



HUGHES SERVICE INFORMATION NOTICE

NOTICE NO. N-117.2*

DATE 11 July 1977

PAGE 1 of 18

*Supersedes Service Notice
No. N-117.1, dated 4 Nov 1974

SUBJECT DUAL RPM AND QUIET OPERATION CONFIGURATION
(PN 269A4957/269A4957-3), MODEL 269C HELICOPTER

MODELS AFFECTED: Model 269C Helicopter Serial No. 0004 and Subsequent

TIME OF COMPLIANCE: At Owners and Operators discretion

PREFACE: This Service Information Notice provides a procedure for modification of the Model 269C helicopter for Dual RPM operation, and to effect quieter operation of the helicopter main and tail rotors, engine exhaust system and cooling scroll.

The Dual RPM configuration modification is basically accomplished by modifying or replacing the existing tachometer with a new 269A4251-13 tachometer calibrated for Dual RPM operation. Also, the collective stick friction guide is reworked or replaced with a new 269A9986-5 guide, to provide increased collective pitch control at reduced rotor speeds. In addition, the manifold pressure placard is replaced and a new Dual RPM V_{NE} operation placard is added.

Quieter operation is attained by optional rework of the engine cooling scroll, main and tail rotor blade tips to further reduce resonance and other noise emanating from the helicopter engine cooling and rotor systems. In addition an optional muffler/resonator installation may be incorporated to reduce exhaust system noise.

(||) Denotes portion of text added or revised.

Customer Service Department

NOTICE NO. N-117.2*
DATE: 11 July 1977
PAGE 2 of 18

PREFACE: Note that as a prerequisite for Dual RPM and quiet operation, Model 269C helicopter Serial No. 0004 thru 0209 must also be equipped with Configuration Modification (2050 lb gross weight) Kit M10078 for Configuration "C" operation as specified in the referenced Owners Flight Manual. Procedures for installing the M10078 Kit are provided in Hughes Service Information Notice No. N-110.

References

- 269 Series - Basic HMI, Issued 1 April 1973; Revision No. 4, 15 December 1976
- 269 Series - HMI Supplement C, Issued 1 March 1973; Revision No. 2, 1 October 1974
- Hughes Model 269C Rotorcraft Flight Manual, Configuration "c", Issued 9 March 1973; Revised 23 March 1976
- Hughes Service Information Notice No. N-110, dated 24 September 1973
- Installation Instructions for Exhaust Muffler Kit 269A8801-3

PART I - PARTS LIST

(DUAL RPM CONFIGURATION - REQUIRED MODIFICATION)

<u>Nomenclature</u>	<u>Part No.</u>	<u>Quantity</u>	<u>Manufacturer</u>
*Tachometer Indicator	269A4251-13	1	Hughes
*Friction Guide, Collective Stick	269A9986-5	1	Hughes
Manifold Pressure Placard	269A4646-203	1	Hughes
V _{NE} Placard and Bracket Assembly	269A4954-1	1	Hughes
Washer	269A4958	1	Hughes
**Rivet, Universal Head	MS20470AD3-3	4	Commercial
Flight Manual Supplement Rotorcraft Dual Engine RPM Operation		1	Hughes

*Existing helicopter component may be modified to component configuration listed.

**Used only if existing collective stick friction guide is to be modified.

PART I - TOOLS AND EQUIPMENT

NOTE

Following listed tools and equipment required only if existing collective stick friction guide is to be modified.

Rivet Gun	Countersink Tool - 100 x 0.170 in. diameter
Drill Motor, Portable	Counterbore Tool - 0.219 in. diameter with No. 41 pilot
Drill Bit - No. 41 (0.0960 in.)	

PART I - MATERIALS

NOTE

Following listed materials required only if existing tachometer indicator is to be modified.

Paint, Lustreless Red	31136, Fed Std 595	A/R	Sherwin-Williams (or equivalent)
Paint, Lustreless Green	34108, Fed Std 595	A/R	Sherwin-Williams (or equivalent)

PART I - PROCEDURE

(DUAL RPM CONFIGURATION - REQUIRED MODIFICATION)

The 269A4957 and 269A4957-3 Dual RPM and Quiet Operation configurations are identical, except as follows. For the Basic configuration, existing helicopter components are reworked and/or modified. For the -3 configuration, existing components are replaced with new components that incorporate the changes.

- a. Remove existing 269A4251-11 tachometer. Install new 269A4251-13 tachometer (Section 14, Basic HMI); or have an approved instrument shop remark -11 tachometer face and reidentify tachometer as shown in Figure 1 and reinstall remarked tachometer.
- b. Remove 269A9986-3 collective stick friction guide (Section 8, Basic HMI).
- c. Install new 269A9986-5 friction guide, or rework and reinstall existing friction guide. Rework 269A9986-3 friction guide as shown in Figure 1 and as follows:

