



TECHNICAL BULLETIN

DATE: 26 APRIL 2000

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ALLISON 250-C30 ENGINE INSTALLATION SURGE FIX MODIFICATION

1. PLANNING INFORMATION

A. Aircraft Affected:

369F/FF Helicopters serial number 0001-0133, 0600-0602, 0700-0702.

B. Assembly/Components Affected By This Notice:

Allison 250-C30 Engine P/N: 369D28640, Aft Section Assembly-Fuselage Structure P/N: 369D23000, Engine Build Up Assembly 250-C30 P/N: 369D28602, Engine Installation 250-C30 P/N: 369DSK400, Electrical Modification for C30 Engine.

C. Reason:

Some 369F/FF helicopters have experienced engine compressor surges. Complying with this Bulletin will reduce possibility of continued engine surges. Helicopter serial number 0134 thru 0599 have the intent of this Bulletin completed before delivery.

D. Description:

Procedures in this Bulletin provide owners and operators with information pertaining to installing an improved Allison 250-C30 engine. Modifications to the engine include a new accumulator for the compressor bleed valve PC air line, an increase in the flow area of the compressor inducer bleed port, modifications to the flow areas of the turbine nozzles, and removal of the T1 thermal switch. These engine modifications do not affect limitations, performance charts, or procedures.

The airframe modifications include a larger inducer bleed overboard outlet port, and removal of the T1 switch airframe provisions. An improved 369D28524-9 bleed assembly is available, but not required for this modification.

Electrical modifications remove/disconnect the components and wiring for the N₂ overspeed, bleed solenoid, N₂ overspeed test, and relocate the utility power switch/breaker to the utility panel.

E. Time of Compliance:

Customer option, at owner/operator's discretion.

F. FAA Approval:

The technical design aspects of this Bulletin are FAA Approved.

G. Manpower:

Twenty (20) man-hours

H. Points of Contact:

For further assistance, contact your local MDHI Field Service Representative (refer to the latest revision of the "At Your Service" handbook for address and telephone numbers) or contact the Field Service Department at MDHI, Mesa, Arizona. Telephone 1-800-388-3378 or (480) 346-6387. DATAFAX: (480) 346-6813.

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I. Material/Part Availability:

Contact MDHI Part Sales Dept.

Table 1. REPLACEMENT PARTS/SUPPLIES

| Nomenclature | Part No. | Qty. | Source |
|--|---------------|----------------|--------|
| Modified 250-C30 Engine | | (Ref. Table 5) | MDHI |
| Electrical Modification S/N 001 Thru S/N 075 | 369D28560-513 | (Ref. Table 2) | MDHI |
| Electrical Modification S/N 076 Thru S/N 133 | 369D28560-511 | (Ref. Table 3) | MDHI |
| Airframe Modification Kit | 369DSK400-901 | (Ref. Table 4) | MDHI |

Table 2. -513 ELECTRICAL MODIFICATION PARTS S/N 001 Thru 075

| Nomenclature | Part No. | Qty. | Source |
|---------------------------------|--------------|------|--------------------|
| Plug Button | SS50705 | 2 | MDHI or Commercial |
| Blank | 369D26451-7 | 1 | MDHI |
| Switch/breaker, Utility (CB117) | MS24509A7.5 | 1 | MDHI or Commercial |
| Stow Caps | HS5077-4003 | 12 | MDHI or Commercial |
| Decal, UTIL/LTR | 369D28560-25 | 1 | MDHI |

Table 3. -511 ELECTRICAL MODIFICATION PARTS S/N 076 Thru 133

| Nomenclature | Part No. | Qty. | Source |
|---------------------------------|----------------------|----------------------|-----------------------|
| Plug Button | SS50705 | 2 | MDHI or Commercial |
| Blank | 369D26451-7 | 1 | MDHI |
| Switch/breaker, Utility (CB117) | MS24509A7.5 | 1 | MDHI or Commercial |
| Black Background Decal Material | Scotchcal Brand Film | 3 sq in (8 sq cm) | 3M Co., St. Paul, MN. |
| Stow Caps | HS5077-4003 | 18 | MDHI or Commercial |
| Decal, UTIL/LTR | 369D28560-25 | 1 | MDHI |

