CHAPTER 62 — MAIN ROTOR

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FIGURES (CONT)

MAIN ROTOR HUB AND BLADES

62-1. MAIN ROTOR HUB AND BLADES.

The main rotor assembly is a two-bladed, semi-rigid, seesaw type rotor with underslung mounting. Refer to figure 62-1 .

The main rotor blades are all metal construction with an aluminum alloy honeycomb core, aluminum skins, spar and trailing edge strip. All the structural components are joined by means of metal-to-metal bonding.

The main rotor hub consists primarily of a forged steel yoke with two spindles, a trunnion assembly, two blade grips with pitch horns, and two grip-retention strap assemblies. Oil or grease lubricated bearings provide for smooth rotation of the trunnion and blade grips on the yoke.

The blades are attached to the hub grips with bolts which have hollow shanks for installation of weights for static balance of hub and blade assembly. After balancing, the bolts must be kept with their respective rotor hub grips. Blade alignment is accomplished by adjustment of blade latches, which engage the root end of the blade. 206-010-100-003 through -017 and 206-011-100-001 through -021 main rotor hub assemblies, prior to compliance with T.B. 206-78-5 or 206-79-21 , are oil lubricated hub assemblies. T.B. 206-78-5 and 206-79-21 modifies these hubs to grease lubricated hub assemblies. Main rotor hub assemblies subsequent to 206-011-100-021 are grease lubricated hub assemblies. A flap restraint is on some main rotor hubs. The flap restraint assembly incorporates counterweights and springs which serve to position limited freedom flapping stops. The stops prevent excessive flapping of the main rotor during starting and shutdown but allow normal flapping at operating rpm.

62-2. TROUBLESHOOTING AND OPERATIONAL CHECKS.

For main rotor troubleshooting, track and balance procedures and operational checks refer to Chapter 18.

62-3. REMOVAL.

SPECIAL TOOLS REQUIRED

NUMBER	NOMENCLATURE
Commercial	Hoist, 600 Lb (272.16 kg) Capacity, Minimum
T100220-1	Sling
—	Main rotor grip holding workaids (2 each) Figure 62-1
—	T-handle workaid (2 each)

CAUTION

DO NOT ALLOW MAIN ROTOR GRIPS OR YOKE TO ROTATE ON PITCH CHANGE AXIS. IF GRIP OR YOKE IS ALLOWED TO ROTATE ON THE PITCH CHANGE AXIS BEYOND 90 DEGREES, THE MAIN ROTOR GRIP RETENTION STRAP/S MUST BE REPLACED. SECURE MAIN ROTOR BLADE GRIP THROUGH PITCH HORNS TO YOKE WITH A SUITABLE WORKAID.

1. Index pitch link assemblies (19, figure 62-1) for reinstallation in same position. Disconnect and remove two pitch link assemblies by removing cotter pins (12 and 23), nuts (13 and 22), thin steel washers (11 and 21), and bolts (10 and 20).

2. Secure main rotor blades (1) and pitch horns to yoke using main rotor grip workaid (figure 62-2) or equivalent.

3. Cut and remove lockwire from bolt (8, figure 62-1). Remove bolt (8), nut (4), washer (5), and lock (9). Nut (4), washer (5) and spacer (28) used without restraint.

4. Remove mast nut (7). Use caution to prevent damage to flap restraint (3) during removal of mast nut.

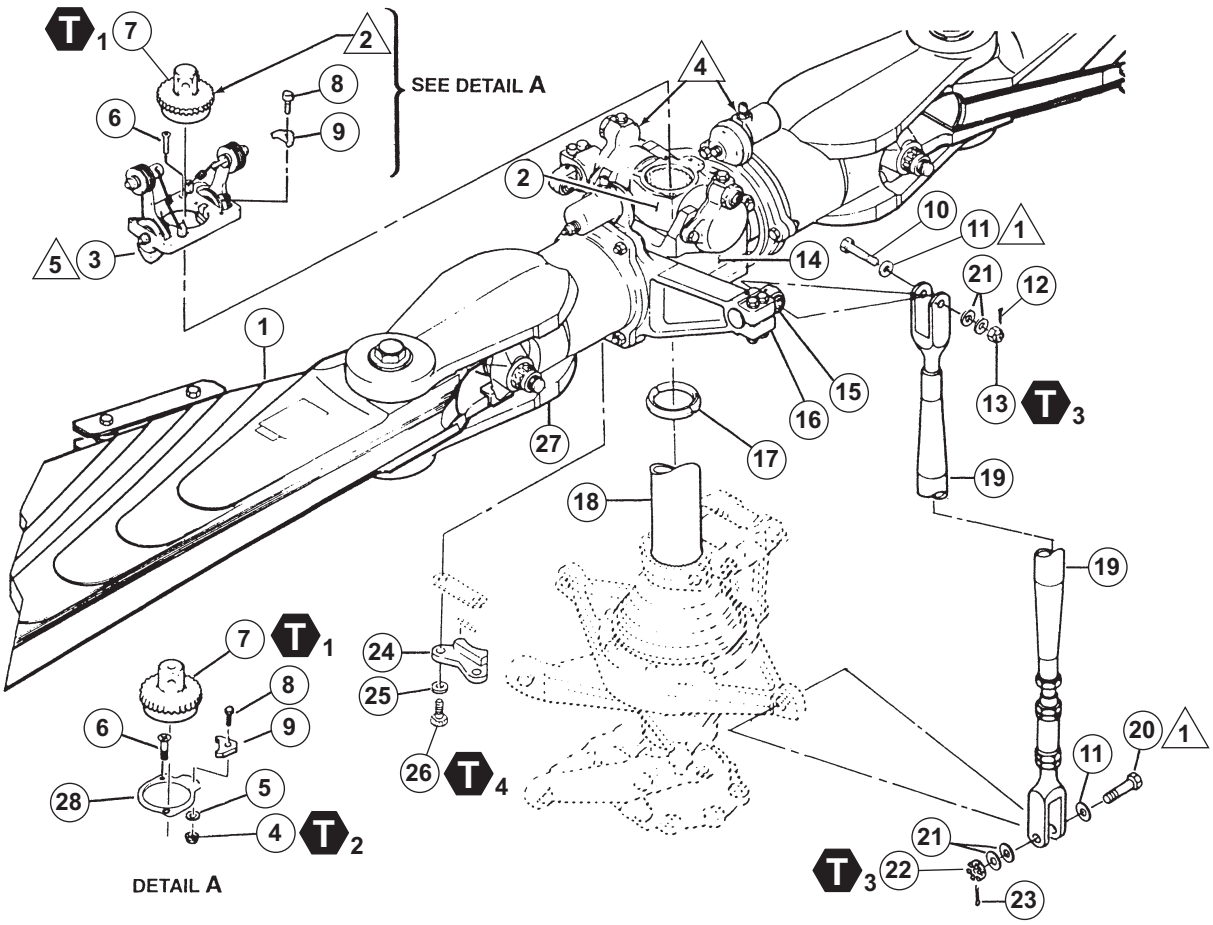
5. Remove two screws (6) and remove flap restraint (3).

6. Install 130-013-13 blade tiedown on tip of one main rotor blade (1) to guide main rotor hub and blade assembly during removal.

NOTE

A cable sling fabricated from lengths of rubber hose slipped on the cables will prevent damage to the rotor hub. The sling should be passed through the opening in the rotor hub grip tangs to prevent blades from turning on pitch change axis during rotor removal.

7. Install T100220 rotor hoisting sling or locally manufactured sling to remove main rotor hub and blades assembly.



OIL LUBRICATED HUB AND BLADE ASSEMBLY SHOWN

1. Main rotor blade
2. Trunnion
3. Flap restraint
4. Nut
5. Washer
6. Screw
7. Mast nut
8. Bolt
9 Lock
10. Bolt
11. Thin steel washer (1)
12. Cotter pin
13. Nut
14. Yoke
15. Trunnion bearing
16. Pitch horn
17. Cone set
18. Mast
19. Pitch link
20. Bolt
21. Thin steel washer (2 max)
22. Nut
23. Cotter pin
24. Static stop
25. Washer
26. Bolt
27. Grip
28. Washer — spacer

NOTES

1. One washer under bolthead. Maximum two washers under nut as required to locate nut for cotter pin.
2. Main rotor mast nut torque check required.
3. The torques listed are for special application. Refer to BHT-ALL-SPM for standard torque application. Torque to be applied to nut.
4. Oil reservoir, installed on 206-010-003 thru -017 and 206-011-100-001 thru -021 hub assemblies prior to T.B.206-78-5 or T.B. 206-79-21 . 206-011-100-021 and subsequent and hubs modified by T.B. 206-78-5 or T.B. 206-79-21 are grease lubricated and will not have oil reservoirs.
5. Flap restraint installation is optional.

T1 250 TO 275 FT-LBS (339 TO 373 Nm)
T2 60 IN-LBS (6.78 Nm)
T3 100 TO 140 IN-LBS (11.30 TO 15.82 Nm)
T4 175 IN-LBS (19.77 Nm)

206AB_MM_62_0001

Figure 62-1. Main Rotor Hub and Blades (Typical)

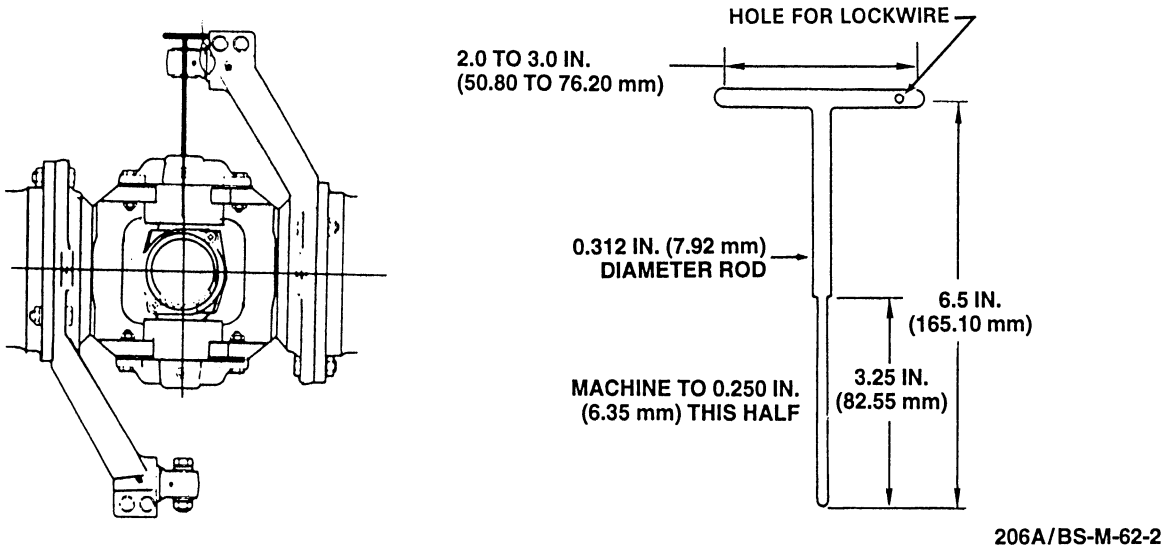


Figure 62-2. T-handle Workaid

CAUTION

SPLIT CONES WILL FALL FROM MAST WHEN HUB IS RAISED. MAKE PROVISIONS TO CATCH SPLIT CONES.

8. Attach a hoist to sling and lift main rotor hub and blade assembly clear of mast (18) and remove cone set (17). Use caution to prevent damage to threads and splines on mast. Place assembly on a workstand and support main rotor blades (1) at their precone angle.

9. For removal of main rotor blades (1), refer to paragraph 62-38.

62-4. MAIN ROTOR HUB AND BLADES — CLEANING

MATERIALS REQUIRED

Refer to BHT-ALL-SPM for specifications.

NUMBER	NOMENCLATURE
C-304	Drycleaning Solvent
C-318	Cleaning Compound

NOTE

The following procedure should be accomplished every 7 days or more frequently if deemed necessary when operating in rain, salt-laden air, or other damaging corrosive environments.

1. Wipe main rotor blades and hub with drycleaning solvent (C-304) to remove oil and grease.

2. Wash main rotor blades and hub with a mild solution (ratio of 4 parts water to 1 part cleaning compound) of cleaning compound (C-318). Rinse with clean water and wipe dry with clean cloth.

3. Apply protective coat of wax or WD40.

62-5. MAIN ROTOR HUB

62-6. MAIN ROTOR HUB — INSPECTION AND REPAIR

MATERIALS REQUIRED

Refer to BHT-ALL-SPM for specifications.

NUMBER	NOMENCLATURE
C-108	Cadmium Plating Solution
C-204	Epoxy Polyamide Primer
C-218	Polyurethane Topcoat
C-423	Abrasive Paper
C-464	India Stone

1. Inspect pitch link (19, Figure 62-1) for damage and corrosion (paragraph 62-20).

2. Inspect main rotor hub parts for mechanical and corrosion damage. Ensure limits are not exceeded before repairs and that limits will not be exceeded after repairs (BHT-206A/B-SERIES-CR&O).

3. Polish out damage that is within allowable limits with No. 400 grit or finer abrasive paper (C-423). Blend edges of repaired area into the surrounding surface to a smooth contour.

4. Apply cadmium plating solution (C-108) to repairs of steel parts and chemical film treatment to repairs of aluminum parts (BHT-ALL-SPM).

5. Spot paint repaired areas as required with finish listed in BHT-206A/B-SERIES-CR&O manual.

6. Inspect splines of trunnion (2) and mast (18) for nicks, burrs, or scratches and, if necessary, dress with fine India stone (C-464).

7. Inspect mast nut (Figure 62-3) for mechanical, corrosion, and thread damage. Polish out acceptable damage (step 11).

8. Inspect lock (9, Figure 62-1) for wear, or scoring of 0.005 inch (0.13 mm) maximum depth. Ensure that both locking tangs will engage mast nut splines when parts are installed. Polish out nicks and burrs. Refer to step 10.

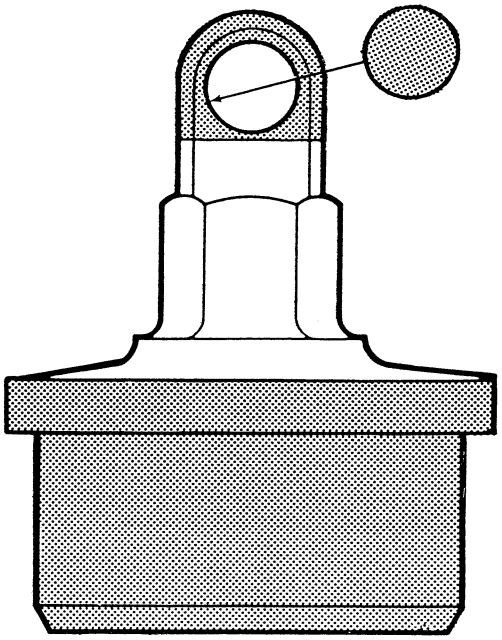
9. Inspect cone set (17) for damage (Figure 62-4). Polish out acceptable damage. Refer to step 10.

10. Polish out acceptable damage with 400 to 600 grit abrasive paper (C-423), or fine India stone (C-464).

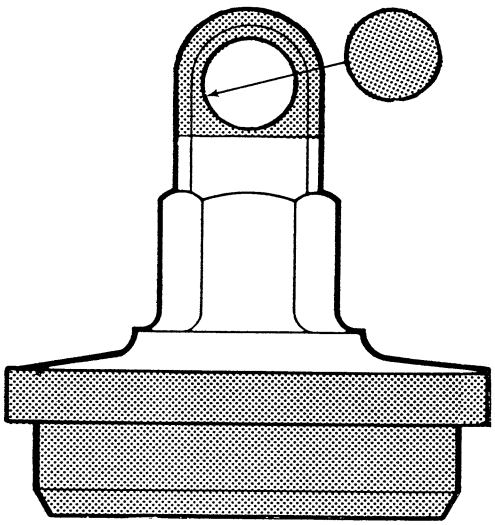
a. Touch up all repaired and bare steel surfaces with cadmium plating solution (C-108). Touch up all repaired and bare aluminum surfaces with chemical film treatment (BHT-ALL-SPM).

b. Apply one spray coat of epoxy polyamide primer (C-204) and two spray coats of light gull gray, polyurethane topcoat (C-218) color to exterior surfaces within 8 hours after priming. Do not allow primer or topcoat on threaded areas (BHT-ALL-SPM).

11. Inspect trunnion bearings (15, Figure 62-1) for radial and axial play. Radial play is not permitted. Axial play must not exceed 0.020 inch (0.51 mm).



206-011-152-101
MAST NUT



206-011-007-003
MAST NUT

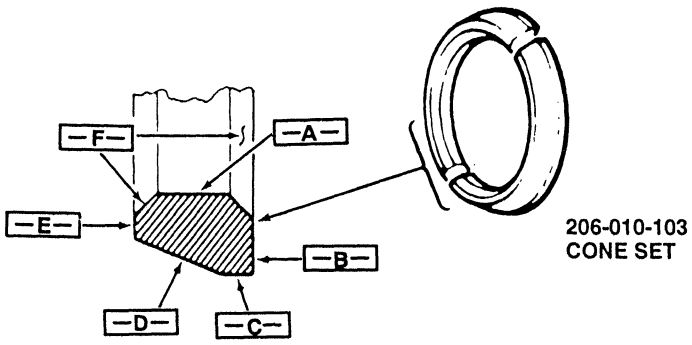
DAMAGE LOCATION SYMBOLS

TYPE OF DAMAGE	MAXIMUM DEPTH AND REPAIR AREAS	
MECHANICAL AND CORROSION BEFORE AND AFTER REPAIR	0.010 In. (0.25 mm)	0.030 In. (0.76 mm)
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 Sq. In. (64.52 mm^2)	Not critical
NUMBER OF REPAIRS	Two	Two
EDGE CHAMFER	0.030 In. (0.76 mm)	0.060 In. (1.52 mm)

THREAD	
Depth	0.50 In. (12.70 mm) of circumference
Length	1/3 of thread
Number	One

206A/BS-M-62-3

Figure 62-3. Mast nut damage limits



206-010-103
CONE SET

DAMAGE LOCATION SYMBOLS

-A- -B- -C- -D- -E- -F-

TYPE OF DAMAGE	MAXIMUM DEPTH AND REPAIR AREAS ALLOWED
MECHANICAL	Damage to surfaces -A-, -C-, -E-, and -F- may be considered negligible and not require repair, provided depth of damage does not exceed 0.010 inch (0.25 mm) and if the minimum radii observed in the damage area are not less than 0.025 inch (0.63 mm). Surface -B- may be resurfaced on a surface plate. Maximum material not to exceed 0.005 inch (0.13 mm). Both halves of cone set must be surfaced exactly the same amount, so that the distance from surface -E- to surface -B- is identical for both halves. Surface -D- must not have any protrusions above the surrounding surface. Dents and scratches not greater than 0.010 inch (0.25 mm) in depth may be polished out.
EDGE CHAMFER	Damage shall be removed from edges using a chamfer of 0.030 inch (0.76 mm) by 45 degrees, when polished to existing surface.

206A/BS-M-62-4

Figure 62-4. Cone set damage limits

62-7. MAIN ROTOR HUB — INSTALLATION

SPECIAL TOOLS REQUIRED

NUMBER	NOMENCLATURE
T100220	Lifting Sling

MATERIALS REQUIRED

Refer to BHT-ALL-SPM for specifications.

NUMBER	NOMENCLATURE
C-101	Corrosion Preventive Compound
C-104	Corrosion Preventive Compound
C-308	Sealant
C-405	Lockwire

NOTE

For alternate main rotor hub and blade installation procedures, refer to TB 206-07-190.

CAUTION

DO NOT ALLOW MAIN ROTOR GRIPS OR YOKE TO ROTATE ON PITCH CHANGE AXIS. IF GRIP OR YOKE IS ALLOWED TO ROTATE ON THE PITCH CHANGE AXIS BEYOND 90°, THE MAIN ROTOR GRIP RETENTION STRAP(S) MUST BE REPLACED. SECURE MAIN ROTOR BLADE GRIP THROUGH PITCH HORN TO YOKE WITH SUITABLE WORKAID.

1. Apply a light film of corrosion preventive compound (C-104) to splines on mast (18, Figure 62-1), and recess provided for cone set (17), and to splines of trunnion (2).

NOTE

A cable sling fabricated from lengths of rubber hose slipped on the cables will prevent damage to the rotor hub. The sling should be passed through the opening in the rotor hub grip tangs to prevent blades from turning on pitch change axis during rotor installation.

2. Install lifting sling (T100220 or equivalent) on main rotor hub and blade assembly and connect to hoist.

3. Install blade tie-down on main rotor hub and blade as a handling guide. Hoist main rotor hub and blade assembly into position directly over mast (18). Align trunnion (2) and main rotor hub directly over mast with master splines aligned.

4. Carefully lower main rotor hub and blade assembly onto mast (18), while aligning master splines. Position cone set (17) in recess on mast (18) and carefully lower main rotor hub and blade assembly into position.

5. Ensure flap restraint (3) is correctly installed and secured. Install mast nut (7). Torque mast nut T as close as possible to permit installation of lock (9) and bolt (8). Do not exceed maximum torque.

6. Install bolt (8) through lock (9) and flap restraint (3) on trunnion (2). Install washer (5) and nut (4) T. Secure bolt (8) with lockwire. Remove lifting sling and hoist.

7. Loosen bolt (26) and washer (25). Tilt one side of main rotor hub and blade to bottom static stop (24) on mast (18). Align radius of static stop (24) with contour of mast (18). Torque bolts (26) T and secure with lockwire (C-405). Repeat procedure for opposite static stop.

8. Apply a bead of sealant (C-308) around external flange surfaces of inboard strap fittings and to adjacent mating surfaces of yoke (14) and static stops (24).

9. Install each pitch link (19) on swashplate outer ring, with arrow pointing up. Apply corrosion preventive compound (C-104) to shank of bolt (20). Install bolt (20) with one thin steel washer (11) under bolt head, one thin steel washer (21) under nut, and nut (22). A maximum of two thin steel washers (21) may be used under nut for alignment of cotter pin. Torque nut (22) T. Install cotter pin (23). Apply corrosion preventive compound (C-101) to bolt head and nut.

10. Remove main rotor grip workaid from trunnion bearings (15) and yoke (14). Ensure grips do not rotate. Connect end of each pitch link (19) to trunnion bearing (15). Apply corrosion preventive compound (C-104) to shank of bolt (10). Install bolt (10), one thin steel washer (11), one thin steel washer (21), and nut (13). One thin steel washer (11) is required under bolt head and a maximum of two thin steel washers (21) may be used under nut for alignment of cotter pin. Torque bolts (10) T. Install cotter pin (12). Apply corrosion preventive compound (C-101) to bolt head and nut.

11. Service main rotor hub assembly if not previously accomplished (Chapter 12).

12. Do a torque check of the mast nut (7), 1 to 5 flight hours after installation (TB 206-07-190) (Chapter 5).

FLAP RESTRAINT

62-8. FLAP RESTRAINT.

The flap restraint (3, figure 62-1) is mounted on the main rotor hub trunnion. It consists of counterweights and springs which limit rotor flapping during starting and shutdown. Normal flapping is not restricted at operating rpm.

