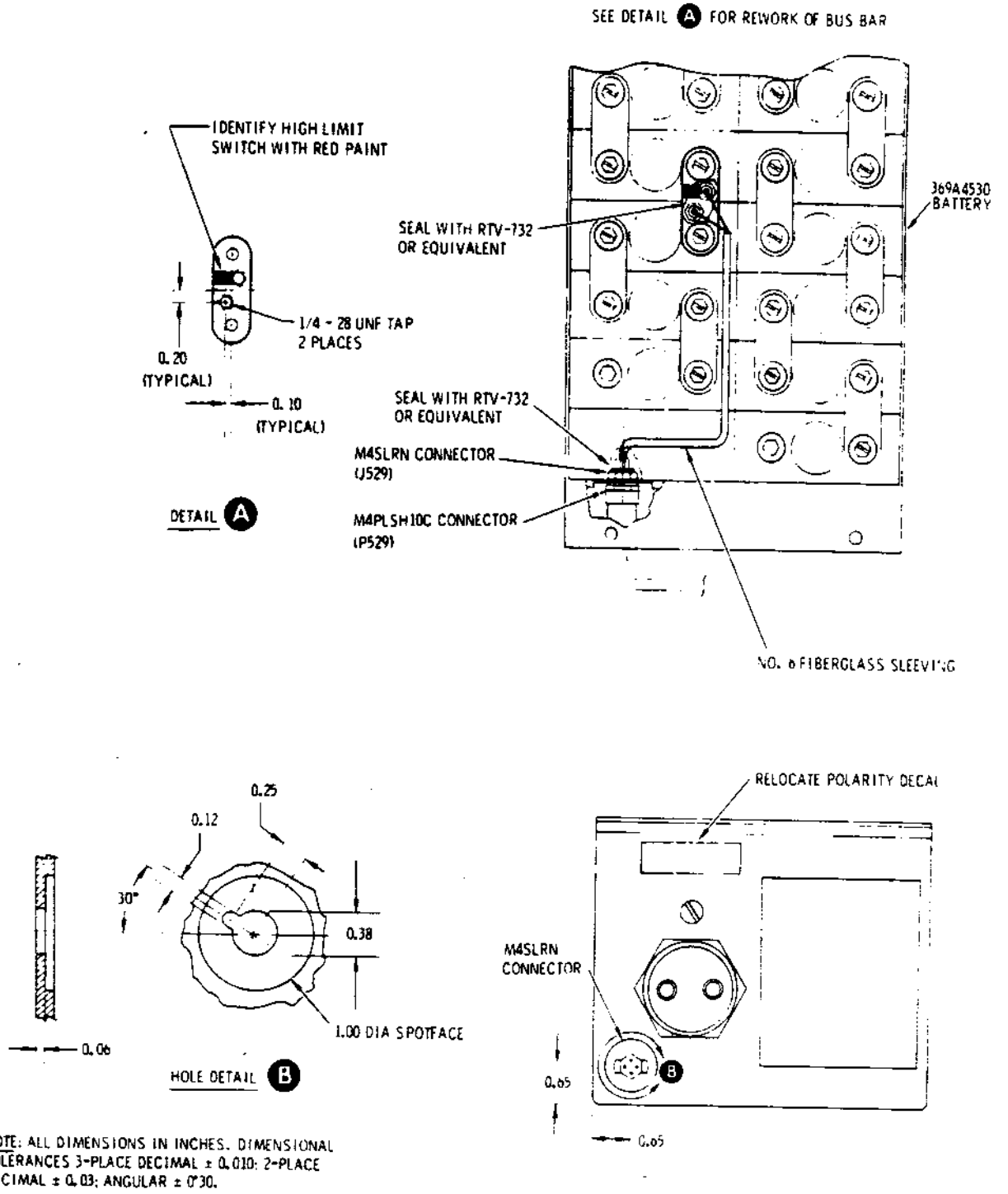

Figure 1. Installation – NI-CAD Battery Temperature Sensing Modification Kit, PN M50037 (Sheet 1 of 2)