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| Table 4. AIRFRAME MODIFICATION PARTS | | | |
|---|-----------------------------------|------------------|--|
| Nomenclature | Part No. | Qty. | Source |
| Doubler | 369DSK400-163 | 1 | MDHI or field fabricate (Ref. Figure 5) |
| Doubler (1) | 369DSK400-165 | 1 | MDHI or field fabricate (Ref. Figure 5) |
| Plug Button (2) | HS4248C40 | 1 | MDHI or Commercial |
| Isopropyl Alcohol (2) | | AR | Commercial |
| Sealant (2) | Pro Seal 700, Type 1 | 2 oz (56.7 g) | Coast Pro Seal. Compton, CA |
| Cover Assembly | 369D23000-35 | 1 | MDHI |
| Rivet | MS20740AD3-2 | 8 | MDHI or Commercial |
| Rivet (1) | MS20615-3M3 | 6 | MDHI or Commercial |
| Rivet | MS20615-4M3 or MS20615-4M4 | 9 | MDHI or Commercial |
| Primer, Epoxy | MIL-P-23377, T1, C3 (RM015930) | 1 oz (28 g) | MDHI or Commercial |
| Top Coat Paint To Match Aircraft | | AR | Commercial |
| Silastic, RTV | 732 (RM002212) | 1 | MDHI or Commercial |
| Clamp | 48H | 2 | MDHI or Wittek Manufacturing Co. Chicago, IL |
| Hose Assembly | DOU1167-0001 | 1 | MDHI or Flexfab Corp. Hastings, MI |

| Table 5. ENGINE BUILD-UP ASSEMBLY PARTS | | | |
|--|-----------------|-------------|---|
| Nomenclature | Part No. | Qty. | Source |
| Allison 250-C30 | 23062052 (4) | 1 | Allison Engine Company Indianapolis, Indiana |
| Tube Assembly | 369A8010-731 | 1 | MDHI |
| Bleed Assembly (Optional) (3) | 369D28524-9 | 1 | MDHI |

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Table 5. ENGINE BUILD-UP ASSEMBLY PARTS (Cont.)

| Nomenclature | Part No. | Qty. | Source |
|--------------|----------------------------------|------|--------------------|
| Clamp (3) | MS21919WCH2 | 1 | MDHI or Commercial |
| Clamp (3) | MS21919WCH8 | 1 | MDHI or Commercial |
| Bracket (3) | AN743C12 | 1 | MDHI or Commercial |
| Screw (3) | NAS1096-3-6 | 1 | MDHI or Commercial |
| Nut (3) | MS21043-3 | 1 | MDHI or Commercial |
| Washer (3) | AN960C10L or NAS1149C0332R | 2 | MDHI or Commercial |

NOTES:

- (1) Required for doubler replacement method.
- (2) Required for plug button method.
- (3) Required for optional engine bleed air improvement upgrade only. Not required for surge fix.
- (4) Or alternate 250-C30 Engine modified in accordance with Rolls-Royce Allison Commercial Engine Bulletin (CEB) 72-3213.

J. Disposition of Parts Removed:

Return engine to Allison Engine Company. Scrap all other parts.

K. Warranty Policy:

N/A

L. Weight and Balance:

N/A

M. Other Publications Affected:

Handbook of Maintenance Instruction (CSP-HMI-2) and Illustrated Parts Catalogs (CSP-IPC-4).

2. ACCOMPLISHMENT INSTRUCTIONS

A. Structural Modification:

(Ref. Figure 1)

- (1). Remove engine (Ref. CSP-HMI-2).
- (2). Remove T1 temperature sensor from bottom of engine inlet plenum (Ref. CSP-HMI-2).

NOTE: There are two acceptable methods to cover the hole in the plenum wall. The existing doubler with holes may be removed, and a new doubler without holes installed. An alternate is to leave the existing doubler in place and install a plug button in the hole.

