

**ALERT SERVICE BULLETIN**

REVISION NOTICE

**Bell Helicopter** **TEXTRON**  
A Subsidiary of Textron Inc.

DATE 12-03-00

**TO:** All Bell 407 Helicopter Owners/Operators

**SUBJECT:** REVISION "B" TO ALERT SERVICE BULLETIN 407-99-33,  
V<sub>NE</sub> RESTORATION TO 140 KIAS, INTRODUCTION OF

Alert Service Bulletin 407-99-33 is revised to extend both the COMPLIANCE and the WARRANTY credit dates to 31 May 2001 from the original 31 January 2001.

Owners/operators of 407 helicopters operating under FAA jurisdiction who want to extend the compliance date will need to apply for an Alternate Means of Compliance (AMOC).

**-NOTE-**

Operators of a fleet need only submit one request for AMOC. List all aircraft on one form.

Address your AMOC request to the Manager, Rotorcraft Certification Office, Rotorcraft Directorate. This letter should be submitted with a cover letter to your local FAA Flight Standards District Office (FSDO) for forwarding to the Rotorcraft Certification Office. Examples of the FSDO cover letter and the AMOC request letter are given in Information Letter 407-00-46.

**ALERT SERVICE BULLETIN**

407-99-33

12-03-00

**Bell Helicopter** **TEXTRON**

A Subsidiary of Textron Inc.

NO.

12-17-99

DATE

1 of 16

PAGE

DATE "B"

REV

**MODELS AFFECTED:** 407

**SUBJECT:** **V<sub>NE</sub> RESTORATION TO 140 KIAS, INTRODUCTION OF.**

**HELICOPTERS AFFECTED:** 407, S/N 53000 through 53396; S/N 53398 and 53399.

[Helicopters S/N 53397, 53400 and subsequent will have the intent of this bulletin completed before delivery]

**COMPLIANCE:** No later than 31 May 2001.

**B.**

- NOTE -

You must have completed ASB 407-99-27, Revision A, dated 9 June 1999 and TB 407-96-2, Revision A, dated 11 May 1997 before you complete this bulletin.

**DESCRIPTION:**

This bulletin gives the instructions to return the 407 to V<sub>NE</sub> of 140 Knots Indicated Air Speed (KIAS).

Revision A increases the warranty credit paid, toward labor to incorporate this bulletin, as shown in the warranty section. Revision B extends the compliance date to 31 May 2001.

**B.**

Bell Helicopter Textron has designed an airspeed-actuated pedal stop that allows the full recovery of the original performance of the 407 with improved flight safety. It permits maximum tail rotor hover performance while restricting the tail rotor authority at high airspeeds. The kit is made up of an airspeed-actuated solenoid that operates a stop above a pre-determined airspeed to limit the amount of left tail rotor control input. The status of the system operation is annunciated by a segment light module that is located on the face of the instrument panel. If the system should malfunction in the engaged position, a separate caution light alerts the pilot, who can then operate the manual release cable to disengage the system.

7851 55102 REV 1196

Normal system function is fully automatic and requires no pilot input. During take-off, as the aircraft accelerates through 55 KIAS the pedal stop engages reducing the left pedal authority by 25 %. Even with the stop engaged, all normal Flight Manual performance values are reachable throughout the entire approved operation envelope. On approach for a landing, as the aircraft decelerates through 50 KIAS, the pedal stop dis-engages, and makes it possible to again get full tail rotor authority.

The kit is designed for a standard configuration helicopter. If you have the Quiet Cruise kit or the Increased Gross Weight kit installed, it will be necessary to install a different Airspeed Limitation decal. The decals must be ordered separately; refer to the MATERIAL section of this bulletin.

**APPROVAL:**

The engineering design aspects of this bulletin are Transport Canada approved. Transport Canada Airworthiness Directive (AD) CF-98-36R7 will include the accomplishment of this ASB as terminating action to the earlier  $V_{NE}$  restriction

**MANPOWER:**

The kit is designed for a standard configuration helicopter.

Because the configuration of operating helicopters varies with equipment installed, it is not possible to accurately predict the time needed to modify every helicopter. Bell Helicopter will reimburse the manpower to a maximum amount, as stated in the WARRANTY section.

**WARRANTY:**

Owners/operators of 407 helicopters who comply with the instructions outlined in this bulletin will receive a credit toward labor to incorporate this ASB to a maximum of US \$4400.00.

- A. Bell Helicopter recognizes that aircraft that have more optional equipment (customizing) installed could be more labor intensive. In these instances, Bell Helicopter will consider making adjustments to the amount paid towards labor. Owners/operators are encouraged to contact the Warranty Department with details of customizing.

To receive a credit:

- Order the kit and tools per instructions in the material section of the bulletin.
- Incorporate the kit and send a completed Malfunction Report (MR) for the labor to BHT Warranty Administration within 30 days of completion of this bulletin.

- NOTE -

Customers who fail to comply with the instruction in this bulletin after 31 May 2001 are **not** eligible for the special warranty credit provisions listed above.

B.