62-9. REMOVAL.

1. Cut and remove lockwire from bolt (8, figure 62-1). Remove bolt (8), nut (4), washer (5), and lock (9).

2. Remove mast nut (7). Use caution to prevent damage to flap restraint (3) during removal of mast nut.

3. Remove two screws (6), and lift flap restraint (3) from trunnion (2).

62-10. INSPECTION AND REPAIR.

1. Visually inspect support (8, figure 62-5) and arm assembly (4) in accordance with figure 62-6.

2. Inspect arm assembly (1, figure 62-5) for bond line separation of rubber stop (9).

3. Inspect springs (7), for correct spring rate, 1.00 inch (25.40 mm) extension under a pull of 0.84 (±0.08) pounds (3.74 ±0.35 N).

4. Ensure that arm assemblies (1) operate freely and that 0.002 inch (0.05 mm) minimum clearance exists between faces of arm assembly (1) and slot in support (8).

5. Repair damage to mast nut lock (9, figure 62-1) which would prohibit functional engagement. Replace mast nut lock if cracked.

62-11. INSTALLATION.

1. Position flap restraint (3, figure 62-1) trunnion (2), and secure with two screws (6).

2. Install and secure mast nut (7) (T) to permit installation of lock (9).

3. Install lock (9) with bolt (8), washer (5), and nut (4) (T). Secure bolt (8) with lockwire.

4. Adjust flap restraint (paragraph 62-12).

62-12. ADJUSTMENT OF ENGAGEMENT RPM.

1. Inspect flap restraint assembly to ensure that the arms (4, figure 62-5) operate freely and that springs (7) will retract arms to upright position.

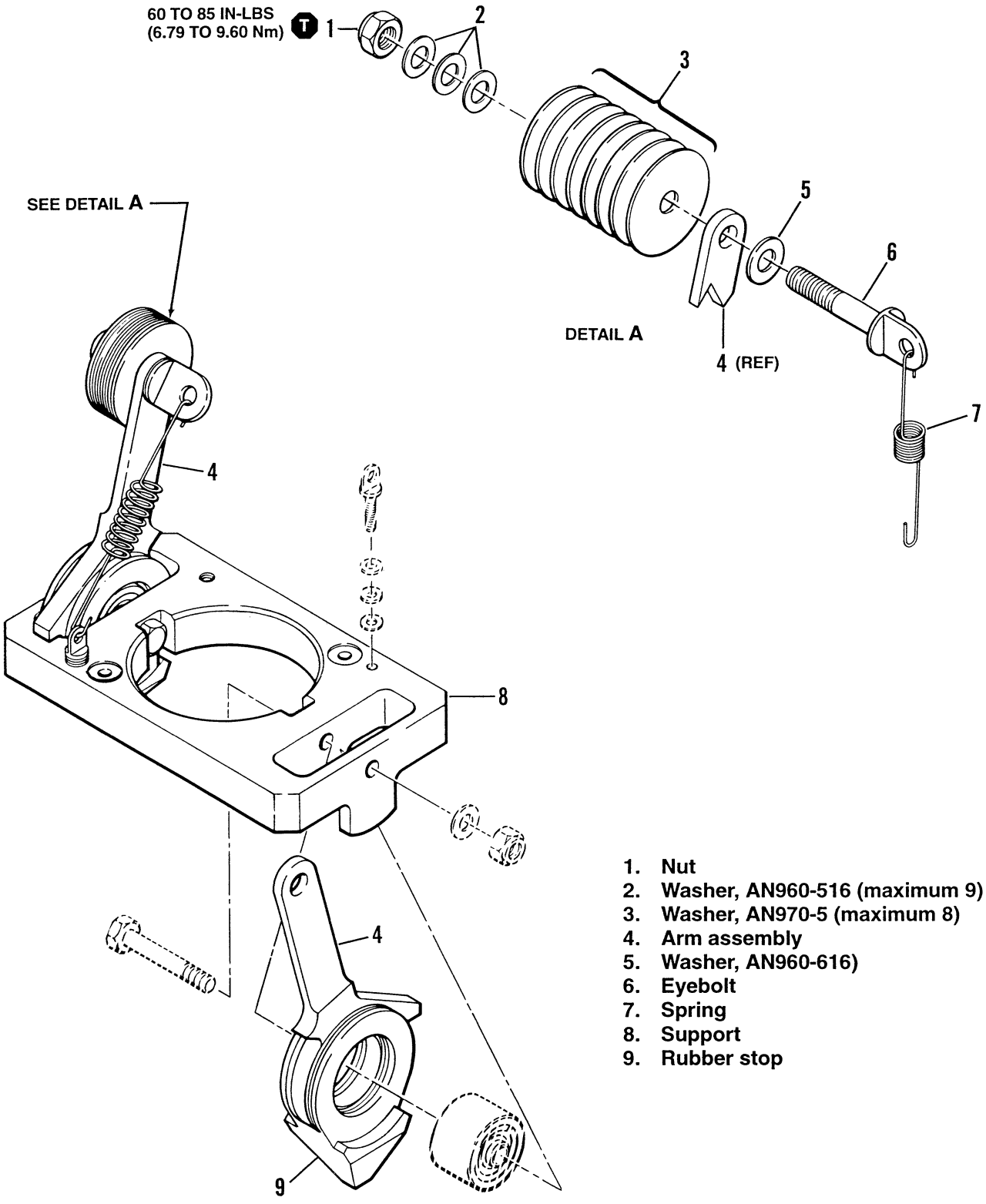
2. Accomplish preflight inspection. Start helicopter and note percent rpm at which the flap restraint arms (4) move outboard as rotor percent increases. Allow engine to stabilize at completion of standard starting procedure, then shut down engine and note percent at which the flap restraint arms (4) move into upright position. Both flap restraint arms should operate in the rpm range of 25 to 31 percent as rpm increases or decreases.

3. If flap restraint arm operation occurs below 25 percent, remove washers (3) and replace with washers (2). If flap restraint arm operation occurs above 31 percent, remove washers (2) and replace with washers (3). Tighten nut (1) (T) after changing washers.

NOTE

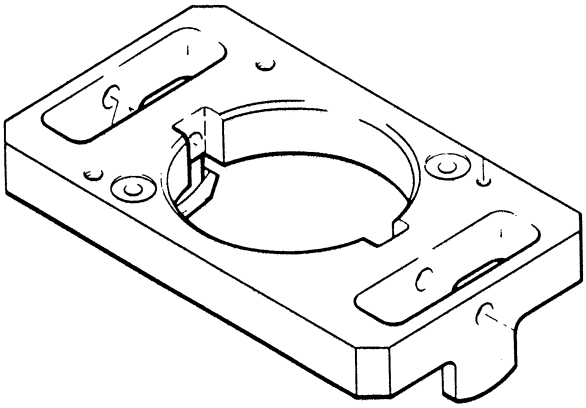
Make washer adjustments as required, but a maximum of eight washers (3) and nine washers (2) may be installed on each arm.

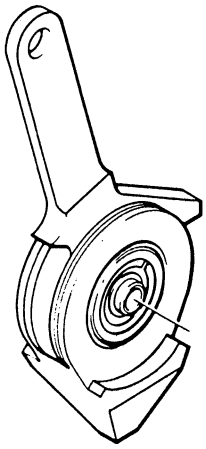
4. If washer adjustment does not cause flap restraint arms to operate at correct percent rotor rpm, check springs (7). A pull of 0.84 ± 0.08 pounds (3.74 ± 0.36 newtons) should cause a 1 inch (25.4 mm) extension of spring (7).



1. Nut
2. Washer, AN960-516 (maximum 9)
3. Washer, AN970-5 (maximum 8)
4. Arm assembly
5. Washer, AN960-616)
6. Eyebolt
7. Spring
8. Support
9. Rubber stop

Figure 62-5. Flap restraint assembly





206-011-117-3
FLAP RESTRAINT
ASSEMBLY

TYPE OF DAMAGE	DAMAGE LOCATION SYMBOL MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL BEFORE AND AFTER REPAIR	0.010 In. (0.25 mm)
CORROSION BEFORE AND AFTER REPAIR	0.010 In. (0.25 mm)
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 Sq. In. (64.52 mm^2)
NUMBER OF REPAIRS	Not critical
THREADS	
DEPTH	1/3 of thread
LENGTH	1/4 of circumference
NUMBER	Two

206A/BS-M-62-6

Figure 62-6. Flap restraint assembly damage and repair limits

MAIN ROTOR BLADES

62-13. MAIN ROTOR BLADES.

Main rotor blades are of all-metal construction with an aluminum alloy spar, spar spacer, trailing edge strip, honeycomb core, and aluminum skins. All structural components are joined by metal-to-metal bonding. The blades are set in hub grips at a preconed angle and are secured by a single retaining blade bolt in each grip. An inboard trim tab and an outboard trim tab are provided on the trailing edge for tracking adjustments. Earlier 206-010-200-033 blades have outboard trim tabs only. The blades have swept tips and are individually interchangeable.

62-14. CLEANING.

NOTE

The following cleaning procedure should be accomplished each week, or more frequently if necessary, to prevent corrosion and extend main rotor blade service life.

1. Wipe main rotor blades with solvent (C-304) to remove oil and grease.

2. Wash main rotor blades with a mild solution (ratio of 4 parts water to 1 part cleaning compound) of cleaning compound (C-318). Rinse with fresh water and wipe dry with clean cloth.

3. When dry, coat all surfaces of main rotor blades with preservative oil (C-125).

62-15. INSPECTION AND REPAIR.

NOTE

For inspection and repair of main motor blades, refer to figure 62-7. For damage in excess of that noted, remove the main rotor blade and contact Product Support Engineering with damage details to determine course of action..

1. Inspect retention bushing for corrosion, pitting, elongation, and size.

2. Main retention bushing must be replaced if inside diameter exceeds 1.524 inches (38.71 mm).

3. Any corrosion or pitting of retention bushing in excess of replacement dimension, after polishing, is cause for replacement. Local polishing, in excess of replacement dimension, is acceptable.

4. Immediately after retention bushing cleanup apply a coat of corrosion preventive compound (C-104) to inside surface.

5. Replacement of retention bushing may only be accomplished by a repair station having the capability to master sweep and balance blades.

6. Nicks and scratches in the skins, in excess of 0.008 inch (0.20 mm) deep, must be patched if it falls within the area and limits (BHT-206A/B-SERIES-CR&O).

7. In the outboard 3.00 feet (914.40 mm) of the blade, any dent in the skin that does not tear the skin, produce a void beyond allowable limits, or affect flight characteristics is acceptable.

8. Dents in the skin inboard of a station 3.00 feet (914.40 mm) from the tip of the blade, that are not in excess of 0.060 inch (1.52 mm) deep, are acceptable. Dents in excess of this value must be polished smooth and patched (BHT-206A/B-SERIES-CR&O).

NOTE

Polish out all acceptable nicks and scratches using No. 180 grit or finer grit sandpaper. Polish to a surface finish of 63 RMS (1.6 Nm) or better. Remove only enough material to remove the nick or scratch.

9. If a nick or scratch exists in a sharp dent in the skin, the total depth of both must not exceed 0.060 inch (1.52 mm). If the nick or scratch cannot be polished out, it must be cut out and patched (BHT-206A/B-SERIES-CR&O).

10. Nicks or scratches in the doublers or grip plates that are not greater than 0.012 inch (0.30 mm) in depth are acceptable if they are polished out.

11. Inspect for voids.

NOTE

A void shall be defined as an unbonded area that is supposed to be bonded. Many sub-definitions of voids are often given, such as lack of adhesive, gas pocket, misfit, etc. These instructions shall make no distinction among these, but shall group them in the one general term “Void”. All dimensions are in inches and metrics.

All acceptable voids in this paragraph must be sealed with the following:

Adhesive (C-322) or epoxy

Adhesive (C-317) or epoxy.

a. Voids at the Butt End of the Blade.

(1) A void between the trailing edge extrusion and skin not deeper than 1.0 inch (25.40 mm) nor wider than 0.25 inch (6.35 mm) is acceptable.

(2) A void between the skin and trailing edge closure not deeper than 0.15 inch (3.81 mm) and wider than 1.0 inch (25.40 mm) is acceptable.

b. Voids in the Retention Area Inboard of Station 60.

(1) Edge voids 0.06 inch (1.52 mm) maximum depth, of any one bondline, shall not exceed 10 percent in total length of the bondline. Single edge voids, of 0.06 inch (1.52 mm) maximum depth and 2.0 inches (50.80 mm) maximum length, are acceptable on doublers and grip plates. Edge voids are not acceptable in the outboard 5.0 inches (127.00 mm) of each finger of the doublers and the outboard 3.0 inches (76.20 mm) of the grip plates unless repaired in accordance with BHT-206A/B-SERIES-CR&O manual.

(2) Voids between the skin and core not wider chordwise than 0.75 inch (19.05 mm) and not longer spanwise than 3.0 inches (76.20 mm) are permissible. The total area of all voids shall not exceed 5.0 square inches (3226 mm^2).

(3) Edge voids between the edge of the skin and the trailing edge extrusion or spar that are less than 0.06 inch (1.52 mm) wide by any length, or less than 0.12 inches (3.05 mm) wide by 7.0 inches (177.80 mm) long are acceptable.

(4) Voids running into the main retention bolt hole, in any bondline, are not acceptable.

(5) Other voids between the skin and the trailing edge extrusion or spar which do not exceed 0.18 inch (4.57 mm) in width by 10.0 inches (254.00 mm) long, are acceptable.

c. Voids Under the Skin Outboard of Station 60.

(1) Voids between the skin and the trailing edge extrusion shall not exceed 1/3 the width of the mating surfaces.

(2) Voids between the skin and the core shall not exceed 1.0 inch (25.40 mm) in width (chordwise) by 25.0 inches (635.00 mm) long. Voids within 1.0 inch (25.40 mm) of each other are to be considered one void.

(3) Voids between the skin and the spar not wider than 0.25 inch (6.35 mm) are acceptable. Voids not larger than 0.38 inch (9.65 mm) by 2.0 inches (50.80 mm) are acceptable, provided spacing between void centers exceeds 6.0 inches (152.40 mm). Edge voids are acceptable up to 0.08 inch (2.03 mm) deep.

(4) Edge voids between the edge of the skin and the trailing edge extrusion, that are less than 0.08 inch (2.03 mm) wide by any length or less than 0.18 inch (4.57 mm) wide by 10.0 inches (254.00 mm) long, are acceptable.

12. Inspect for leading edge corrosion and erosion.

a. Measure the chord line dimension of the blade, adjacent to the area of corrosion that will be cleaned up, using a micrometer caliper or equivalent (figure 62-7, Area A.) This measurement minus the maximum of 0.125 inch (3.17 mm) cleanup at the leading edge will determine that the remaining leading edge thickness is within limits.

Example

Measured dimension A	13.009 inches (330.43 mm)
Maximum cleanup allowed	0.125 inches (3.18 mm)
Minimum dimension a measurement allowed to the deepest part of the cleanup area	12.884 inches (327.25 mm)

NOTE

Two squares clamped opposing each other and wire or feeler gages can be used to obtain dimension A accurately.

b. An alternate measurement can be made by removing tip cap and measuring thickness from the aft side of spar to the leading edge. If chordwise measurement is 0.625 inch (15.87 mm) or less, replace blade.

c. If dimensions calculated in substeps a. or b. are within limits, repair blade leading edge as follows:

NOTE

All sanding must be accomplished in spanwise direction only.

(1) Sand leading edge spanwise with 180 grit or finer abrasive cloth or paper with a final cleaning using aluminum wool (C-422). Sanding shall be accomplished by hand only and to a depth to remove corrosion/erosion. Blend edges of the sanded areas into adjacent areas to maintain blade airworthiness, (figure 62-7, Area B and C).

NOTE

Do not sand the skin to the spar butt joint. A minimum leading edge thickness of 0.625 inch (15.87 mm) must be maintained after corrosion cleanup (figure 62-7, Area B).

(2) Remove sanding residue with aromatic naphtha (C-388).

NOTE

Do not allow alcoholic phosphoric cleaner (C-344) to touch the painted surfaces. It is advisable to wear rubber gloves when using alcoholic phosphoric cleaner (C-344).

(2) On all surfaces where corrosion has been polished out, apply alcoholic phosphoric cleaner (C-344) using a clean cloth or brush. Rub solution briskly into surface for approximately 40 to 60 seconds.

d. Refinish repaired areas in accordance with paragraph 62-15.

62-16. TOUCHUP REFINISHING.

1. Remove tip cap assembly and plug the holes in end of spar to keep out paint.

2. Clean and treat main rotor blades in accordance with paragraph 62-13.

3. Polish out surface corrosion with clean cloth or brush and alcoholic phosphoric cleaner (C-344). Rub solution briskly into surface for approximately 40 to 60 seconds.

4. Rinse the blade thoroughly with clean running water and wipe dry with clean cloths.

NOTE

For completion of step 4. through final paint application, surfaces of blades are not to be handled with bare hands.

5. On all bare metal surfaces including surfaces covered in step 3. apply or spray (using brush solution) application of chemical film treatment. If not available, use an application of 10 percent solution of chromic acid (C-103). Refer to BHT-ALL-SPM for mixing instructions. After one minute, wipe with a damp cloth and dry with a clean cloth.

NOTE

If materials referenced in steps 3. and 5. are not immediately available, the bare aluminum may be coated with zinc chromate primer (C-201). This is temporary protection only. Do not refinish the area in accordance with steps 6. and 9. until steps 3. and 5. have been accomplished.

6. Thoroughly dry the cleaned surfaces. Apply one light coat 0.3 to 0.5 mils (0.008 to 0.013 mm) thick of epoxy polyamide primer (C-204) or equivalent. Allow to air dry from 45 minutes to 4 hours.

7. Apply adhesive (C-322) over reworked areas only. Apply three coats over trim tab and doublers, one coat over butt joint of skin to spar where applicable, and skin to abrasive strip or butt joint of skin to trailing edge strip. Allow adhesive to air dry 45 to 60 minutes between coats.

WARNING

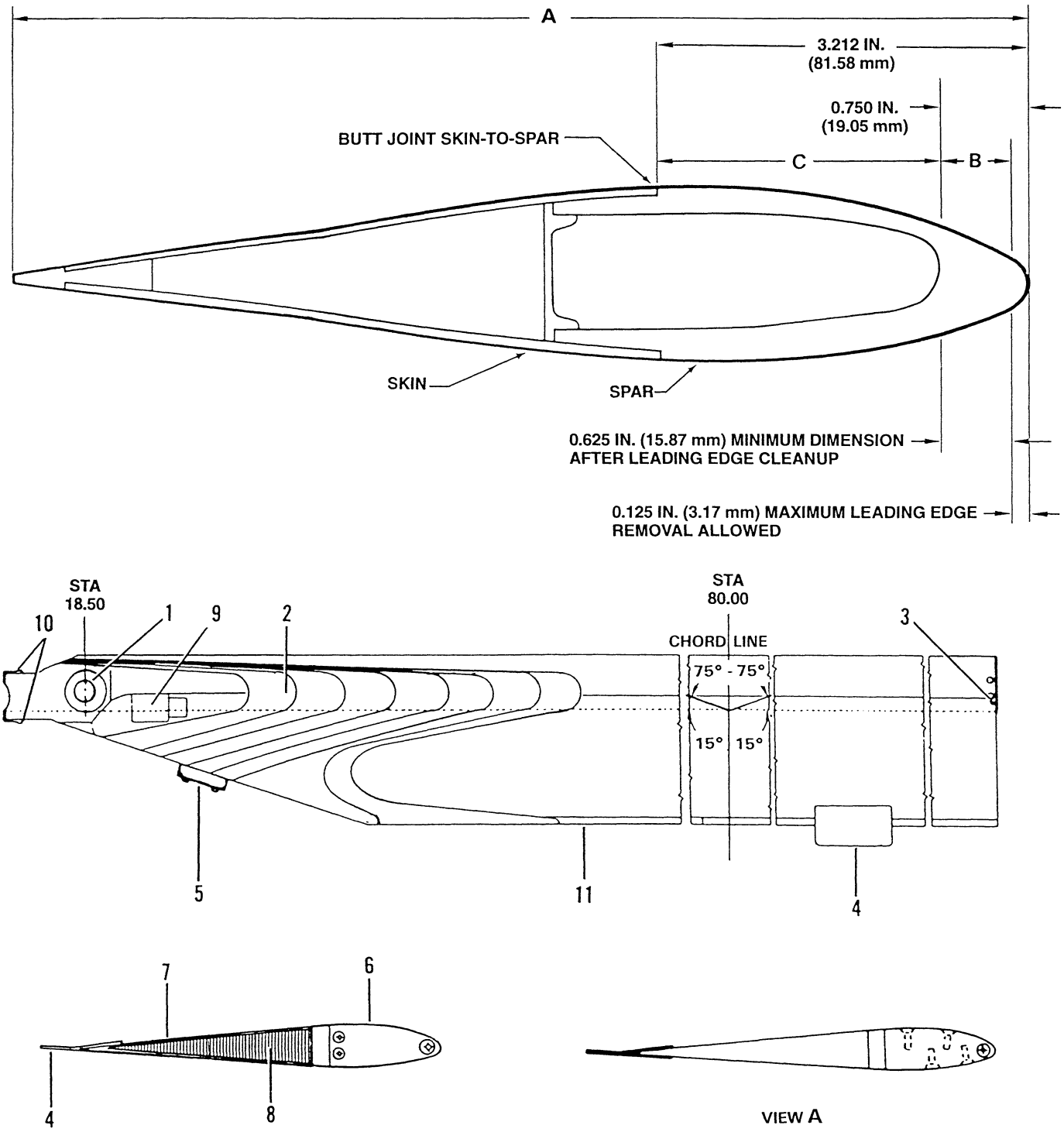
METHYL-ETHYL-KEYTONE (MEK) (C-309) IS TOXIC AND FLAMMABLE. USE ONLY IN WELL VENTILATED AREA. DO NOT USE NEAR OPEN FLAME.

NOTE

Mix adhesive (C-322) per manufacturers instructions. Then mix 13 percent to 15 percent (by weight) of epoxy polyamide primer (C-204) into the adhesive and mix thoroughly. Thin to a sprayable consistency by adding MEK (C-309) not to exceed 50 percent by volume of mixed adhesive (approximately 35 percent by volume will produce a sprayable consistency). Pot life of thinned adhesive (C-322) is approximately 3 hours. After application of final coat of adhesive, allow blade to air-dry at 70 to 80°F (21 to 27°C) for 16 to 24 hours (BHT-ALL-SPM).

8. Apply a light mist coat of epoxy polyamide primer (C-204). Allow to air-dry 1 hour to 8 hours maximum.

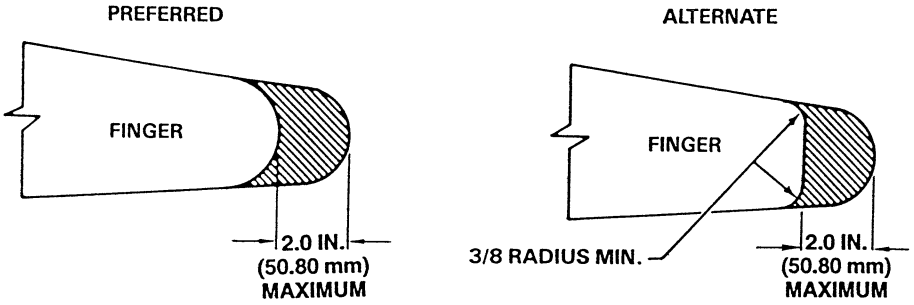
9. Apply first coat of polyurethane topcoat (C-218) to touchup areas on surface of blade. Spray only repaired areas. Allow 1 hour minimum drying time, then apply a second coat. Allow 1 hour minimum drying time before applying any other paint over second coat (BHT-ALL-SPM).



