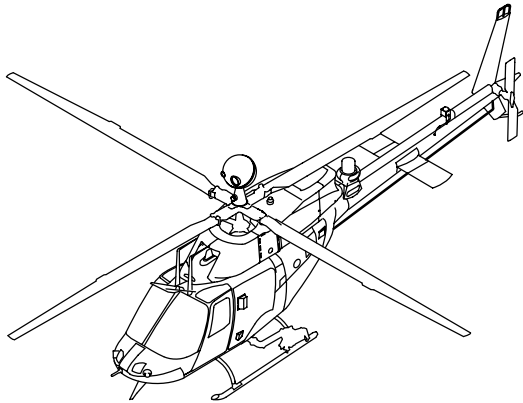

TECHNICAL MANUAL

**AVIATION UNIT AND
INTERMEDIATE
MAINTENANCE
MANUAL**



FLIGHT CONTROLS	11
------------------------	-----------

ENVIRONMENTAL CONTROL SYSTEMS	12
--	-----------

MISSION EQUIPMENT	13
--------------------------	-----------

EMERGENCY EQUIPMENT	14
----------------------------	-----------

**ARMY MODEL
OH-58D HELICOPTER**

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Headquarters, Department of the Army

28 FEBRUARY 2000

CHANGE

NO. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 31 January 2001

Aviation Unit and Intermediate
Maintenance Manual

**ARMY MODEL
OH-58D HELICOPTER**

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Remove pages	Insert pages
i and ii	i and ii
11-417 through 11-430	11-417 through 11-430
11-435 through 11-440	11-435 through 11-440
-----	11-440.1/11-440.2 blank
11-441 through 11-444	11-441 through 11-444
-----	11-444.1 and 11-444.2
11-445 through 11-478	11-445 through 11-478
11-481 through 11-492	11-481 through 11-492
11-495 through 11-502	11-495 through 11-502
11-505 through 11-522	11-505 through 11-522
11-531 and 11-532	11-531 and 11-532
11-539 and 11-540	11-539 and 11-540
11-543 and 11-544	11-543 and 11-544
11-549 and 11-550	11-549 and 11-550
12-9 through 12-18	12-9 through 12-18
12-25 through 12-28	12-25 through 12-28
12-31 through 12-38	12-31 through 12-38
12-41 and 12-42	12-41 and 12-42
12-45 through 12-48	12-45 through 12-48
13-1 and 13-2	13-1 and 13-2
13-7 through 13-10	13-7 through 13-10
13-15 and 13-16	13-15 and 13-16
13-23 through 13-28	13-23 through 13-28
13-33 through 13-44	13-33 through 13-44

Remove pages
13-47 through 13-50
13-51 through 13-56

13-57 through 13-60
14-9/(14-10 blank)
Index 1 through Index 74

Insert pages
13-47 through 13-50
13-55 blank/13-56

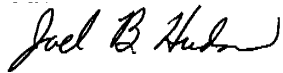
13-56.1 through
13-56.41/(13-56.42 blank)
13-57 through 13-60
14-9/(14-10 blank)
Index 1 through Index 74

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JOEL B. HUDSON
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Remove pages	Insert pages
A/(B blank)	A and B
a through d	a through d
i through xii	i through xii
xv through xxix/(xxx blank)	xv through xxix/(xxx blank)
11-3 through 11-6	11-3 through 11-6
11-9 through 11-16	11-9 through 11-16
11-19 through 11-32	11-19 through 11-32
11-35 and 11-36	11-35 and 11-36
11-39 and 11-40	11-39 and 11-40
11-43 through 11-56	11-43 through 11-56
11-59 through 11-84	11-59 through 11-84
-----	11-84.1/(11-84.2 blank)
11-85 through 11-88	11-85 through 11-88
11-91 through 11-152	11-91 through 11-152
11-155 through 11-208	11-155 through 11-208
11-213 through 11-216	11-213 through 11-216
11-219 through 11-228	11-219 through 11-228
11-231 through 11-324	11-231 through 11-324
11-327 through 11-336	11-327 through 11-336
11-339 through 11-394	11-339 through 11-394
11-397 and 11-398	11-397 and 11-398
11-401 through 11-406	11-401 through 11-406

TM 1-1520-248-23-5

C 1

Remove pages
11-409 through 11-416
Glossary-1/(Glossary-2 blank)
Index-1 through Index-15/
(Index-16 blank)

Insert pages
11-409 through 11-416
Glossary-1 through Glossary-8
Index-1 through Index-74

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WARNING

HIGH VOLTAGE

The helicopter contains high voltage and shall be electrically grounded when parked. Serious burns and electrical shock can result from contact with exposed electrical wires or connectors.

WARNING

HIGH VOLTAGE

High voltage may be stored in the ignition system after operation of the APU. This high voltage can cause injury or death.

- Do not make contact with exposed wires or connectors.
- Allow at least 5 minutes after operation of the ignition system before disconnecting or removing ignition system components.
- Turn all power switches off before making any connections or disconnections.
- Observe instructions for grounding the power cable to discharge high voltage.
- For artificial respiration, refer to FM 21-11.

WARNING

STRAY VOLTAGE

Stray voltage may exist in electronic equipment installed in the helicopter. These voltages present an explosive hazard to fuel and fuel fumes. Severe injury or death could result.

WARNING

PITOT HEAT

The pitot tube assembly is very hot during and immediately after operation requiring pitot heat. Severe burns will result if contacted by hands or other parts of the body.

WARNING**LUBRICATING OILS HAZARDOUS**

Lubricating oils DOD-L-85734, MIL-L-7808, and MIL-L-23699 contain materials hazardous to health. They can cause paralysis if swallowed. Prolonged contact with skin can cause irritation. Fire can result if oil is exposed to heat or flames.

- Use only in areas with adequate ventilation.
- Wash hands thoroughly after handling.

WARNING

The laser rangefinder/designator (LRF/D) is very dangerous. Looking at the laser beam or its reflection from a shiny surface can cause permanent blindness. Under noncombat conditions, the laser shall be used only in controlled areas and at times specified by a range control officer.

BATTERY ELECTROLYTE

Corrosive battery electrolyte (potassium hydroxide) requires rubber gloves, apron, and face shield when handling leaking batteries. Potassium hydroxide spilled on clothing or other material shall be washed immediately with clean water. If spilled on personnel, severe skin burns will result. Immediately start flushing the affected area with clean water and continue flushing until medical assistance arrives.

**WARNING
RADIATION HAZARD****SELF-LUMINOUS DIALS**

Self-luminous instrument dials contain radioactive materials.

- If glass is broken or case becomes unsealed, avoid personal contact. Injury to personnel could result.
- Forceps or gloves made of rubber or polyethylene shall be used to pick up contaminated material.
- Place material and gloves in a plastic bag. Seal bag and dispose of it as radioactive waste in accordance with AR 755-15 and TM 3-261.
- Repair procedure shall conform to requirements in AR 700-52.

WARNING

DRYCLEANING SOLVENT

Drycleaning solvent is flammable and toxic. It can irritate skin and cause burns.

- Use only in well-ventilated area away from heat and open flame.
- Wear rubber gloves and goggles.
- In case of contact, immediately flush skin or eyes with water for at least 15 minutes.
- Get medical attention for eyes.

WARNING

SOUND LEVEL

Sound pressure levels in this helicopter during operating conditions exceed the Surgeon General hearing conservation criteria. Hearing protection devices, such as aviator helmet or ear plugs or ear sound suppressors, are required to be worn by all personnel in and around the helicopter during its operation.