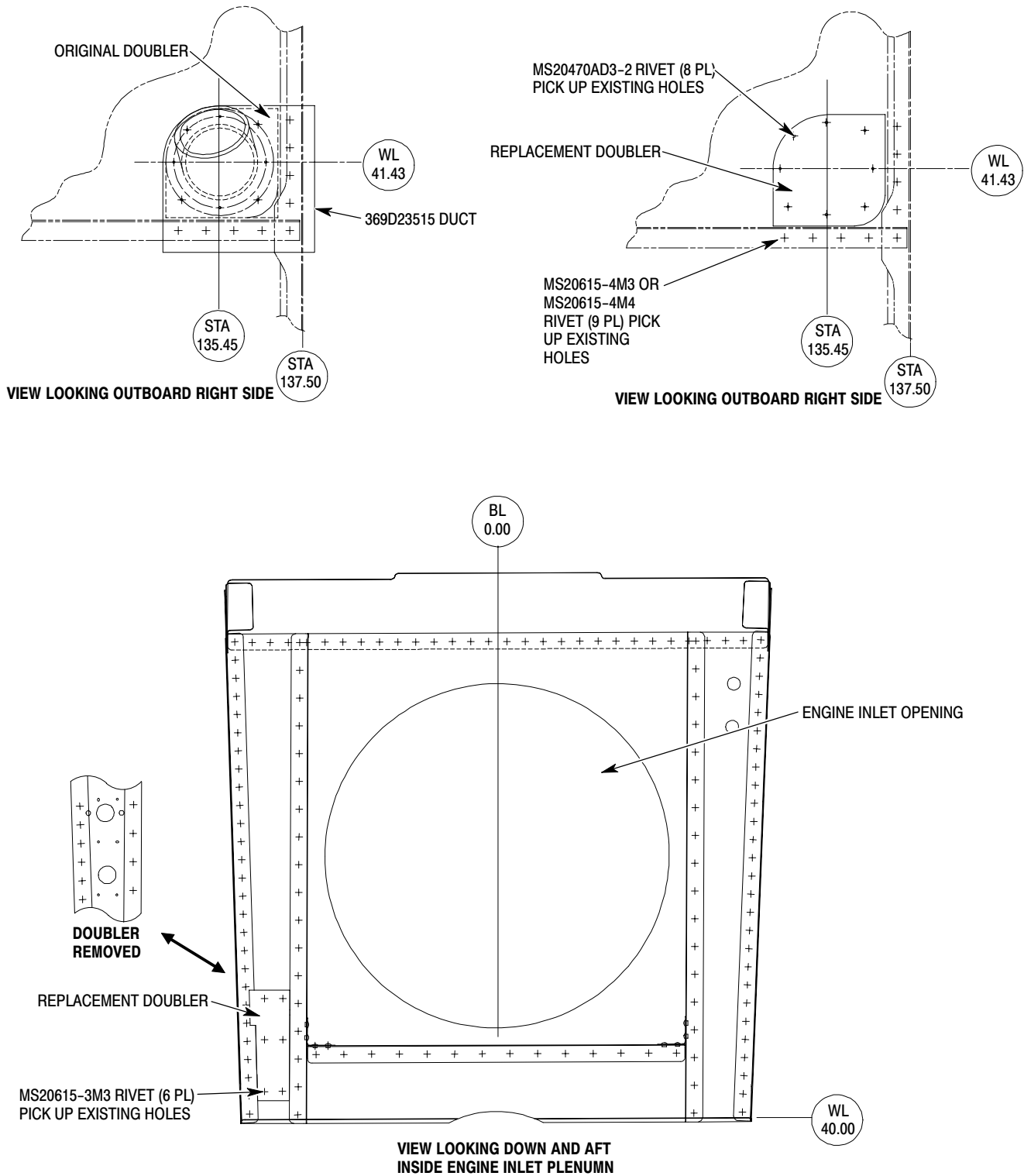
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- (3). Doubler replacement method:
 - (a). Remove existing T1 doubler from plenum wall.
 - 1). Remove six (6) MS20615-3M rivets with a number forty (40) drill bit.
 - 2). Remove doubler and discard.
 - (b). Remove all sealant residue and clean area.
 - (c). Install replacement T1 doubler 369DSK400-163.
 - 1). Align replacement doubler over holes in plenum wall and pick up existing rivet holes.
 - 2). Drill rivet holes with a number forty (40) drill bit and deburr.
 - 3). Install replacement doubler with MS20615-3M3 rivets. Install rivets wet with MIL-P-23377, T1, C3 primer.
 - 4). Seal all open gaps and crevices with Silastic RTV 732.
- (4). Alternate plug button installation method:
 - (a). Remove all residue and clean area.
 - (b). Install HS4248C40 plug button:
 - 1). Install plug button with head on plenum (forward) side of plenum wall.
 - 2). Bend all tabs outboard, flush with plenum wall.
 - 3). Wipe with isopropyl alcohol or equivalent and air dry fifteen minutes
 - 4). Seal plug button with a 0.125 in (3.1 mm) bead of Pro Seal 700.
 - 5). Cure seal in accordance with manufacturer's instructions.
- (5). Touch up white paint (Ref. CSP-HMI-2).
- (6). Remove 369D23515 duct.
 - (a). Remove eight (8) MS20470AD3 with a number forty (40) drill bit.
 - (b). Remove nine (9) MS20615-4M rivets with a number thirty (30) drill bit.
 - (c). Remove duct and discard.
 - (d). Fill nine (9) unused holes with MS20615-4M3 or MS20615-4M4 rivets. Install rivets wet with MIL-P-23377, T1, C3 primer.
 - (e). Align replacement 369DSK400-165 doubler with over holes in aircraft skin and pick up existing rivet holes.
 - (f). Drill rivet holes with number forty (40) drill bit and deburr.
 - (g). Install replacement doubler with MS20470AD3-2 rivets. Install rivets wet with primer MIL-P-23377, T1, C3 primer.
 - (h). Seal all open gaps and crevices with Silastic RTV 732.
 - (i). Touch up white paint on inside of engine compartment (Ref. CSP-HMI-2).