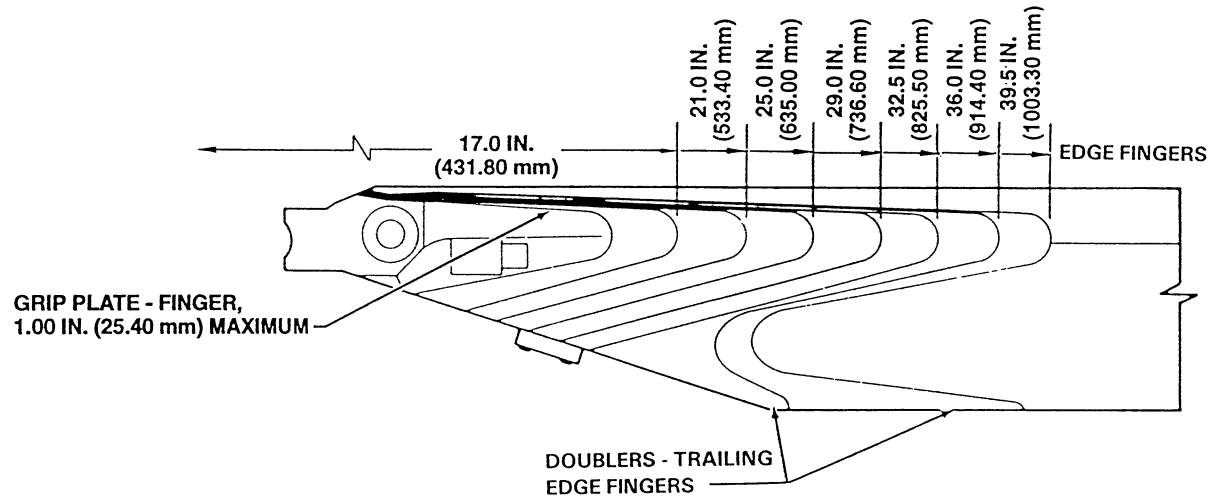
1. Grip pad
2. Doublers
3. Spanwise alignment reference point
4. Trim tab
5. Balance weight
6. Spar
7. Skin
8. Core
9. Identification plate
10. Wear pad

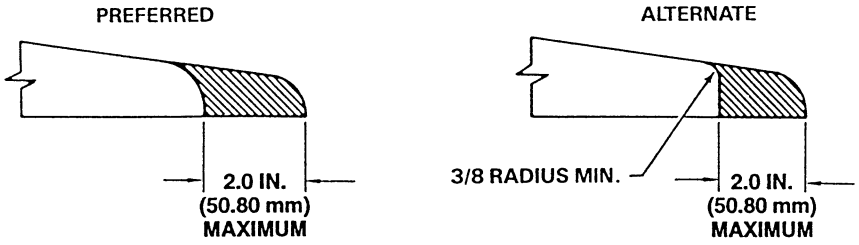
206A/BS-M-62-7-1

Figure 62-7. Main rotor blades — inspection and repair (Sheet 1 of 3)



DOUBLER MEASUREMENT IN INCHES (MM) FROM
CENTERLINE OF BLADE RETAINER BOLT HOLE-LEADING



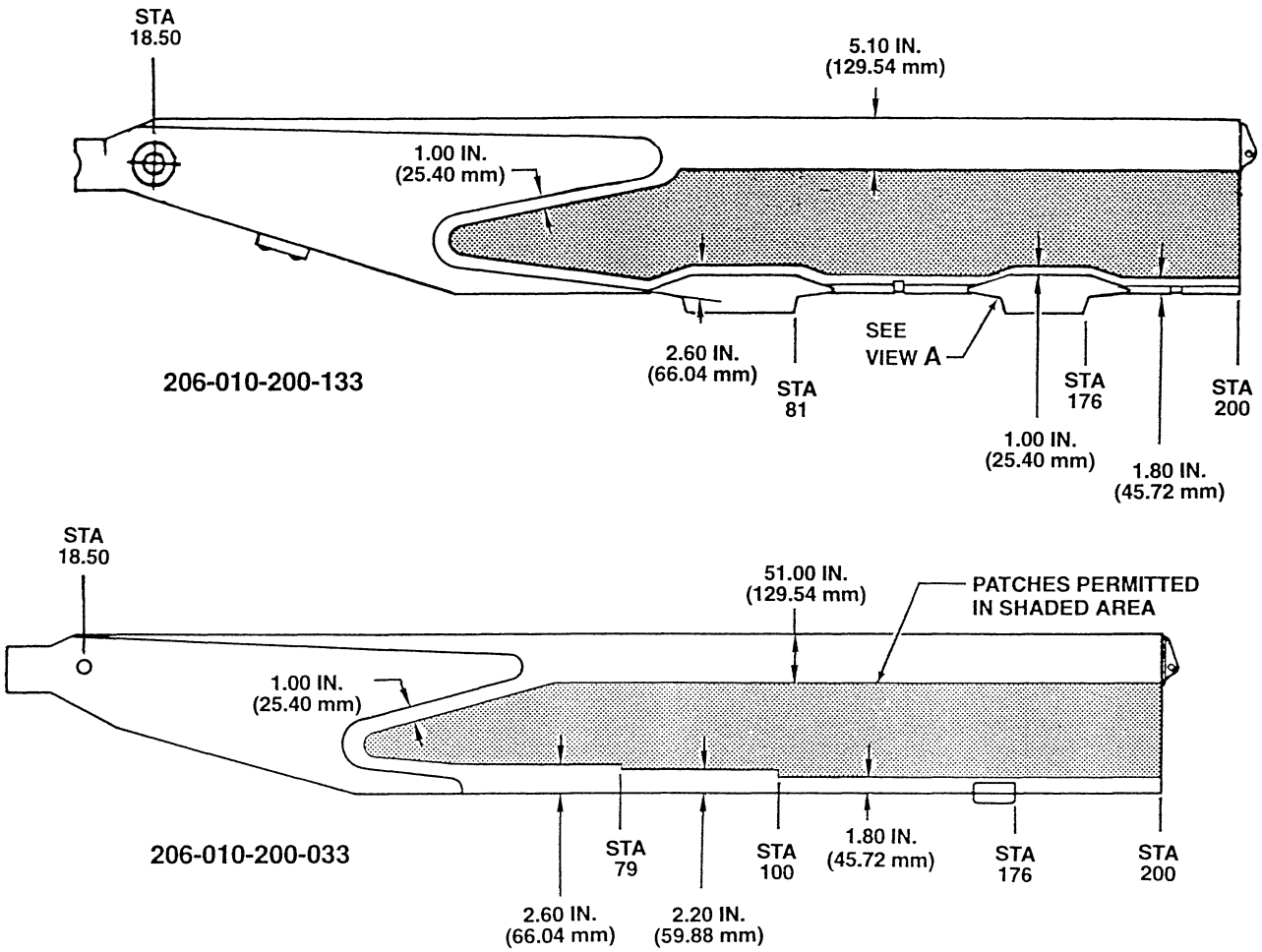


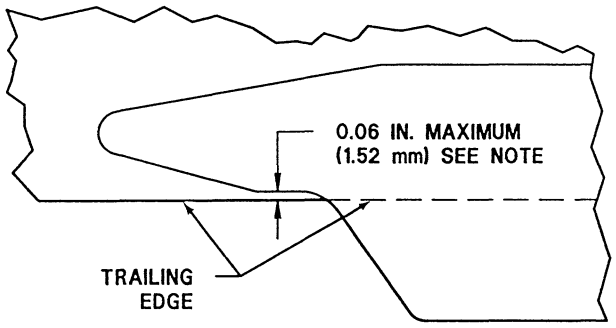
CAUTION

DO NOT TRIM LEADING OR TRAILING EDGE DOUBLER FINGERS PAST 2.0 INCH (50.80 MM) MAXIMUM OF ORIGINAL DOUBLER LENGTH. MEASURE ORIGINAL LENGTH FROM CENTERLINE OF BLADE RETAINING BOLT HOLE.

206A/BS-M-62-7-2

Figure 62-7. Main rotor blades — inspection and repair (Sheet 2)





VIEW A

NOTE

Rear edge of trim tab tang flush with or 0.06 inches forward of blade trailing edge.

206A/BS-M-62-7-3

Figure 62-7. Main rotor blades — inspection and repair (Sheet 3)

WARNING

ALIPHATIC NAPHTHA IS TOXIC. KEEP AWAY FROM FLAME AND SPARKS. AVOID BREATHING VAPORS AND USE IN A WELL VENTILATED AREA. AVOID REPEATED CONTACT WITH SKIN.

62-17. EROSION PROTECTION TAPE.

NOTE

Use of polyurethane tape (C-419) is optional. It is recommended for protecting the blade leading edge against sand and dust erosion. It also gives partial protection against rain. The tape may be removed and replaced with new tape as often as necessary. If tape ends peel or appear loose, remove tape before next flight.

1. New blades with final paint finish fully cured shall be wiped with clean cloth or rag dampened with aliphatic naphtha (C-305) and wiped dry prior to full evaporation of naphtha.

2. Blades that have been in service shall have all contamination cleaned off leading edge using abrasive pads (C-407) followed by wiping with a clean cloth dampened with aliphatic naphtha (C-305). Wipe dry with clean cloths.

3. Blades that are having the tape replaced are to be treated the same as blades that have been in service. Tape may be removed and replaced as often as necessary.

4. Cut a strip of polyurethane tape (C-419) 6.0 inches (152.40 mm) wide by 96 inches (2438.40 mm) long. The tape must be the same size (within reasonable limits) for each blade of a set to prevent, an out-of-balance condition.

5. Tape shall be applied to blade by a minimum of two people. Place one end of tape flush with tip of blade so that equal coverage will be applied to bottom and top surfaces. Using a plastic spatula or similar tool, firmly affix tape to extreme leading edge of blade for full length of tape.

6. Using spatula or similar tool, affix tape firmly to each side of leading edge. In the event an air bubble is entrapped raise that area of tape, releasing air, and reaffix tape firmly. Properly applied, tape should show no evidence of bubbles.

7. Inspect tape daily for proper adhesion and tape condition. Replacement is to be based on daily inspection findings.

62-18. TRUNNION BEARING REPLACEMENT.

1. Remove each trunnion bearing (3, figure 62-8) as follows:

a. Remove nut (5), washer (4), and bolt (1) with washer (2) from pitch horn.

b. Refer to figure 62-9 for fabrication and use of pitch horn trunnion workaid.

c. Use a pitch horn trunnion workaid (figure 62-9 to spread pitch horn by turning workaid bolthead enough to release and pull trunnion bearing (3, figure 62-8). Remove workaid.

d. Inspect inboard surface of lugs for pitch horn trunnions (3) for deformation. Lug inboard surface shall be parallel to pitch horn (6) and to grip (7) mating surface. Deformation greater than 0.0025 inches (0.064 mm) requires replacement of pitch horn.

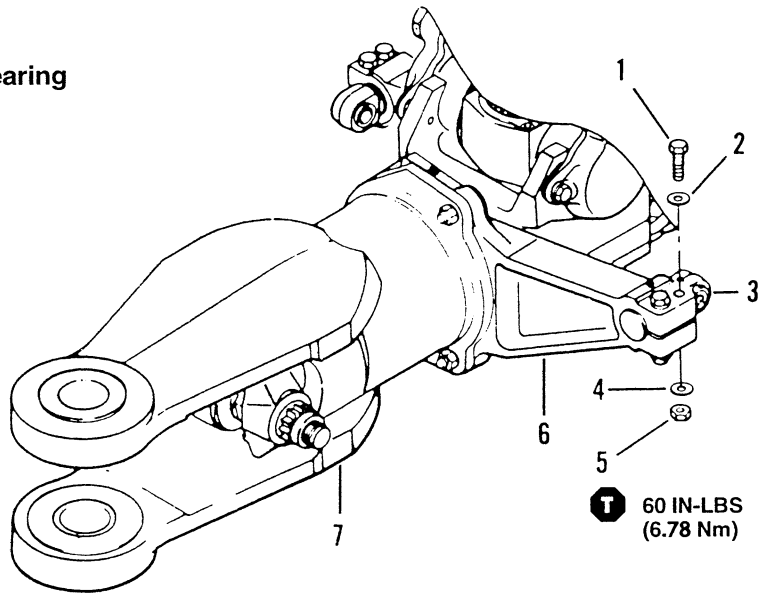
2. Install each trunnion bearing (3) as follows:

a. Use a pitch horn trunnion workaid tool to spread pitch horn. Insert trunnion bearing (3), rotating to align slot of trunnion bearing with bolt hole in pitch horn.

b. Install bolt (1) with washers (2 and 4), and nut (5) (T). Ensure one washer is installed under bolthead and one under nut.

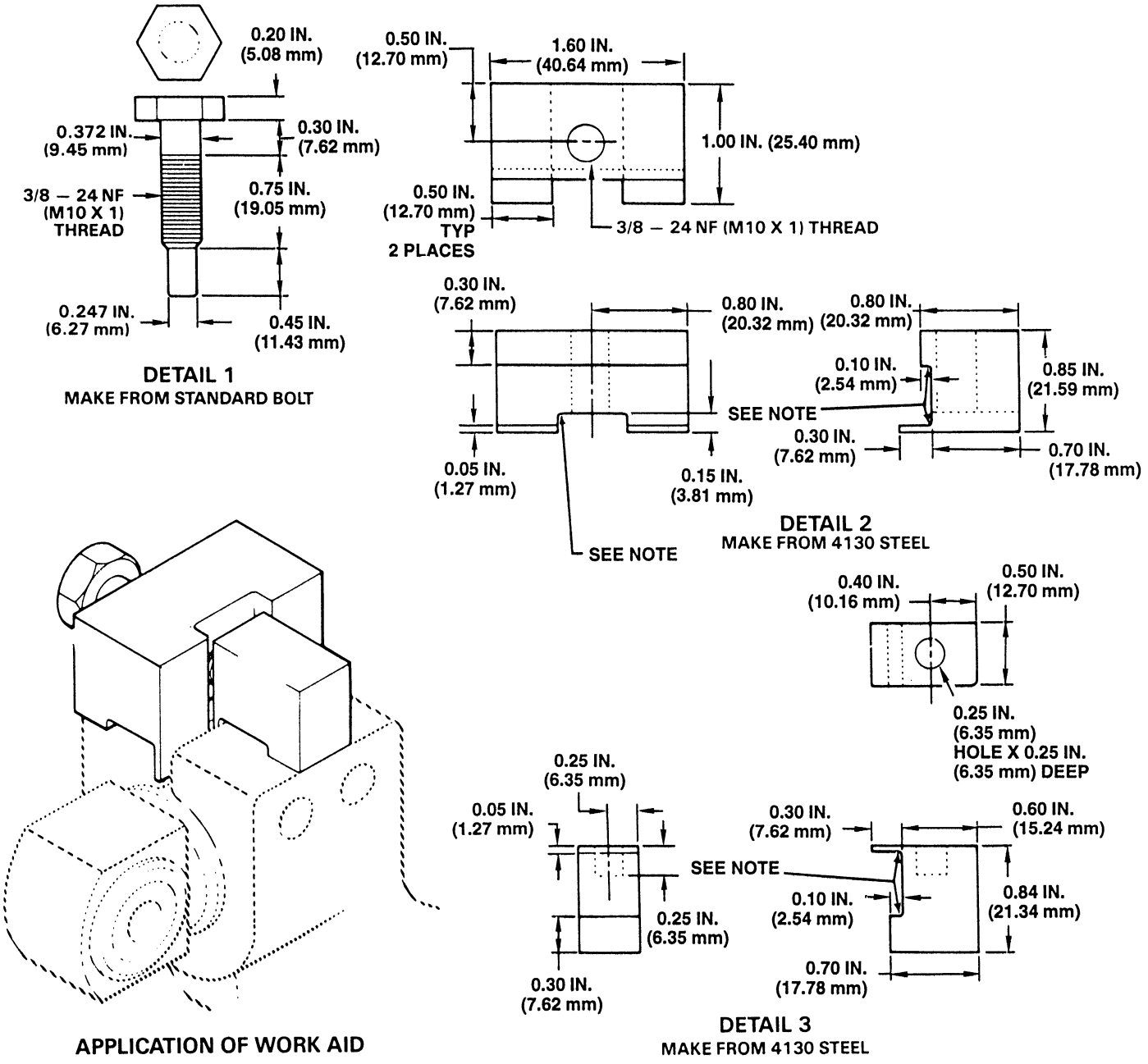
3. Purge lubricate trunnion bearing (3) at two grease fittings with grease (C-001). Inject grease slowly to avoid blowing cover seal.

1. Bolt
2. Washer
3. Trunnion bearing
4. Washer
5. Nut
6. Pitch horn
7. Grip



206A/BS-M-62-8

Figure 62-8. Trunnion bearing



USE: To allow removal of pitch horn trunnion with less possibility of damage to pitch horn

NOTE

Fillet radius 0.03 inch (0.76 mm)

206A/BS-M-62-9

Figure 62-9. Fabrication of pitch horn trunnion workaid

PITCH LINK

62-19. PITCH-LINK.

The pitch link connects the pitch horn on the blade grip to swashplate outer ring, for control input from collective and cyclic controls. A pitch link is required for each main rotor blade.

62-20. REMOVAL.

Index pitch link assemblies (19, figure 62-1) for reinstallation in same position. Disconnect and remove pitch link assemblies by removing cotter pins (12 and 23), nuts (13 and 22), thin steel washers (11 and 21), and bolts (10 and 20).

62-21. INSPECTION.

1. Inspect pitch link (19, figure 62-1) for surface damage. Replace pitch link if damage exceeds reparable limits (BHT-206A/B-SERIES-CR&O).

2. After flight in rain and each time the pitch link assemblies are adjusted, inspect tube assemblies for corrosion. Apply corrosion preventive compound (C-104) to the following areas (figure 62-10, 62-12 and 62-14).

a. The threads of the upper and lower clevises (1 and 7, figure 62-10 and 1 and 8, figure 62-11).

b. The ends of the tubes (3, figure 62-10; 2, figure 62-12; 4, figure 62-14).

c. The mating faces of the locks (4 and 5, figure 62-10 and 5 and 6, figure 62-11 and nuts (2 and 6, figure 62-10 and 2 and 7, figure 62-11).

d. The top surfaces of the nuts (2 and 6, figure 62-10, and 2 and 7, figure 62-11) after they are properly torqued.

62-22. INSTALLATION.

WARNING

WHEN ADJUSTING LENGTH OF PITCH LINKS, OBSERVE MINIMUM THREAD ENGAGEMENT FOR CLEVISES. LESS THAN MINIMUM THREAD ENGAGEMENT FOR CLEVISES MAY CAUSE PITCH LINKS TO FAIL DURING FLIGHT.

1. Adjust length of main rotor pitch links from swashplate to pitch horn. Refer to Chapter 18.

NOTE

Observe index references on swashplate, pitch links, and main rotor hub assembly.

2. Install pitch link (19, figure 62-1) with adjustment locking nut or barrel at bottom. Apply soft film corrosion preventive compound (C-104) to shank of bolt (20). Install bolt (20), one thin steel washer (11) under bolthead, and one thin steel washer (21) under nut (22) (T). A maximum of two thin steel washers (21) are allowed under nut (22) for alignment of cotter pin. Install cotter pin (23). Apply hard film corrosion preventive compound (C-101) to bolthead and nut.

3. Apply soft film corrosion preventive compound (C-104) to shank of bolt (10). Install bolt (10), one thin steel washer (11) under bolthead, and one thin steel washer (21) under nut (13) (T). A maximum of two thin steel washers (21) are allowed under nut (13) for alignment of cotter pin. Install pin (12). Apply hard film corrosion preventive compound (C-101) to bolthead and nut.

62-23. ADJUSTMENT OF PITCH ANGLE — MAIN ROTOR HUB AND BLADES.

SPECIAL TOOLS REQUIRED

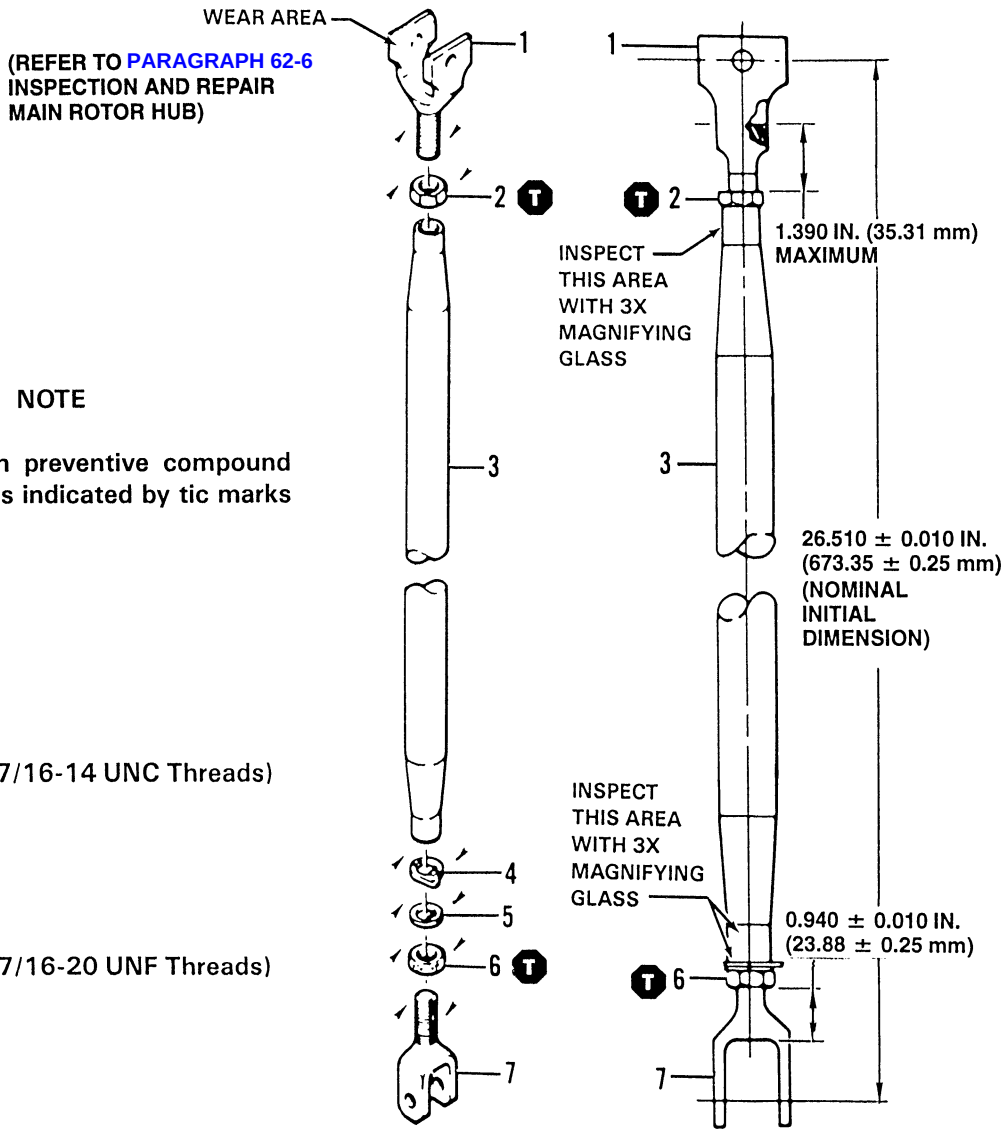
NUMBER	NOMENCLATURE
GS18217	Propeller Protractor

1. Adjust minimum pitch angle of main rotor blades to minus 3/4 degree as follows:

a. Ensure that collective rigging is correct (Chapter 67).

b. Position collective control stick in full down position and secure with collective friction.

c. Pull one blade down until hub static stop contacts mast.