WARNING

MAIN AND TAIL ROTOR BLADES

Stay clear of turning main and tail rotor blades. Wind gusts, coast down or cyclic movement may cause the main rotor blade to flap down below the height of a person. Dangerous winds are created by the main rotor blades when blades are operated at or near top rpm. Adequate distance must be maintained from main and tail rotor blades during operation. Severe injury or death may result.

WARNING

ARMAMENT

Loaded weapons, or weapons being loaded or unloaded, shall be pointed in a direction which offers the least exposure to personnel or property in the event of accidental firing. Personnel should remain clear of hazardous area of all loaded weapons. Death or severe injury may result.

WARNING

HF ANTENNA

Ensure that HF antenna is not operating while performing maintenance. When operating, HF antenna emits infrared radiation that can cause radiation burns. If exposed to infrared radiation, seek medical aid immediately.

WARNING

ASBESTOS DUST

Avoid creating dust. Breathing asbestos dust may cause serious long-term bodily harm.

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGED PAGES. DESTROY SUPERSEDED PAGES.

NOTE: The portion of the text affected by the changes is indicated by a vertical bar in the outer margins of the page. Changes to illustrations are indicated by a vertical bar or a pointing hand adjacent to the area of the change.

Dates of issue for original and changed pages are:

Original..... 0... 28 February 2000
 Change..... 1... 30 November 2000
 Change..... 2... 31 January 2001

TOTAL NUMBER OF PAGES IN THIS VOLUME IS 848, CONSISTING OF THE FOLLOWING:

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
Cover-1	1	11-73	0	11-142	0
Cover-2 Blank	0	11-74 — 11-78	1	11-143 — 11-145	1
A — C	2	11-79	0	11-146	0
D Blank	2	11-80 — 11-81	1	11-147 — 11-149	1
a — d	1	11-82 — 11-83	0	11-150	0
i	2	11-84	1	11-151	1
ii — xii	1	11-84.1 Added	1	11-152 — 11-154	0
xiii — xiv	0	11-84.2 Blank	1	11-155 — 11-167	1
xv	1	11-85	0	11-168 — 11-169	0
xvi — xvii	0	11-86	1	11-170	1
xviii — xxix	1	11-87	0	11-171	0
xxx Blank	0	11-88	1	11-172 — 11-174	1
11-1 — 11-2	0	11-89 — 11-91	0	11-175	0
11-3	1	11-92 — 11-95	1	11-176 — 11-179	1
11-4 — 11-5	0	11-96	0	11-180	0
11-6	1	11-97 — 11-98	1	11-181	1
11-7 — 11-8	0	11-99	0	11-182 — 11-183	0
11-9 — 11-12	1	11-100	1	11-184 — 11-194	1
11-13	0	11-101	0	11-195	0
11-14	1	11-102	1	11-196 — 11-197	1
11-15	0	11-103	0	11-198 — 11-199	0
11-16	1	11-104 — 11-108	1	11-200 — 11-202	1
11-17 — 11-18	0	11-109	0	11-203	0
11-19	1	11-110	1	11-204 — 11-207	1
11-20 — 11-21	0	11-111	0	11-208 — 11-212	0
11-22 — 11-24	1	11-112 — 11-116	1	11-213 — 11-215	1
11-25	0	11-117	0	11-216 — 11-218	0
11-26	1	11-118 — 11-120	1	11-219 — 11-228	1
11-27	0	11-121	0	11-229 — 11-230	0
11-28	1	11-122	1	11-231 — 11-233	1
11-29	0	11-123	0	11-234	0
11-30 — 11-31	1	11-124	1	11-235	1
11-32 — 11-35	0	11-125	0	11-236	0
11-36	1	11-126 — 11-128	1	11-237 — 11-241	1
11-37 — 11-38	0	11-129	0	11-242	0
11-39	1	11-130	1	11-243	1
11-40 — 11-43	0	11-131	0	11-244	0
11-44 — 11-55	1	11-132	1	11-245 — 11-256	1
11-56 — 11-58	0	11-133	0	11-257	0
11-59 — 11-64	1	11-134	1	11-258	1
11-65	0	11-135	0	11-259	0
11-66	1	11-136	1	11-260 — 11-267	1
11-67	0	11-137	0	11-268	0
11-68 — 11-69	1	11-138 — 11-139	1	11-269 — 11-277	1
11-70 — 11-71	0	11-140	0	11-278	0
11-72	1	11-141	1	11-279	1

* Zero in this column indicates an original page.

LIST OF EFFECTIVE PAGES (Cont)

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
11-280	0	11-376	0	11-470	0
11-281	1	11-377 — 11-381	1	11-471 — 11-476	2
11-282	0	11-382	0	11-477	0
11-283	1	11-383 — 11-385	1	11-478	2
11-284 — 11-285	0	11-386	0	11-479 — 11-481	0
11-286 — 11-287	1	11-387 — 11-388	1	11-482 — 11-483	2
11-288	0	11-389	0	11-484	0
11-289 — 11-292	1	11-390 — 11-391	1	11-485 — 11-486	2
11-293	0	11-392 — 11-393	0	11-487	0
11-294 — 11-297	1	11-394	1	11-488 — 11-490	2
11-298	0	11-395 — 11-397	0	11-491	0
11-299 — 11-300	1	11-398	1	11-492	2
11-301	0	11-399 — 11-400	0	11-493 — 11-494	0
11-302 — 11-309	1	11-401 — 11-404	1	11-495	2
11-310	0	11-405	0	11-496	0
11-311	1	11-406	1	11-497 — 11-500	2
11-312	0	11-407 — 11-408	0	11-501	0
11-313	1	11-409 — 11-411	1	11-502	2
11-314	0	11-412	0	11-503 — 11-504	0
11-315	1	11-413	1	11-505	2
11-316	0	11-414	0	11-506	0
11-317	1	11-415	1	11-507 — 11-511	2
11-318	0	11-416	0	11-512	0
11-319	1	11-417	0	11-513 — 11-516	2
11-320	0	11-418 — 11-421	2	11-517	0
11-321	1	11-422	0	11-518 — 11-519	2
11-322	0	11-423	2	11-520 — 11-521	0
11-323 — 11-324	1	11-424	0	11-522	2
11-325 — 11-326	0	11-425	2	11-523 — 11-530	0
11-327	1	11-426	0	11-531	2
11-328	0	11-427	2	11-532 — 11-539	0
11-329 — 11-330	1	11-428	0	11-540	2
11-331	0	11-429	2	11-541 — 11-542	0
11-332	1	11-430 — 11-435	0	11-543	2
11-333	0	11-436	2	11-544 — 11-548	0
11-334 — 11-336	1	11-437	0	11-549	2
11-337 — 11-338	0	11-438 — 11-439	2	11-550 — 11-554	0
11-339 — 11-343	1	11-440	0	12-1 — 12-9	0
11-344	0	11-440.1 Added	2	12-10 — 12-11	2
11-345 — 11-348	1	11-440.2 Blank	2	12-12	0
11-349	0	11-441 — 11-444	2	12-13 — 12-17	2
11-350	1	11-444.1 — 11-444.2	2	12-18 — 12-24	0
11-351	0	Added	2	12-25 — 12-28	2
11-352	1	11-445 — 11-446	2	12-29 — 12-30	0
11-353	0	11-447	0	12-31 — 12-32	2
11-354 — 11-355	1	11-448 — 11-452	2	12-33	0
11-356 — 11-357	0	11-453	0	12-34 — 12-36	2
11-358 — 11-359	1	11-454 — 11-455	2	12-37	0
11-360 — 11-361	0	11-456	0	12-38	2
11-362 — 11-365	1	11-457 — 11-458	2	12-39 — 12-40	0
11-366	0	11-459	0	12-41	2
11-367 — 11-368	1	11-460 — 11-462	2	12-42 — 12-44	0
11-369	0	11-463	0	12-45 — 12-48	2
11-370 — 11-372	1	11-464	2	13-1	2
11-373	0	11-465	0	13-2 — 13-6	0
11-374 — 11-375	1	11-466 — 11-469	2	13-7 — 13-9	2

* Zero in this column indicates an original page.