NOTICE NO. N-117.2*

DATE: 11 July 1977

PAGE 4 of 18

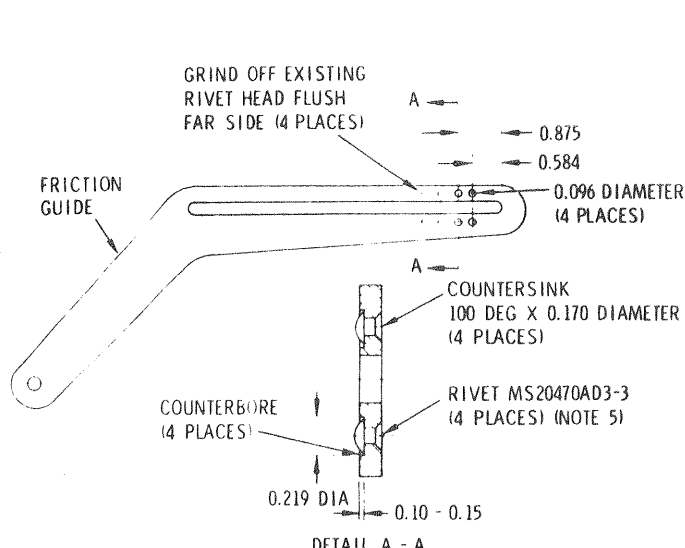
1. Grind off four existing rivet heads flush.
 2. Using No. 41 drill bit, drill four 0.096 inch diameter holes at locations shown.
 3. Counterbore four holes to a 0.219 inch diameter, 0.010 to 0.015 inch depth as shown.
 4. Countersink opposite side of four holes 100° x 0.170 inch diameter as shown.
 5. Install four MS20470AD-3 rivets; drive rivets flush and smooth on bucked end.
- d. Adjust collective pitch stick friction (Section 8, Basic HMI).
- e. Install new 269A4646-203 placard over existing manifold pressure placard. (See Figure 1.)
- f. Paint over existing V_{NE} placard on instrument panel with black lusterless paint; install new 269A4958 washer and 269A4954-1 V_{NE} placard and bracket assembly placard for 269A4956 Dual RPM placard installation as shown in Figure 1. Position new 269A4949 bracket and new 269A4958 washer between existing inner mounting rubber washer and special HS306 washer as shown.

NOTE

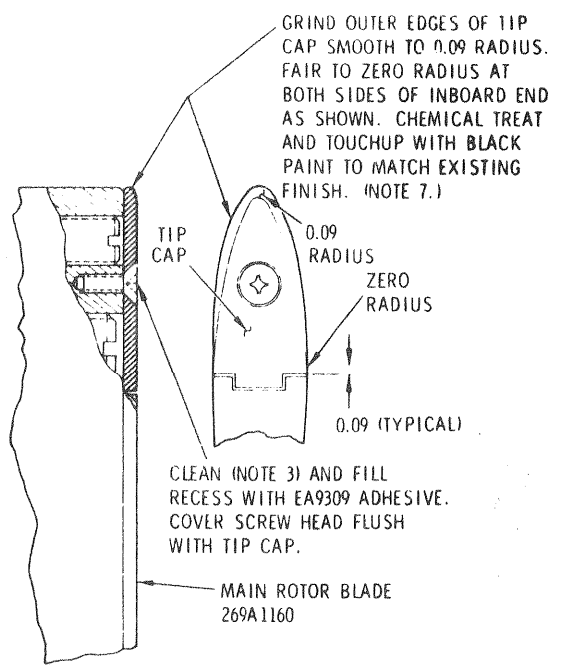
If Dual RPM configuration is incorporated with 8-Day Clock Kit 269A4948-1, do not install 269A4949 bracket as part of clock kit.

WEIGHT AND BALANCE DATA

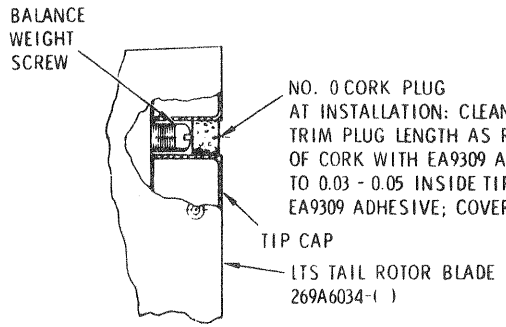
Weight and balance is not affected by incorporation of Dual RPM configuration.



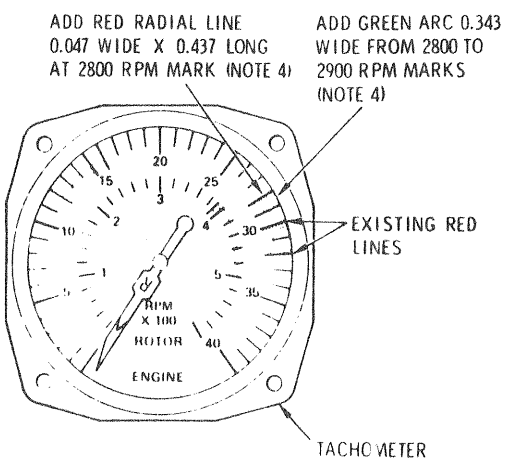
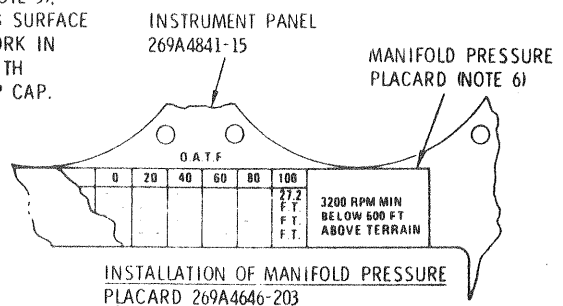
REWORK OF COLLECTIVE STICK FRICTION GUIDE
 269A9986-3 TO 269A4957-9 (NOTE 8)



REWORK OF MAIN ROTOR BLADE FORWARD
 TIP CAP 269A1174 TO 269A4957-13 (NOTES 2, 8)



INSTALLATION OF CORK IN LTS
 TAIL ROTOR BLADE (NOTE 2)