NOTE

Apply corrosion preventive compound (C-104) to areas indicated by tic marks (!).

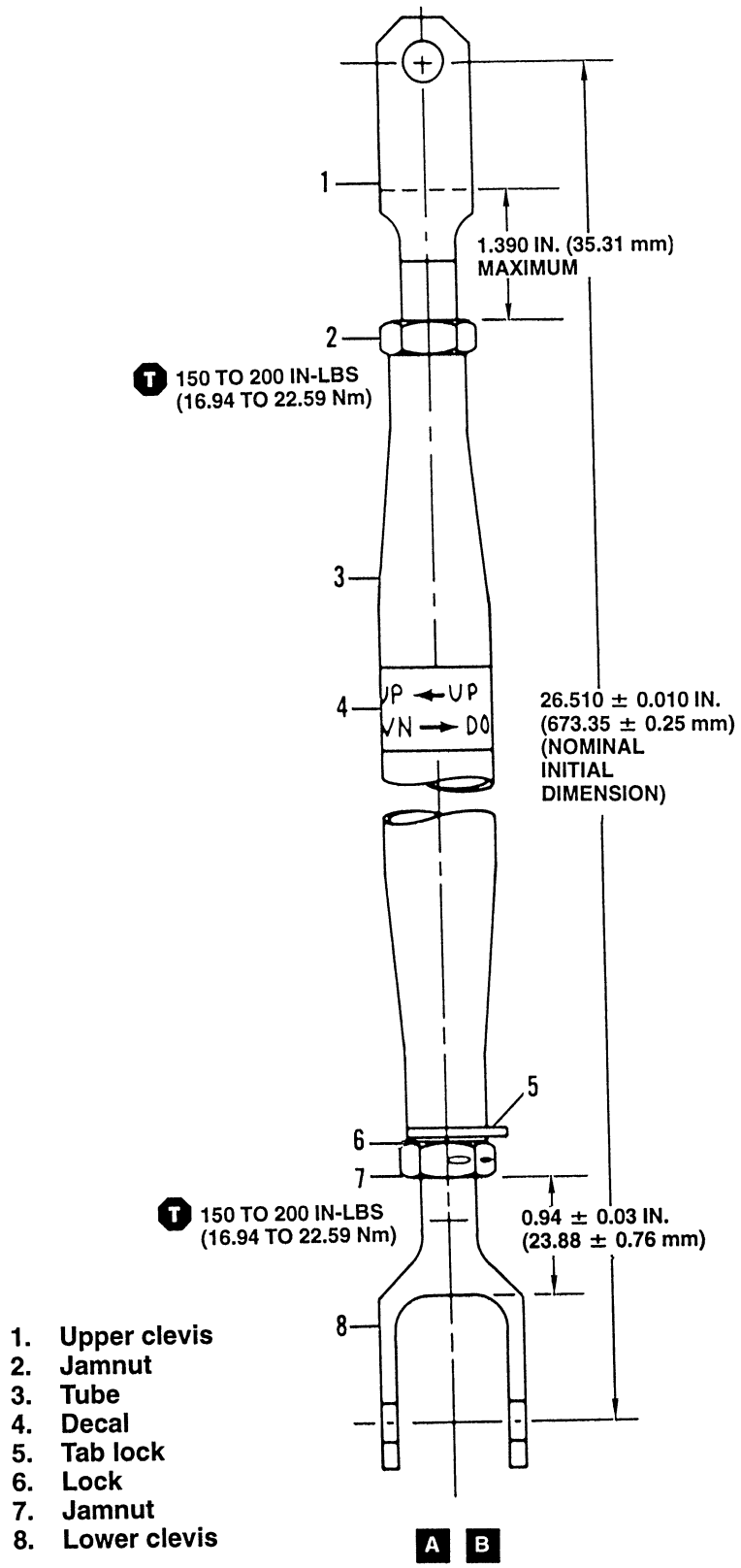
1. Upper clevis (7/16-14 UNC Threads)
2. Jamnut
3. Tube
4. Tab lock
5. Lock
6. Jamnut
7. Lower clevis (7/16-20 UNF Threads)

T 150 TO 200 IN-LBS (16.95 TO 22.60 Nm).

A B

206A/BS-M-62-10

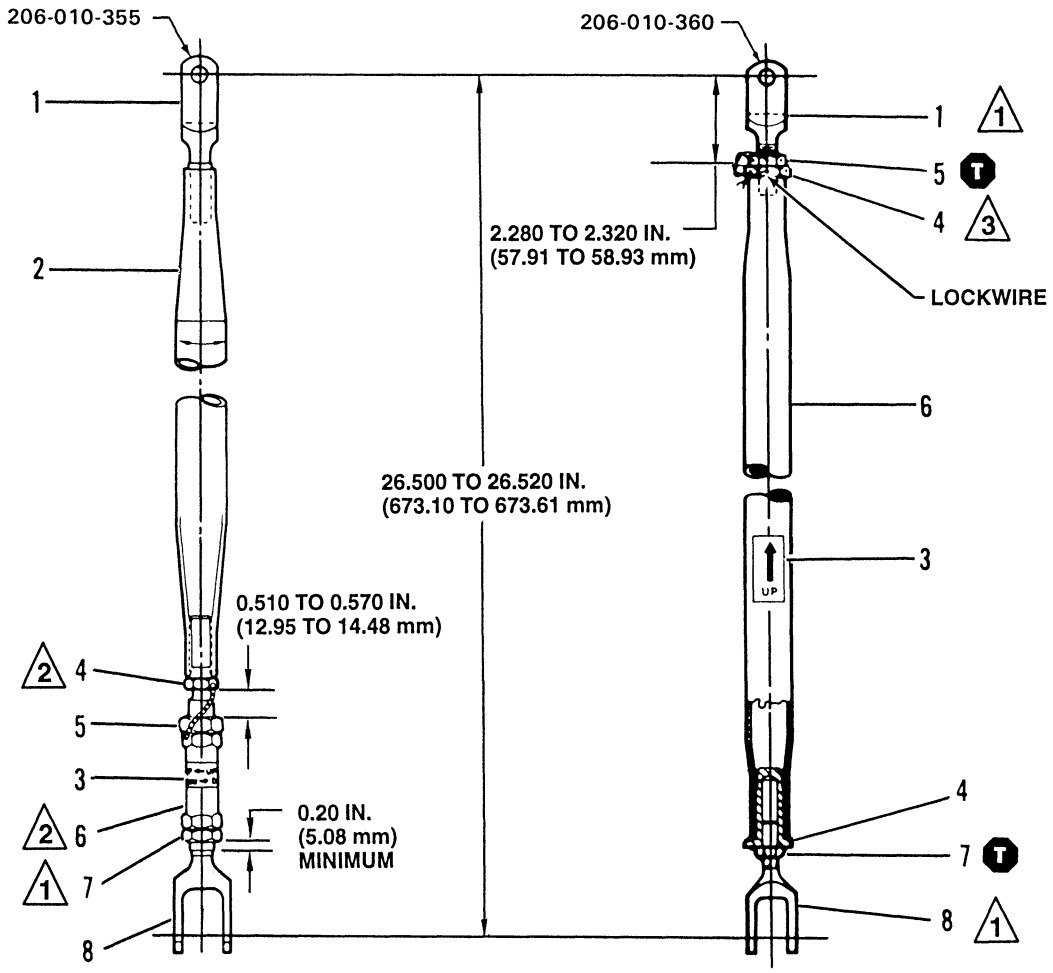
Figure 62-10. 206-010-330 Pitch link assembly



1. Upper clevis
2. Jamnut
3. Tube
4. Decal
5. Tab lock
6. Lock
7. Jamnut
8. Lower clevis

206A/BS-M-62-11

Figure 62-11. 206-010-342 Pitch link assembly



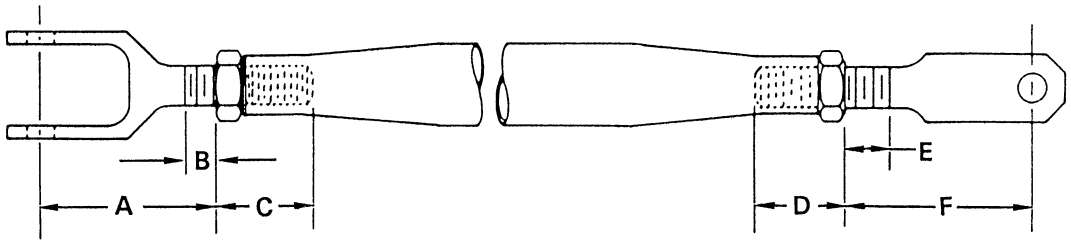
1. Clevis
2. Tube
3. Decal
4. Insert
5. Jamnut
6. Barrel
7. Jamnut
8. Clevis

NOTES

1. Apply corrosion preventive compound (C-101) to all threads at assembly
2. Secure barrel (6) to insert (4) with lockwire.
3. Secure jamnut (5) to insert (4) with lockwire.
T. 150 TO 200 IN-LBS (16.95 TO 22.60 Nm)

206A/BS-M-62-12

Figure 62-12. 206-010-355 and 206-010-360 Pitch link assembly



NOTES

1. Use any dimension that is most convenient to determine minimum clevis thread engagement.

2. Maximum threads shown in B and E are perfect threads. Some clevises have two imperfect threads.

PITCH LINK PART NUMBER	A MAX INCHES	B MAXIMUM INCH	B MAXIMUM THREAD	C MIN INCH	D MIN INCH	E MAXIMUM INCH	E MAXIMUM THREAD	F MAX INCHES
206-010-330-005	2.106	0.511	10	0.769	0.760	0.520	7	2.300
206-010-330-009	2.656	1.011	20	0.769	0.760	1.020	14	2.800
206-010-330-011	2.656	1.011	20	0.769	0.760	1.020	14	2.800
206-010-342-003	2.483	0.858	17	0.892	0.760	1.100	14	2.800
206-010-360-001	2.240	0.460	6	0.760	0.769	1.011	20	2.791
206-010-360-003	2.240	0.460	6	0.760	0.769	0.451	9	2.231

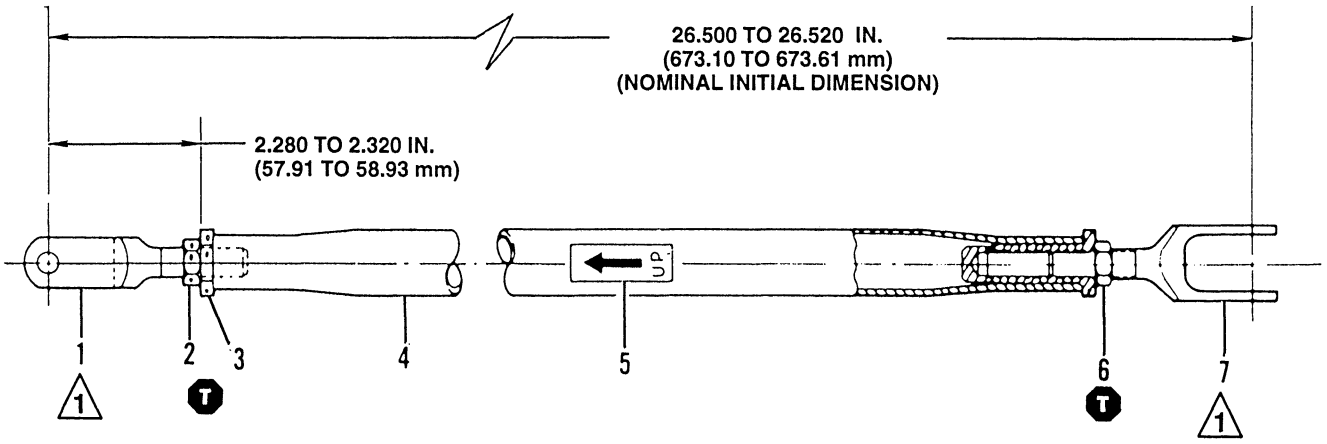
CLEVIS THREAD ENGAGEMENT

PITCH LINK PART NUMBER	A-MAX METRIC	B-MAX METRIC	B-MAX THREAD	C-MIN METRIC	D-MIN METRIC	E-MAX METRIC	E-MAX THREAD	F-MAX METRIC
206-010-360-005	53.49 mm	12.98 mm	10	19.53 mm	19.30 mm	13.21 mm	7	58.42 mm
206-010-330-009	67.46 mm	25.68 mm	20	19.53 mm	19.30 mm	25.91mm	14	71.12 mm
206-010-330-011	67.46 mm	25.68 mm	20	19.53 mm	19.30 mm	25.91 mm	14	71.12 mm
206-010-342-003	63.07 mm	21.79 mm	17	22.66 mm	19.30 mm	27.94 mm	14	71.12 mm
206-010-360-001	56.90 mm	11.68 mm	6	19.30 mm	19.53 mm	25.68 mm	20	70.89 mm
206-010-360-003	56.90 mm	11.68 mm	6	19.30 mm	19.53 mm	11.46 mm	9	56.67 mm

CLEVIS THREAD ENGAGEMENT

206A/BS-M-62-13

Figure 62-13. Pitch link assembly (typical)



1. Clevis
2. Jamnut
3. Insert
4. Tube
5. Decal
6. Jamnut
7. Clevis

CAUTION

ENSURE THAT DECAL (5) IS POINTING UP

NOTES

1 Apply corrosion preventive compound (C-104) to all threads at each assembly.

T 150 TO 200 IN-LBS (16.95 TO 22.60 Nm)

206A/BS-M-62-14

Figure 62-14. 206-010-360 Pitch link assembly

d. Using a GS18217propeller protractor measure pitch angle of one blade on flat surface of grip, adjacent to blade bolt.

e. While maintaining hub position (refer to step c), move protractor to opposite grip and measure pitch angle.

f. Add both pitch angles algebraically, and divide the total by two.

g. Adjust both pitch links equally, and in the same direction, until negative 3/4 degree pitch is obtained.

2. Apply corrosion preventive compound (C-101) to all threaded surfaces of pitch link assembly.

3. A B Lockwire jamnuts on 206-010-330 (figure 62-10) and 206-010-342 (figure 62-11) pitch link assemblies. If blades are not to be tracked immediately, secure with lockwire.

4. On 206-010-355 pitch link assemblies, secure barrel (6, figure 62-12) to insert (4) with lockwire. On 206-010-360 pitch link, secure upper jamnut (5) to insert (4) with lockwire.

5. Track main rotor blades. Refer to Chapter 18.

SWASHPLATE AND SUPPORT

62-24. SWASHPLATE AND SUPPORT.

The swashplate and support encircles the mast directly above the transmission and is mounted on a universal support (pivot sleeve) which permits it to be tilted in any direction. Movement of the cyclic control stick results in a corresponding tilt of the swashplate and the main rotor. Movement of the collective pitch lever actuates the sleeve assembly which raises or lowers the swashplate and transmits collective control to the main rotor. The cyclic controls are mixed with the collective control by action of the mixing lever at the base of the control column (figure 62-15).

62-25. REMOVAL.

1. Remove main rotor hub and blades (paragraph 62-3).

2. Disconnect two cyclic control tubes (27 and 30, figure 62-15) that attach to horns of inner ring (26).

3. Disconnect collective control tube (29), that attaches to collective lever (28).

4. Remove cotter pin (10), nut (36), washers (11 and 12), and idler link (14) from stud on swashplate outer ring (35). Remove or secure washer (11) on stud for future use.

CAUTION

NEVER ATTEMPT TO REMOVE BOLT (2) BETWEEN IDLER LEVER (5) AND COLLAR SET (23) BEFORE LOOSENING NUTS (21), NOR USE FORCE FOR REMOVAL. SLIGHT TAPPING WITH PLASTIC OR RAWHIDE MALLET PERMITTED.

5. Loosen nuts (21). Remove cotter pin (8), nuts (9), washers (3), spacers (4), and bolts (2). Remove idler lever (5) and idler link (14) from collar set (23).

6. Remove adhesive bead from around top surface of collar set (23) by peeling or scraping with edge of a non-metallic scraper.

7. Remove nuts (21), washers (19), bolts (20) and washers (19). Grasp collar set (23) halves and slide off of splines of mast (1) (slight tapping with plastic or rawhide mallet is permitted).

8. Remove adhesive residue from collar set (23) and mast (1). Brush off residue and clean boot (17).

9. Loosen clamp (18) for removal over splines of mast

10. Cut and remove lockwire (24) from boot (17). Work boot from around cap on outer ring and remove.

11. Remove nuts (34), washers (20 and 33), aluminum washer (31), and oil filler cap lanyard bracket from lower flange of support (32) and transmission top case studs.

12. Lift swashplate and support off mast (1). Exercise care while removing swashplate and support from mast to prevent damage to splines.

62-26. CLEANING.

WARNING

MEK (C-309) IS TOXIC AND FLAMMABLE. USE ONLY IN WELL VENTILATED AREA. DO NOT USE NEAR OPEN FLAME.

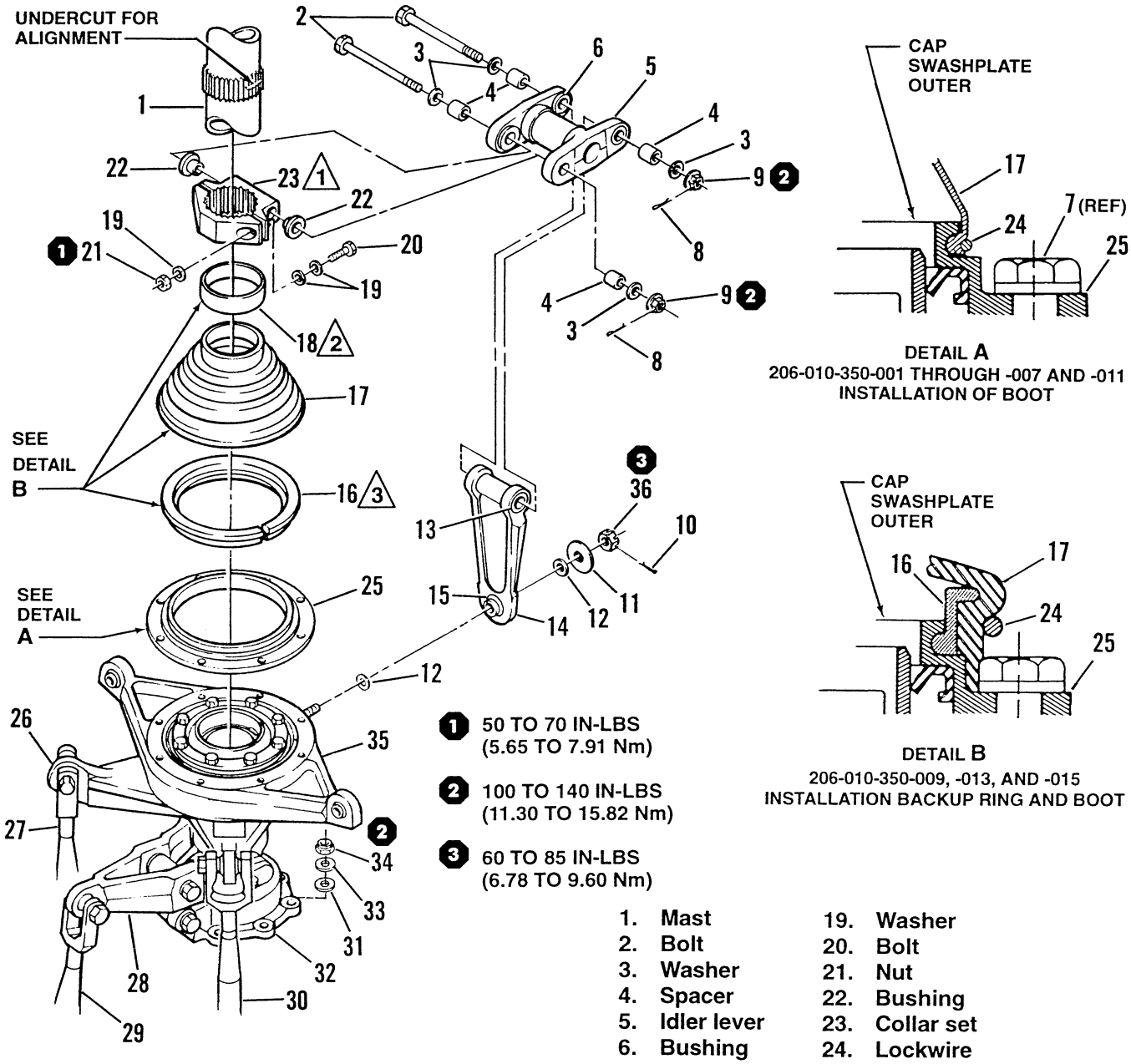
1. Clean swashplate and support assembly with solvent (C-304).

CAUTION

DO NOT ALLOW SOLVENT OR GREASE TO CONTACT TEFLON BEARINGS OF THE SWASHPLATE AND SUPPORT ASSEMBLY.

2. Clean teflon bearings and mating surfaces with a cloth dampened with MEK (C-309).

3. Clean main rotor mast and top surface of transmission assembly with solvent (C-304).



1. Mast
2. Bolt
3. Washer
4. Spacer
5. Idler lever
6. Bushing
7. Bolt
8. Cotter pin
9. Nut
10. Cotter pin
11. Washer
12. Washer
13. Bushing
14. Idler link
15. Bearing
16. Backup ring
17. Boot
18. Clamp
19. Washer
20. Bolt
21. Nut
22. Bushing
23. Collar set
24. Lockwire
25. Outer cap
26. Inner ring
27. Cyclic control tube
28. Collective lever
29. Collective control tube
30. Cyclic control tube
31. Aluminum washer
32. Support
33. Washer
34. Nut
35. Outer ring
36. Nut

206A/BS-M-62-15

NOTES

1. 206-010-333 collar set replaced by 206-011-005 collar set.

2. AN737-TW91 clamp effective 206-010-350-015 pylon installation and subsequent.

3. 206-010-351-001 backup ring effective 206-010-350-009, -013, and -015 pylon installation. Refer to detail B.

Figure 62-15. Swashplate, support, and drive assembly

62-27. INSPECTION AND REPAIR.

NOTE

Refer to BHT-206A/B-SERIES-CR&O manual for detail inspection and repair procedures.