LIST OF EFFECTIVE PAGES (Cont)

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
13-10 — 13-14	.....0	13-47	.....2	14-1 — 14-8	.....0
13-15	.....2	13-48	.....0	14-9	.....2
13-16 — 13-23	.....0	13-49 — 13-50	.....2	14-10 Blank	.....0
13-24 — 13-25	.....2	13-51 — 13-54 Deleted	.....2	Glossary-1	.....1
13-26	.....0	13-55 Blank	.....2	Glossary-2 —	
13-27	.....2	13-56	.....2	Glossary-4	.....0
13-28 — 13-32	.....0	13-56.1 — 13-56.41		Glossary-5	.....1
13-33 — 13-39	.....2	Added	.....2	Glossary-6 —	
13-40 — 13-41	.....0	13-56.42 Blank	.....2	Glossary-7	.....0
13-42	.....2	13-57 — 13-58	.....2	Glossary-8	.....1
13-43	.....0	13-59	.....0	Index 1 — Index 68	.....2
13-44	.....2	13-60	.....2	Index 69 — Index 74	
13-45 — 13-46	.....0	13-61 — 13-70	.....0	Added	.....2

**AVIATION UNIT AND INTERMEDIATE
MAINTENANCE MANUAL
FOR ARMY MODEL
OH-58D HELICOPTERS**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-MMC-LS-P, Redstone Arsenal, AL 35898-5230. You may also submit your recommended changes by E-mail directly to ls-lp@redstone.army.mil in the format provided in the back of this manual immediately preceding the hard copy 2028. DA Form 2028's may also be faxed to DSN 788-6546 or commercial fax 256-842-6546. A reply will be furnished to you.

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TABLE OF CONTENTS

PAGE

HOW TO USE THIS MANUAL vi

VOLUME 1

CHAPTER 1

INTRODUCTION

Section I	General Information.....	1-2
Section II	Equipment Description and Data	1-3
Section III	Principles of Operation.....	1-17
Section IV	Servicing	1-56
Section V	Lubrication.....	1-91
Section VI	Ground Handling and Jacking.....	1-101
Section VII	Mooring	1-124
Section VIII	Hoisting and Sling Loading.....	1-156
Section IX	Preventive Maintenance Inspections	1-165
Section X	Overhaul and Retirement Schedule	1-201
Section XI	Flight Safety Parts	1-203

*This manual together with TM 1-1520-248-23-1, TM 1-1520-248-23-2, TM 1-1520-248-23-3, TM 1-1520-248-23-4, TM 1-1520-248-23-6 and TM 1-1520-248-23-7, all dated 28 February 2000, supersedes TM 55-1520-248-23-1, TM 55-1520-248-23-2, TM 55-1520-248-23-3, TM 55-1520-248-23-4, TM 55-1520-248-23-5, TM 55-1520-248-23-6, TM 55-1520-248-23-7, TM 55-1520-248-23-8-1, TM 55-1520-248-23-8-2, and TM 55-1520-248-23-9, all dated 12 January 1988, including all changes.

TABLE OF CONTENTS (Cont)

PAGE

CHAPTER 2	AIRFRAME	
Section I	Cowlings, Fairings, Access Panels, and Doors	2-2
Section II	Fuselage (Cowlings, Fairings, Access Panels, and Doors)	2-10
Section III	Tailboom	2-354
Section IV	Pylon	2-481
CHAPTER 3	ALIGNING GEAR	
Section I	Landing Gear	3-1
GLOSSARY	.....	Glossary 1
ALPHABETICAL INDEX	.....	Index 1
 VOLUME 2		
CHAPTER 4	POWERPLANT	
Section I	Engine Assembly	4-2
Section II	Air Induction	4-91
Section III	Exhaust System	4-128
Section IV	Engine Oil System	4-134
Section V	Ignition System	4-179
Section VI	Powerplant Controls	4-180
Section VII	Engine Mounts	4-228
Section VIII	Forward Firewall	4-272
Section IX	Aft Firewall	4-287
CHAPTER 5	ROTORS	
Section I	Main Rotor Hub Blade Assembly	5-2
Section II	Main Rotor Controls	5-161
Section III	Main Rotor Tracking and Dynamic Balancing	5-334
Section IV	Tail Rotor Hub and Blades	5-369
Section V	Tail Rotor Pitch Change Mechanism	5-450
GLOSSARY	.....	Glossary 1
ALPHABETICAL INDEX	.....	Index 1
 VOLUME 3		
CHAPTER 6	DRIVE TRAIN SYSTEM	
Section I	Serviceability Checks	6-2
Section II	Engine to Transmission Driveshaft	6-23
Section III	Transmission	6-31
Section IV	Standpipe Electrical Assembly, Torquemeter System, and Main Rotor Mast Assembly	6-95
Section V	Freewheeling Unit	6-187
Section VI	Tail Rotor Driveshafts	6-239
Section VII	Tail Rotor Gearbox	6-327
Section VIII	Oil System	6-369

TABLE OF CONTENTS (Cont)

PAGE

CHAPTER 7	HYDRAULIC SYSTEM	
Section I	Actuators	7-2
Section II	Hydraulic System Bleeding	7-36
Section III	Hydraulic Filter Assemblies	7-39
Section IV	Hydraulic Hoses, Lines, Tubes, Fittings, and Quick-Disconnects	7-47
Section V	Pressure Switch, Manifolds, and Relief Valve	7-61
Section VI	Hydraulic Solenoid Valve	7-75
Section VII	Hydraulic Reservoir	7-86
Section VIII	Hydraulic Pump	7-108
CHAPTER 8	INSTRUMENT SYSTEMS	
Section I	Engine, Rotor and Transmission Instruments	8-2
Section II	Flight Instruments	8-45
Section III	Pitot-Static Instrument and Air Data Systems	8-59
Section IV	Navigation Instruments	8-77
Section V	Miscellaneous Instruments	8-77
GLOSSARY	.....	Glossary 1
ALPHABETICAL INDEX	.....	Index 1
 VOLUME 4		
CHAPTER 9	ELECTRICAL SYSTEM	
Section I	Avionics Cooling System	9-2
Section II	Avionic System Mounts	9-19
Section III	Direct Current Power and Distribution System	9-44
Section IV	Alternating Current Power and Distribution System	9-98
Section V	Lighting System	9-131
Section VI	Miscellaneous Electrical Equipment	9-175
Section VII	Powerplant and Transmission Electrical Equipment	9-405
Section VIII	Armament Electrical Equipment	9-440
CHAPTER 10	FUEL SYSTEM	
Section I	Fuel System Components	10-2
Section II	Fuel Cell	10-62
GLOSSARY	.....	Glossary 1
ALPHABETICAL INDEX	.....	Index 1
 VOLUME 5		
CHAPTER 11	FLIGHT CONTROLS	
Section I	Rigging	11-2
Section II	Collective Controls	11-55
Section III	Cyclic Control System	11-209
Section IV	Directional Controls	11-417
Section V	Component Inspection	11-521