**MATERIAL:**

**Required Material:**

Material listed below will be shipped at no charge. To obtain these parts at no charge customers must follow these procedures;

1. Place order with your normal Bell Helicopter supply source.
2. All orders must contain the Serial Number(s) of the Bell Helicopter(s) the parts are intended for.
3. Ship to address.
4. Method of shipment.
5. Your Bell Helicopter Account Number.
6. These orders must be supplied via Telephone or Facsimile and cannot be ordered utilizing the CO-OP system. These parts will be supplied from Bell Helicopter Fort Worth, Texas or Bells Supply Centers Located in Amsterdam, Netherlands, Calgary, Canada or Singapore.

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>	<u>QUANTITY</u>
407-070-201-127	DECAL (QUIET CRUISE)	1 (NOTES 1, 2, 4)
407-070-201-129	DECAL (INCREASED GW)	1 (NOTES 1, 3, 4)
407-704-004-103	MODIFICATION KIT	1
SK-407EC-500-1	SERVICE KIT	1 (NOTE 5)

**NOTES:**

1. Only one decal is used on the basic aircraft. If your aircraft is equipped with dual controls two decals are necessary. Refer to PART II of this bulletin.

2. Use this decal only on helicopters equipped with Quiet Cruise kit. Order this decal separately.
3. Use this decal only on helicopters equipped with Increase Gross Weight kit. Order this decal separately.
4. Aircraft that are not equipped with either Quiet Cruise kit or Increased Internal Gross Weight need decal 407-070-201-125. This decal is part of the Airspeed Actuated Pedal Stop kit. Therefore, it is not necessary to order it.
5. Only helicopters equipped with an air conditioning system require this Kit.

**Consumable Material:**

The material that follows is necessary to do this modification. However, this material is considered consumable (bench stock) material and may not require ordering depending on the operator's consumable material stock levels. You can get this material through your Bell Helicopter Textron Supply Center.

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>	<u>QUANTITY</u>
3950 SCOTCHCAL	EDGE SEALER	C-349
TT-N-95,TYII 1GAL	ALIPHATIC NAPHTHA	C-305

- NOTE -

The "C" REF. NO. above is a cross-reference found in the Standard Practices Manual.

**SPECIAL TOOLS:**

The special tools that follow are necessary to do Installation Instruction BHT-407-II-26:

<u>TOOL NUMBER</u>	<u>NOMENCLATURE</u>	<u>QUANTITY</u>
CA-407-99-33	Tool Kit	1
Consisting of:		
206-001-707-133PAT81	Bellcrank Mod Tool	1
407-030-173-101PAT81	Casting Mod Tool	1
TC-00336	Cable Release Locator	1

The special tool that follows is necessary to do Direction Control Rigging:

<u>TOOL NUMBER</u>	<u>NOMENCLATURE</u>	<u>QUANTITY</u>
T101751-101	Tail Rotor Rigging Tool	1

Bell Helicopter will maintain a limited Number of the above special tools to be loaned to customers when complying with this bulletin. To acquire these tools Customers must follow the procedure below.

1. Notify your Bell Helicopter supply source.
2. Provide your estimated need date and estimated completion date.
3. Upon completion of the modification inspect tools and assure they are complete.
4. Prepare Tools for shipping.
5. Notify Ernie Gonzales at Phone (817) 280-2516 or Facsimile (817) 280-3224.
6. Ship tools based on Instructions from Ernie Gonzales.

#### **ELECTRICAL TOOL LIST:**

The electrical tool list that follow are necessary to do Installation Instruction BHT-407-II-26.

<u>NUMBER</u>	<u>NOMENCLATURE</u>
83100-01	Zip Tool (Bentley Harris)
AD1377	Crimp tool (Raychem)
M22520/1-01	Crimp tool
M22520/1-03	Turret
M22520/5-01	Crimp tool
M22520/5-100	Die assembly
M22520/7-01	Crimp tool
M22520/7-08	Positioner
M22520/7-11	Positioner
M22520/7-12	Positioner
M81714/69-01	Module removal tool
M81969/14-10	Insertion/extraction tool
M81969/16-01	Insertion/extraction tool
M81969/16-04	Insertion/extraction tool
M81969/18-01	Insertion/extraction tool

**WEIGHT AND BALANCE:**

As noted in Installation Instructions 407-II-26.

**ELECTRICAL LOAD DATA:**

As noted in Installation Instructions 407-II-26.

**REFERENCES:**

BHT-407-MM-2, Rev. 7, 01 May 1998.

Chapter 11, Placards and Markings.

BHT-407-FM-1: TEMPORARY REVISION FOR VNE INCREASE TO 130 KIAS (ASB 407-99-27) – REISSUED 03 JUNE 1999.

BHT-407-FM-1: TEMPORARY REVISION FOR HOVER PERFORMANCE CORRECTION FOR TEMPORARY TAIL ROTOR PEDAL STOP, dated 10 March 1999 or later revision (TB 407-98-13).

BHT-407-FMS-3: Particle Separator – TEMPORARY REVISION FOR HOVER PERFORMANCE CORRECTION FOR TEMPORARY TAIL ROTOR PEDAL STOP, dated 10 March 1999 or later revision.