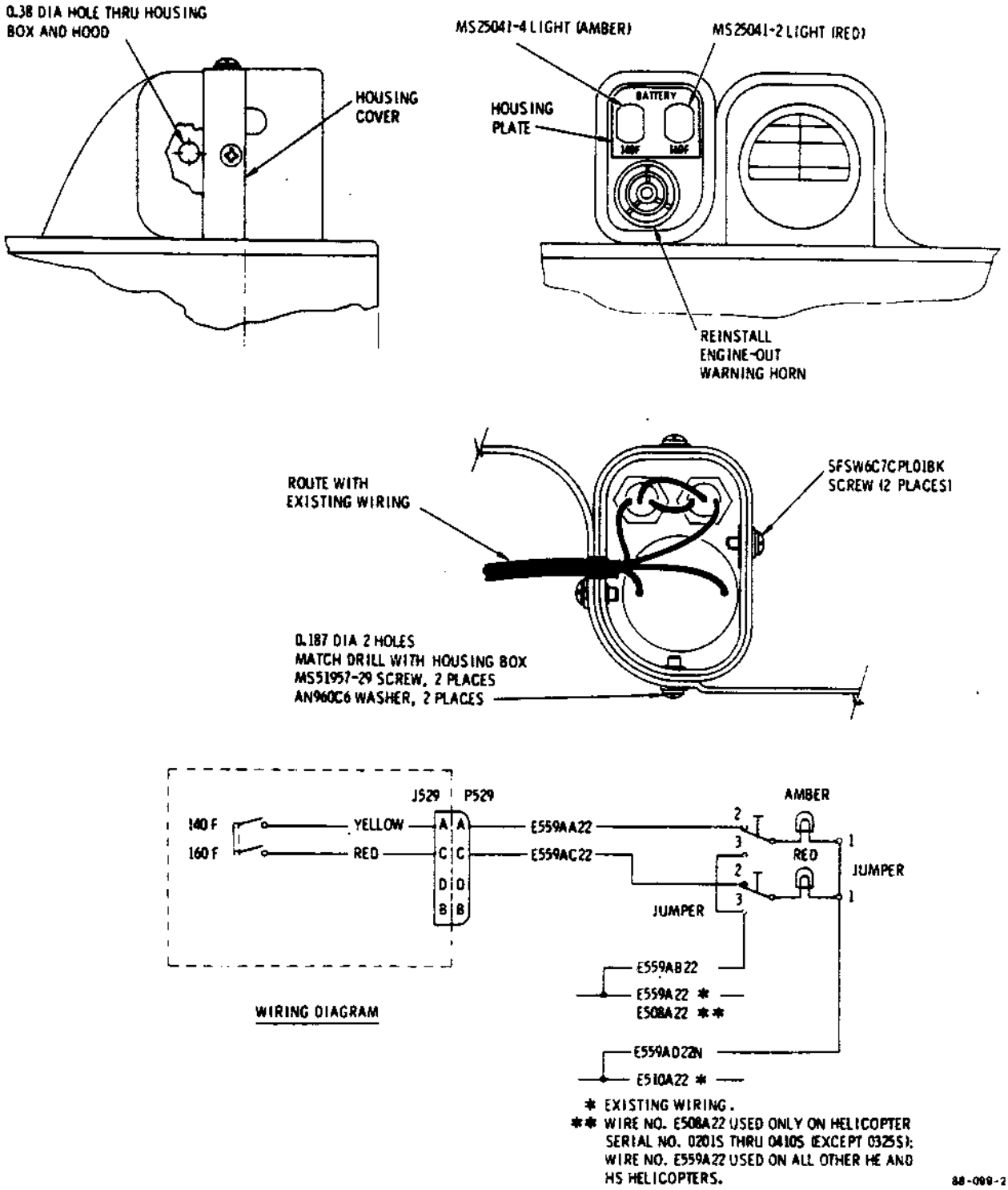

Figure 1. Installation – NI-CAD Battery Temperature Sensing Modification Kit, PN M50037 (Sheet 2 of 2)