TABLE OF CONTENTS (Cont)

PAGE

CHAPTER 12	ENVIRONMENTAL CONTROL SYSTEMS	
Section I	Heating System	12-2
Section II	Ventilating System	12-38
CHAPTER 13	MISSION EQUIPMENT	
Section I	Cargo Hook Suspension Assembly	13-2
Section II	Rapid Deployment	13-24
Section III	Rescue Ladder	13-58
CHAPTER 14	EMERGENCY EQUIPMENT	
Section I	Miscellaneous Emergency Equipment	14-2
GLOSSARY	.....	Glossary 1
ALPHABETICAL INDEX	.....	Index 1
 VOLUME 6		
APPENDIX A	REFERENCES	
APPENDIX B	MAINTENANCE ALLOCATION CHART (MAC)	
Section I	Introduction	B-1
Section II	Maintenance Allocation Chart	B-4
Section III	Tool and Test Equipment Requirements	B-26
Section IV	Remarks	B-38
APPENDIX C	HELICOPTER INVENTORY MASTER GUIDE	
APPENDIX D	EXPENDABLE AND DURABLE ITEMS LIST	
APPENDIX E	STORAGE OF HELICOPTER	
Section I	General Information	E-1
Section II	Flyable Storage	E-4
Section III	Short Term Storage	E-8
Section IV	Intermediate Storage	E-17
APPENDIX F	WIRING DATA	
APPENDIX G	WEIGHT AND BALANCE	
Section I	General Information	G-1
Section II	Instructions for Use of Forms and Charts	G-2
Section III	Weighing Instructions	G-26

TABLE OF CONTENTS (Cont)

PAGE

APPENDIX H	ILLUSTRATED LIST OF MANUFACTURED ITEMS (AVUM, AVIM)	
APPENDIX J	RESERVED FOR FUTURE USE	
APPENDIX K	RESERVED FOR FUTURE USE	
APPENDIX L	RESERVED FOR FUTURE USE	
APPENDIX M	ELECTRICAL BONDING PROCEDURES	
Section I	Introduction	M-1
Section II	Equipment Requirements	M-2
Section III	Resistance Requirements	M-2
Section IV	Procedures	M-3
Section V	Test	M-9
APPENDIX N	RESERVED FOR FUTURE USE	
APPENDIX P	STANDARD TORQUE VALUES	
APPENDIX Q	CORROSION CONTROL	
Section I	Introduction	Q-1
Section II	Inspection and Corrosion Prone Areas	Q-2
Section III	Preventive Maintenance	Q-2
Section IV	Processes and Equipment Requirements	Q-4
Section V	Corrosion Prone Areas	Q-4
APPENDIX R	RESERVED FOR FUTURE USE	
GLOSSARY	.....	Glossary 1
ALPHABETICAL INDEX	.....	Index 1
VOLUME 7		
FOLDOUTS	.....	FP-1

HOW TO USE THIS MANUAL

1. GENERAL

To get the job done correctly, you must be able to find all the information you need. Knowing how to use this manual is the key. You should know what is in this manual, how the manual is organized, and how to use it.

2. ORGANIZATION

- a. The complete OH-58D/OH-58D(R) Kiowa Warrior helicopter (AVUM/AVIM) maintenance manual consists of a set of seven volumes. These volumes are numbered as follows: TM 1-1520-248-23-1 through TM 1-1520-248-23-7.
- b. Volumes are made up of chapters. Each chapter is numbered in Arabic numerals (1, 2, 3, etc.). Each chapter has maintenance information on a particular helicopter system.
- c. Chapters are broken down into sections. Sections are numbered in Roman numerals (I, II, III, etc.).
- d. Sections are made up of paragraphs and tasks. The first three sections of Chapter 1 are made up of paragraphs that describe and locate the helicopter systems and components. Other sections throughout the manual are made up primarily of tasks, but all sections contain introductory paragraphs that describe the section contents. Sections cover major parts of a system.
- e. Tasks are detailed descriptions of maintenance procedures. Some tasks are brief. Some are several pages long.
- f. The title of each task contains the name of the component followed by the type of operation that is being described, e.g., Removal, Cleaning, Inspection, Repair, Installation, and others as applicable.
- g. A task starts with an initial setup (content detailed in paragraph 8.) which is followed by a step-by-step procedure on how to perform the task correctly. The steps in the procedures have illustrations to help make things clear.
- h. The words “INSPECT” or “INSPECT” may be seen in a task. “INSPECT” means that the repairer shall stop and check the component. “INSPECT” means that a Technical Inspector (TI) is required. Do not go beyond that point in the procedure until the TI has completed his inspection.
- i. If applicable, a paragraph at the end of a task called “FOLLOW-ON MAINTENANCE” may be seen. The steps listed will be required to place the helicopter in a flyable state following the completion of the maintenance task.
- j. Operational checks and troubleshooting procedures are contained in the three-volume TM 1-1520-248-T manual. A reference to TM 1-1520-248-T will be made if an operational check must be performed to ensure serviceability.

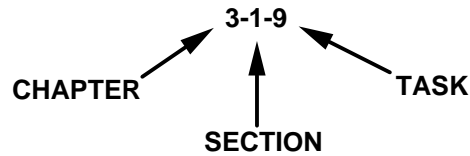
3. PARAGRAPH NUMBERING

- a. Paragraph numbers are assigned to each major information subject.
- b. Paragraphs are individually numbered by chapter and sequence.

4. TASK NUMBERING

Task numbers are in three parts. The first is the chapter number. The second is the section number in that chapter. The third number is the task's actual sequence in the section. Each number is separated by a (-) as shown in the example:

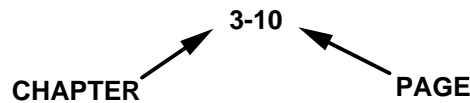
HOW TO USE THIS MANUAL — continued



Task numbers are the most important numbers in the manual. Always use the task number, NOT the page number, to find information.

5. PAGE NUMBERING

Except for front matter (all material that precedes Chapter 1), appendices, glossary, alphabetical index, and foldouts, all page numbering is by chapters. The first number is the number of the chapter; the second number is the number of the page in that chapter. The numbers are separated by a dash as shown in the example:



6. MANUAL INDEX

- a. The alphabetical index for the entire manual is located at the end of each volume of volumes 1 through 6. The index lists all task titles and certain key paragraphs of non-task text in alphabetical order. After you find the title in the index, it tells the task number or paragraph number of that task or text. For example, if you need information on the wire cutter, go to the “C” section of the index and look under “Cutter.”

There you will find:

Cutter (Rapid Deployment), Lower Wire — Removal/Installation 2-2-60

The index tells that the wire cutter information for the lower wire cutter is in Chapter 2, section 2, task 60.