BHT-407-FMS-4: Snow Deflector – TEMPORARY REVISION FOR HOVER PERFORMANCE CORRECTION FOR TEMPORARY TAIL ROTOR PEDAL STOP, dated 10 March 1999 or later revision.

BHT-407-FMS-25: QUIET CRUISE MODE – TEMPORARY REVISION FOR VNE CHANGE TO 130 KIAS (ASB 407-99-27), dated 3 June 1999 or later revision.

BHT-407-FMS-28: INCREASED INTERNAL GROSS WEIGHT – TEMPORARY REVISION - HOVER PERFORMANCE CORRECTION FOR TEMPORARY PEDAL STOP, dated 8 July 1999 or later revision.

BHT-407-FMS-28: INCREASED INTERNAL GROSS WEIGHT – TEMPORARY REVISION FOR 130 KIAS VNE, dated 3 June 1999 or later revision.

TB 407-96-2 – MODIFICATION FOR INCREASE IN VNE, INTRODUCTION OF. – Revision A, dated 11 March 1997.

TB 407-99-17 – NEW TAIL ROTOR INSTALLATION 407-012-100-109, INTRODUCTION OF. – Original, dated 15 April 1999.

ASB 407-99-27 – VNE RESTORATION TO 130 KIAS, INTRODUCTION OF. – Revision A, dated 9 June 1999.

**PUBLICATIONS AFFECTED:**

BHT-407-MM-1.

Chapter 5, Inspections.

Chapter 5 – FAA SUPPLEMENT, Inspections.

BHT-407-MM-2.

Chapter 11, Placards and Markings.

Chapter 12, Servicing.

BHT-407-MM-8.

Chapter 67, Flight Controls.

BHT-407-MM-11.

Chapter 96, Electrical.

**ACCOMPLISHMENT INSTRUCTIONS:**

**Part I – Modification of the Helicopters to the Airspeed Actuated Pedal Stop.**

1. Complete BHT-407-II-26 – INSTALLATION INSTRUCTION FOR TAIL ROTOR PEDAL STOP KIT.
2. Put the three Flight Manual temporary revisions titled: VNE INCREASE TO 140 KIAS, dated 17 December 1999, in the Flight Manual.
  - a) BHT-407-FM-1.
  - b) BHT-407-FMS-25, QUIET CRUISE MODE.
  - c) BHT-407-FMS-28, INCREASED INTERNAL GROSS WEIGHT.

3. Remove the three Flight Manual temporary revisions titled: VNE INCREASE TO 130 KIAS, reissued 3 June 1999.
  1. BHT-407-FM-1.
  2. BHT-407-FMS-25, QUIET CRUISE MODE.
  3. BHT-407-FMS-28, INCREASED INTERNAL GROSS WEIGHT.
  
4. Remove the four Flight Manual temporary revisions that follow – HOVER PERFORMANCE CORRECTION FOR TEMPORARY TAIL ROTOR PEDAL STOP, dated 10 March 1999, or later approved revision, in the Flight Manual:
  - a) BHT-407-FM-1.
  - b) BHT-407-FMS-3, PARTICLE SEPARATOR.
  - c) BHT-407-FMS-4, SNOW DEFLECTOR.
  - d) BHT-407-FMS-28, INCREASED INTERNAL GROSS WEIGHT.

**Part II – Installation of the New Airspeed Limitation Decals and Removal of the Temporary Instrument Markings.**

1. (Refer to Figure 1). If not completed in PART I, Step 1, then remove the temporary airspeed indicator glass markings.
  
2. If your helicopter operates the Quiet Cruise Mode or Increased Internal Gross Weight you must also do the steps that follow:
  - a) Quiet Cruise Mode.

**CAUTION**

DO NOT USE PAINT THINNER OF MEK (C-309)  
ON INTERIOR TRIM PANELS.

- NOTE -

Use aliphatic naphtha (C-305) to remove the decal  
adhesive.

- 1) Install the decal, Airspeed Limitations (6, Figure 1) as follows:

- (a) Remove the airspeed limitation decal (5) found on the overhead trim panel near the windshield.

- (b) Lift one corner of the decal with a sharp knife and remove it.
- (c) In the location of the decal you removed, install the new adhesive-backed decal.
- (d) Apply edge sealer (C-349) to the edges of the decal.

- NOTE -

On the helicopters supplied with the dual control kit, 407-706-702-ALL, one more decal (5) is installed on the co-pilot side of the overhead trim panel. Replace this decal (5) with the new decal (6). (Refer to Step 1).

- (e) Increased Internal Gross Weight.

**CAUTION**

DO NOT USE PAINT THINNER OF MEK (C-309)  
ON INTERIOR TRIM PANELS.

- NOTE -

Use aliphatic naphtha (C-305) to remove the decal adhesive.

- 1) Install the decal, 407 (5250 LB) Airspeed Limitations (7, Figure 1) as follows:
  - (a) In a location adjacent to the decal, Airspeed Limitations (5 or 6, Figure 1) install the new adhesive-backed decal (7).
  - (b) Apply edge sealer (C-349) to the edges of the decal.