1. Inspect swashplate and support assembly for evidence of excessive grease leakage from seals (21, figure 62-16). If seal leakage is excessive seals must be replaced.

2. Inspect swashplate and support assembly for worn duplex bearings (5). Rotate outer ring (17) while holding inner ring (15) stationary. The duplex bearings (5) must feel smooth, and no binding or dragging should be evident. If resistance to turning is not smooth and moderate throughout 360 degrees of rotation in both directions, bearings should be replaced.

3. Inspect swashplate and support assembly for vertical and tilting movement as follows:

a. Tilt inner ring (15) forward and inspect sidewalls of pivot sleeve (8) for abnormal wear. Inspect top outboard edges of pivot sleeve bearing assemblies (6) for evidence of physical damage and wear of teflon bearing material. Tilt inner ring aft and inspect side of pivot sleeve (views A and B).

b. Inspect slots in sleeve (8) for abnormal wear from bearing assemblies (6).

c. Inspect exposed surface of sleeve (8), while tilting inner ring (15), for damage to hard anodized or tungsten carbide surface. Any damage that penetrates the hard anodized or tungsten carbide surface will require replacement of pivot sleeve.

d. Inspect for excessive looseness between sleeve (8) and support assembly (10). Grasp sleeve (8) above attachment point for collective lever (13) and attempt to move laterally. If movement is 0.020 inch (0.51 mm) or greater, replacement of sleeve (8), bearings (9), or support assembly (10) will be required.

4. Inspect for looseness at the following points on the swashplate and support assembly.

a. Sleeve (8) to collective lever (13), and pin (14).

b. Idler link (11) to support assembly (10), and to collective lever (13).

c. Inspect stud on outer ring (17) for thread damage and looseness.

5. Inspect spherical bearing (12) in collective lever (13), and spherical bearings (16) in inner and outer rings (15 and 17) for axial play. If spherical bearings (12 and 16) exceed 0.010 inch (0.25 mm) axial or radial looseness, replace bearing (BHT-206A/B-SERIES-CR&O).

6. Inspect grease fittings for damage and security.

7. Check friction of swashplate and support assembly.

8. Inspect collar set, lever, idler link, and boot (paragraph 62-31) (BHT-206A/B-SERIES-CR&O).

62-28. INSTALLATION.

CAUTION

ENSURE LOCKWIRE ON MAST LOCKING PLATE SCREW IS PROPERLY POSITIONED TO PREVENT CONTACT WITH SWASHPLATE SUPPORT INNER SURFACE.

1. Purge lubricate swashplate and support duplex bearings (5) through grease fitting (22 and 23) in top cap. Make sure grease purges out through bottom seal, not through top seal. Using a clean, dry cloth, wipe surfaces clean of excess grease.

2. Clean cap and studs on top of transmission and mast with solvent (C-304), if not previously accomplished.

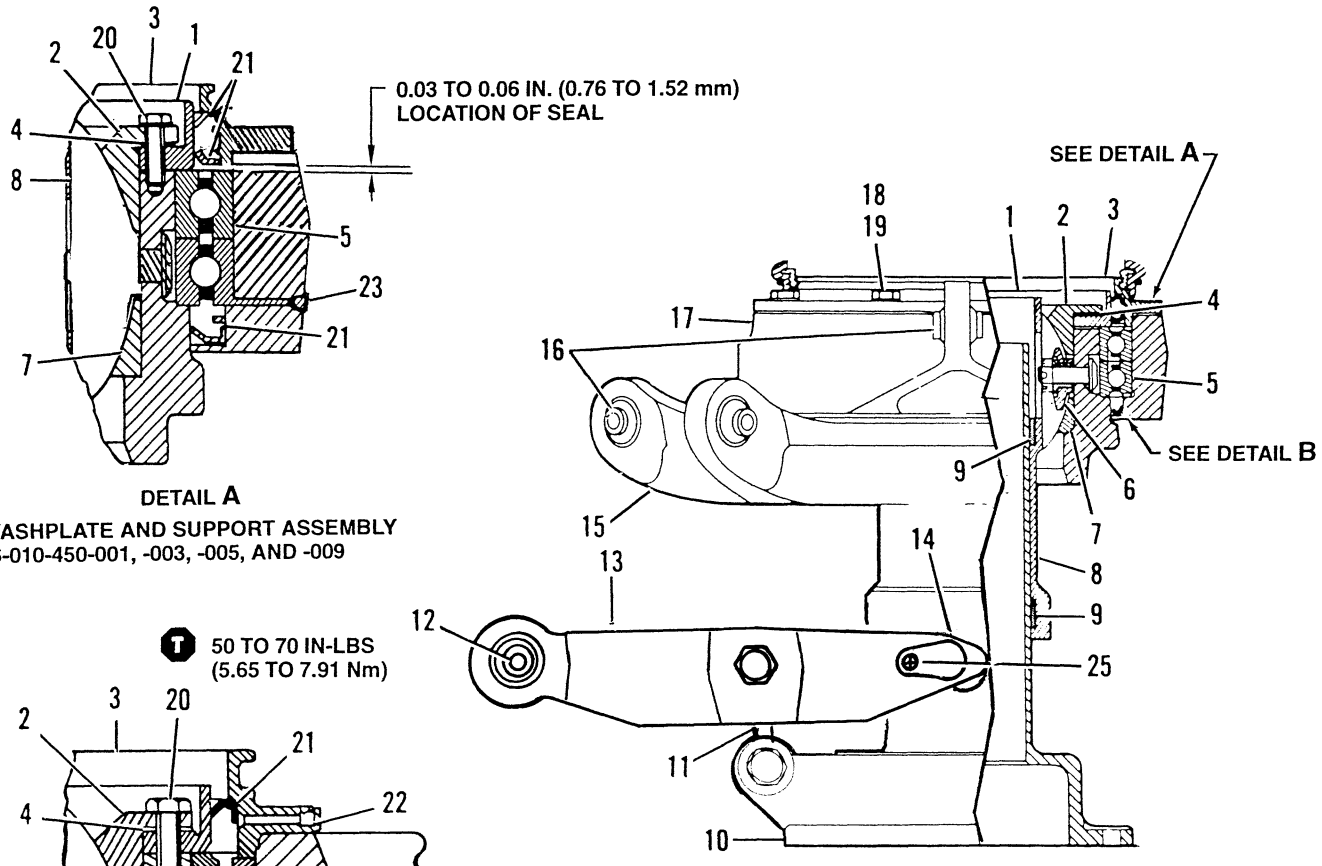
3. Lower swashplate and support assembly over mast (1, figure 62-15) and position on transmission with bearing end of collective lever (28) aligned forward.

4. Install oil filler cap lanyard bracket, steel washers (20), aluminimum washers (31), and nut (34) (T).

5. Install collar set (23), idler lever (5), idler link (14), boot (17) (paragraph 62-36).

6. Connect collective control tube (29), to collective lever (28) and secure with bolt, washer, nut, and cotter pin.

7. Connect two cyclic control tubes (30 and 27), to swashplate inner ring (26) and secure with bolts, washers, nuts, and cotter pins.



1. Inner cap
2. Bearing set
3. Outer cap
4. Shim
5. Duplex bearings
6. Bearing assembly
7. Bearing
8. Sleeve
9. Bearing
10. Support assembly
11. Idler link
12. Spherical bearing
13. Collective lever
14. Pin
15. Inner ring
16. Spherical bearing
17. Outer ring
18. Bolt
19. Washer
20. Bolt
21. Seal
22. Grease fitting
23. Grease fitting
24. Drivescrew (grease fitting removed)
25. Screw

NOTE

Do not lubricate 206-010-450-007 swashplate duplex bearing at this location.

206A/BS-M-62-16

Figure 62-16. Swashplate and support assembly inspection and repair

8. Install main rotor hub and blade assembly (paragraph 62-7) and main rotor pitch links (paragraph 62-21).

9. Do a swashplate tilt friction check 10 to 25 flight hours after installation (Chapter 5).

62-29. SWASHPLATE FRICTION ADJUSTMENT

MATERIALS REQUIRED

Refer to BHT-ALL-SPM for specifications.

NUMBER	NOMENCLATURE
C-304	Drycleaning Solvent
C-325	Adhesive
C-405	Lockwire

If friction cannot be adjusted within prescribed limits, or damage to pivot sleeve and associated parts is evident, remove assembly and overhaul. Refer to BHT-206A/B-SERIES-CR&O manual.

NOTE

Friction adjustment may be accomplished on or off the helicopter.

1. If swashplate and support assembly are installed on the helicopter, disconnect main rotor pitch control tube assemblies to pitch horns on outer ring (35, Figure 62-15) and the two cyclic control tube assemblies (27 and 30) to pitch horns on inner ring (26).

2. If swashplate and support assembly has been removed from the helicopter, bolt support assembly (32) to work bench.

3. Check swashplate and support assembly friction adjustment as follows:

a. Place swashplate inner ring (26) horns to their relative installed position. Place horn in down position. Measure only in normal travel section of collective sleeve. (RANGE OF NORMAL OPERATION.)

b. Attach a spring scale into the inner ring horn bearing (Figure 62-17). Pull spring scale vertical with steady load to cause ring to tilt on spherical surface. Record minimum and maximum scale reading during rotation but disregard breakaway values. Repeat task several times to ensure accurate readings are obtained, then repeat procedure for opposite inner ring horn.

c. The load to tilt the rings on the sleeves should range between 15 and 32 pounds (66.72 to 142.34 N), all positions checked. The minimum and maximum values in all positions checked must be within 4.0 pounds (17.79 N); if minimum is 25 pounds (111.21 N) maximum must not exceed 29 pounds (128.99 N).

d. If tilt preload values are not within limits, adjust per step 4.

4. Adjust swashplate and support assembly friction as follows:

a. Support inner and outer rings on sleeve by wrapping lower end of sleeve with a piece of cardboard secured with masking tape.

b. Index mark with felt tip pen position of bearing (2, Figure 62-16), inner cap (1), to outer cap (3), and sleeve (8).

c. Remove lockwire and eight inner bolts (20) and washers (19) from bearing (2) and inner cap (1). Lift out top half of bearing (2) and shims (4), leaving inner cap (1) in place.

d. To increase tilt friction, remove shim laminates equally.

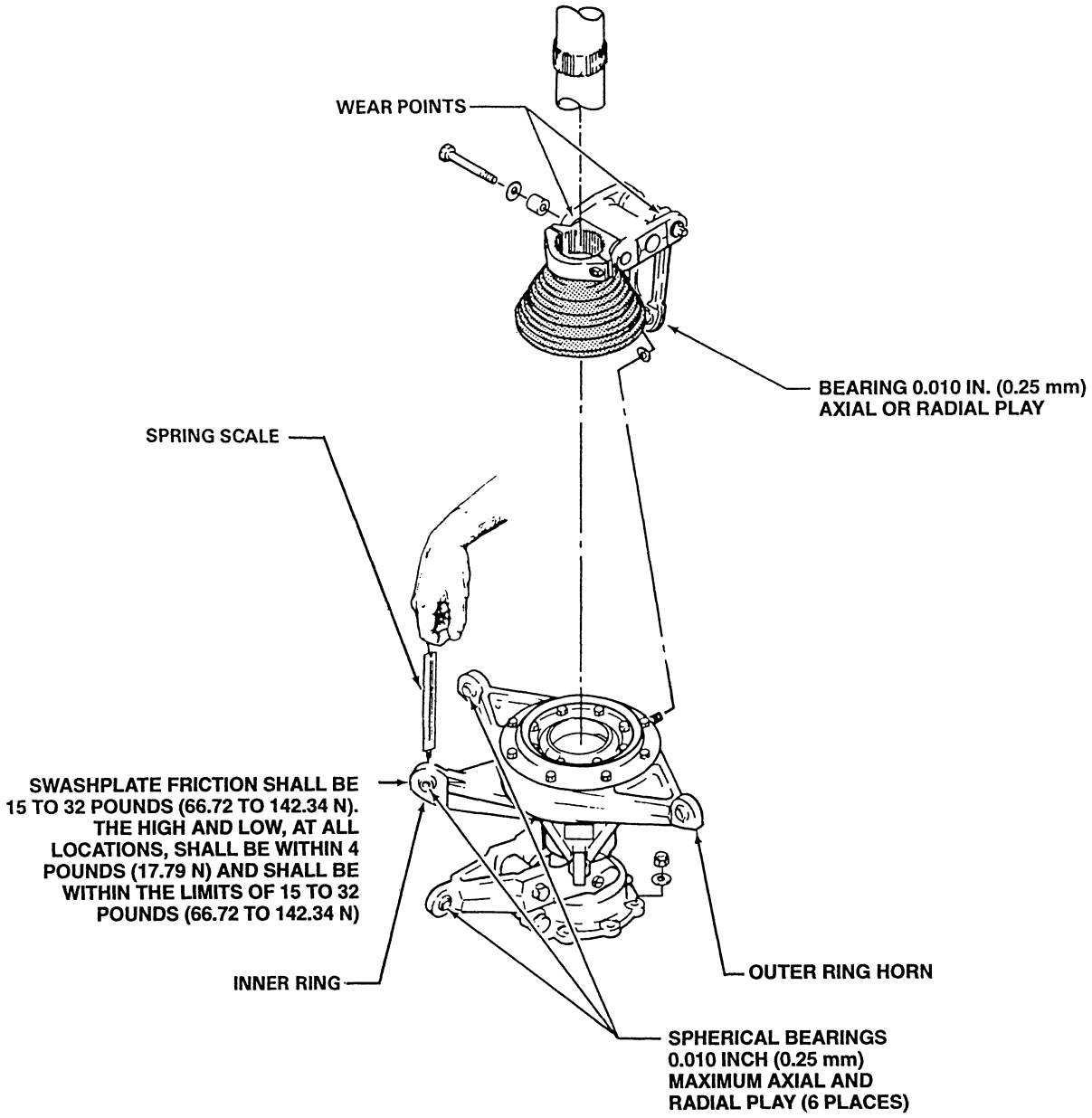


Figure 62-17. Swashplate Friction Measurement and Inspection

NOTE

Shims 206-010-463-001 and -003 have been replaced by the -005, but existing -001 and -003 may still be used.

-001 Shim — Total thickness: 0.040 inch (1.01 mm).

Laminations: 20 at 0.002 inch (0.05 mm).

Four 90° segments.

-003 Shim — Total thickness: 0.041 inch (1.04 mm)

Laminations: Ten at 0.002 inch (0.05 mm) with square ends. Seven at 0.003 inch (0.08 mm) with chamfered ends.

Four 90° segments.

-005 Shim — Total thickness: 0.041 inch (1.04 mm).

Laminations: Ten at 0.002 inch (0.05 mm) with square ends. Seven at 0.003 inch (0.08 mm) with chamfered ends.

Two 180 ° segments.

e. To decrease tilt friction, add shim laminates equally to set within limits of shimming.

f. If inner cap (1) was removed, scrape off old adhesive from cap and mating surface on inner ring with a sharp plastic scraper and clean with drycleaning solvent (C-304) to remove grease film. Apply light film of adhesive (C-325) to cap and install. Ensure cap mates properly to upper seal.

NOTE

If bolts (20) are torqued to the minimum torque of 50 inch-pounds (5.7 Nm) to obtain the initial 24 to 32 pound (106.75 to 142.34 N) friction, it will permit readjustment after the initial 10 to 25 hours of operation by simply retorquing the eight bolts to maintain the friction. Do not exceed 70 inch-pounds (7.9 Nm) torque.

g. Install top half of bearing (2) with eight bolts (20) and countersunk washers. Torque the bolts T .

h. Remove cardboard wrap from sleeve.

i. Verify correct tilt friction, repeat adjustment procedures as required.

j. Secure bolt heads together with lockwire (C-405).

k. Do a swashplate tilt friction check 10 to 25 flight hours after adjustment (Chapter 5). Readjust to within limits, if required.

COLLECTIVE LEVER AND LINK

62-30. COLLECTIVE LEVER AND LINK.

The collective lever and link assembly is mounted to the swashplate support assembly and transfers collective flight control inputs to the swashplate.

62-31. REMOVAL.

1. Disconnect collective control tube (29, figure 62-15) from collective lever (24).

2. Cut and remove lockwire from screw (7, figure 62-18) on collective lever (15). Remove screw (7), washer (8), and pin (6).

3. Disconnect idler link (13) from support assembly (2) by removing cotter pin (21), nut (20), washers (4), and bolt (5).

4. Disconnect idler link (13) from collective lever (15) by removing cotter pin (17), nut (16), washers (10), and bolt (9).

5. Insert a length of lockwire through idler link (13) to hold spacers (11) in place.

62-32. INSPECTION AND REPAIR.

NOTE

For detailed inspection and repair procedures, refer to BHT-206A/B-SERIES-CR&O manual.

1. Inspect collective lever (15, figure 62-18) and idler link (13) for nicks, scratches, sharp dents, and corrosion (figures 62-19 and 62-20). Inspect boot (17, figure 62-15) for cuts, tears, and deterioration.

2. Inspect the four Teflon-faced bushings (12, figure 62-18) on idler link (13) for fabric looseness or Teflon penetration. If Teflon fibers are beginning to show through, or the fabric is loose, or damaged, replace bushings (BHT-206A/B-SERIES-CR&O).

3. Inspect spherical bearing (14) in collective lever (15) for axial and radial play. Axial or radial looseness exceeding 0.010 inch (0.25 mm) requires bearing replacement (BHT-206A/B-SERIES-CR&O).

4. Inspect bushings (3) in pivot sleeve (1) and bushings in collective lever (15) for excessive wear (BHT-206A/B-SERIES-CR&O).

62-33. INSTALLATION.

CAUTION

DO NOT APPLY GREASE TO FACES OF TEFLON IDLER LINK BUSHINGS (12, FIGURE 62-18) AND BUSHINGS (3).

1. Apply a light coating of grease (C-001) to shank of pin (6), outside diameters of spacers (11), and to plastic faces of bushings (3) in pivot sleeve (1), and idler link (13).

2. Install spacers (11) into idler link (13). Position idler link (13) in collective lever (15) and secure with bolt (9), washers (10), and nut (16) (T) plus friction drag of nut and secure with cotter pin (17).

3. Ensure bushings (3) are installed in pivot sleeve (1) and support assembly (2).

4. Position collective lever (15) and idler link (13) to support assembly (2) and install bolt (5), washers (4), and nut (20) (T) plus friction drag of nut and secure with cotter pin (21).

5. Position collective lever (15) to bushings (3) on pivot sleeve (1), align holes and install pin (6). Secure pin (6) with screws (7) (T) and washer (8) and secure to arm of collective lever (15) with lockwire.

6. Reconnect collective control tube (23, figure 62-15) to collective lever (24) and check for freedom of movement.

62-34. SWASHPLATE DRIVE ASSEMBLY.

The swashplate drive assembly consists of a collar set, idler link, and idler lever. The collar set is attached to the mast and the idler link is attached to the outer ring of the swashplate. The idler lever connects between the collar set and idler link.

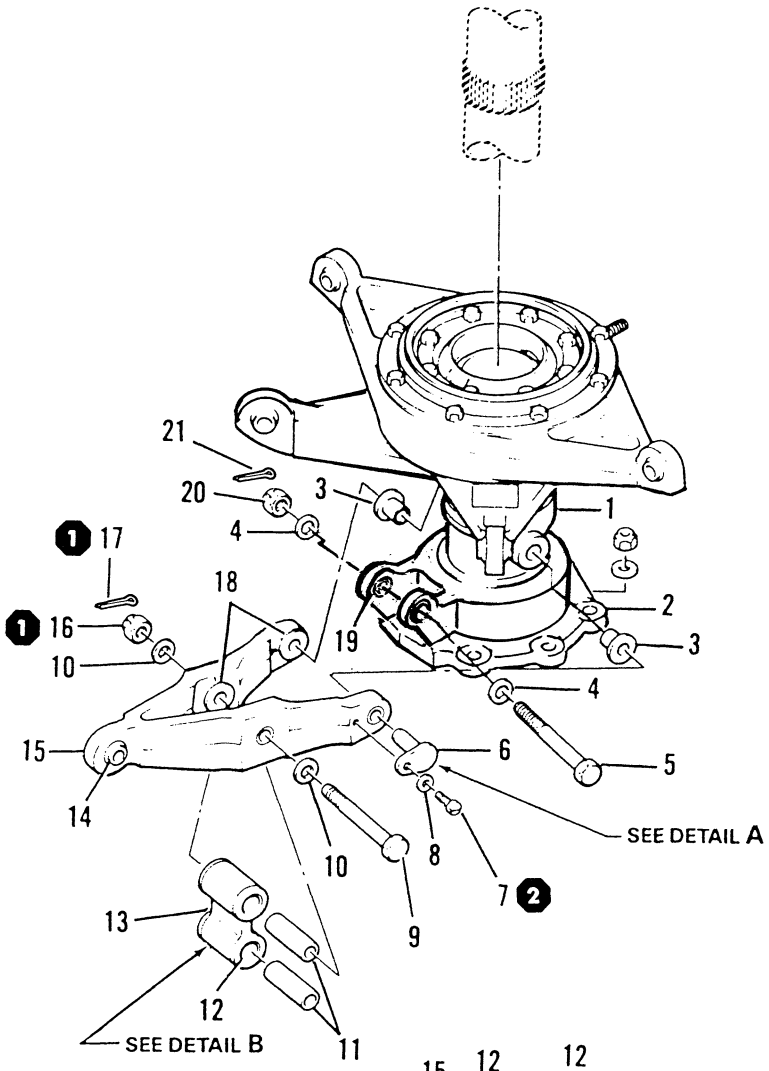
62-35. REMOVAL.

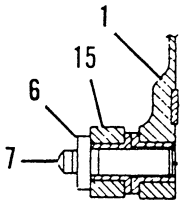
1. Remove main rotor hub and blade if boot (17, figure 62-21) is to be replaced (paragraph 62-3).