REWORK OF TACHOMETER 269A4251-11
 TO 269A4957-15

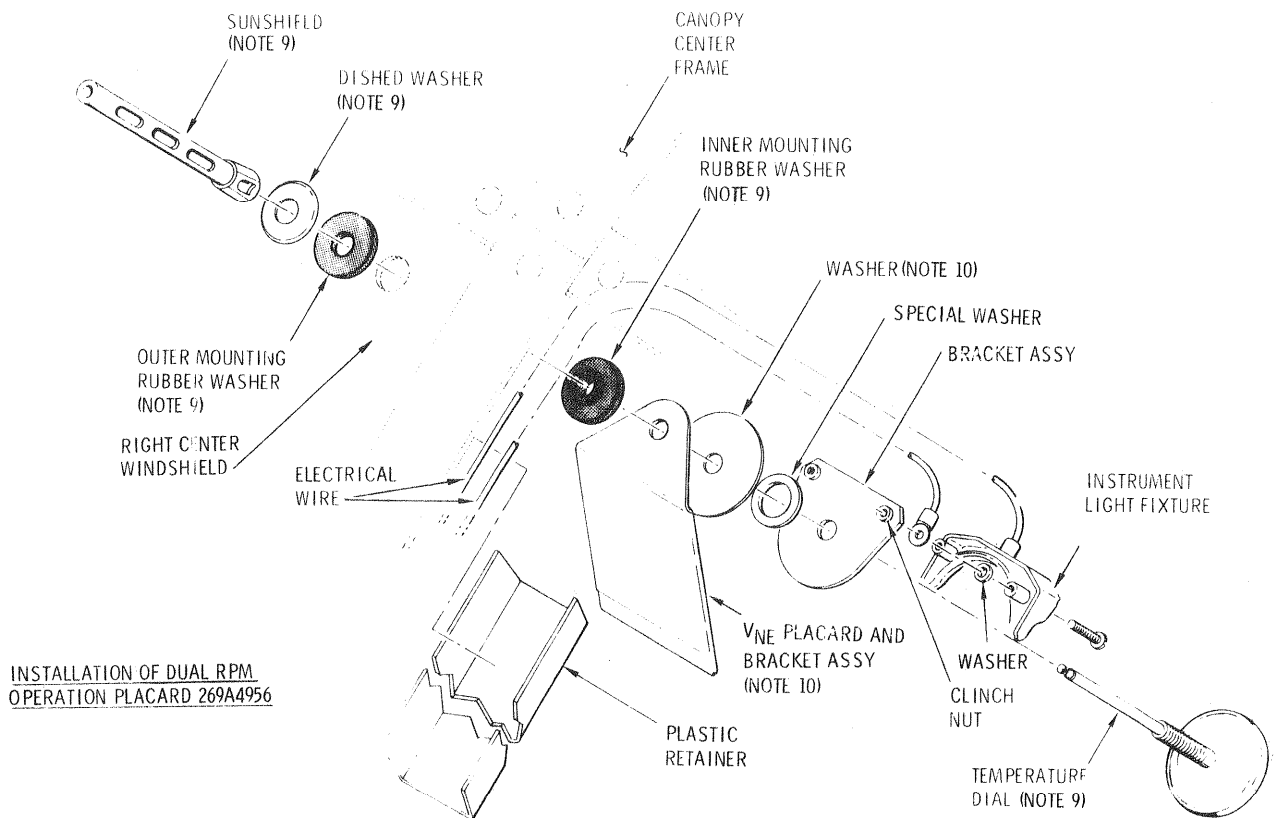
NOTES:

1. ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED.
2. OPTIONAL.
3. MEK USED TO CLEAN ALL FAYING SURFACES TO BE BONDED. SURFACES TO BE FREE OF OIL, GREASE, SCALE, CORROSION AND FOREIGN MATTER.
4. IF REWORK IS ACCOMPLISHED ON INSTRUMENT GLASS, ADD A TORQUE STRIPE BETWEEN GLASS AND BEZEL.
5. SMOOTH DRIVEN END FLUSH WITH GUIDE SURFACE.
6. PRESS AND SMOOTH IN PLACE OVER EXISTING PLACARD. PRESSURE SENSITIVE BACKING SECURES PLACARD.
7. REFER TO SECTION 2. BASIC HMI.
8. AT COMPLETION OF REWORK, REIDENTIFY REWORKED ITEM WITH PART NO. INDICATED.

PART	NO.	EQUIVALENT TO	NO.
COLLECTIVE STICK			
FRICTION GUIDE:	269A4957-9		269A9986-5
MAIN ROTOR BLADE			
FORWARD TIP CAP:	269A4957-13		269A1174-3
ENGINE COOLING			
SCROLL ASSEMBLY:	269A4957-11		269A8533-1
TACHOMETER:	269A4957-15		269A4251-13

88-116-1

Figure 1. Dual RPM and Quiet Operation Configuration (sheet 1 of 4)