- NOTE -

On the helicopters supplied with the dual control kit, 407-706-702-ALL, one more decal is installed on the co-pilot side of the overhead trim panel.

### Part III – New Directional Controls Rigging Procedure.

1. Adjust the rigging of the directional controls (refer to Figure 2, Sheet 1) as follows:

- NOTE -

Rig the directional controls with the Hydraulic Boost in the “OFF” position and the pedal stop not engaged.

- a) Do a check of the rigging of the directional controls at four locations. If you need to make adjustments you can use the procedure in the Maintenance Manual BHT-407-MM-8, Paragraph 67-94. The procedure changes that follow are different from those in the Maintenance Manual (Refer to Figure 2).

- NOTE -

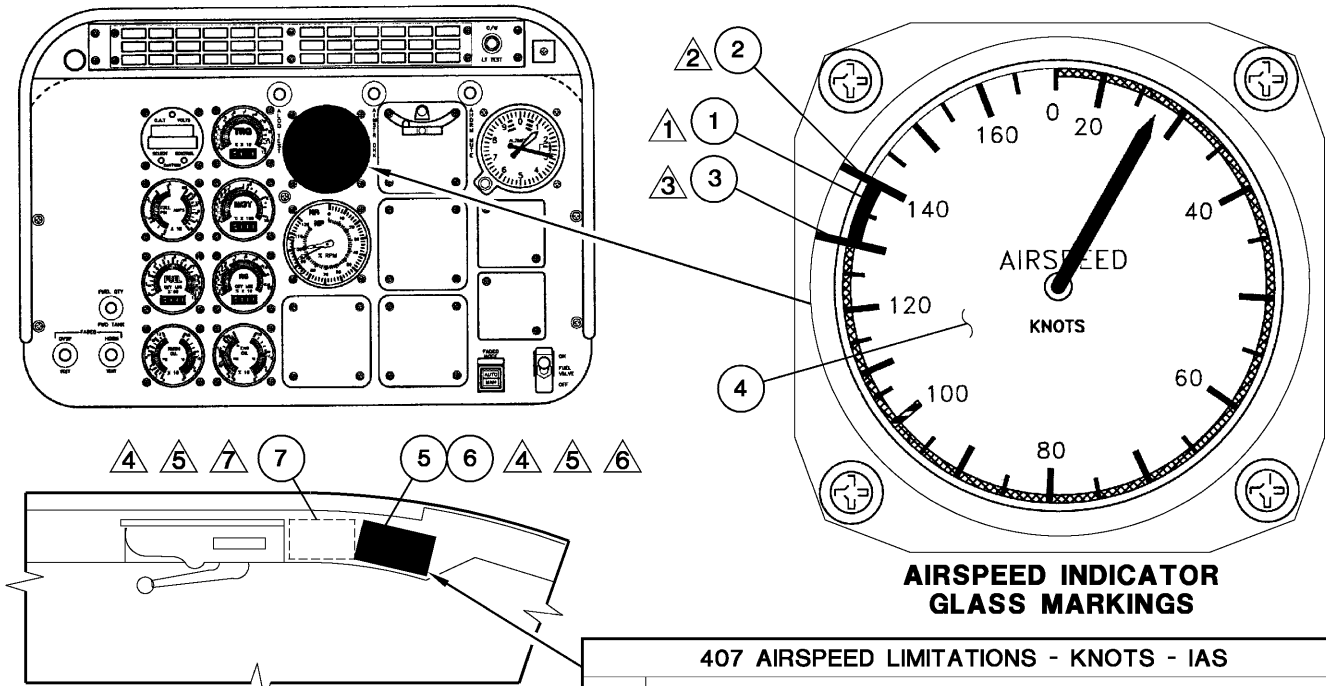
The initial values given in the steps below refer to those set when ASB 407-99-27 was completed.

- b) Make sure that the directional pedal angle (BHT-407-MM-8, Paragraph 67-94, Step 2 and Figure 67-24, Detail A) is **now  $52^{\circ} \pm 0.5^{\circ}$**  with the pedal stop not engaged. The initial value was  **$46^{\circ}$** . If the dimension is **not  $52^{\circ} \pm 0.5$** , adjust the value.
- c) Make sure that the dimension between the floor and the bellcrank (BHT-407-MM-8, Paragraph 67-94, Step 5 and Figure 67-24, Detail B) is **now 1.94 inches (49.30 mm)** with the pedal stop not engaged. The initial value was **2.13 inches (54.10 mm)** If the dimension is **not 1.94 inches, (49.30 mm)** adjust the dimension.
- d) Make sure that the dimension between the bellcrank and the aft face of web on the casting (BHT-407-MM-8, Paragraph 67-94, Step 16 and Figure 67-24, Detail C) is **now – 0.07 inch (1.78 mm)** with the pedal stop not engaged. The initial was **– 0.35 inch. (8.90 mm)** If the dimension is **not – 0.07 inch (1.78 mm)**, adjust the dimension.