- b. You can find your task in the index, even if you only know a single word in the title. In the sample title above you could also find your tasks by looking under “Wire”. Examples:

Wire Cutter (Rapid Deployment), Lower — Removal/Installation 2-2-60

Or, you could look under “Lower”:

Lower Wire Cutter (Rapid Deployment) — Removal/Installation 2-2-60

In using the manual index, many similar task titles will be encountered. Some titles are similar though in different systems. This is true with shafts, brackets, supports, bearings, etc. The index will provide the name of the correct system to help you avoid going to the wrong paragraph/task.

- c. Any task can be located in the way described. If you know the name, job, part, assembly, procedure, description, etc., you can use one of the words to find the paragraph number in the index.

7. GLOSSARY

- a. A glossary of words used throughout the manual is located just before the alphabetical index in each volume of volumes 1 through 6. Section I of the glossary is the list of abbreviations and acronyms. Abbreviations are shortened terms for words. Acronyms are shortened terms for several words and use only the first letter of each of the words. Abbreviations and acronyms are defined where first used. The glossary provides a good place to check if there is any doubt.

HOW TO USE THIS MANUAL — continued

- b. Section II of the glossary contains definitions of unusual terms that appear in the manual. Many words have more than one meaning. A word that has a certain meaning in everyday language could have a different meaning for the helicopter. This is the reason for the definitions. If you see an unfamiliar word in the manual, check the list of definitions.
- c. Review the glossary periodically to ensure familiarity with the abbreviations, acronyms, and unusual terms.

8. INITIAL SETUP

The first page of each maintenance task in the manual contains the initial setup. Always check the initial setup before starting a task on the helicopter. The initial setup contains information you must know. **DON'T START A TASK UNTIL:**

- You understand the task
- You understand what you are to do
- You understand what is needed to do the work
- You have the things you need.

An example initial setup is shown below. Not all tasks have the headings shown.

Each part of the initial setup is explained by the following subparagraphs (a. through h.). Each subparagraph describes initial setup entries in order of their appearance in the example.

- a. **Title:** The title in the upper border contains the chapter/section/task number and title of the task as listed in the index. The task is performed at the intermediate level if (AVIM) appears in the title.
- b. **This Task Covers:** This entry appears in the border below the title. The task may require one or more operations (such as removal and installation).
- c. **Applicable Configurations:** This entry specifies the model or models for which the task is used, i.e., OH-58D, OH-58D(R), or All.
- d. **Tools:** This heading identifies the list of tool kit(s) by MOS(s). The tools in the kit(s) and any others listed will be all that are required to perform the task. Tasks requiring tools other than those in this tool kit are considered SPECIAL TOOLS. Special tools could be: (1) tools from the shop set; (2) tools from the kits of other MOSs, or (3) tools made especially for the OH-58D helicopter. Special tools will be listed in addition to MOS tool kits when needed. Tool kits and special tools have an item number assigned to them and are located in Appendix B. Appendix B contains a "Tools and Test Equipment Requirements" listing. Each item listed has an Equipment Reference Code. This code is used to clearly identify a tool or item of test equipment, e.g., (B127). It is acceptable to use a torque wrench other than that which is listed as long as the torque range is the same. Example: 1/4 - inch drive torque wrench **30 INCH-POUNDS to 150 INCH-POUNDS** or 3/8 - inch drive torque wrench **30 INCH-POUNDS to 150 INCH-POUNDS**. If a tool or a part will have to be made, it is listed in an index in Appendix H. The index will identify the tool or part by name or part number, and a figure number in Appendix H will be referenced. All information required to construct a part or tool is provided in the figure.

HOW TO USE THIS MANUAL — continued

INITIAL SETUP EXAMPLE

9-6-1. WEIGHT-ON-GEAR SWITCH (RAPID DEPLOYMENT LANDING GEAR) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspection (TI) ■
68F Aircraft Electrician

Tools:
Electrical Repairer Tool Kit (B177)

Material:
Sealing Compound (D179)
Lockwire (D132)
Rubber Gloves (D111)

References:
TM 11-1520-248-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Helicopter on Jacks (Task 1-6-8)

e. **Material:** This heading identifies the list of materials needed to complete the task. Most materials cannot be used on the helicopter a second time; they are expendable. Expendable materials are items such as solvent, grease, oil, hydraulic fluid, etc.

(1) Each expendable has an item number assigned to it and is located in Appendix D. The item number is placed in parentheses following the item name on the initial setup page. A typical example of an expendable item is:

Lockwire (D132)

See the expendable and durable item list in Appendix D for more information about expendable and durable materials.

(2) Some parts are also expendable.

(3) It may be necessary to use a part as a tool to do a step in a task. These parts do not appear in TM 1-1520-248-23P. A typical example would be when a bolt is used to temporarily hold an assembly in place or to align two pieces of material to be fastened.

f. **Personnel Required:** This heading lists the people required to perform the task. It also tells the MOS of each person and the number of persons required. For example:

67S	Scout Helicopter Repairer (2)	■
67S	Scout Helicopter Technical Inspector (TI)	■

This listing would indicate that two 67S repairers and a 67S technical inspector will be needed to complete the task.

IF YOUR MOS IS NOT LISTED IN THE PERSONNEL REQUIRED COLUMN IN THE INITIAL SETUP, CHECK WITH YOUR MAINTENANCE SUPERVISOR FIRST BEFORE STARTING THE TASK.

g. **References:** This heading identifies the list of other technical manuals (TMs) needed to complete a task. The steps in the task will tell you when you must refer to another TM.

HOW TO USE THIS MANUAL — continued

- h. **Equipment Condition:** This heading identifies the list of tasks or parts of tasks that must be accomplished before starting a task. It may require an operation such as jacking the helicopter, or just the tailboom; or removing parts, assemblies, etc. These operations are described in other tasks or technical manuals. The paragraphs or TMs that describe how to do these operations are referenced here. If the job is to be done on the helicopter, the statement “Helicopter Safed” will appear here. The reference will be to Task 1-6-7 where armament safing is described. It is essential that equipment conditions listed in a particular task be followed in sequence so that required conditions are not missed and all required tasks are reviewed prior to start of maintenance.

9. WARNINGS, CAUTIONS AND NOTES

The warnings used in this manual may be in text or icon format. Text warnings are used to describe hazardous situations, and icons are for hazardous materials and certain operations where defined.

Icon warnings are pictorial images which may be used in place of words. The safety summary sheet, which is located immediately after the title page, explains in detail what each icon means.

WARNING AND CAUTION STATEMENTS

WARNING and CAUTION statements are used prior to operating or maintenance procedures, practices, or conditions considered essential to the protection of personnel (WARNING) or equipment and property (CAUTION). A WARNING or CAUTION will apply each time the related step is repeated. Prior to starting any task, the WARNINGS or CAUTIONS included in the text for that task will be reviewed and understood. Refer to the materials list figure at the beginning of the appropriate manual section for material used during maintenance of this equipment. The detailed warnings for hazardous material and operations are listed separately in the safety summary as “Hazardous Materials and Operations Icons”.

HAZARDOUS MATERIALS

This publication describes physical and chemical processes which may require the use of chemicals, solvents, paints, or other commercially available material. The user of this publication should obtain the material safety data sheets (Occupational Safety and Health Administration (OSHA) Form 20 or equivalent) from the manufacturers or suppliers of materials to be used. The user must become completely familiar with the manufacturer/supplier information and adhere to the procedures, recommendations, warnings, and cautions of the manufacturer/supplier for the safe use, handling, storage, and disposal of these materials.