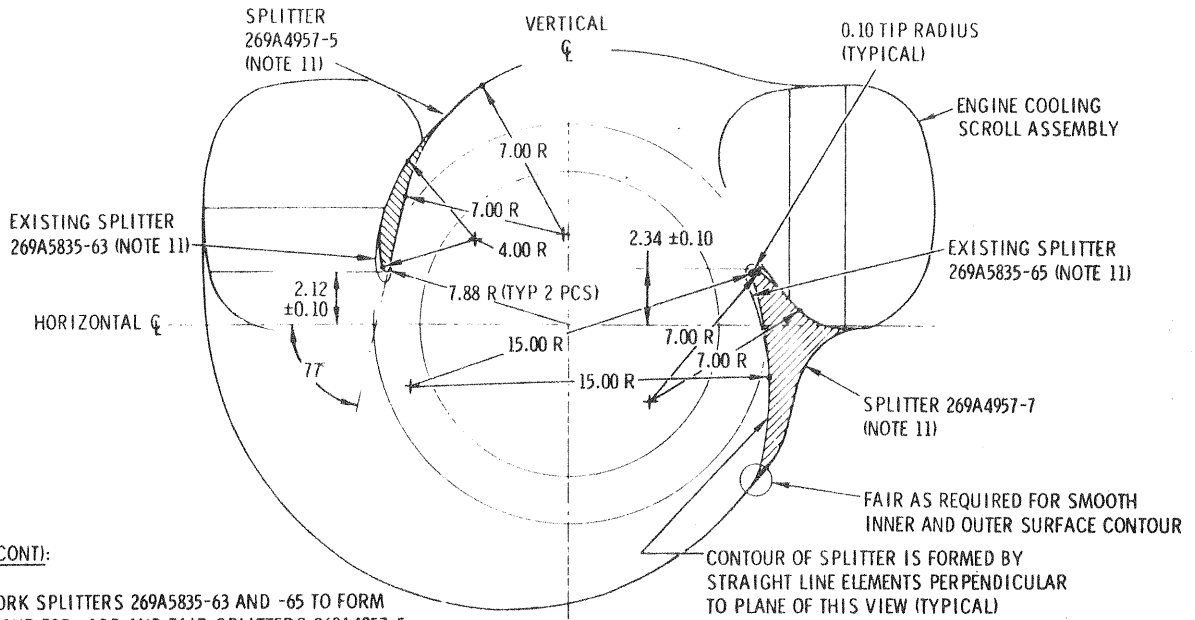


INSTALLATION OF DUAL RPM
OPERATION PLACARD 269A4956

NOTES (CONT):

- 9. PART OF OAT INDICATOR INSTALLATION. (REFER TO SECTION 14, 269 HMI SUPPLEMENT C.)
- 10. PART OF DUAL RPM OPERATION PLACARD INSTALLATION 269A4956.

Figure 1. Dual RPM and Quiet Operation Configuration (sheet 2 of 4)



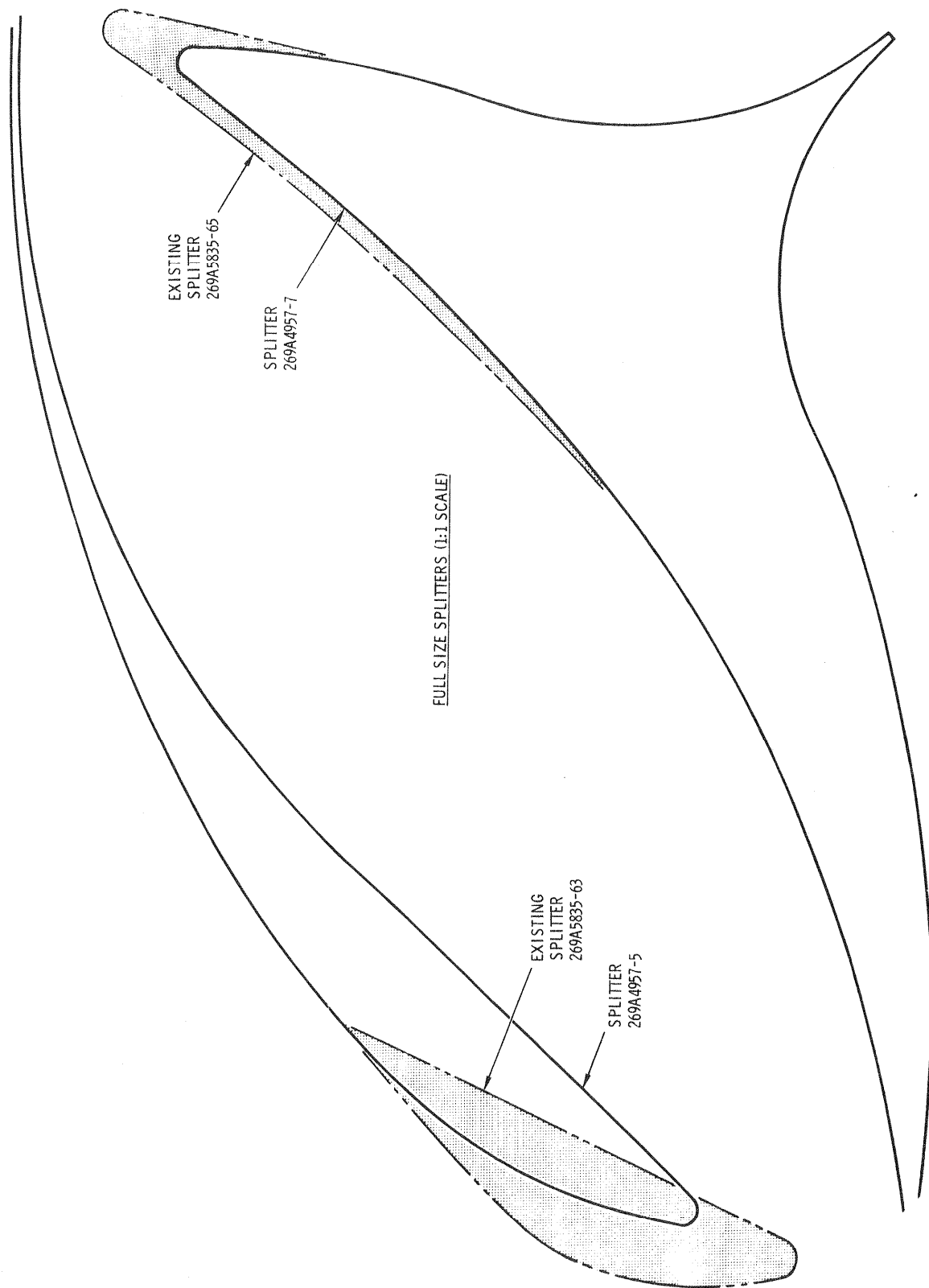
NOTES (CONT):

11. REWORK SPLITTERS 269A5835-63 AND -65 TO FORM CONTOUR FOR, ADD AND FAIR SPLITTERS 269A4957-5 AND -7 AS SHOWN AND ACCORDING TO INSTRUCTIONS IN TEXT. SEE SEPARATE DETAIL ON THIS FIGURE THAT SHOWS NEW SPLITTERS FULL SIZE, FOR FABRICATION OF FULL SIZE SPLITTER TEMPLATES.