- NOTE -

Workaid 407-99-26-101 was initially used as part of ASB 407-99-27. If you do not have the workaid, then you must make it locally using the instructions in Figure 3.

- e) Put the tail rotor blade in the horizontal position and hold within  $0.5^{\circ}$ . Install the workaid (Figure 2, Sheet 2) on the tail rotor assembly.
  - f) Make sure that the mean tail rotor blade angle (BHT-407-MM-8, Paragraph 67-94, Step 15. Figure 67-25, View B-B) is **now  $24.5^{\circ}$  to  $25.5^{\circ}$**  with the pedal stop not engaged. The initial values were  **$18.7^{\circ}$  to  $19.7^{\circ}$** . If the mean angle is **not  $24.5^{\circ}$  to  $25.5^{\circ}$**  adjust it (refer to BHT-407-MM-8, Paragraph 67-94, Step 18).
2. Make an entry in the helicopter Historical Record (HR) to show that this bulletin is completed.
  3. Make an entry in the record of the Alert Service Bulletin in the Maintenance Manual.



**OVERHEAD TRIM PANEL  
VIEW LOOKING INBOARD  
RIGHT SIDE**

**AIRSPEED INDICATOR  
GLASS MARKINGS**

**LEGEND**

- 1. Decal (BLACK) (REF)
- 2. Decal (WHITE) (REF)
- 3. Decal (TRANSLUCENT, LIGHT TOMATO RED) (REF)
- 4. Airspeed indicator glass face
- 5. Decal 407-070-201-125 (STANDARD)
- 6. Decal 407-070-201-127 (QUIET CRUISE)
- 7. Decal 407-070-201-129 (INC. G. W.)

407 AIRSPEED LIMITATIONS - KNOTS - IAS											
OAT C°	PRESSURE ALTITUDE FT X 1000										
	0	2	4	6	8	10	12	14	16	18	20
52	137	-	-	-	-	-	-	-	-	-	-
45	139	132	125	-	-	-	-	-	-	-	-
40	140	133	126	119	-	-	-	-	-	-	-
35	140	135	128	120	113	-	-	-	-	-	-
30	140	137	129	122	115	108	-	-	-	-	-
25	140	138	131	124	116	109	102	95	-	-	-
20	140	140	133	125	118	111	103	96	89	-	-
0	140	140	140	132	125	117	110	103	95	88	-
-25	140	140	140	135	130	125	119	111	104	97	89
-40	137	133	128	123	118	114	110	105	101	97	93

**NEW AIRSPEED LIMITATION DECAL  
(STANDARD HELICOPTER CONFIGURATION)**

**NOTES**

- 1. Remove decal on the cover glass that covers the green arc.
- 2. Remove decal on the cover glass that covers the red  $V_{NE}$  mark at 140 Knots.
- 3. Remove decal on the cover glass that shows the  $V_{NE}$  mark at 130 Knots.
- 4. Apply edge sealer (C-349) to edges of the decal.
- 5. If you have the dual controls installed, one more decal is installed on the co-pilot side.
- 6. If your helicopter operates the Quiet Cruise Mode, then replace existing decal (5) with decal (6).
- 7. If your helicopter operates the Increased Internal Gross Weight, then add decal (7) in a location adjacent to decal (5 or 6).

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**Figure 1. Installation of New Airspeed Limitation Decal and Removal of Airspeed Indicator Glass Markings (Sheet 1 of 2)**

407 AIRSPEED LIMITATIONS - KNOTS - IAS											
OAT C°	PRESSURE ALTITUDE FT X 1000										
	0	2	4	6	8	10	12	14	16	18	20
52	137	-	-	-	-	-	-	-	-	-	-
45	139	132	125	-	-	-	-	-	-	-	-
40	140	133	126	119	-	-	-	-	-	-	-
35	140	135	128	120	113	-	-	-	-	-	-
30	140	137	129	122	115	108	-	-	-	-	-
25	140	138	131	124	116	109	102	95	-	-	-
20	140	140	133	125	118	111	103	96	89	-	-
0	140	140	140	132	125	117	110	103	95	88	-
-25	140	140	140	135	130	125	119	111	104	97	89
-40	137	133	128	123	118	114	110	105	101	97	93
MAXIMUM AUTOROTATION VNE 100 KIAS											
QUIET MODE VNE 100 KIAS											
MAXIMUM QUIET MODE ALTITUDE IS 6000 FT HD											

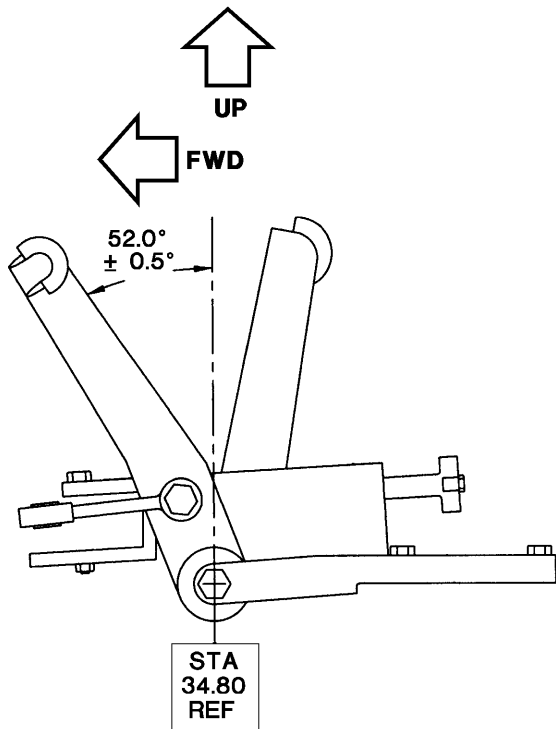
**AIRSPEED LIMITATION DECAL **  
**QUIET MODE**