HAZARDOUS MATERIALS WARNINGS

Warnings for hazardous material in this manual are designed to warn personnel of hazards associated with such items when they come in contact with them during actual use. For each hazardous material used, material safety data sheet (MSDS) is required to be provided and available for review by the users. Consult your local safety and health staff concerning any questions on hazardous chemicals, MSDSs, personnel protective equipment requirements, and appropriate handling and emergency procedures.

This Safety Summary gives the complete warnings for hazardous material used in this manual.

NOTES

Notes tell something extra or special a person must know to do the task. They can appear before or after the item they tell about. Notes shall be read and remembered when working on the helicopter.

10. USE OF SHALL, WILL, SHOULD, AND MAY

Within this technical manual the word shall is used to indicate a mandatory requirement. The word will is used to express a declaration of purpose or futurity. The word should is used to indicate a desired result

HOW TO USE THIS MANUAL — continued

or a nonmandatory but preferred method of accomplishment. The word may is used to indicate an acceptable method of accomplishment.

11. TORQUING INFORMATION

- a. An inspector shall be present to verify all torques specified in this manual.
- b. Each hardware fastener (except types used in sheet metal work) is assigned an applied torque.
- c. There are two types of applied torques. They are: special torques and standard torques.
 - (1) Special torques differ from standard torques as determined by engineers who look at each application. Special torques are given in bold type. Torque wrenches and adapters to be used when a special torque is given are listed under Tools in the initial setup.
 - (2) Standard torques are listed in Appendix P. Standard torques not listed in Appendix P can be found in TM 1-1500-204-23. Standard torque applies to all fasteners for which a special torque is not specified.

12. INSPECTION INFORMATION

General inspection information is in the front of each chapter or section for the equipment covered in that chapter or section. Inspection criteria peculiar to a specific part, assembly, or component are in the inspection steps of the removal/installation task for that part, assembly, or component.

13. GENERAL MAINTENANCE INFORMATION

The following are considered standard maintenance practices. Instructions about these practices are not normally included in maintenance procedure task steps.

- a. Lines shall be tagged before they are disconnected. Tubes and parts shall be capped or plugged when they are disconnected.
- b. Used preformed packings, retainers, gaskets, cotter pins, lockwashers, etc., shall be discarded. New parts shall be installed.
- c. Packings shall be lubricated before installation. Specific instructions are provided in each maintenance procedure.
- d. Tubes and related parts shall be tied out of the way with twine, not lockwire.
- e. Disassembly procedures reflect disassembly needed to support total authorized repair. You may not need to disassemble a part as far as described in the task. Follow the steps to disassemble as far as needed to repair/replace worn or damaged parts.
- f. Before a component or the disassembled parts of a component are inspected, they are cleaned as required.
- g. Components and mating surface areas shall be inspected for serviceable condition before installation.
- h. Guide lines shall be used when any item is hoisted overhead.
- i. When a nut is tightened or loosened on a bolt, the bolt head shall be held with a wrench.
- j. When a coupling nut on a line is tightened or loosened, the mating fitting shall be held with a wrench.
- k. A special torque shall be cited when a direction to torque is given. A standard torque is required when no specific torque is given. Standard torque information is located in Appendix P of this manual and TM 1-1500-204-23.

HOW TO USE THIS MANUAL — continued

- l. When torquing hardware, observe compliance with drag torque as required. To determine drag torque, thread nut onto screw or bolt until at least two threads protrude. The nut shall not contact the mating part. The torque necessary to begin turning the nut is the drag torque. Drag torque is explained in more detail in TM 1-1500-204-23.
- m. Chafing is a condition which occurs when two or more components contact each other in such a manner that friction and consequent wear occur. This condition is not acceptable. Proper routing, clamping, and component installation are required.

14. ELECTRICAL WIRING AND CABLING

This technical manual contains removal and installation procedures for wiring harness/cable assemblies that are permanently installed in the helicopter. Wiring harnesses/cable assemblies that can or are normally removed with avionic/electronic equipment are contained in TM 11-1520-248-23. Wiring harnesses/cable assemblies applicable to armament systems are contained in TM 9-1090-214-23&P where these wiring harnesses/cable assemblies are external to the helicopter fuselage.

15. GENERAL REFERENCES

- a. Refer to TM 55-1500-323-24 for all electrical tasks of a general nature not peculiar to the OH-58D helicopter.
- b. Refer to TM 1-1500-204-23 for mechanical tasks of a general nature not peculiar to the OH-58D helicopter.
- c. Refer to TM 1-1520-266-23 for approved nondestructive inspection methods.

16. APPENDICES

The organization and content of Appendices to this manual are provided for reference as required during performance of maintenance tasks.

- Appendix A is a list of References.
- Appendix B is the Maintenance Allocation Chart and Tool and Test Equipment Requirements List.
- Appendix C is the Helicopter Inventory Master Guide.
- Appendix D is an Expendable Supplies and Materials List.
- Appendix E describes Storage of Helicopter.
- Appendix F is Wiring Data.
- Appendix G provides Weight and Balance Data.
- Appendix H provides Locally Manufactured Items Data.
- Appendices J, K and L are reserved for future use.
- Appendix M provides Electrical Bonding Procedures.
- Appendix N is reserved for future use.
- Appendix P provides Standard Torque Values.
- Appendix Q provides Corrosion Control Information.
- Appendix R is reserved for future use.

Table 1. Organization and Content of Appendix A

Organization	Content
References List	List of additional manuals required for use by maintenance personnel in the performance of their duties.

HOW TO USE THIS MANUAL — continued

Table 2. Organization and Content of Appendix B

Organization	Content
Section I	Introduction to Maintenance Allocation Chart.
Section II	Maintenance Allocation Chart.
Section III	Tool and Test Equipment Requirements. Tools and test equipment, including special tools and common tool sets required for each maintenance function as referenced in Maintenance Allocation Chart and individual tasks.
Section IV	List of remarks for each maintenance function as referenced in the Maintenance Allocation Chart.

Table 3. Organization and Content of Appendix C

Organization	Content
Helicopter Inventory Master Guide	Paragraph that provides general information.
Security	Normally, helicopter inventory records are not classified.
Inventoriable Items	List of mission equipment, loose equipment, modification kits, and special environment equipment.
Periods of Inventory	Guidelines on the events and frequency of events that mandate an inventory accounting of listed items.

Table 4. Organization and Content of Appendix D

Organization	Content
Scope	Description of purpose and limits for the Appendix.
Explanation of Columns	Description of the tabular layout by function. Expendable Supplies and Material List in both numerical and alphabetical order.

HOW TO USE THIS MANUAL — continued**Table 5. Organization and Content of Appendix E**

Organization	Content
Section I	General Information including components involved in accidents, Requirements, Storage Categories, Procedures, and Inspection.
Section II	Description of procedures required to store the OH-58D in a flyable state.
Section III	Description of procedures required to store the OH-58D for a short term.
Section IV	Description of procedures required to store the OH-58D for an intermediate period of time.

Table 6. Organization and Content of Appendix F

Organization	Content
Wiring Diagrams	Essential general wiring information about electrical systems and circuits.
Equipment List	Electrical equipment items listed by reference designator, and their nomenclature, location, and access in tabular form.
Wire Repair and Replacement	Wiring repair and replacement data including wire sizes and part numbers, wire construction, marking, soldering, support, and stripping.
Routing and Clamping	Diagrams of OH-58D wire bundle clamping arrangements.