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Figure 1. Structural Modifications



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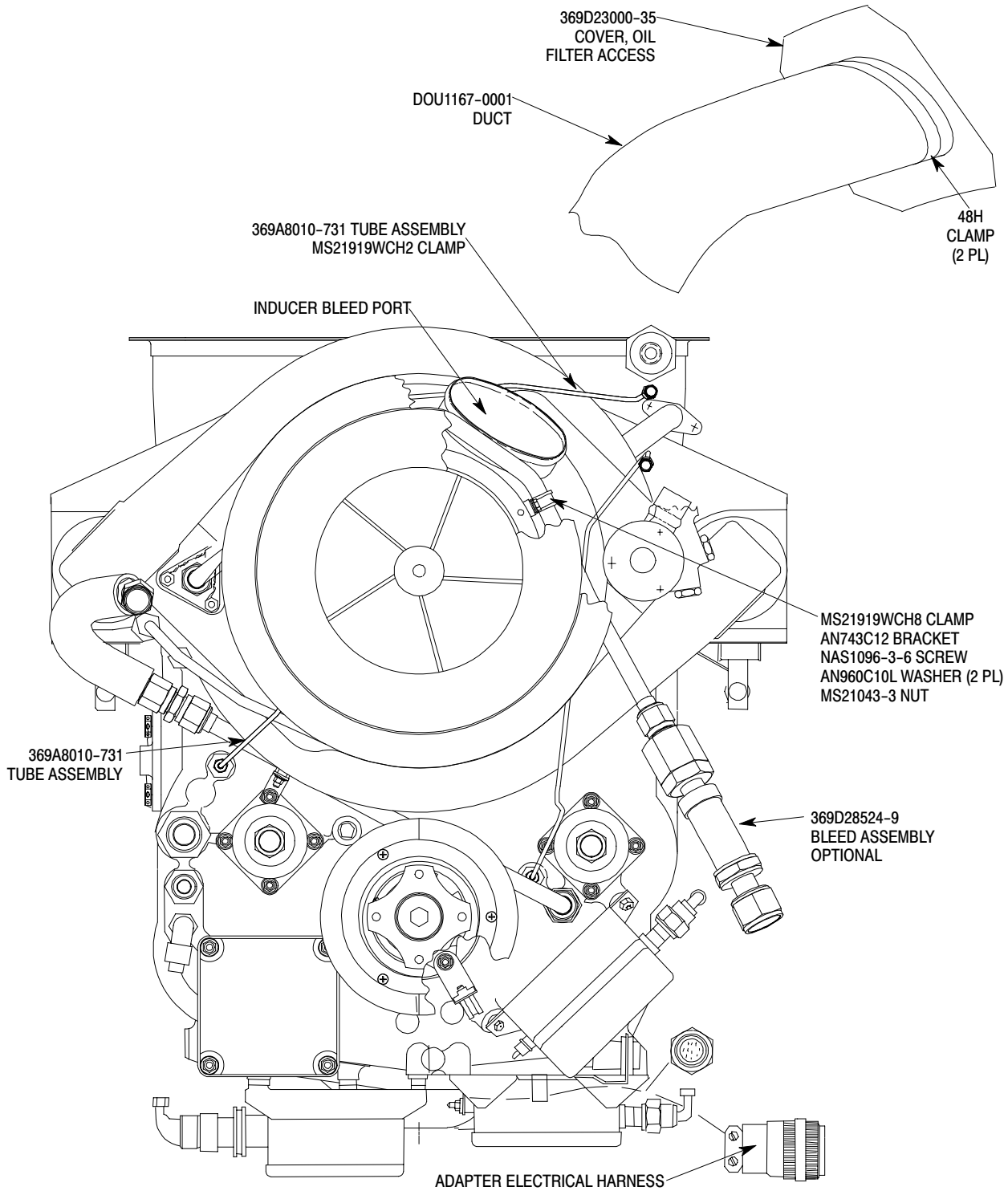
- (j). Touch up exterior paint to match aircraft.
- (7). Paint 369D23000-35 oil filter access cover assembly to match aircraft.