407 (5250LB) AIRSPEED LIMITATIONS - KNOTS - IAS											
OAT C°	PRESSURE ALTITUDE FT X 1000										
	0	2	4	6	8	10	12	14	16	18	20
52	137	-	-	-	-	-	-	-	-	-	-
45	139	132	123	-	-	-	-	-	-	-	-
40	140	133	125	113	-	-	-	-	-	-	-
35	140	135	128	116	104	-	-	-	-	-	-
30	140	137	129	118	106	99	-	-	-	-	-
25	140	138	131	121	109	100	93	86	-	-	-
20	140	140	133	124	112	102	94	87	80	-	-
0	140	140	140	132	123	111	101	94	86	79	-
-25	140	140	140	135	130	125	114	102	95	88	80
-40	137	133	128	123	118	114	110	105	101	93	86
MAXIMUM AUTOROTATION VNE 100 KIAS											

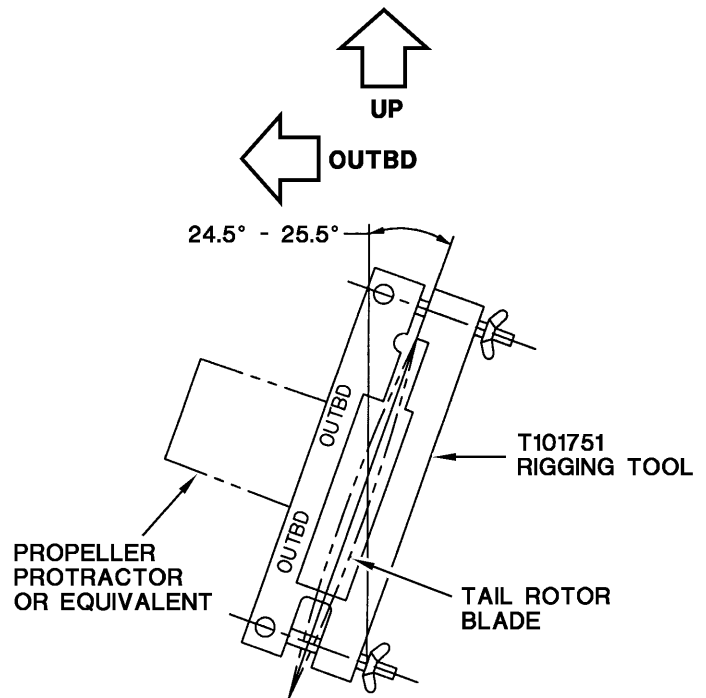
**AIRSPEED LIMITATION DECAL **  
**INCREASED INTERNAL GROSS WEIGHT**

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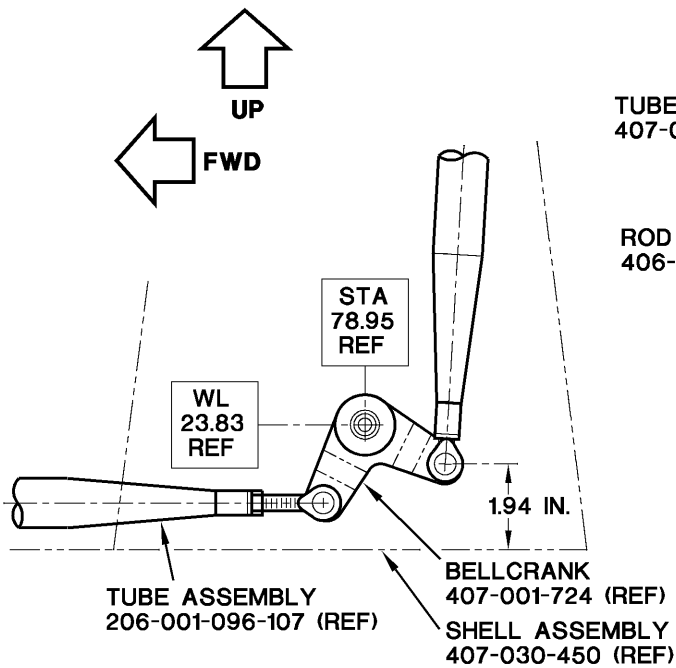
**Figure 1. Installation of New Airspeed Limitation Decal and Removal of Airspeed Indicator Glass Markings (Sheet 2)**