1. Pivot sleeve
2. Support assembly
3. Bushing
4. Washer
5. Bolt
6. Pin
7. Screw
8. Washer
9. Bolt
10. Washer
11 Spacers
12. Bushing
13. Idler link
14. Spherical bearing
15. Collective lever
16. Nut
17. Cotter pin
18. Bushing
19. Bushing
20. Nut
21. Cotter pin

❶ 95 TO 110 IN-LBS (10.73 TO 12.43 Nm)

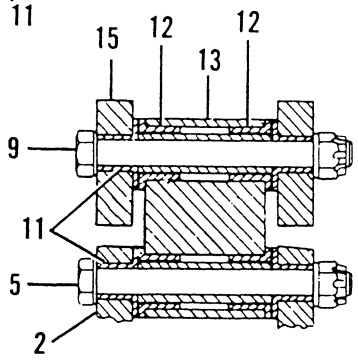
❷ 20 TO 25 IN-LBS (2.26 TO 2.82 Nm)





PIN INSTALLATION

DETAIL A

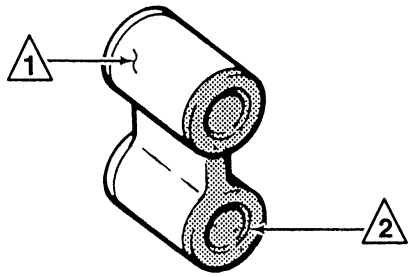


COLLECTIVE LEVER AND LINK

DETAIL B

206A/BS-M-62-18

Figure 62-18. Collective lever



206-010-407
IDLER

DAMAGE LOCATION SYMBOLS

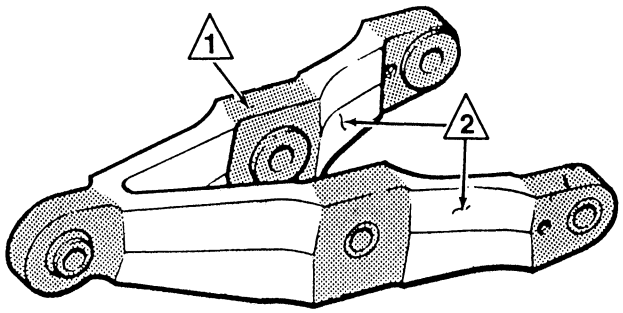
TYPE OF DAMAGE	MAXIMUM DEPTH AND REPAIR AREAS	
MECHANICAL BEFORE AND AFTER REPAIR	0.010 In. (0.25 mm)	0.030 In. (0.76 mm)
CORROSION BEFORE AND AFTER REPAIR	0.005 In. (0.13 mm) 0.010 In. (0.25 mm)	0.015 In. (0.38 mm) 0.030 In. (0.76 mm)
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 Sq. In. (64.52 mm^2)	0.25 Sq. In. (161.30 mm^2)
NUMBER OF REPAIRS	One per end	Two
EDGE CHAMFER	0.030 In. (0.76 mm)	0.030 In. (0.76 mm)
BORES	0.001 In. (0.02 mm) for 1/4 circumference	

NOTES

1. Minimum radius of repair is 0.35 inch (8.89 mm).
2. Minimum radius of repair is 0.50 inch (12.70 mm).

206A/BS-M-62-19

Figure 62-19. Swashplate collective idler link damage limits



206-010-467
COLLECTIVE LEVER

DAMAGE LOCATION SYMBOLS

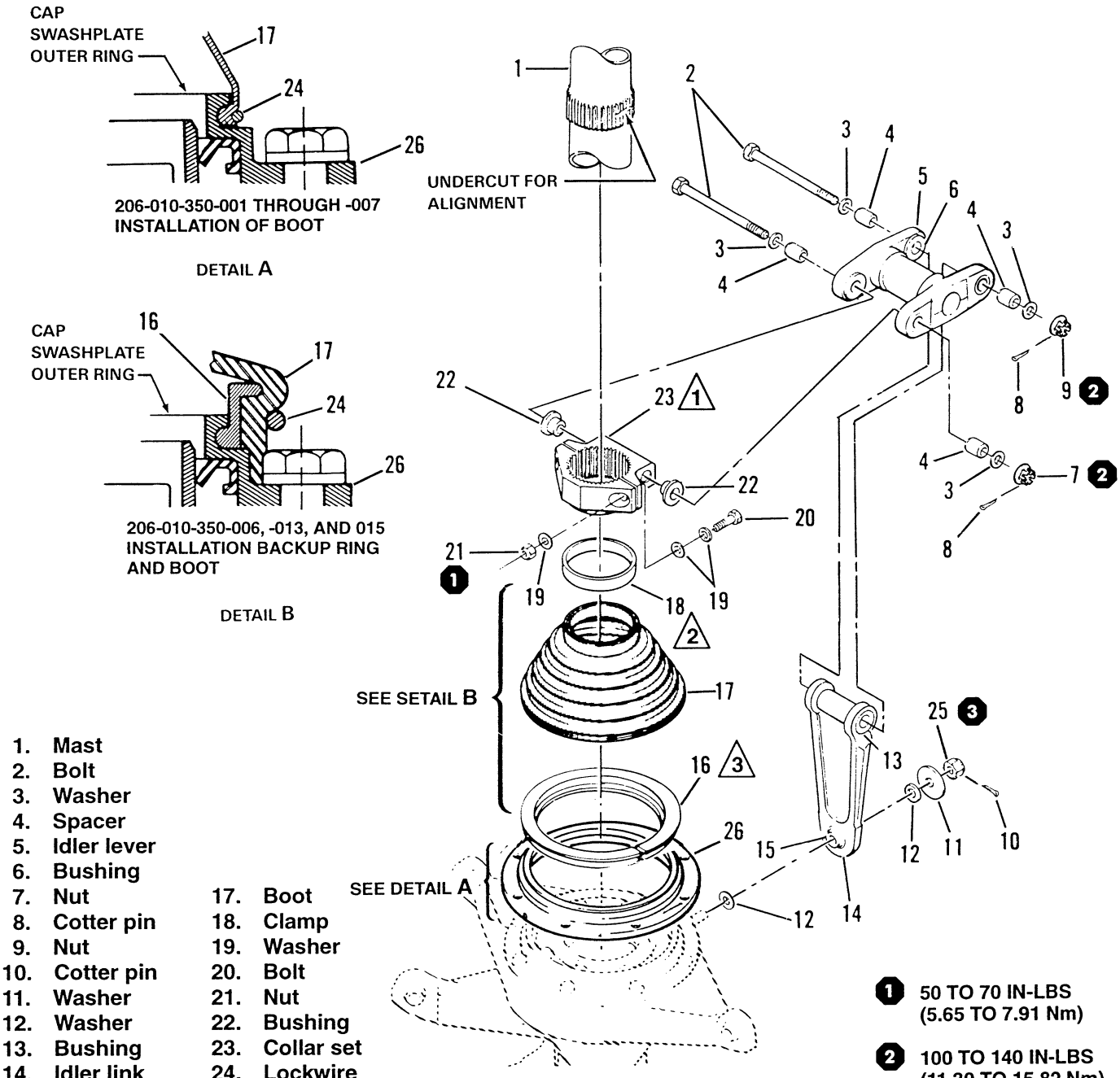
TYPE OF DAMAGE	MAXIMUM DEPTH AND REPAIR AREAS	
MECHANICAL BEFORE AND AFTER REPAIR	0.010 In. (0.25 mm)	0.030 In. (0.76 mm)
CORROSION BEFORE AND AFTER REPAIR	0.005 In. (0.13 mm) 0.010 In. (0.25 mm)	0.015 In. (0.38 mm) 0.030 In. (0.76 mm)
MAXIMUM AREA PER FULL DEPTH REPAIR	0.15 Sq. In. (96.78 mm^2)	0.25 Sq. In. (161.30 mm^2)
NUMBER OF REPAIRS	One per segment	Not critical
EDGE CHAMFER	0.030 In. (0.76 mm)	0.050 In. (1.27 mm)
BORES	0.001 In. (0.02 mm) for 1/4 circumference	

NOTES

1. Minimum radius of repair is 0.050 inch (1.27 mm).
2. Minimum radius of repair is 0.35 inch (8.89 mm).

206A/BS-M-62-20

Figure 62-20. Swashplate collective lever damage limits



1. Mast
2. Bolt
3. Washer
4. Spacer
5. Idler lever
6. Bushing
7. Nut
8. Cotter pin
9. Nut
10. Cotter pin
11. Washer
12. Washer
13. Bushing
14. Idler link
15. Bearing
16. Backup ring
17. Boot
18. Clamp
19. Washer
20. Bolt
21. Nut
22. Bushing
23. Collar set
24. Lockwire
25. Nut
26. Outer cap

NOTES

1. 206-010-333 collar set replaced by 206-011-005 collar set.
2. AN737-TW91 clamp effective 206-010-350-015 pylon installation and subsequent.
3. 206-010-351-001 backup ring effective 206-010-350-009, -013, and -015 pylon installation. Refer to detail B.

206A/BS-M-62-21

Figure 62-21. Swashplate drive assembly

2. Loosen clamp (18) and slip boot (17) from over flange of collar set (23), or from main rotor mast (1), if boot is secured to mast.

3. Remove cotter pin (10), nut (25), washers (12 and 11), and idler link (14) from stud on swashplate outer ring. Remove and secure washer (11) on stud for future use.

WARNING

NEVER ATTEMPT TO REMOVE BOLT(2) BETWEEN IDLER LEVER (5) AND COLLAR SET (23) BEFORE LOOSENING NUTS (21). DO NOT USE FORCE FOR REMOVAL; SLIGHT TAPPING WITH PLASTIC OR RAWHIDE MALLET PERMITTED.

4. Loosen nuts (21). Remove cotter pin (8), nut (7), washers (3), spacers (4), and bolt (2). Remove idler lever (5) and idler link (14) from collar set (23).

5. Remove nuts (21), washers (19), and bolts (20). Grasp collar set (23) halves and slide off of splines mast (1); slight tapping with plastic or rawhide mallet is permitted.

6. Remove cotter pin (8), nut (9), washers (3), spacers (4), and bolt (2). Remove idler lever (5) from idler link (14).

NOTE

Hardware installation for lever (5) is the same at both ends.

7. Cut and remove lockwire (24, details A and B) from boot (17). Work boot from around cap on outer ring and remove.

62-36. INSPECTION AND REPAIR.

1. Inspect bearing (15, figure 62-21) in idler link (14). If inner ball portion of bearing can be moved 0.010 inch (0.25 mm) or more in the bolt hole axis, replace idler link (14), or replace bearing (15) (BHT-206A/B-SERIES-CR&O).

2. Visually inspect the collar set (23) for cracking or permanent deformation, especially the area adjacent to the undercut in rear collar half. Inspect for heavy scoring, threading, and pitting of bolt hole and splines.

3. Inspect boot (17) for cuts, tears, and deterioration. Replace as required.

4. With collar set (23), idler lever (5), and idler link (14) fully assembled and installed on mast (1) accomplish the following inspection:

a. Check the parts for security and that bolts (2) cannot be rotated by finger pressure.

b. Without removal, look for metal contact between idler lever (5), idler link (14), and collar set (23). Metal to metal contact is an indication that the Teflon bearing pad on bushings in idler lever (5) has worn through, is loose, or frayed.

NOTE

Temporarily mark the idler lever (5) making it possible to determine which side of the idler lever had been up and which end was outboard. Disassembly inspection is also required if there is visual indication of metal to metal scoring of bushings (22) in collar set (23), idler lever (5), or idler link (14).

c. If metal to metal scoring has occurred, replace all four bushings (6) in idler lever (5), and two bushings (13) in idler link (14).

NOTE

Replacement of worn bushings is recommended, since it is difficult to determine how much wear has occurred on each side, once the idler lever (5) has been rotated. Additionally, there is less chance of unscheduled replacements between inspection intervals.

d. If bushings in idler lever (5) , idler link (14), or collar set (23) require replacement, refer to BHT-206A/B-SERIES-CR&O manual.

62-37. INSTALLATION.

1. If not previously accomplished, clean all foreign material from top surface of swashplate and support with a clean dry cloth. Install boot (17, figure 62-21) and clamp (18) over mast (1).

2. Ensure collar set (23) is a matched set. The set numbers are vibro-etched on top edge or near bolt holes.

WARNING

NEVER ATTEMPT TO REMOVE OR INSTALL BOLT (2) BETWEEN IDLER LEVER (5) AND COLLAR SET (23) BEFORE LOOSENING NUTS (21). DO NOT USE FORCE FOR EITHER REMOVAL OR INSTALLATION; SLIGHT TAPPING WITH PLASTIC OR RAWHIDE MALLET IS PERMITTED.

3. Fasten two halves of collar set (23) together around mast (1). Install two bolts (20) with heads on the same side of the collar set as idler lever (5). Position two washers (19) under head of bolts (20) and insert through collar set (23). Position one washer (19) on bolt shank (20) and loosely install nuts (21).

4. Slide collar set (23) to undercut splines on mast (1). Align undercut on collar set rear half with undercut on mast. Compress collar set with hand pressure and firmly move collar set to fully engage all splines. Verify proper spline engagement and alignment by visually sighting through bolt hole, then carefully insert bolt (2) through collar set (23) to ensure proper positioning of undercut grooves. If required, reposition collar set (23) until all splines are fully engaged and bolt (2) can be installed.

5. After proper alignment of collar set (23), position idler lever (5) to collar set (23) and carefully install bolt (2) with washers (3), spacers (4), and nut (7) (T) and install cotter pin (8). Install bolt (2) with head in direction of main rotor rotation. Evenly tighten nuts (21) (T).

6. Apply a bead of adhesive (C-307) around top inside edge surface of collar set (23). Fill gap that may exist between collar set halves with adhesive (C-307).

7. Insert idler link (14) in idler lever (5), and install bolt (2), washers (3), spacers (4), and nut (9) (T) and install cotter pin (8).

CAUTION

WASHERS (12) ARE SAME SIZE AND MUST BE INSTALLED ON EACH SIDE OF SELF-ALIGNING BEARING IN IDLER LINK (14).

8. Remove nut (25), washer (11) that was previously installed at removal for future use. Install small washer (12) on stud of swashplate outer ring. Position self-aligning bearing of idler link (14) on stud, and install another small washer (12), large washer (11), and nut (25) (T) and install cotter pin (8).

9. Position top of boot (17) next to lower side of collar set (23), and secure with clamp (18). Secure clamp (18) with lockwire.

MAIN ROTOR HUB AND BLADE

62-38. MAIN ROTOR HUB AND BLADES.

62-39. DISASSEMBLY.

SPECIAL TOOLS REQUIRED

NUMBER	NOMENCLATURE
T101544	Adapter Set, Main and Tail Rotor Balance
T101576	Balance Set, Main and Tail Rotor
—	T-handle Workaid

1. Ensure T-handle workaid (figure 62-22) is installed through the pitch horn trunnion bearing and yoke to avoid damaging the straps.

2. Place main rotor hub and blade assembly on a suitable stand or work bench with main rotor blades (2, figure 62-23) at their preconed angle.

3. Loosen nut (12, figure 62-23, detail A) on trailing edge side of main rotor blade (2). Remove nut (9) and washer (8) from blade bolt (6).

4. Remove blade bolt (6) while positioning main rotor blade (2) at preconed angle and remove from grip. Store main rotor blades in a padded rack with leading edge down.

5. Repeat steps 1. through 4. to remove opposite main rotor blade.

62-40. INSPECTION.

1. Inspect for edge voids using the tapping hammer method such that all edge voids shall be detected.

2. Inspect by the tapping method for core slippage.

3. Inspect skin to spar joint by tapping at a frequency that will enable voids 0.20 inch (5.08 mm) or greater to be detected.

62-41. ASSEMBLY.

1. Ensure T-handle workaid is installed through the pitch horn trunnion bearing and yoke to avoid damaging the straps.

2. Place main rotor hub on a suitable stand or work bench.

3. Ensure nut (12, figure 62-23) on trailing edge side of hub is loose and turn blade latch (13) to horizontal position.

4. Wipe bushing (3), retention bolt holes grips, and the recesses (inner diameter edges of buffer pad (4), and edges of bolt holes) in the inboard faces of the blade grip tangs with solvent (C-304).

5. Apply coating of corrosion preventive compound (C-104) sufficient to fill the recesses. Match-mark buffer pads (4) and bolt holes for reassembly in same position. Also apply corrosion preventive compound (C-104) to shanks of blade bolt (6), blade bolt bore or bushing in grips pad, bushing (3), grip buffer pad (4), and blade grip pad (11).

6. Helicopters S/N 4 through 2211 (figure 62-23): insert root end of main rotor blade (2) into grip with leading edge in direction of rotation. Support main rotor blade at preconed angle, align blade latch (13) and hole for blade bolt (6). Position washer (5) on blade bolt (6) with chamfered side toward bolt head. Insert blade bolt (6) through grip and main rotor blade.

7. Helicopters S/N 2212 through subsequent (figure 62-24) repeat step 6., omitting washer (5).

NOTE

Remove corrosion preventive compound from threads on blade bolt before installing washer (8) and nut (9).

8. Loosely install washer (8) and nut (9).

9. Position blade latch (13) to vertical position and secure nut (12) (T) during main rotor blade alignment.

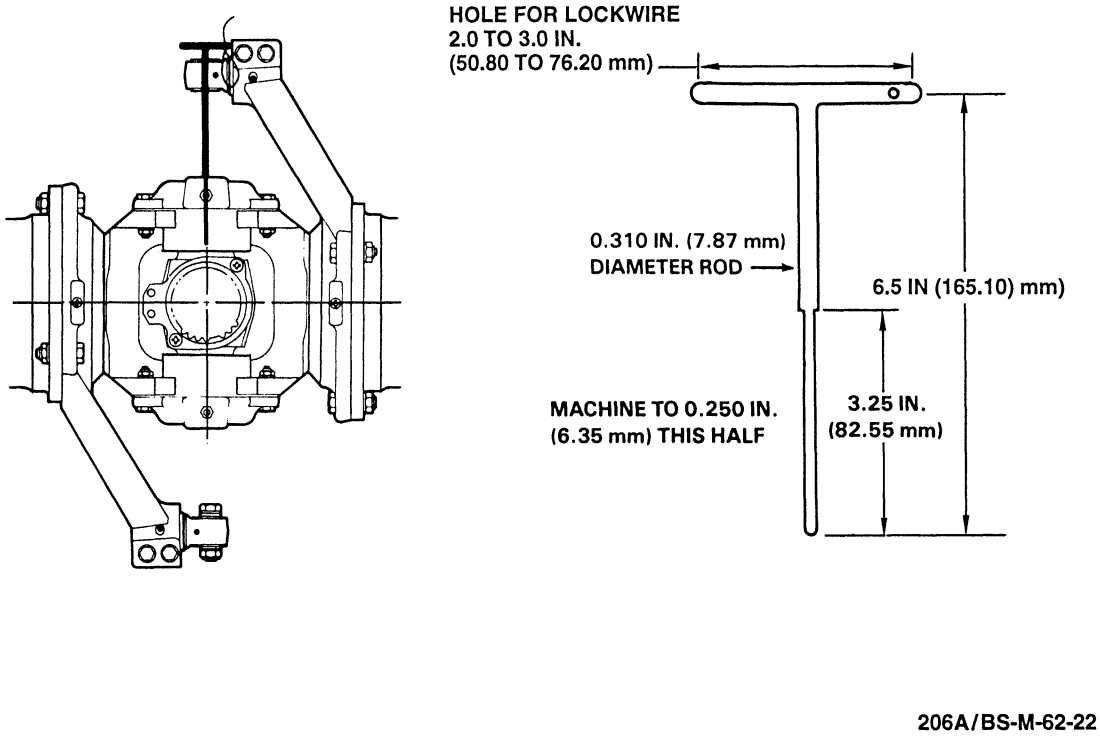


Figure 62-22. T-handle workaid

CAUTION

CORRECT TORQUE FOR BLADE BOLT NUT IS GOVERNED BY PART NUMBER LOCATED ON THE SIDE OF THE NUT. USING THE WRONG TORQUE WILL DESTROY NUT AND BOLT THREADS OR LEAVE NUT UNDERTORQUED. CHECK NUT PART NUMBER BEFORE TORQUING.

10. Secure nut (9) (T) after main rotor blade alignment.

11. Ensure T-handle workaid is installed through the pitch horn trunnion bearing and yoke to avoid damaging the straps (figure 62-22).

12. Repeat steps 1. through 10 to install opposite main rotor blade.

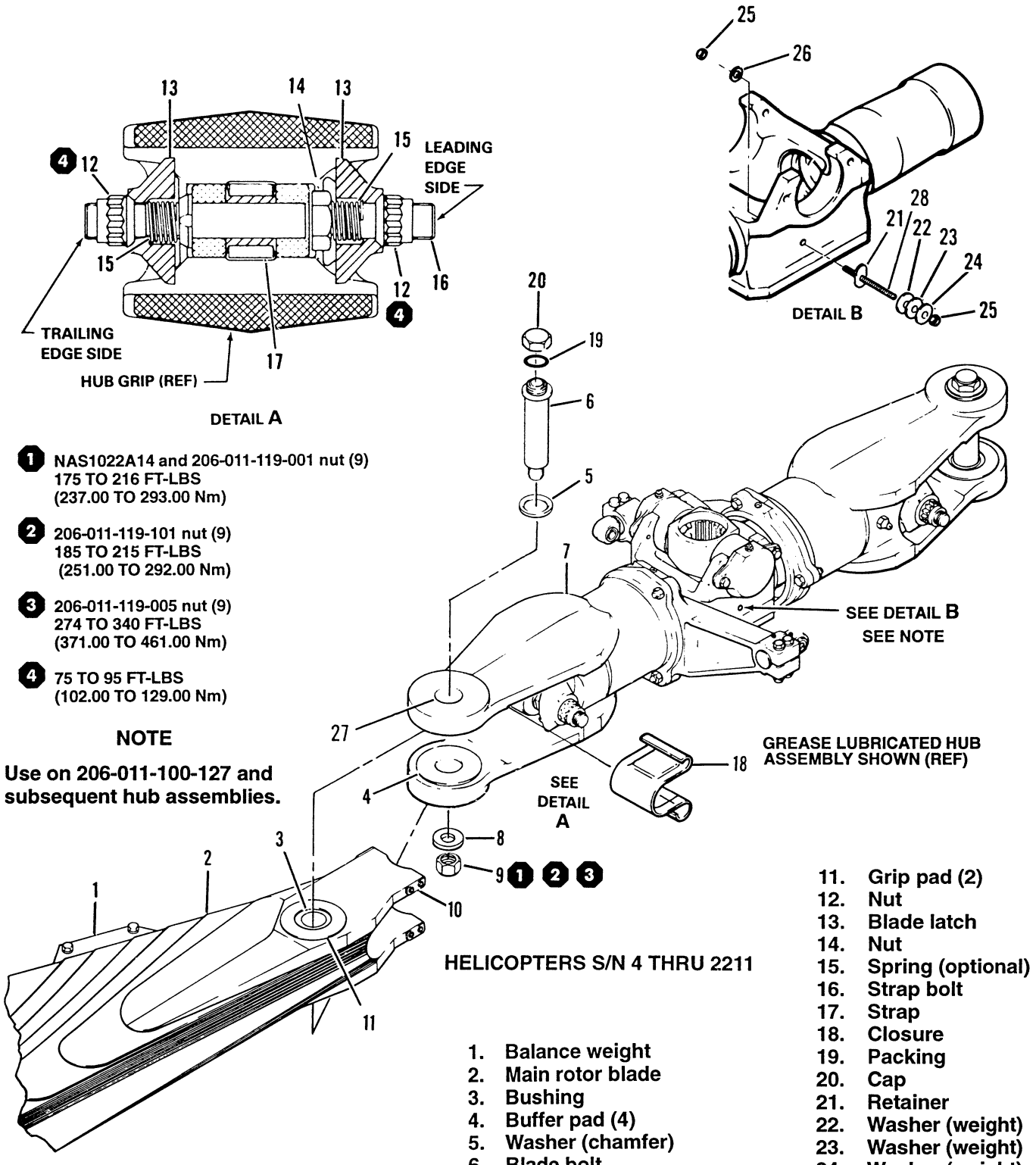
62-42. ALIGNMENT — STRING METHOD.

SPECIAL TOOLS REQUIRED

NUMBER	NOMENCLATURE
T100220	Sling
Figure 62-22	T-Handle
Figure 62-24	Wheeled Blade Support
T101544	Adapter
T101576	Balance Set
– –	Nylon Cord

NOTE

The center stand used to support the hub and blade assembly should be positioned directly beneath a hoist, and have three point leveling screws. The stand shall also have a steel top, or a piece of steel plate thick enough to resist flexing, fastened to the top.