REWORK OF SCROLL ASSEMBLY 269A8535-55 TO 269A4957-11 (AFT VIEW) (NOTES 2, 8)

88-116-3 A

Figure 1. Dual RPM and Quiet Operation Configuration (sheet 3 of 4)



92-11-4

Figure 1. Dual RPM and Quiet Operation Configuration (sheet 4 of 4)

PART II - PARTS LIST
 (QUIET OPERATION CONFIGURATION - OPTIONAL MODIFICATION)

<u>Nomenclature</u>	<u>Part No.</u>	<u>Quantity</u>	<u>Manufacturer</u>
*Forward Tip Cap, Main Rotor Blade	269A1174-3	3	Hughes
*Engine Cooling Scroll Assembly	269A8533-1	1	Hughes
Cork Plug, 0.39 dia x 0.52 x 0.28 dia (or equivalent)	0	2	Van Waters and Rogers, Los Angeles, Calif.

*Existing helicopter component may be modified to component configuration listed.

PART II - MATERIALS

NOTE

Following listed materials are needed only if engine cooling scroll and main rotor blade tip caps are to be reworked.

†Sandpaper, No. 100 Grit	100 Grit	A/R	Commercial
†Stafoam, 1 x 2 x 6 in.	608 (or equivalent)	1	Commercial
†Fiberglass Cloth	181 (or equivalent)	4 sq ft	Commercial
†Polyester Resin	Koppers 2000-7 (or equivalent)	1 pt	Thalco, Inc., Los Angeles, Calif.
†Catalyst:			
0.75% MEK Peroxide	-	1 oz	Thalco, Inc., Los Angeles, Calif.
1.00% Cobalt Naphthante	-	1 oz	Thalco, Inc., Los Angeles, Calif.

†Used for rework of engine cooling scroll.

PART II - MATERIALS (cont)

<u>Nomenclature</u>	<u>Part No.</u>	<u>Quantity</u>	<u>Manufacturer</u>
††Paint, Lustreless Black	37038, Fed Std 595	A/R	Sherwin-Williams (or equivalent)
††Chemical Film and Chemical Film Mat- erials for Aluminum Alloys	MIL-C-5541, Class 2, Grade and Type Optional	A/R	Commercial
††Solvent, Methylketone (MEK)	TT-M-261	A/R	Commercial
††Adhesive Kit, 25 gram or	*EA9303 *JR-135-2	1	Hysol Div., Dexter Corp., Pittsburgh, Pa.
††Adhesive Kit	(Urethane modi- fied epoxy)	1	Chemerics, Woburn, Mass. and Irvine, Ca.

††Used for rework of main rotor blade tip caps and tail rotor blades.

*Optionally, an equivalent adhesive may be used.

PART II - PROCEDURE

(QUIET OPERATION CONFIGURATION - OPTIONAL MODIFICATION)

Muffler/Resonator Installation 269A8245 is optional for use with the Quiet Operation configuration to further reduce noise. (Refer to Part III Procedures - Optional Muffler/Resonator 269A8245 Installation). Incorporate the Quiet Operation configuration as shown in Figure 1 and as follows.

a. Modify tail rotor blade tip caps as follows:

1. Using methylethylketone (MEK), clean faying surfaces in balance screw recess of dirt, oil, grease and other foreign materials. Lightly abrade bonded surface before applying adhesive.
2. Apply EA9309 adhesive to side surface of cork plug and press plug into recess 0.03 - 0.05 inch below tip cap outboard surface, as shown in Figure 1. Fill recess flush with adhesive.

b. Modify main rotor blade tip caps as follows:

1. Smoothly grind off edges of forward tip cap to a 0.09 inch radius and fair to zero radius at sides of inboard ends, as shown in Figure 1.
2. Using MEK, clean tip caps of dirt, oil, grease or other foreign materials. Lightly abrade bonded surface before applying adhesive.

3. Fill recess at tip cap retaining screwhead flush with tip cap outboard surface with EA9309 adhesive.

4. Chemical treat reworked areas and paint black to match existing finish (Section 2, Basic HMI).

c. Remove engine cooling scroll (Section 8, Basic HMI).

d. Install new 269A8533-1 engine cooling scroll assembly, or rework and reinstall existing 269A8535-55 scroll assembly. Rework 269A8535-55 scroll assembly to 269A4957-11 (equivalent to 269A8533-1) as follows:

1. Rework 269A8535-63 and -65 splitters in shaded areas (Figure 1) and prepare basic contour of 269A4957-5 and -7 splitters, by removing excess material or building-up with core foam as required.

NOTE

Use full-scale templates of 269A4957-5 and -7 splitters to contour new splitters. Make templates from full-scale template patterns in Figure 1. Rework only those areas shown that deviate from existing 269A8535-63 and -65 splitters.

2. Cover contour of 269A4957-5 and -7 splitters with one layer of fiberglass cloth impregnated with polyester resin and catalyst. Use extra layer(s) of impregnated fiberglass cloth as required to smoothly fair splitters. For buildup, minimum of one, and extra layers are used as necessary up to maximum number needed to form and fair required contour.