B. Engine Build-up:

(Ref. Figure 2)

- (1). Build up engine in accordance with CSP-HMI-2, with the following exceptions.
 - (a). If installing 369D28524-9 improved bleed assembly, install.
 - 1). Install MS21919WCH8 clamp, AN743C12 bracket, NAS1096-3-6 screw, AN960C10L washers, and MS21043-3 nut.
 - 2). Install 369A8010-731 tube assembly and MS21919WCH2 clamp. Attach clamp at existing clamp point with existing hardware.

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Figure 2. Engine Build-up

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C. Electrical Modification -513 Aircraft S/N 001 Thru 075:

(Ref. Figure 3)

- (1). Remove 20GA jumper from CB143-1 and CB144-1 and discard.
- (2). Remove wire number Q515A20 from CB144-2 and cap and stow.
- (3). Remove wire number P538A20 from CB122-2 and cap and stow.
- (4). Remove wire number E568A20 from CB122-2 and S15-1 and discard.
- (5). Remove wire number E568B20 from S15-1 and XDS252-C and cap and stow.
- (6). Remove wire number E568C20 from S15-1 and K311-4 and cap and stow.
- (7). Remove wire number P539A20 from S15-2 and cap and stow.
- (8). Remove CB144 (Compressor Bleed) and CB122 (N₂ Overspeed) and discard.
- (9). Remove S15 (N₂ Overspeed Test) and discard.
- (10). Remove M50465 (N₂-OVSP CIRCUIT DE-ACTIVATED) decal from switch panel and discard.
- (11). Remove decals for CB144, CB122, and S15 from switch panel and discard.
- (12). Install plug buttons in removed circuit breaker locations and paint to match panel.
- (13). Install Utility Switch/Breaker (CB117) into hole from removal of S15.
- (14). Install 369D28560-25 (UTIL/LTR) decal above CB117.
- (15). Remove utility power wires M501A20 and P506AF16 from CB208 in circuit breaker panel and connect to CB117 in switch panel.
- (16). Remove the 369D28560-25 (UTIL/LTR) decal from circuit breaker panel above CB208 and uncover "RADALT" on panel.
- (17). Remove wire number E568E20 from XDS252-1 and K311-6 and cap and stow.
- (18). Remove wire number E568D20 from XDS252-NC and K311-5 and cap and stow.
- (19). Remove wire number P535D20N from XDS252-4 and E52 and cap and stow.
- (20). Remove XDS252 (Switch/Light N₂ Overspeed) and discard.
- (21). Fill hole from removed XDS252 with a 369D26451-7 blank.
- (22). Remove wire number P540D20 from K311-8 and XDS21 and cap and stow.
- (23). Remove wire number P535E20N from K311-2 and E2 and cap and stow.
- (24). Remove 20GA jumper from K311-7 and TB10-C and discard.
- (25). Remove K311 (Overspeed Relay) and discard.
- (26). Remove wire number P540A20 from TB10-D and cap and stow.
- (27). Remove diode from TB10-C and TB10-D and discard.