Table 7. Organization and Content of Appendix G

Organization	Content
Section I	General information required for intermediate maintenance personnel to perform their phase of weight and balance control.
Section II	Instruction on proper use of forms and charts required for calculations and documentation of weight and balance data.
Section III	Specific instructions for properly weighing the OH-58D helicopter.

HOW TO USE THIS MANUAL — continued

Table 8. Organization and Content of Appendix H

Organization	Content
Part Number Index	Part numbers arranged in alphanumeric order along with figure reference for each part number.
Illustrations of Locally Manufactured Items	Illustrations of locally manufactured items in sufficient detail to enable their construction.

Appendices J, K and L are reserved for future use.

Table 9. Organization and Content of Appendix M

Organization	Content
Section I	Introduction and general information including intended purpose, definitions, electrical bonding classes, and tools.
Section II	Description of tools required.
Section III	Resistance requirements for each class of bonding.
Section IV	Surface preparation and methods of bonding.
Section V	Testing of completed bonds.

Appendix N is reserved for future use.

Table 10. Organization and Content of Appendix P

Organization	Content
Introduction	General information about the Appendix.
Torque Values	General and specific information about torquing procedures including Torque Tables.
Selection and Use of Torque Wrench	Methods of choosing torque wrenches and procedures and calculations.

HOW TO USE THIS MANUAL — continued

Table 11. Organization and Content of Appendix Q

Organization	Content
Section I	An introduction that explains purpose of Appendix and defines corrosion.
Section II	Explanation of Inspection and Corrosion Prone Areas as to Purpose of Inspection and Responsibilities for Corrosion Control.
Section III	Preventive Maintenance described in terms of Prevention and Preservation.
Section IV	Required references to appropriate manuals for Corrosion Control Processes and Equipment Requirements.
Section V	Description of Corrosion Prone Areas. Provision of and reference to Inspection and Repair Procedures. Data is both tabular and pictorial.

Appendix R is reserved for future use.

SAFETY SUMMARY

1. GENERAL SAFETY INSTRUCTIONS.

This manual contains procedures which, if not followed properly, can cause injury or long-term health hazards to personnel. This safety summary includes general safety precautions and instructions that must be understood and applied during operation and maintenance to ensure personnel safety. Prior to performing any task, the WARNINGS included in that task shall be reviewed and understood.

2. WARNINGS.

WARNINGS are used in this manual to highlight operating or maintenance procedures, practices, conditions, statements which are considered essential to protection of personnel (WARNING). WARNINGS immediately precede the step or procedure to which they apply. WARNINGS consist of four parts: heading (WARNING or icon [see HAZARDOUS MATERIALS WARNINGS]), or statement of the hazard, maintenance precautions, and possible result if disregarded.

WARNING

Highlights an essential operating or maintenance procedure, practice, condition, statement, etc., which, if not strictly observed, could result in injury or long-term health hazards to personnel.

3. HAZARDOUS MATERIALS WARNINGS.

Hazardous Materials Warnings in this manual are provided through use of the Hazard Symbols listed below. Consult the HAZARDOUS MATERIALS DESCRIPTION below or Material Safety Data Sheets (MSDS) (Occupational Safety and Health Administration (OSHA) Form 20 or equivalent) for specific information on hazards, effects, and protective equipment requirements. If you do not have an MSDS for the material involved, contact your supervisor or the base Safety or Bioenvironmental Engineering Office.

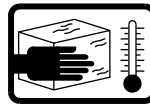
3.1 Hazardous Materials and Operations Icons. Icons are used in this manual to identify dangers associated with hazardous materials and certain conditions. The symbols used and their definitions are as follows.



The abstract bug symbol shows that a material may contain bacteria or viruses that present a danger to your life or health.



The symbol of drops of a liquid onto a hand shows that the material will cause burns or irritation of human skin or tissue.



The symbol of a hand in a block of ice shows that the material is extremely cold and can injure human skin or tissue.



The rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition, or high pressure.



The symbol of a person wearing goggles shows that the material will injure your eyes.



The symbol of a flame shows that a material can ignite and burn you.



The symbol of a skull and crossbones shows that a material is poisonous or is a danger to life.



The symbol of three circular wedges shows that the material emits radioactive energy and can injure human tissue or organs.



The symbol of a human figure in a cloud shows that vapors of a material present a danger to your life or health.



The symbol of a lightning bolt shows that you may contact voltage and current that may present a danger to your life or health.

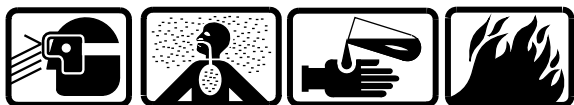


To avoid violent reactions that can cause personal injury, always pour acid into water, never water into acid.



The symbol of a head with the ear highlighted shows that the noise level may injure your hearing.

3.2 Hazardous Materials Description. The following hazardous materials are used in this manual. Each icon represents certain hazards as described above. Beneath the icons is the hazardous material name. Below the icons and material name is a description of the hazardous material. Only the icons and material name are used in the text of the manual. If a full description of the hazardous material is required while performing procedures in this manual, use the material name to locate the appropriate description below.



ACETONE

Acetone is flammable; do not use near open flames, near welding areas, or on hot surfaces. Do not smoke while using acetone, and do not use it where others are smoking. Prolonged inhalation of vapor can irritate eyes and mucous membranes and can cause dizziness and headache. If any liquid contacts skin, wash with soap and water. Immediately remove solvent-saturated clothing. If vapors cause drowsiness, go to fresh air. In all cases get immediate medical attention. When handling large quantities of liquid (more than a gallon), use at air-exhausted workbench. Wear approved gloves. Store solvent and dispose of liquid-soaked rags in approved metal safety container. Metal containers of solvent must be grounded to maintain electrical continuity.



ACRYLIC LACQUER

Acrylic lacquer is flammable. Keep away from open flames, sparks, and heat. Overexposure may cause coma, headache, narcotic effect, confusion, depression, irritation of skin, eyes, and respiratory system. Remove contaminated clothing. Wipe off with towel or cloth. Remove remainder with

mineral spirits or lacquer remover and thoroughly wash skin area with soap and water. Immediately flush eyes with water for 15 minutes. If inhaled, move to fresh air. If breathing has stopped perform resuscitation. In all cases get immediate medical attention. When working with acrylic lacquer, wear approved protective gloves, goggles or safety glasses, protective clothing, and approved respirator. Use in a well-ventilated area.



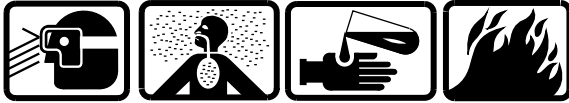
ADHESION PROMOTER

Adhesion promoter is flammable; keep away from sparks, flames, and non-explosion proof devices. Inhalation may cause nose and throat irritation, headache, drowsiness, weakness, or exhaustion. Prolonged or repeated skin contact may cause irritation. Vapor and liquid may cause eye irritation. Ingestion may cause intoxication and gastrointestinal irritation. Prolonged overexposure to ethanol can have adverse effects on liver. If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Remove contaminated clothing and wash with soap and water. Flush eyes with plenty of water for 15 minutes while holding eyelids open. If ingested, dilute with one to two glasses of water or milk. Induce vomiting by sticking finger down throat. In all cases, get immediate medical attention. When working with adhesion promoter, wear approved respirator, goggles, and rubber gloves. Work in well-ventilated area.