3. Finish reworked areas of scroll according to instructions for touchup - Glass Fiber Laminate Parts in Section 2, Basic HMI.

4. Reidentify reworked scroll assembly as 269A4957-11.

WEIGHT AND BALANCE DATA

Weight and balance not affected by incorporation of Quiet Operation configuration.

NOTICE NO. N-117.2*

DATE: 11 July 1977

PAGE 12 of 18

PART III - PARTS LIST

(MUFFLER/RESONATOR 269A8245 - OPTIONAL INSTALLATION)

NOTES

1. Muffler/Resonator Installation 269A8245 is optional. Resonator Installation 269A8245-3 is part of complete Muffler/Resonator Installation 269A8245.
2. Resonator Installation 269A8245-3 is optional if optional Exhaust Muffler Kit 269A8801-5 is installed, to form a complete Muffler/Resonator Installation 269A8245. (For additional information on Exhaust Muffler Kit 269A8801-5, refer to Installation Instructions for Exhaust Muffler Kit 269A8801-5.)
3. Although Muffler/Resonator Installation 269A8245-3 is optional, some items used for this installation are required items for 2050 lb gross weight Conversion Kit M10078.

<u>Nomenclature</u>	<u>Part No.</u>	<u>Quantity</u>		<u>Manufacturer</u>
		<u>Basic</u>	<u>-3</u>	
Muffler-Collector	269A8241-3	1		Hughes
Resonator	3444	1	1	Midas, L. A., Ca.
Tube, Exhaust	269A8242	1	1	Hughes
Cable Assembly	269A8806	1		Hughes
Support Assembly	269A8802	1		Hughes
Muffler-Collector Band	269A8803	1		Hughes
Clamp Assembly	269A8250	1	1	Hughes
Collector Clamp	269A8219	2	2	Hughes
Collector-Manifold Strap	269A8807-3	1	1	Hughes
Muffler-Collector Strap	269A8807-5	1		Hughes
Clamp	C10X-38SS	1	1	Umpeco, Inc., City of Industry, Ca.
Clamp	C10Y-38-8C	1	1	Umpeco, Inc., City of Industry, Ca.

<u>Nomenclature</u>	<u>Part No.</u>	<u>Quantity</u>		<u>Manufacturer</u>	
		<u>Basic</u>	<u>-3</u>		
Bolt	AN305A	3	2	Commercial	
Bolt	AN3C12A	4		↑ ↓	
Bolt	AN4C5A	1			
Bolt	AN4C6A	2			
Bolt	AN4C20A	1			
Bolt	AN5C10	2			
Nut	AN3C5	2			
Nut	NAS1021C3	6			
Nut	NAS1021C4	6	2		
Nut	AN310C5	2			Commercial
Nut	AN310C3	2	2		Commercial
Washer	AN960C10	16	4	Commercial	
Washer	AN960C416	10	2	↑ ↓	
Washer	AN960C516	4			
Cotter Pin	MS24665-229	2			
Cotter Pin	MS24665-153	2	2	Commercial	
†*Exhaust Muffler	269A4593-3	1		Hughes	
†*Exhaust Collector	269A8238	-		Hughes	
†Muffler-Collector Weld Assembly	269A8241	-		Hughes	
†Muffler Tab	269A8241-5	-	1	Hughes	

†Part of complete muffler-collector 269A8241-3 listed above.

*When welded together, form muffler-collector weld assembly 269A8241.

For incorporation of 269A8245 Muffler/Resonator Installation (Collector -
Muffler and Resonator):