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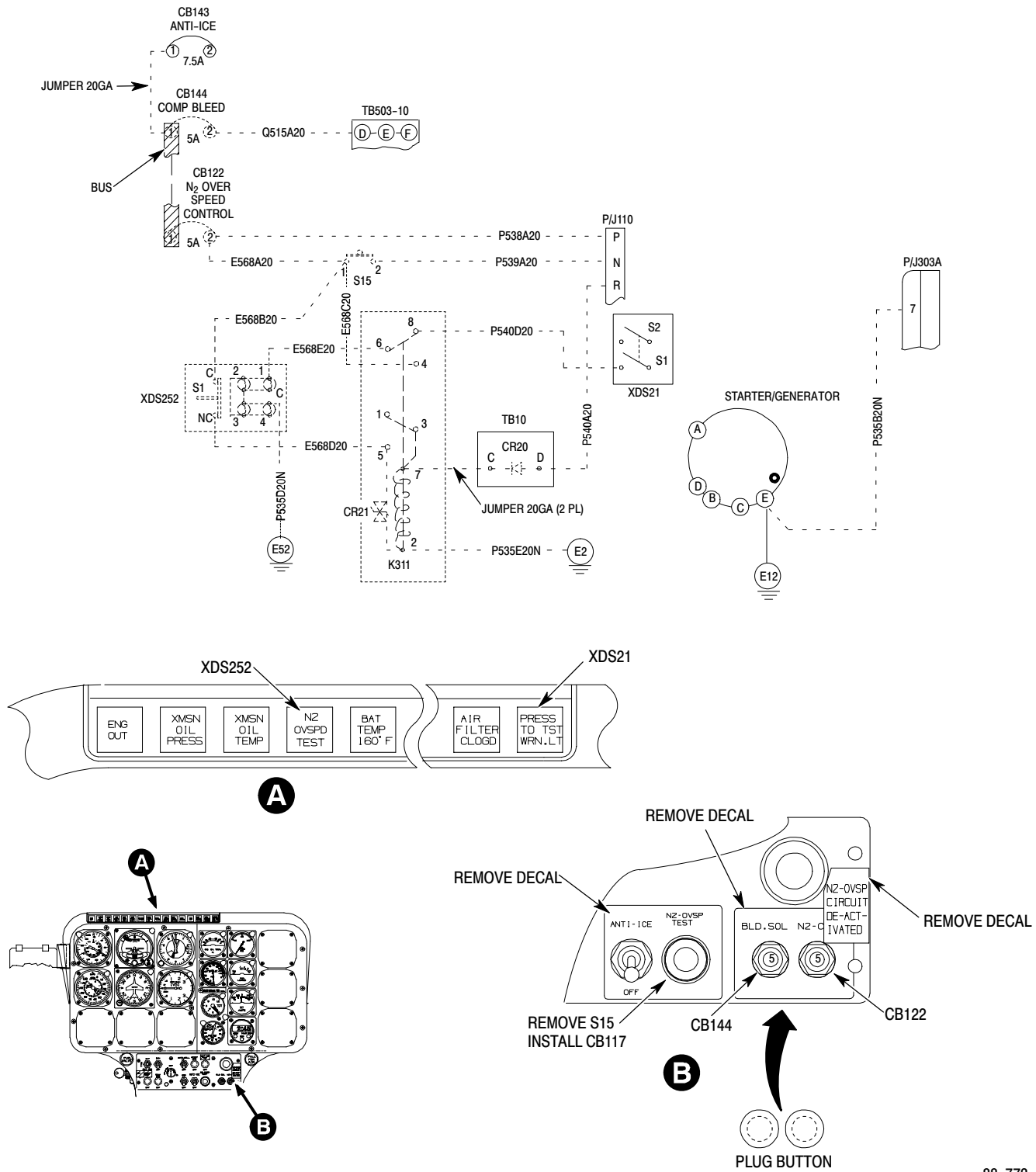


Figure 3. Electrical Modification -513 Aircraft S/N 001 Thru 075

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(28). Remove wire number P535B20N from starter/generator terminal E and cap and stow.

D. Electrical Modification -511 Aircraft S/N 076 Thru 133:

(Ref. Figure 4)