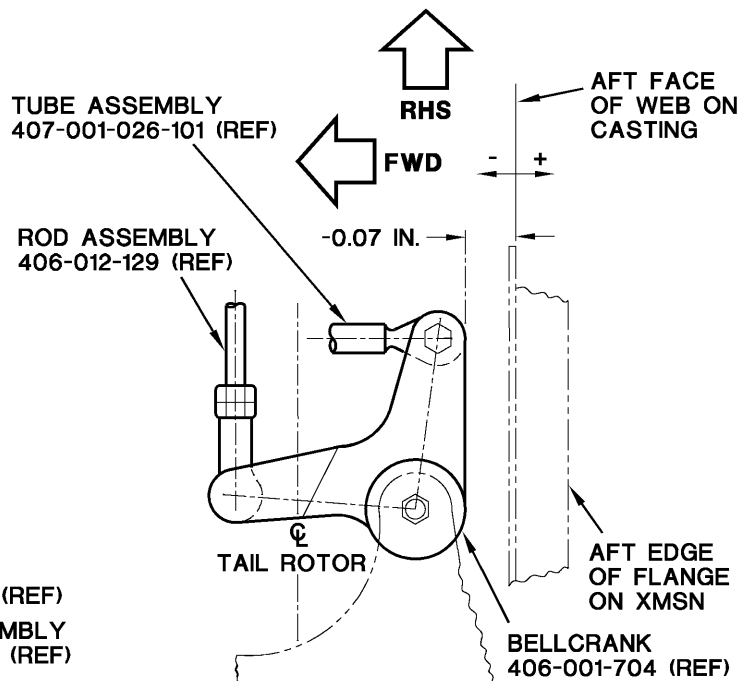
**NEW PEDAL ANGLE 52.0° ± 0.5°**



**VIEW LOOKING FORWARD  
NEW T/R BLADE ANGLE 24.5° - 25.5°**



**BELLCRANK POSITION  
LEFT PEDAL FULL FWD**



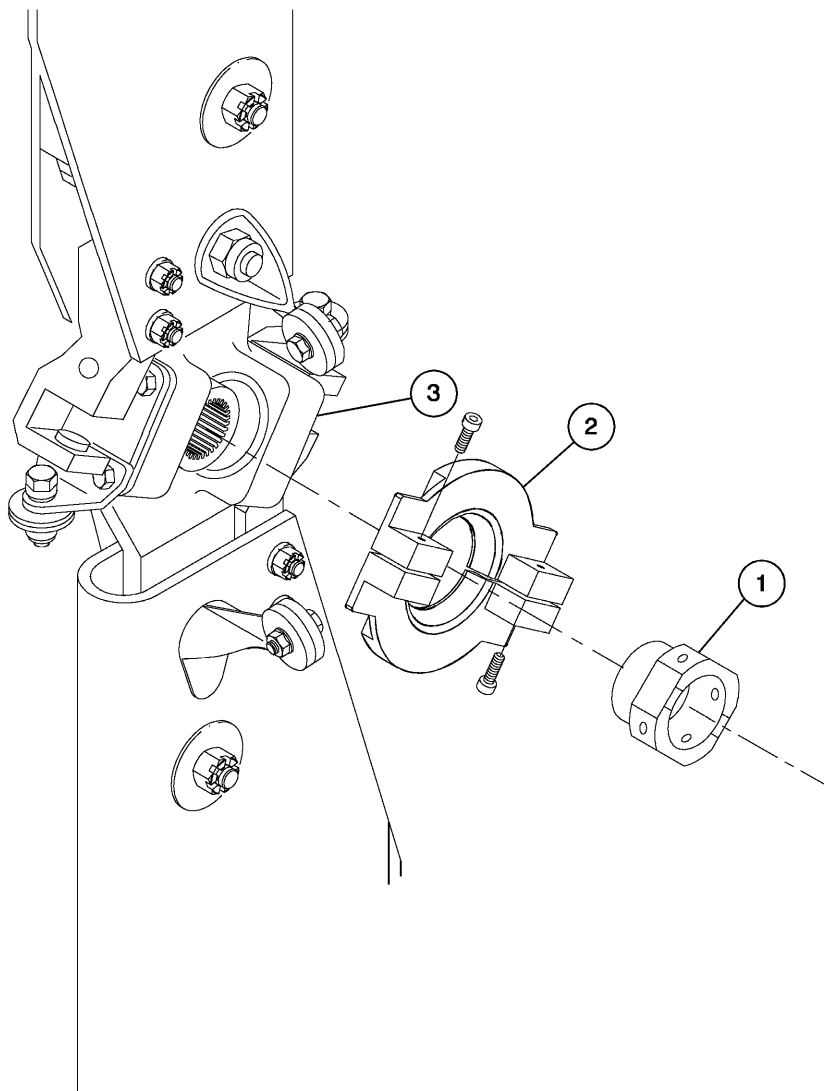
**BELLCRANK ORIENTATION**

**NOTE**

All values are given for boost "off" condition and pedal stop not engaged.