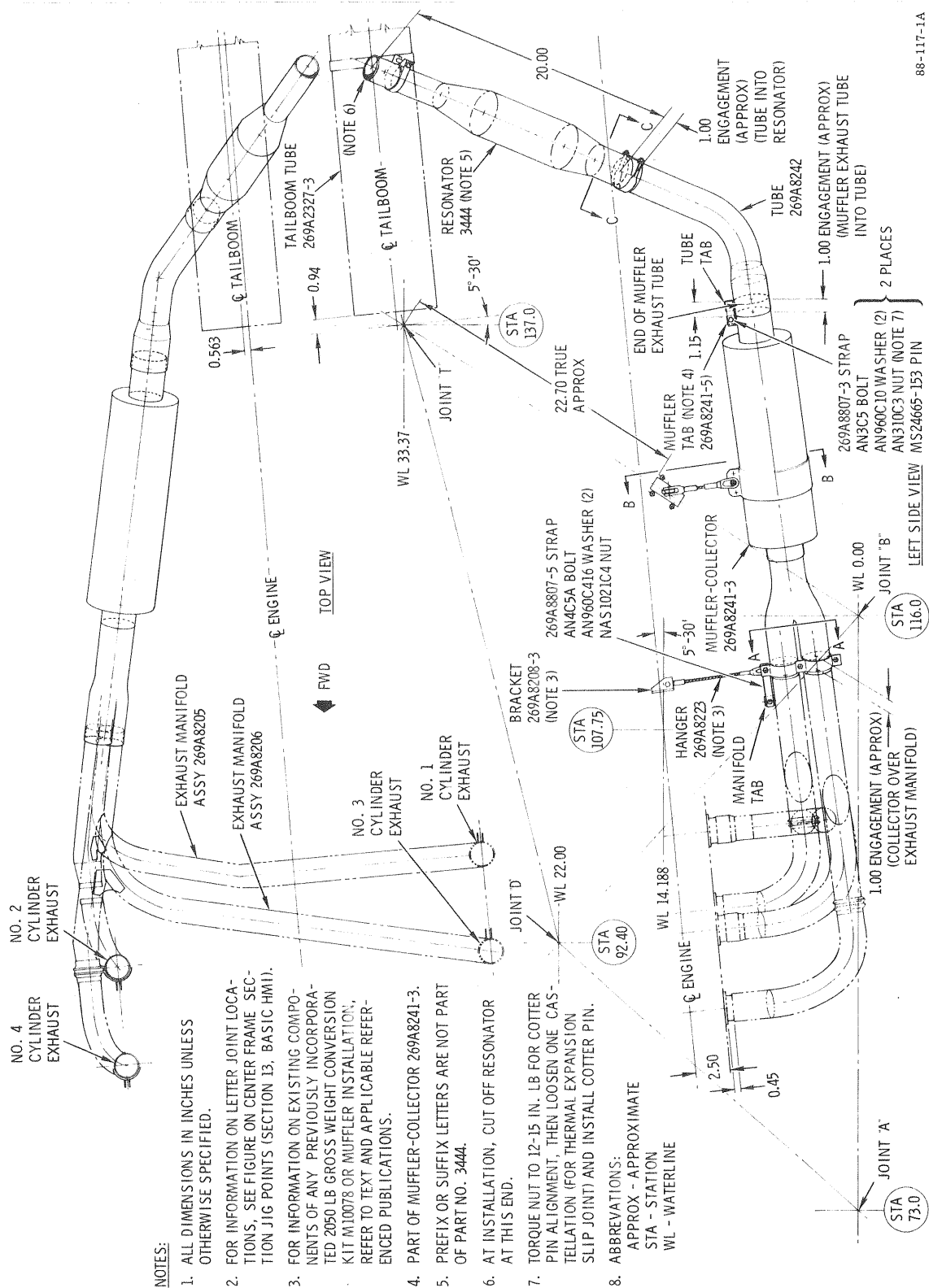
ADD: 15.4 lb at 136.6 inch-arm

For incorporation of 269A4393-3 Muffler and Resonator Installation 269A8245-3:

ADD: 14.4 lb at 138.0 inch-arm

For incorporation of only 269A8245-3 Resonator Installation:

ADD: 6.8 lb at 148.8 inch-arm



NOTES:

1. ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED.
2. FOR INFORMATION ON LETTER JOINT LOCATIONS, SEE FIGURE ON CENTER FRAME SECTION JIG POINTS (SECTION 13, BASIC HM1).
3. FOR INFORMATION ON EXISTING COMPONENTS OF ANY PREVIOUSLY INCORPORATED 2050 LB GROSS WEIGHT CONVERSION KIT M10078 OR MUFFLER INSTALLATION, REFER TO TEXT AND APPLICABLE REFERENCED PUBLICATIONS.
4. PART OF MUFFLER-COLLECTOR 269A8241-3.
5. PREFIX OR SUFFIX LETTERS ARE NOT PART OF PART NO. 3444.
6. AT INSTALLATION, CUT OFF RESONATOR AT THIS END.
7. TORQUE NUT TO 12-15 IN. LB FOR COTTER PIN ALIGNMENT, THEN LOOSEN ONE CASTELLATION FOR THERMAL EXPANSION SLIP JOINT) AND INSTALL COTTER PIN.

ABBREVIATIONS:

- APPROX - APPROXIMATE
- STA - STATION
- WL - WATERLINE

Figure 2. Muffler/Resonator Installation 269A8245 and Resonator Installation 269A8245-3 (Sheet 1 of 3)