- (1). Remove wire number P538A22 from CB122 and cap and stow.
- (2). Remove wire number H1165AA22 from CB144 and cap and stow.
- (3). Remove CB144 (Compressor Bleed) and CB122 (N₂ Overspeed) and discard.
- (4). Remove wire number OVSP001A22 from S15-1 and cap and stow.
- (5). Remove wire number OVSP002A22 from S15-2 and cap and stow.
- (6). Remove S15 (N₂ Overspeed Test) and discard.
- (7). Remove M50465 (N₂-OVSP CIRCUIT DE-ACTIVATED) decal from switch panel and discard.
- (8). Cover switch and circuit breaker panel legend for CB144 and CB122 with black background decal material.
- (9). Install plug buttons in removed circuit breaker locations and paint to match panel.
- (10). Install Utility Switch/Breaker (CB117) into hole from removal of S15.
- (11). Install 369D28560-25 (UTIL/LTR) decal above CB117.
- (12). Remove utility power wires M501A20 and P506AF16 from CB208 in circuit breaker panel and connect to CB117 in switch panel.
- (13). Remove the 369D28560-25 (UTIL/LTR) decal from circuit breaker panel above CB208 and uncover "RADALT" on panel.
- (14). Remove wire number OVSP003A22 from XDS252-C (switch circuit) and cap and stow.
- (15). Remove wire number OVSP005A22 from XDS252-1 and cap and stow.
- (16). Remove wire number OVSP006A22 from XDS252-C (light circuit) and cap and stow.
- (17). Remove wire number OVSP007A22 from XDS252-NC and cap and stow.
- (18). Remove XDS252 (Switch/Light N₂ Overspeed) and discard.
- (19). Fill hole from removed XDS252 with a 369D26451-7 blank.
- (20). Remove wire number OVSP004A22 from K311-4 and cap and stow.
- (21). Remove wire number OVSP005A22 from K311-6 and cap and stow.
- (22). Remove wire number OVSP008A22 from K311-3 and cap and stow.
- (23). Remove wire number OVSP009A22 from K311-7 and cap and stow.
- (24). Remove wire number OVSP007A22 from K311-5 and cap and stow.
- (25). Remove wire number OVSP010A22N from K311-2 and cap and stow.
- (26). Remove wire number OVSP011A22 from K311-8 and cap and stow.

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- (27). Remove K311 (Overspeed Relay) and discard.
- (28). Remove wire number OVSP012A22N from TB505-5/6D and cap and stow.
- (29). Remove wire number OVSP013A22 from TB505-5/6J and cap and stow.
- (30). Remove wire number OVSP014A22 from TB505-5/6H and cap and stow.

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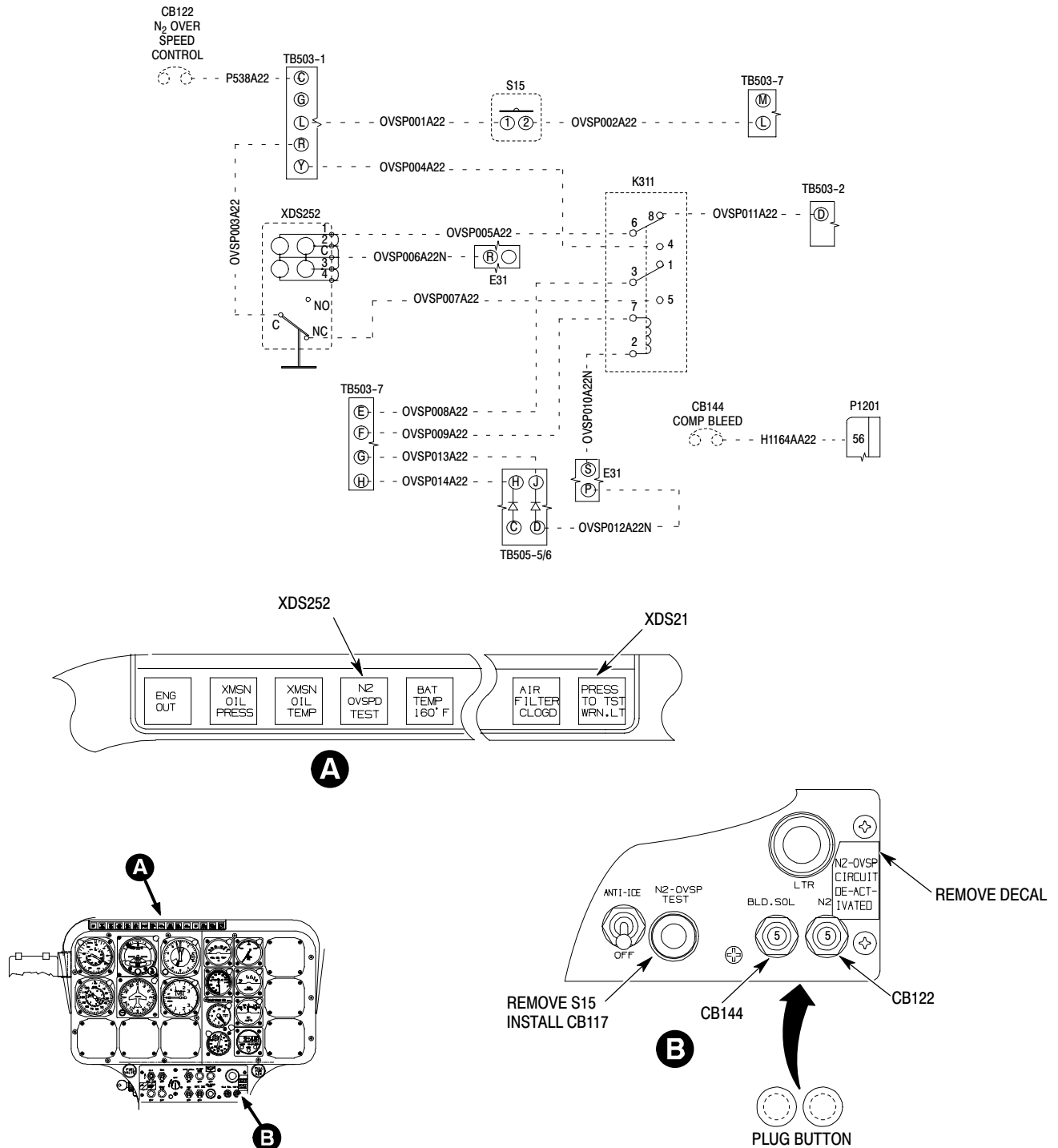