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**Figure 2. New Directional Control Rigging Procedure (Sheet 1 of 2)**



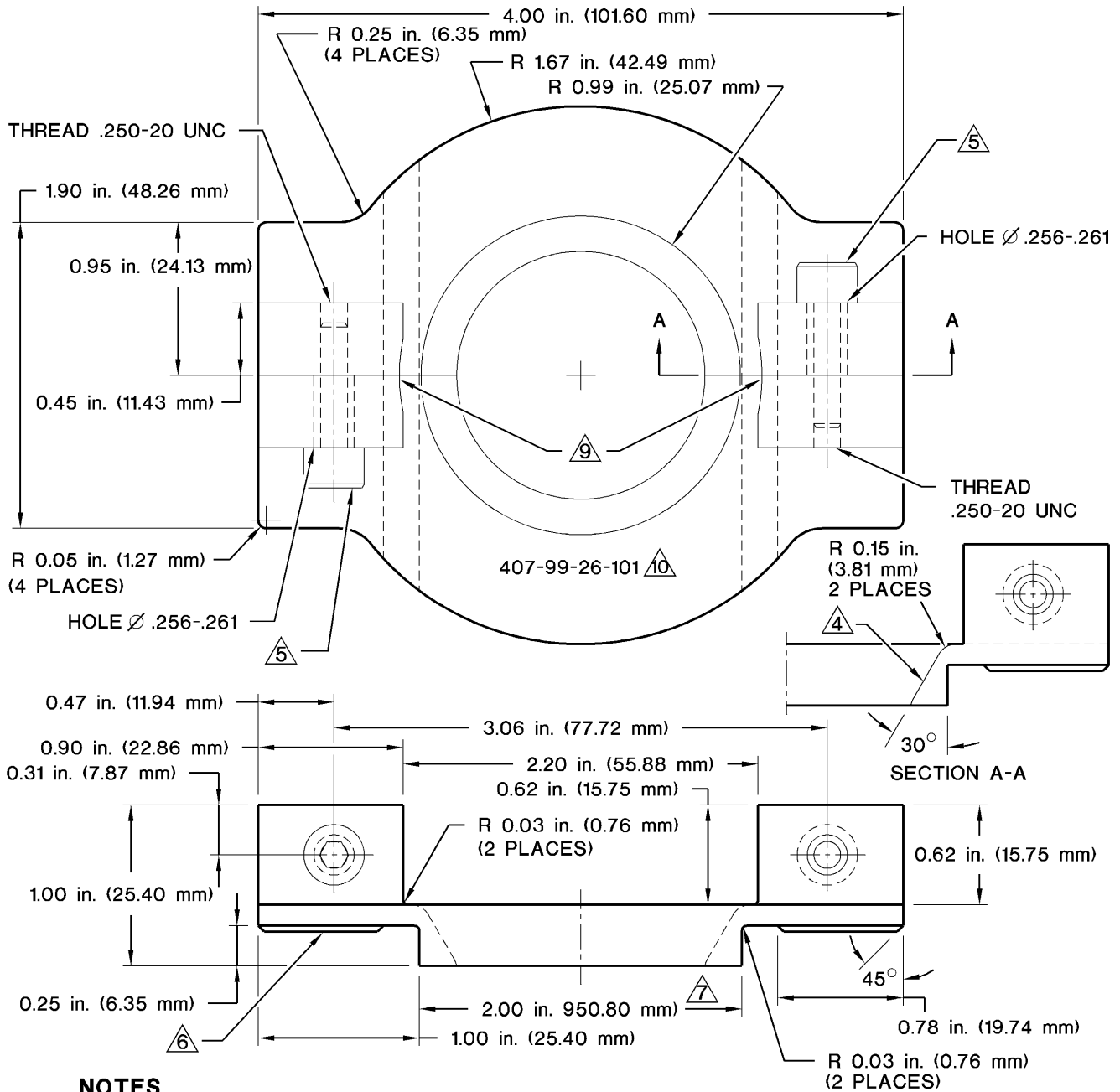
**LEGEND**

- 1. Retainer nut
- 2. Workaid, tail rotor centering
- 3. Hub and blade assembly

**NOTE**

It will be necessary to remove the lockwire that holds the nut (1) to the yoke of the hub and blade assembly (3).  
Make sure to install lockwire after you have completed the rigging.

**Figure 2. New Directional Rigging Procedure, Workaid Position (Sheet 2)**



**NOTES**

- |   |  |
|---|--|
| 1. Aluminum (Roll) Stock (or equivalent) 6061-T6, 1.00 inch (25.40 mm) thick. | △6 Teflon Pad or equivalent, .020 inch (0.51 mm) thick, 2 places.    |
| 2. Deburr all sharp edges.  | △7 Width to fit inside yoke on tail rotor hub.                       |
| 3. Install only as matched set.   | 8. Finish: 125 μ inch (3.2 μ meter) RMS.                             |
| △4 Cut to fit nut 407-012-111-101.  | △9 Trim to clear nut 407-012-111-101.                                |
| △5 Cap screw NAS1352-4-12, 2 places.  | △10 Use vibrotech or impression-stamp to identify P/N 407-99-26-101. |

**Figure 3. Workaid, Tail Rotor Centering**