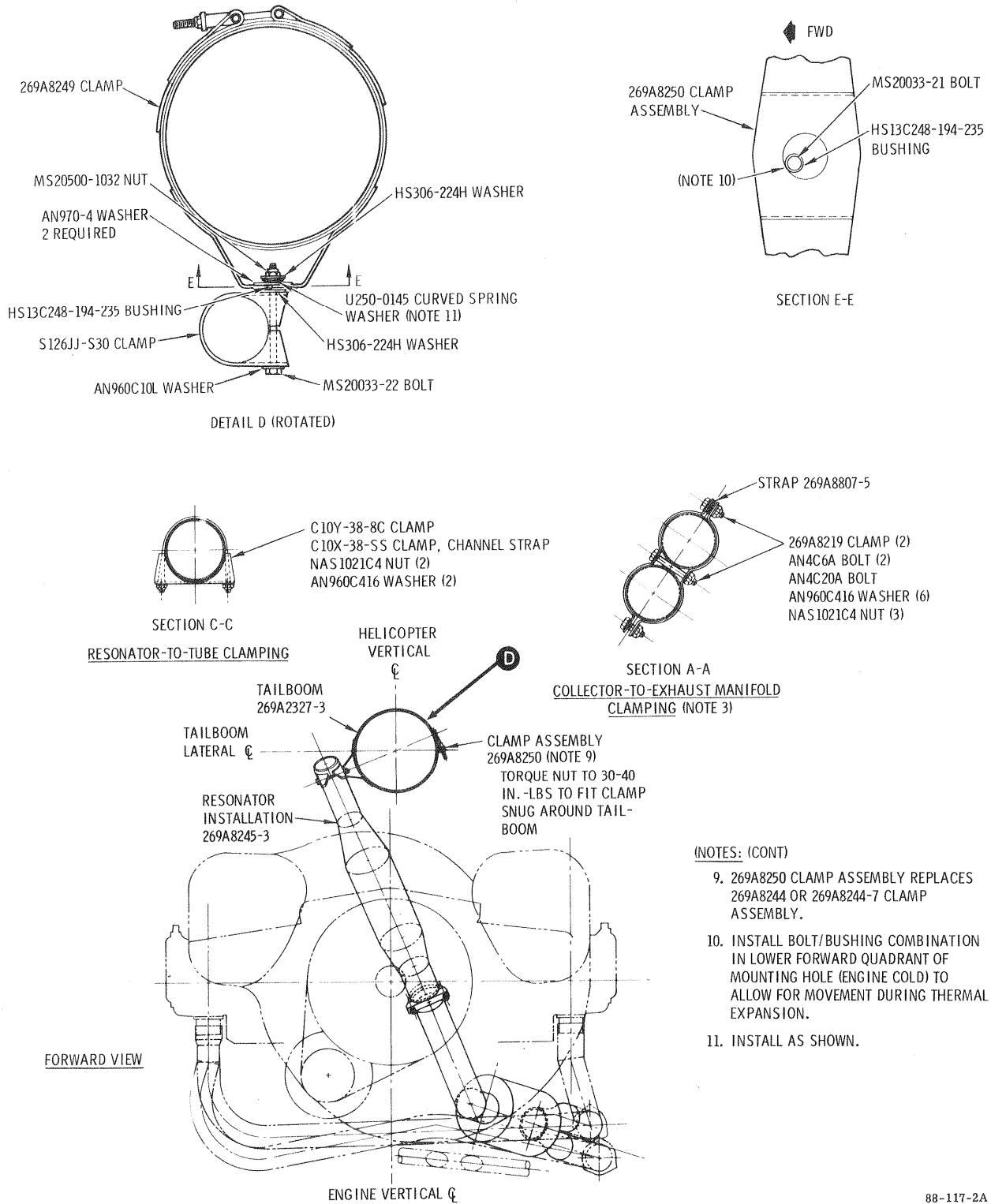


Figure 2. Muffler/Resonator Installation 269A8245 and Resonator Installation 269A8245-3 (Sheet 2 of 3)

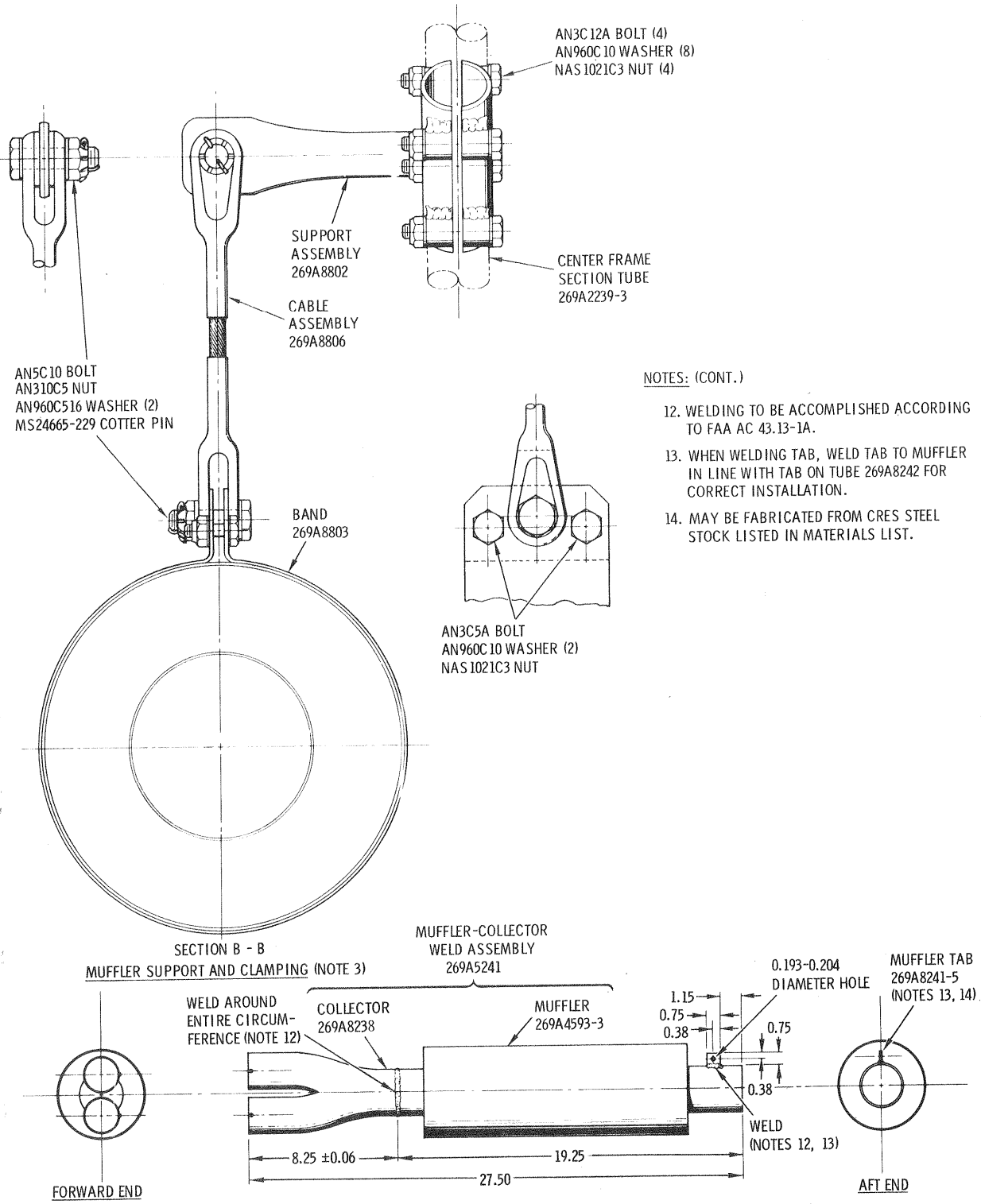


Figure 2. Muffler/Resonator Installation 269A8245 and Resonator Installation 269A8245-3 (Sheet 3 of 3)