Figure 4. Electrical Modification -511 Aircraft S/N 076 Thru 133

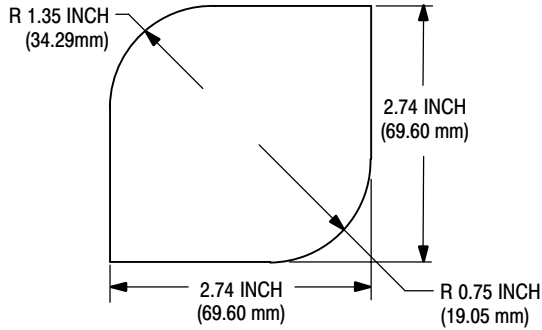
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E. Engine Installation:

- (1). Install engine (Ref. CSP-HMI-2).
- (2). Connect DOU1167-0001 hose assembly to engine inducer bleed port with 48H clamp. Tighten clamp.
- (3). Connect DOU1167-0001 hose assembly to 369D23000-35 cover assembly, oil filter access with 48H clamp. Tighten clamp.
- (4). Install oil filter access cover (Ref. CSP-HMI-2).
- (5). Record compliance to this Technical Bulletin in the Compliance Record section of the helicopter Log Book.

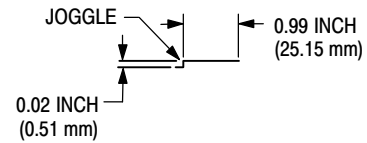
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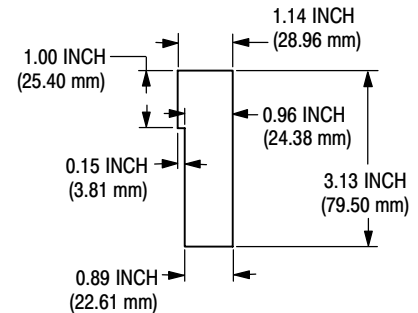


1. MAKE FROM 0.020 INCH (0.51 mm) X 3.00 INCH (76.2 mm) X 3.00 INCH (76.2 mm) 2024-T3 AL ALY SHT, 00-A-250/4.
2. CHEMICAL TREAT PER MIL-C-5541, CLASS 1A.
3. APPLY MIL-P-23377, TYPE 1, CLASS C, EPOXY PRIMER.
4. APPLY HMS15-1100, TYPE 2 EPOXY ENAMEL TO MATCH SURROUNDING AREA AFTER INSTALLATION.

369DSK400-165 DOUBLER



1. MAKE FROM 0.020 INCH (0.51mm) X 3.00 INCH (76.2 mm) x 3.00 INCH (76.2 mm) 301 CRES SHT, COND 1/2 HARD, 00-5-799.
2. PASSAVITAION TREATMENT PER QQ-P-35.
3. APPLY MIL-P-23377, TYPE 1, EPOXY PRIMER.
4. APPLY HMS15-1100, TYPE 2 EPOXY ENAMEL TO MATCH SURROUNDING AREA AFTER INSTALLATION.



369DSK400-163 DOUBLER

Figure 5. Field Fabrication of Doublers