❶ NAS1022A14 and 206-011-119-001 nut (9)
175 TO 216 FT-LBS
(237.00 TO 293.00 Nm)

❷ 206-011-119-101 nut (9)
185 TO 215 FT-LBS
(251.00 TO 292.00 Nm)

❸ 206-011-119-005 nut (9)
274 TO 340 FT-LBS
(371.00 TO 461.00 Nm)

❹ 75 TO 95 FT-LBS
(102.00 TO 129.00 Nm)

NOTE

Use on 206-011-100-127 and subsequent hub assemblies.

1. Balance weight
2. Main rotor blade
3. Bushing
4. Buffer pad (4)
5. Washer (chamfer)
6. Blade bolt
7. Main rotor hub assembly
8. Washer
9. Nut
10. Wear pad (8)
11. Grip pad (2)
12. Nut
13. Blade latch
14. Nut
15. Spring (optional)
16. Strap bolt
17. Strap
18. Closure
19. Packing
20. Cap
21. Retainer
22. Washer (weight)
23. Washer (weight)
24. Washer (weight)
25. Nut
26. Washer
27. Bolt bore
28. Stud

206A/BS-M-62-23-1

Figure 62-23. Main rotor hub and blade assembly (Sheet 1 of 2)

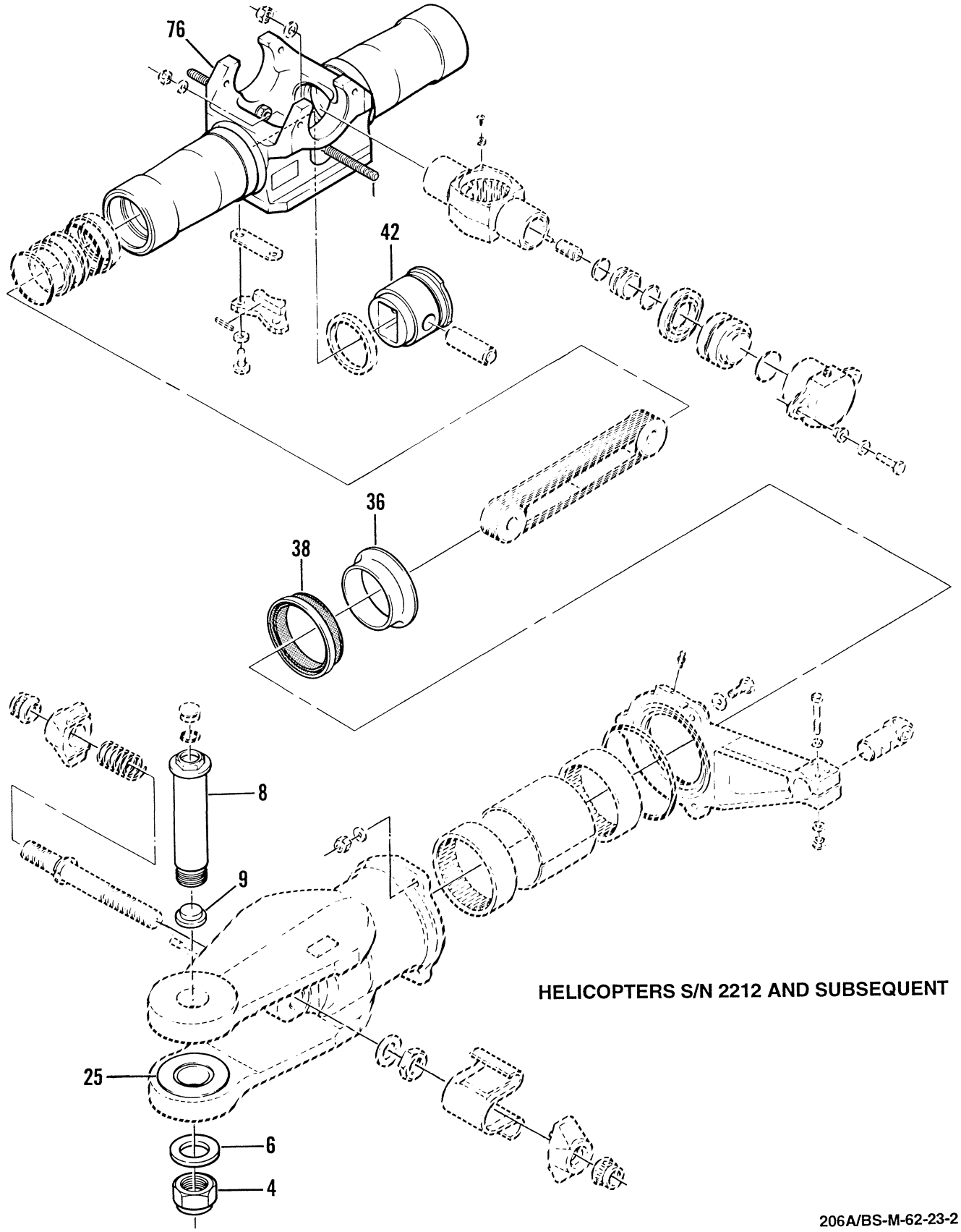


Figure 62-23. Main rotor hub and blade assembly (Sheet 2)

NOTE

Blade alignment may be more easily accomplished by use of wheeled supports between main rotor blade and support stands. Wheeled supports will permit the main rotor blades to move forward and aft on support stands when sweep adjustments are made during main rotor blade alignment.

1. Fabricate main rotor blade support stands (figure 62-24).

a. Roller skates may be used for wheeled supports. Remove toe and heel attaching clamps from skates (8). Remove adjusting bolt from center of skates and substitute an eyebolt (6) with eye up. Eyebolt should extend approximately 1.0 inch (25.40 mm) above the skate.

b. Fabricate two padded blocks (3) to fit the lower airfoil surface of main rotor blade. The blocks (3) may be made from 2 x 3 inch (50.80 x 76.20 mm) hardwood slightly longer than chordwise dimension of main rotor blade. Shape blocks (3) so that the 3-inch (76.20 mm) width will fit contour of lower surface of main rotor blade. Fasten felt padding (2) to blocks (3) to prevent blade damage.

c. Fabricate brackets (4) to adapt blocks to eyebolts (6). Use two pieces of 1-inch (25.40 mm) angle for each block (3). Fasten brackets (4) to lower surface of blocks (3) about 3-inches (76.20 mm) aft of forward end so bracket will support block and blade pitch change rotation axis. Position brackets (4) so bolt (5) that adapts bracket to eyebolts (6) will act as a hinge or pivot point for main rotor blade pitch change movement. Drill holes in brackets (4) to accept bolt (5) of same size as hole in eyebolt (6). Attach brackets (4) to blocks (3) with wood screws. Attach blocks (3) to eyebolts (6) with bolts (5).

CAUTION

DO NOT ALLOW MAIN ROTOR GRIPS OR YOKE TO ROTATE ON PITCH CHANGE AXIS. IF GRIP OR YOKE IS ALLOWED TO ROTATE ON PITCH CHANGE AXIS BEYOND 90 DEGREES, THE MAIN ROTOR GRIP RETENTION STRAP(S) MUST BE REPLACED. SECURE MAIN ROTOR BLADE GRIP THROUGH PITCH HORNS TO YOKE WITH LOCKWIRE OR SUITABLE WORKAID.

2. Ensure T-handle workaid is installed through the pitch horn trunnion bearing and yoke to avoid damaging blade retention straps (figure 62-23).

3. Attach T100220 sling and raise main rotor assembly about 1.0 foot (304.80 mm) from stand. Place base (8, figure 62-25), mandrel assembly (11) and insert through main rotor hub trunnion from lower side. Place plug (4) on mandrel assembly (11) and secure with screw (2) and washer (3). Position base (8) at right angle to main rotor blades.

4. Place two parallel supports 90 degrees to the yoke on stand beneath main rotor. Supports may be aluminum bars approximately 2 x 3 x 12 inches (50.80 x 76.20 x 304.80 mm) or a suitable substitute. Lower main rotor until base (8) rests on supports.

CAUTION

IF WHEELED BLADE SUPPORTS ARE USED, STANDS SHOULD HAVE STOPS AT EACH END TO PREVENT BLADE AND WHEELED SUPPORT FROM ROLLING OFF STAND.

5. Support each main rotor blade at approximate preconed angle with two rotor blade support stands (9, figure 62-24) and wheeled supports manufactured in previous steps. Ensure that main rotor blades are in preconed angle. Main rotor blade bolt will have least resistance when properly aligned.

6. Remove T-handle workaids (figure 62-22) from pitch horn trunnion bearing and yoke.

7. Install locks (6, figure 62-25) and adjusters (7) on base (8) with screws (10) and washers (9). Secure locks to rotor blade pitch horns with pins (5).

8. Place bubble protractor (1, figure 62-27) on flat surface of yoke (22). Adjust three leveling screws on stand to achieve level. Tighten nuts on leveling screws. Reposition bubble protractor on flat machined surface of one grip (4) adjacent to blade bolt (7). Adjust locks (15) to zero degrees pitch angle with the yoke. Repeat procedure on opposite grip.

NOTE

If special tools specified in preceding steps are not available, allow main rotor hub to rest on stand and use machinists jacks or other means to position rotor blade grips to zero pitch angle at grips and level hub.

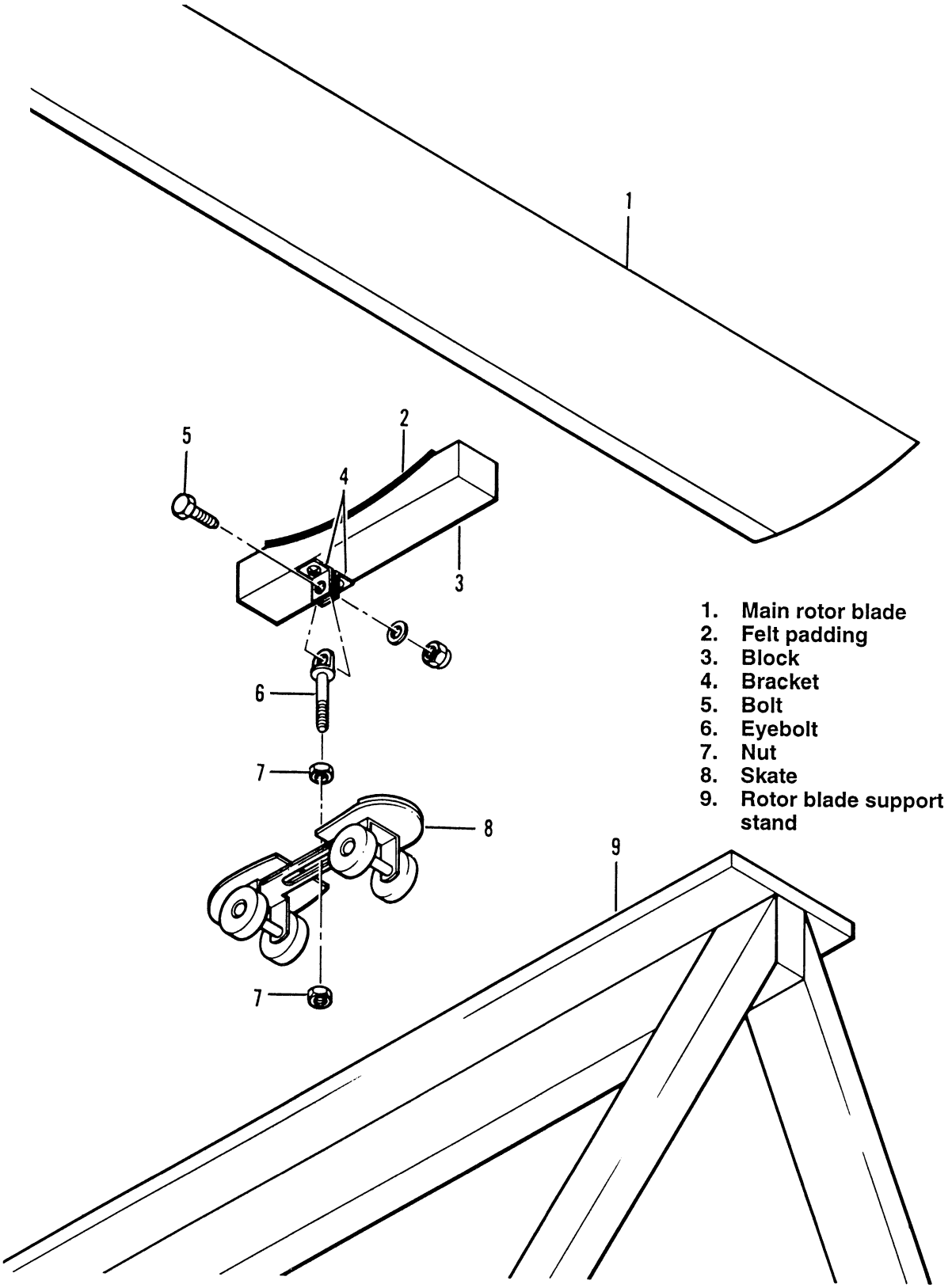
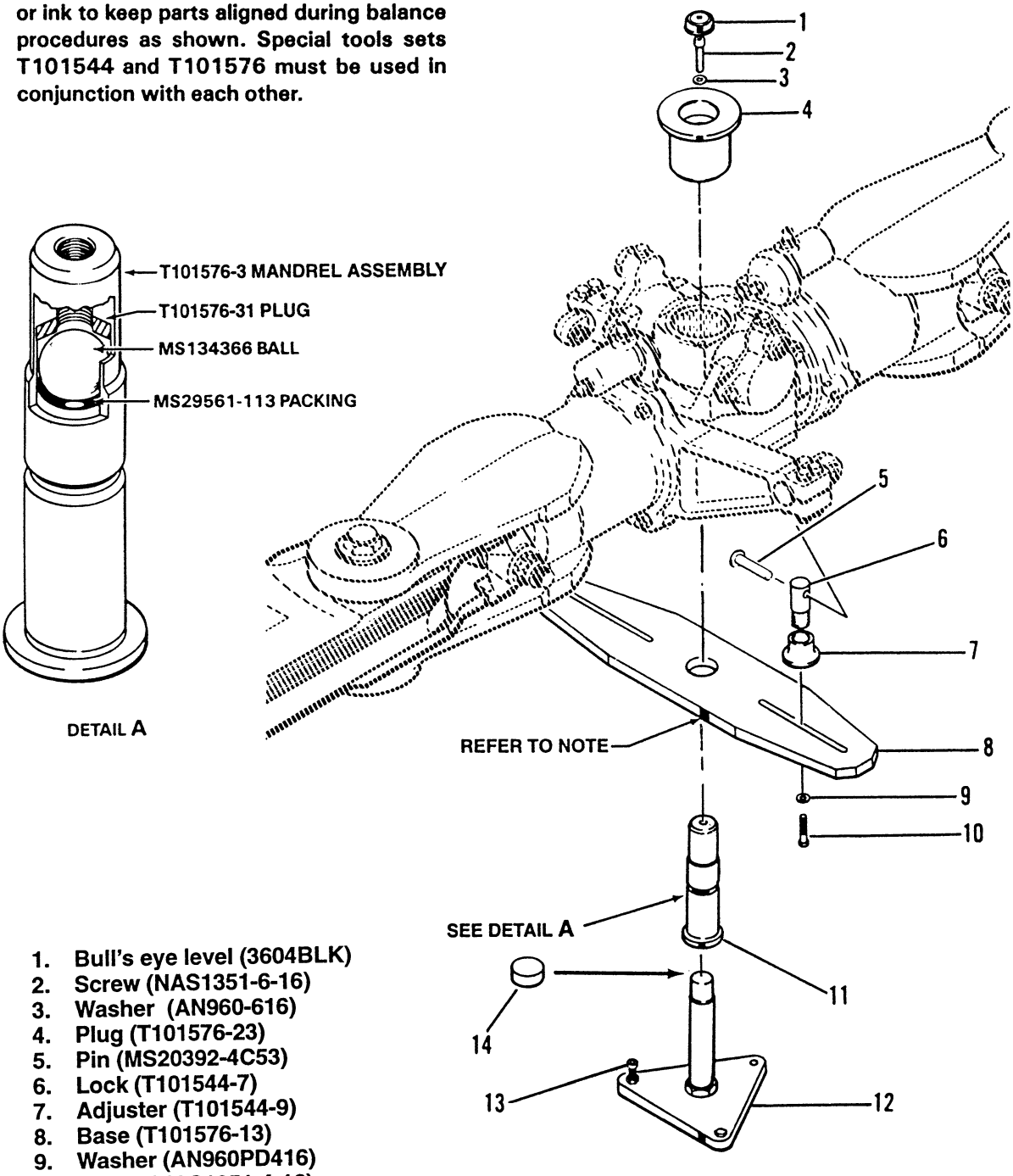


Figure 62-24. Main rotor blade wheeled support workaid

NOTE

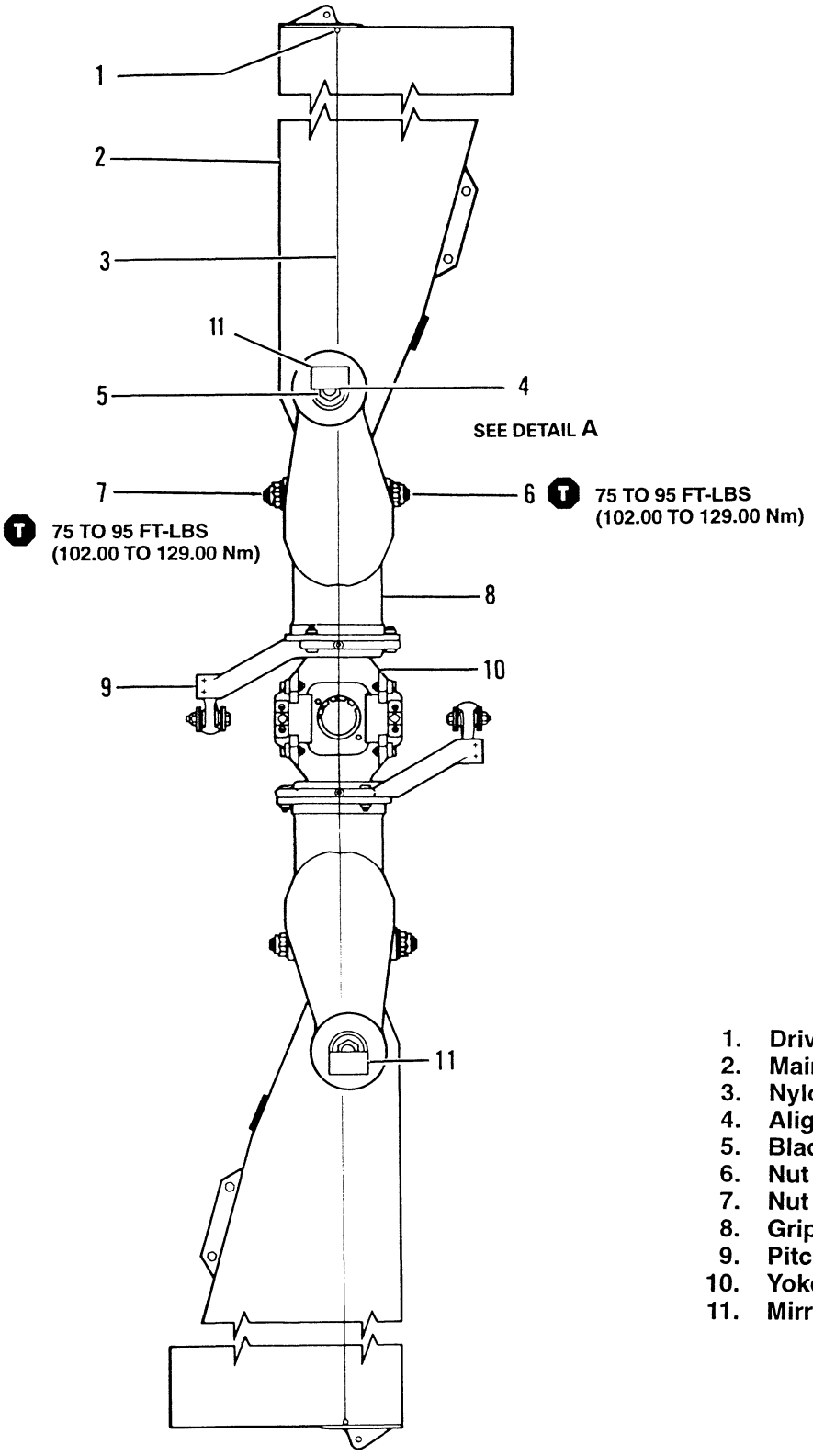
Index parts 1, 4, 8, 11, and 12 with pencil or ink to keep parts aligned during balance procedures as shown. Special tools sets T101544 and T101576 must be used in conjunction with each other.