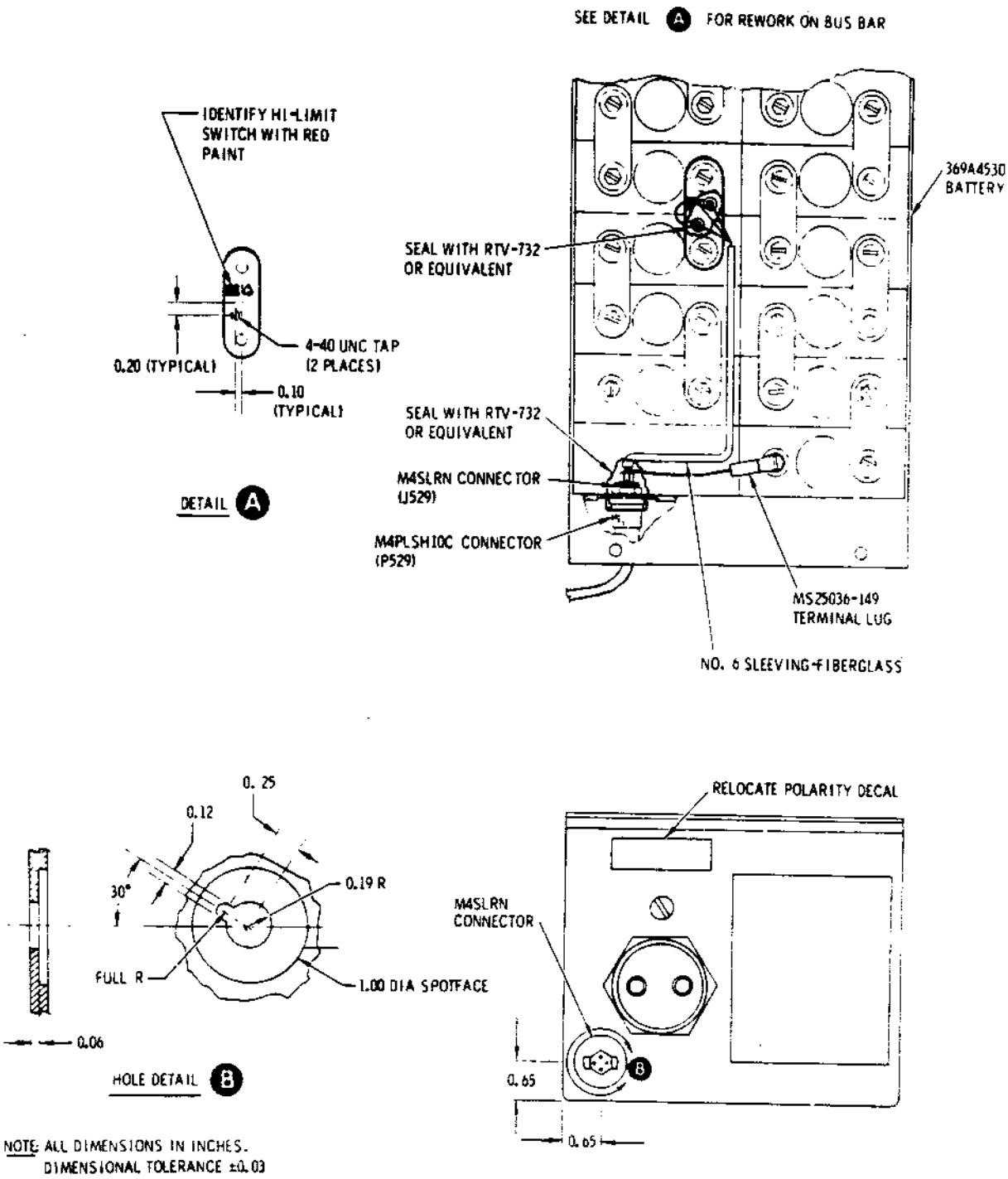

Figure 2. Installation – NI-CAD Battery Temperature Sensing Modification Kit, PN M50038 (Sheet 1 of 2)