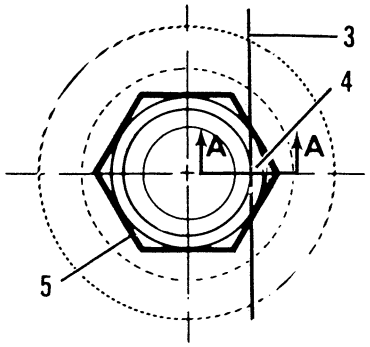


1. Bull's eye level (3604BLK)
2. Screw (NAS1351-6-16)
3. Washer (AN960-616)
4. Plug (T101576-23)
5. Pin (MS20392-4C53)
6. Lock (T101544-7)
7. Adjuster (T101544-9)
8. Base (T101576-13)
9. Washer (AN960PD416)
10. Screw (NAS1351-4-16)
11. Mandrel assembly (T101576-3)
12. Stand assembly (T101576-7)
13. Screws (NAS1351-4-16) and nuts (AN316-4R)
14. Plate (T101576-19)

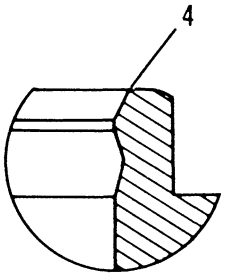
206A/BS-M-62-25

Figure 62-25. Main rotor balancing — tool application





DETAIL A

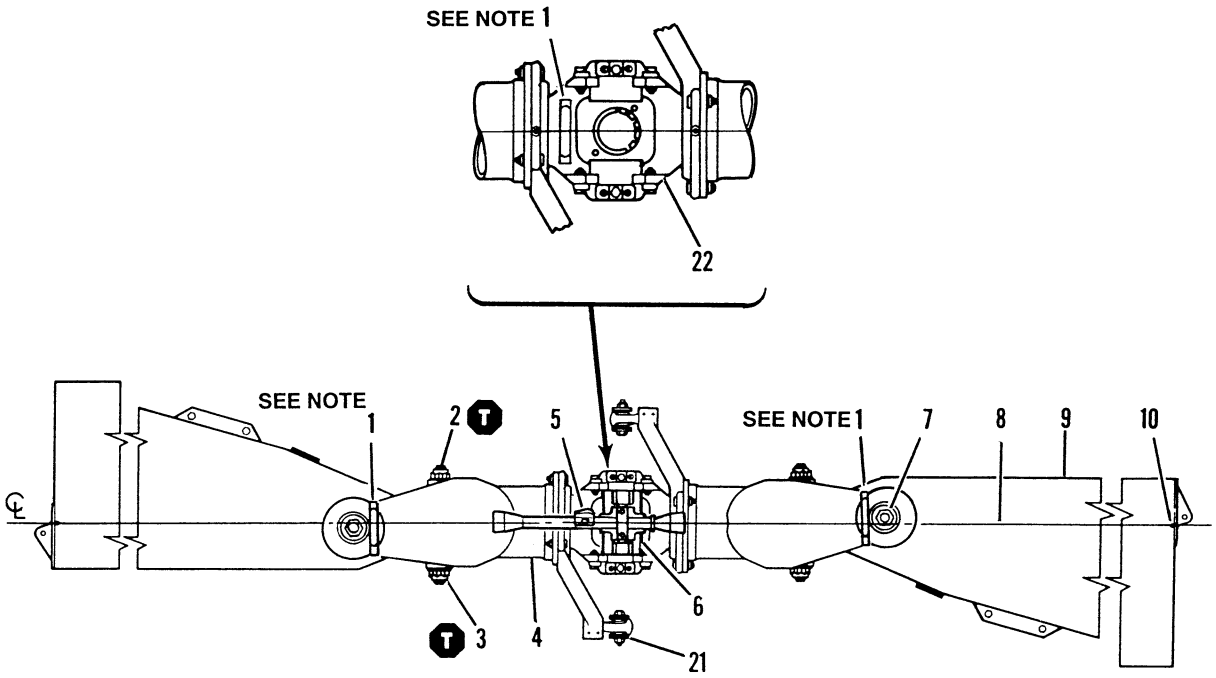


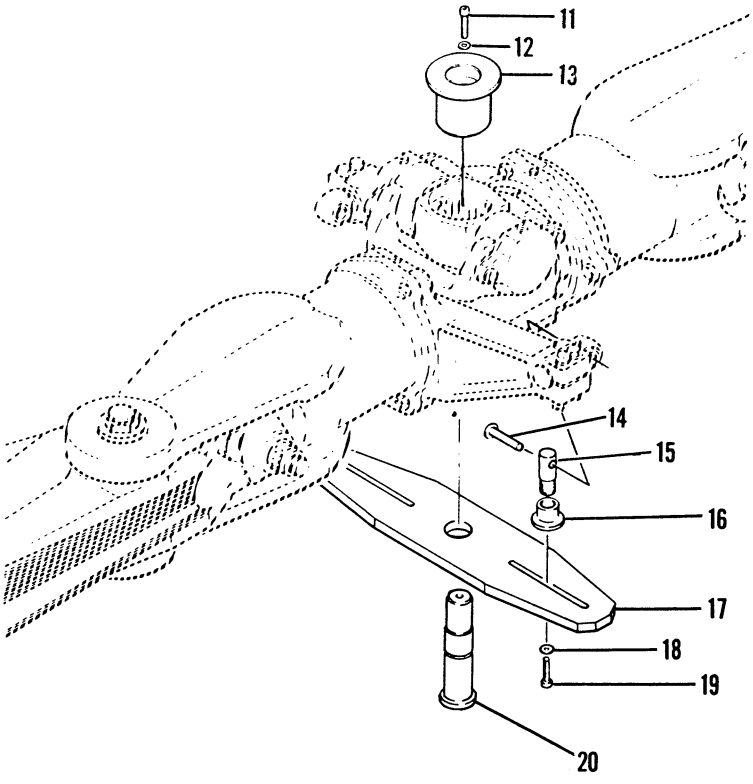
SECTION A-A

1. Drive pin
2. Main rotor blade
3. Nylon cord (fish line)
4. Alignment point (top edge of chamfer)
5. Blade bolt
6. Nut
7. Nut
8. Grip
9. Pitch horn
10. Yoke
11. Mirror

206A/BS-M-62-26

Figure 62-26. Main rotor blade alignment — string method





1. Protractor (zeroing point)
2. Trailing edge nut
3. Leading edge nut
4. Grip
5. T101401 scope assembly
6. T101532 support assembly
7. Blade bolt
8. Pitch change axis
9. Main rotor hub and blade
10. Drive pin (alignment point)
11. Screw
12. Washer
13. Plug
14. Pin
15. Lock
16. Adjuster
17. Base
18. Washer
19. Screw
20. Mandrel assembly
21. Bearings
22. Yoke
23. Spacer

NOTE

Protractor must be aligned as shown.

T 75 TO 95 FT-LBS (102.00 TO 129.00 Nm)

206A/BS-M-62-27

Figure 62-27. Main rotor hub and blade alignment — scope method

9. Remove caps (20, figure 62-23) from each main rotor blade bolt (6). Locate drivescrew (1, figure 62-26) on upper surface of main rotor blades at tip end approximately 3 inches (76.20 mm) aft of leading edge. Attach a thin nylon cord (fish line) between the alignment pins (drivescrews) at tip of each blade. Draw the cord taut and secure in place with tape.

10. Torque nuts (6 and 7) T.

11. To determine the vertical position of the cord in relation to the blade bolt use two small mirrors (11). Lay the mirrors across the open top flange of the blade bolts (4). With one eye view the cord, the mirror image of the cord, and the alignment point on the blade bolt. When all three reference points are aligned, at both blade bolts, the main rotor blades are aligned. Ensure that the blades are not binding on the outer support stands when blade sweep adjustments are made. If wheeled supports are not used, raise blade tip to clear outboard support stand and lower vertically each time a sweep adjustment is made.

12. Align hub and blade assembly as follows:

a. Loosen nut (9, figure 62-23) to prevent binding while sweeping blade.

b. Adjust leading and trailing edge nuts (6 and 7, figure 62-26) by loosening one nut and tightening the other until main rotor blades are aligned. Always retorque both nuts, and verify zero blade angle step 8. before checking results.

c. Adjust nuts (6 and 7) to sweep blades, as required, to position cord (3) in alignment with cord in mirror and chamfer of blade bolt (figure 62-26, detail A).

d. Ensure that the blades are not binding on the outer support stands when blade sweep adjustments are made. If wheeled support workaids (figure 62-24) are used, binding should not occur. If wheeled support workaids are not used, raise blade tip to clear outboard support stand and lower vertically each time a sweep adjustment is made.

13. An alternate method using two small mirrors may be used (figure 62-26).

a. Lay the two mirrors (11) across the open top flange of the blade bolts (5). With one eye, view the nylon cord, the mirror image of the nylon cord, and alignment point (4) on the blade bolt. When all three reference points are aligned at both blade bolts, the main rotor blades are aligned, and verify zero blade angle before taking visual measurements.

14. Secure nuts (6 and 7) T. If blades are to be balanced immediately, do not torque nuts (6 and 7) now.

15. Secure nut (9) T.

16. Balance the main rotor assembly (paragraph 62-42).

62-43. ALIGNMENT — SCOPE METHOD.

SPECIAL TOOLS REQUIRED

NUMBER	NOMENCLATURE
T100220	Sling
T101401	Scope Assembly
T101532	Support Assembly
T101544	Adapter Set
T101576	Balance Set
Figure 62-22	T-Handle Workaid
Figure 62-24	Blade Wheeled Support Workaid

NOTE

The center stand used to support the hub and blade assembly should be positioned directly beneath a hoist, and have three point leveling screws. The stand shall also have a steel top, or a piece of steel plate thick enough to resist flexing, fastened to the top.

NOTE

Blade alignment may be more easily accomplished by use of wheeled supports between main rotor blade and rotor blade support stands (9, figure 62-24). Wheeled supports will permit the main rotor blades to move forward and aft on support stands when sweep adjustments are made during main rotor blade alignment.

CAUTION

DO NOT ALLOW MAIN ROTOR GRIPS OR YOKE TO ROTATE ON PITCH CHANGE AXIS. IF GRIP OR YOKE IS ALLOWED TO ROTATE ON THE PITCH CHANGE AXIS BEYOND 90 DEGREES, THE MAIN ROTOR GRIP RETENTION STRAPS MUST BE REPLACED. SECURE MAIN ROTOR BLADES GRIP THROUGH PITCH HORNS TO YOKE WITH LOCKWIRE OR SUITABLE WORKAID.

1. Ensure that T-handle workaids are installed through the pitch horn trunnion bearings and yoke to avoid damaging straps (figure 62-22).

2. Attach a T100220 sling and raise main rotor hub and blade assembly about 1.0 foot (304.80 mm).

3. Place base (17, figure 62-27) at right angle to main rotor blades under yoke. Lower hub and blade assembly onto two fabricated parallel supports placed on the stands beneath main rotor hub yoke. Supports may be fabricated from aluminum bars approximately 2 x 3 x 12 inches (50.80 x 76.20 x 304.80 mm) or a suitable substitute. Lower main rotor hub and blade until base (17) rests on supports.

CAUTION

BLADE SUPPORTS SHOULD HAVE STOPS AT EACH END TO PREVENT BLADE AND WHEELED SUPPORTS FROM ROLLING OFF STANDS.

4. Support each main rotor blade at approximate preconed angle with two rotor blade support stands (9, figure 62-24) and wheeled supports manufactured in previous steps. Position stands about 5 feet (1524.00 mm) inboard from blade tip.

5. Remove T-handle workaids (figure 62-22) from pitch horn trunnion bearing and yoke.

6. Install locks (15, figure 62-27) and adjusters (16) on base (17) with screws (19) and washers (18). Secure locks to rotor blade pitch horns with pins (14).

7. Place bubble protractor (1) on flat surface of yoke. Adjust three leveling screws on stand to achieve level. Tighten nuts on leveling screws. Reposition bubble protractor on flat machined surface of one grip (4) adjacent to blade bolt (7). Adjust locks (15) to zero degrees pitch angle with the yoke. Repeat procedure on opposite grip.

NOTE

If tools specified in steps 3., 6., and 7. are not available, allow main rotor hub and blade to rest on stand and use machinists jacks or other means to position main rotor grips to zero degrees pitch angle.

8. Secure trailing and leading edge nuts (2 and 3) (T).

9 Position support assembly (6) through trunnion with legs resting on pillow blocks. Place T101401 scope assembly (5) in support as shown.

10. Check scope for zero adjustment.

a. Sight through scope at a surface approximately 50 feet (1524 mm) away.

b. Draw a straight vertical mark on surface aligned with vertical crosshair.

c. Loosen clamp screws on scope mount, rotate scope 180 degrees on tube axis, and tighten clamp screws.

d. Take another sight to check that vertical crosshair aligns with line previously marked.

e. If vertical crosshair fails to align on target line, adjust scope as follows:

(1) Make a second vertical line at new alignment of vertical crosshair.

(2) Make a third vertical line midway between first and second vertical lines.

(3) Adjust scope by turning screw marked L on side of scope to align vertical crosshair on third vertical line.

(4) Loosen clamp screws on scope mount, rotate scope 180 degrees on tube axis, check that vertical crosshair aligns with target line. Repeat procedure until alignment is correct.

11. Locate drivepin (10) on upper surface of main rotor blade at tip end and about 3 inches (76.20 mm) aft of leading edge.

12. Sight through scope to blade alignment point, drivepin (10), on surface of either blade. Center of drivepin head should align on vertical crosshair within 0.1 inch (2.54 mm) forward and 0.4 inch (10.16 mm) aft.

13. Reverse T101401scope assembly (5) on T101532 support assembly (6). Repeat step 12. to check alignment on opposite blade. Blade to blade difference must not exceed 0.050 inch (1.27 mm).

NOTE

Ensure main rotor blades are not binding on the outer support stands when making blade sweep adjustment. If wheeled supports are not used, raise blade tip to clear outboard support stands and lower vertically each time sweep adjustments are made.

14. If main rotor blades are not aligned as described in steps 12. and 13, loosen nuts on blade bolts. Adjust leading or trailing edge nuts (2 and 3) by loosening one nut and tightening the other until main rotor blades are aligned. Always torque both nuts (2 and 3) (T) before checking results.

15. Torque nut (9, figure 62-23) (T) on blade bolt.

16. When blade alignment is complete, remove scope (5, figure 62-27) and support assembly (6).

17 Balance main rotor hub and blade assembly (paragraph 62-42).

62-44. BALANCING — STATIC METHOD.

SPECIAL TOOLS REQUIRED

NUMBER	NOMENCLATURE
T100220	Sling
T101544	Main Rotor Balance Adapater Set
T101576	Balanace Set
T101576-1	Standard
T101576-3	Mandrel
T101576-7	Standard
T101576-21	Washer

NOTE

T101544 Main rotor balance adapter set and T101576 balance set shall be used together.

Rework of T101576-3 mandrel assembly and use of T101576-21 washer will reduce sensitivity during main rotor hub and blade assembly balancing (figure 62-25 and 62-28).

NOTE

Main rotor assembly shall be removed from stand each time sweep adjustments are made. Three small holes about 1/8 inch (3.18 mm) deep drilled in metal covered center support stand to accommodate the three legs of stand will prevent shifting of stand during balancing procedures.

CAUTION

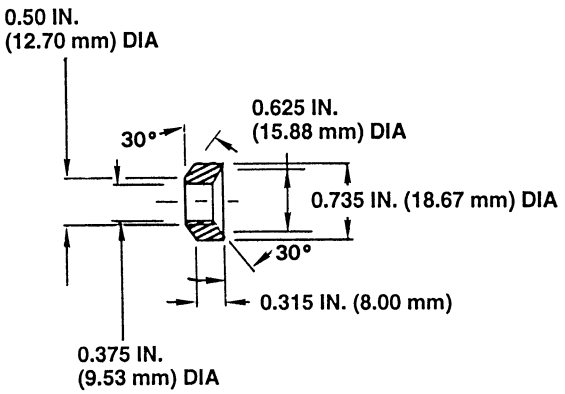
DO NOT ALLOW MAIN ROTOR GRIPS OR YOKE TO ROTATE ON PITCH CHANGE AXIS. IF GRIP OR YOKE IS ALLOWED TO ROTATE ON THE PITCH CHANGE AXIS BEYOND 90 DEGREES, THE MAIN ROTOR GRIP RETENTION STRAP/S MUST BE REPLACED. SECURE MAIN ROTOR BLADE GRIP THROUGH PITCH HORNS TO YOKE WITH LOCKWIRE OR SUITABLE WORKAID.

1. Align main rotor blades (paragraph 62-40 or 62-41).

2. Install T100220 sling and raise main rotor hub and blade clear of stand assembly (12, figure 62-25). Place stand assembly (12) beneath main rotor hub on center support stand. Remove stands used to support blades at preconed angle during alignment procedure to permit main rotor blades to assume natural position. Carefully lower main rotor assembly on stand assembly (12) to prevent damage to stand and ball located in mandrel assembly (11). Hold stand assembly (12) in position and raise main rotor assembly clear of stand.

NOTE

The main rotor assembly must be removed from T101576-7 stand assembly (12) each time sweep adjustments are made. It may be advisable to drill three small holes about 1/8 inch (3.18 mm) deep in the metal covered center support stand to accommodate the three legs of T101576-1 stand assembly (12). The three legs of the stand would act as dowels and prevent shifting of stand and possible change in level when the main rotor is removed for sweep adjustment.

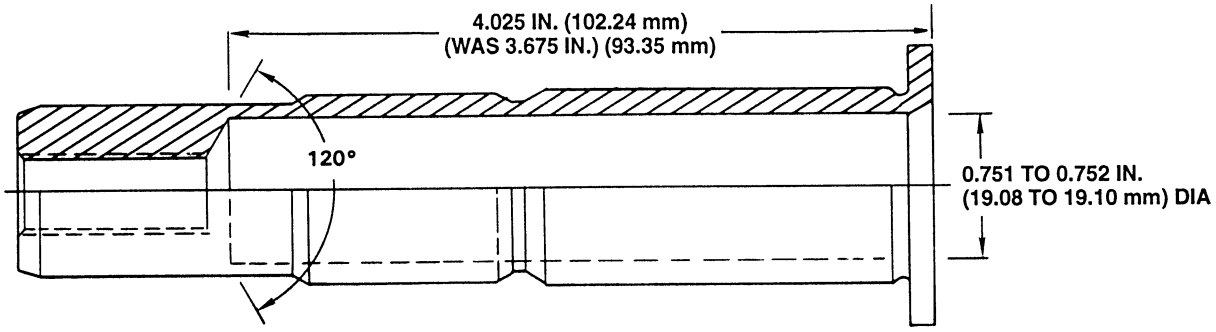


MATERIAL: 440C STEEL, 180-200 KSI. 1.0 IN. (25.40 mm) DIA X 0.5 IN. (12.70 mm)
IDENTIFY TOOL AS PART NO. T101576-21

SPACER, BALANCE SET

NOTE

Use of T101544-5 spacer and rework of T101576-3 mandrel assembly will reduce sensitivity during main rotor balancing.



REWORK MANDREL ASSEMBLY BY EXTENDING DEPTH OF BORE TO 4.052 IN. (102.92 mm) WITH 0.751 TO 0.752 IN. (19.08 TO 19.10 mm) DRILL. MAINTAIN 120° BEVEL AT BOTTOM OF BORE.

206A/BS-M-62-28

Figure 62-28. Spacer — balance set

3. Index position of stand assembly (12) by marking around its base on center support stand with a pencil or use locating holes. Place plate (14) on stand assembly (12). Place bull's eye level (1) on plate. Level stand by adjusting screws (13) in triangular base of stand. Remove level and plate.

4. Zero main rotor balancing tool before starting balance procedures.

a. Index position of stand on center support stand (drilled holes). Place plate (14) on stand assembly (12). Place bull's eye level (1) on plate. Level stand by adjusting screws (13) in triangular base of stand. Remove level and plate.

b. Place base (8), mandrel assembly (11), and plug (4) on T101576-3 mandrel assembly (11) and secure with screw (2) and washer (3). Install locks (6), and adjusters (7) on outboard end of slot in base with screws (10), washers (9), and pins (5). Ensure locks are spaced equally from mandrel before balance.

c. Place bull's eye level (1) in recess at top of plug (4) and check for chordwise and spanwise balance of tool set. Add washers to base (8) as required to compensate for balance of tool set. Attach washers to same relative position on lower surface of base (8) with tape.

d. Index mark position of all tool set parts when disassembling for future reference.

e. Remove stand assembly (12) from center support stand.

5. Main rotor hub and blade assembly shall be aligned before assembly is balanced (paragraph 62-40 or 62-42).

CAUTION

DO NOT ALLOW MAIN ROTOR GRIPS OR YOKE TO ROTATE ON PITCH CHANGE AXIS. IF GRIP OR YOKE IS ALLOWED TO ROTATE ON THE PITCH CHANGE AXIS BEYOND 90 DEGREES, THE MAIN ROTOR GRIP RETENTION STRAP/S MUST BE REPLACED. SECURE MAIN ROTOR BLADE GRIP THROUGH PITCH HORNS TO YOKE WITH LOCKWIRE OR SUITABLE WORKAID.

6. Remove flap restraint from main rotor hub trunnion.

7. Ensure T-handle workaid is installed through the pitch horn trunnion bearing and yoke to avoid damaging straps (figure 62-22).

8. Attach T100220 sling and raise main rotor hub and blade assembly about 1.0 foot (304.80 mm) from center support stand. Align index mark and place base (8, figure 62-25) on mandrel assembly (11), and insert through main rotor hub trunnion from bottom. Place plug (4) on mandrel assembly (11) and secure with screw (2) and washer (3). Position base (8) at right angle to main rotor blades.

9. Place two parallel supports 90 degrees to yoke on stand beneath main rotor. Supports may be fabricated from aluminum bars approximately 2 x 3 x 12 inches (50.80 x 76.20 x 304.80 mm) or a suitable substitute. Lower main rotor hub and blade until base (8) rests on supports.

10. Support each main rotor blade at approximately preconed angle with two rotor blade support stands (9, figure 32-24). Position stands about 5 feet (1524.00 mm) inboard from blade tip.

11. Remove T-handle workaid from pitch horn trunnion bearing and yoke.

12. Install index marked locks (6) and adjusters (7) on base (8) with screws (10) and washers (9). Secure locks to rotor blade pitch horns with pins (5).

13. Place bubble protractor (1, figure 62-27) on flat surface of yoke. Adjust three leveling screws of center stand as required to accomplish leveling and tighten locknuts. Reposition bubble protractor on flat machined surface of one grip (4) adjacent to blade bolt (7). Adjust locks (15) to set grip to zero degrees pitch angle with the yoke. Repeat procedure on opposite grip.

14. Attach T100220 sling and raise main rotor assembly from center support stand. Remove two parallel bars from center stand and position stand assembly (12, figure 62-25) beneath main rotor assembly. Position plate (14) on stand assembly (12). Place bull's eye level (1) on plate. Level stand by adjusting screws (13) in triangular base of stand. Remove level and plate.

15. Remove rotor blade support stands (9, figure 62-24) used to support blades at preconed angle during alignment procedure to permit main rotor blades to assume natural position. Carefully lower main rotor assembly on stand assembly (12, figure 62-25) to prevent damage to stand and ball located in mandrel assembly (11).

NOTE

Main rotor hub and blade can only be balanced in a draft free area.

NOTE

Ensure trunnion and grip bearing cavities are serviced with grease (C-001).

16. Place bull's eye level (1) in recess at top of plug (4). Check for chordwise and spanwise balance.

a. For 206-011-100-021 hub, correct chordwise balance as follows:

CAUTION

DO NOT MAKE SWEEP ADJUSTMENTS WITH ROTOR RESTING ON STAND ASSEMBLY (12, FIGURE 62-25). DAMAGE TO STAND MAY RESULT.

NOTE

Do not sweep blades forward. Blade sweep adjustments are sensitive. Do not exceed 3 points turn on nut (12, figure 62-23). Make pencil or paint index marks on nuts and blade latches. Record all changes.

NOTE

If more than 3 points turn on nut (12, figure 62-23) is required to attain chordwise balance, main rotor hub trunnion centering and/or blade alignment shall be verified.

(1) Raise main rotor clear of stand. Loosen nut on blade bolt (6) in blade to be swept and make sweep adjustments. Secure nuts (12) (T). Secure nuts (9) (T) on blade bolt (6). Carefully replace rotor assembly on stand and recheck chordwise balance. Repeat as required.

b. For 206-011-100-127 and subsequent hubs, correct chordwise balance as follows:

(1) Balance rotor assembly chordwise by adding or removing washer (weights) (22, 23, and 24) in any combination. Two threads minimum shall be visible on stud (28) after nut (25) is torqued.

(2) If weight stack up required to attain chordwise balance exceeds stud capacity, main rotor hub trunnion centering and/or blade alignment shall be verified.

(3) As an alternative method for chordwise balance, one blade may be swept aft. Refer to chordwise balance procedure in step 16. a. Secure nut (9) (T).

17. Check spanwise balance.

a. Carefully position main rotor assembly on stand assembly (12, figure 62-25).

b. Remove cap (20,figure 62-23) from blade bolt (6) and inspect interior of both blade bolts for presence of weights. Use mechanical fingers to remove any weights.

c. Add lead weights to blade bolt cavity on light blade to balance rotor spanwise. Replace cap (20) with new packing (19).

18. Raise main rotor clear of stand and remove balance tools from rotor.

NOTE

If blade bolt weight cavity is full and more weight is still needed call Bell Helicopter Textron Product Support Engineering, for assistance.