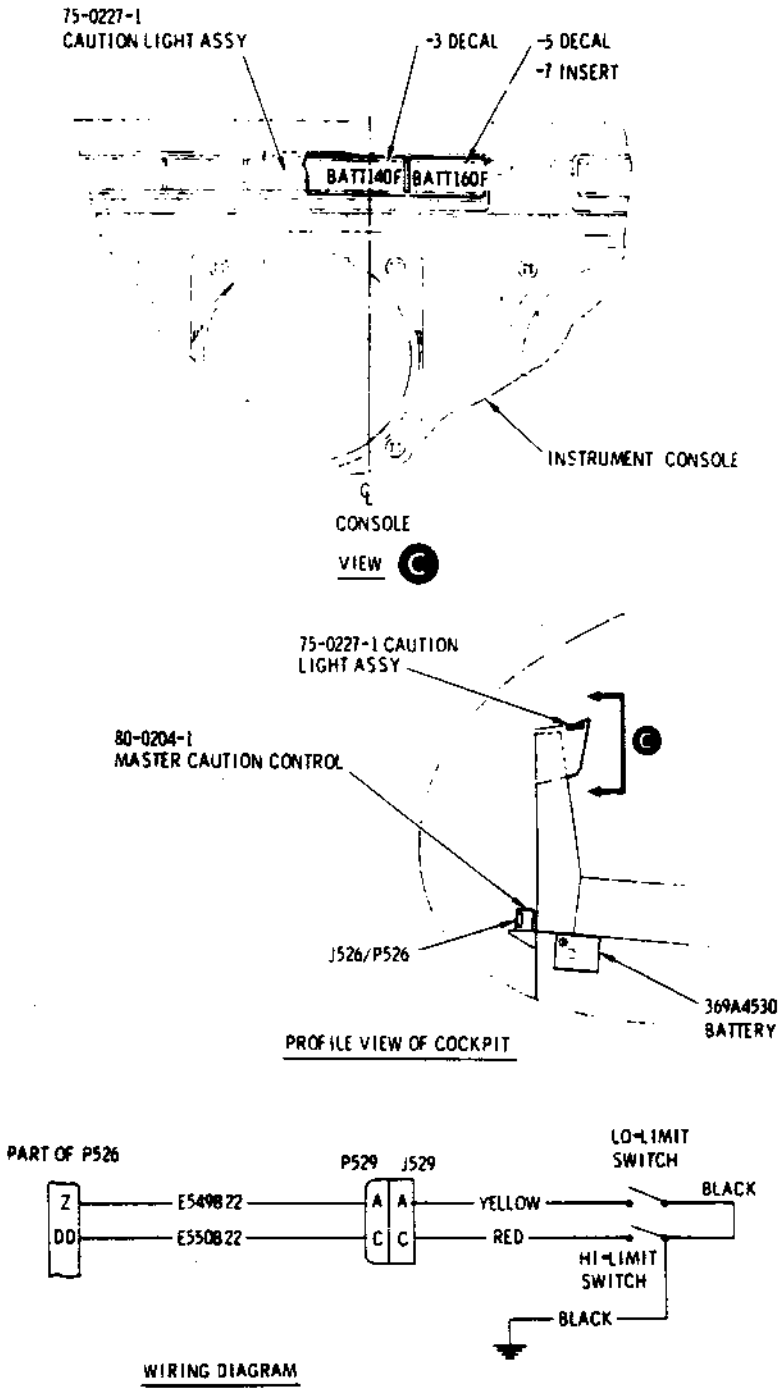

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Figure 2. Installation – NI-CAD Battery Temperature Sensing Modification Kit, PN M50038 (Sheet 2 of 2)