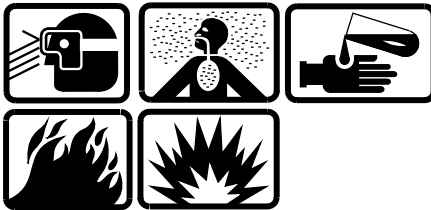
ADHESIVE, EA934NA

Adhesive can cause allergic reaction, skin sensitization, or gastrointestinal irritation. Contact with eyes can cause severe burns. Wash skin immediately with soap and water. Flush eyes with water for at least 15 minutes. Get immediate medical attention in event of eye contact with adhesive. Wash contaminated clothing before reuse. Wear approved respirator in closed area. Work in well-ventilated area using approved rubber gloves and safety glasses or goggles.



**ADHESIVE, MMM-A-1617,
TYPE I, II, OR III**

Adhesive may cause irritation to skin, eyes, and respiratory system. Thoroughly wash skin area with soap and water and immediately flush eyes with water for 15 minutes. In all cases get immediate medical attention. When working with adhesive, wear approved protective gloves, goggles or faceshield, and respirator approved for organic solvents. Use in a well-ventilated area away from open flame, spark sources, and heat.



ADHESIVE PRIMER

Adhesive primer is flammable and its vapor is explosive. Keep away from heat, open flame or other sources of ignition. Inhalation will cause irritation to the respiratory tract. Symptoms are headache, nausea, dizziness, and drowsiness. Move to fresh air and administer oxygen. If skin or eyes are affected wash skin with soap and water and flush eyes with water for 15 minutes. In all cases get immediate medical attention. When working with adhesive primer, wear approved respirator, rubber gloves and splashproof goggles and faceshield. Work in well-ventilated area.



ADHESIVE VAPORS

Adhesive vapors may cause irritation of eyes, nose, and respiratory system. Eye and skin contact with material may cause irritation. If ingested, may cause gastric distress. Flush eyes with water for 15 minutes. Wash skin with soap and water. If inhaled, move to fresh air. In all cases get immediate medical attention. Work in a well-ventilated area. Wear approved gloves and safety glasses.



ANTI-ICING/DEICING FLUID

Anti-icing/Deicing fluid contains diluted alcohol. Alcohol is flammable; do not use near open flames, near welding areas, or on hot surfaces. Do not use while smoking or while others are smoking. Inhalation of vapors can cause drowsiness, dizziness, and headache. If vapors cause drowsiness, go to fresh air. Contact with skin may cause irritation. If liquid touches skin or eyes, flush thoroughly with water. Remove contaminated clothing.



ANTISEIZE COMPOUND

Antiseize compound is flammable; do not use near open flames, welding areas, or on hot surfaces. When decomposed by heating, toxic gases are released. Do not use while smoking or when others are smoking. Liquid can cause severe skin and eye irritation. Inhalation of vapor can cause drowsiness, headache and unconsciousness. Wash affected skin with soap and water. Flush eyes with water for at least 15 minutes. If drowsiness occurs, go to fresh air. Seek medical attention if overexposed. Use approved respirator, gloves, and goggles for prolonged use. Dispose of liquid soaked rags in an approved, grounded metal safety container.



**CHEMICAL CONVERSION
MATERIALS**

Chemical conversion materials are strongly oxidizing and are a fire hazard in contact with acid, reducing agents, and combustible and

readily oxidizing materials; separate storage is mandatory. Thoroughly rinse rags and containers contaminated with chemical conversion materials and dispose of in a fireproof container. Contact with skin and eyes can cause burns. Breathing of dust or vapors can cause ulceration of mucous membranes. Thoroughly wash skin area with soap and water and immediately flush eyes with water for 15 minutes. If ingested, drink milk of magnesia, aluminum hydroxide gel, or lime water followed by large amounts of water. In all cases get immediate medical attention. Wash contaminated clothing before wearing. When working with chemical conversion materials, wear approved respirator, rubber apron, gloves, and goggles or faceshield in a well-ventilated area away from heat, open flames or sparks. Follow approved toxic waste disposal procedures. Read manufacturers label for additional information.



CHROMIC ACID

Chromic acid is highly reactive; do not mix with organic or oxidizable materials such as paper or wood. When mixing solutions, add acid slowly to water, not water to acid. Any contact with skin, or inhalation of vapors and powder can irritate skin and can cause skin ulcers. Repeated or prolonged exposure can cause permanent injury. If any liquid or powder contacts skin, flush affected area with water, and immediately change contaminated clothing. If skin ulcers appear, get immediate medical attention. When handling dry material or solution at air-exhausted workbench, wear approved gloves, apron, and goggles. When handling dry material or solution at unexhausted workbench, wear approved respirator, gloves, apron, and long sleeves.



CLEANING COMPOUND

Aircraft cleaning compound is flammable and is toxic to the skin by absorption and to the liver and kidneys. It can cause irritation of the eyes and respiratory system, skin irritation and headache. Thoroughly wash skin area with water and immediately flush eyes with water for 15 minutes. If ingested, do not induce vomiting. In all cases

get immediate medical attention. When working with cleaning compound, wear approved chemical cartridge respirator, rubber gloves, safety goggles, and protective clothing. Keep away from heat and open flames. Use in a well-ventilated area.



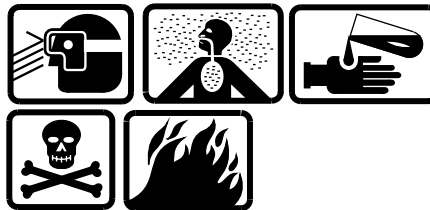
COMPRESSED AIR

When using compressed air for any cleaning or drying operation, do not exceed 30 psig at the nozzle. Eyes can be permanently damaged by contact with liquid or large particles propelled by compressed air. Inhalation of air-blown particles or solvent vapor can damage lungs. If injury occurs, get immediate medical attention. When using air for drying or cleaning at an air-exhausted workbench, wear approved goggles or faceshield. When using air for drying or cleaning at an unexhausted workbench, wear approved respirator and goggles.



CORROSION PREVENTIVE COMPOUND, MIL-C-11796

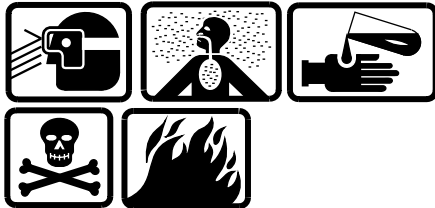
If solution of petrolatum corrosion preventive compound is decomposed by heat, toxic gases are released. Prolonged contact with solution or mist can cause skin irritation. If there is any prolonged contact with skin, wash contacted area with soap and water. If solution contacts eyes, flush eyes with water immediately. Remove saturated clothing. If solution is swallowed, do not try to vomit. In all cases get immediate medical attention. When handling solution, wear approved rubber gloves. If prolonged contact with mist is likely, wear approved respirator.



CORROSION PREVENTIVE COMPOUND, MIL-C-16173

Corrosion preventive compound is combustible; do not use near open flames, near welding areas, or on hot surfaces. Prolonged contact with skin

can cause skin irritation. Prolonged inhalation of vapor can cause dizziness, headache, and intoxication. If there is any prolonged contact with skin, wash affected area with soap and water. If liquid contacts eyes, flush eyes thoroughly with water. Remove contaminated clothing. If vapors cause light-headedness, go to fresh air. If liquid is swallowed, do not try to vomit. In all cases get immediate medical attention. When handling liquid or when applying it at air-exhausted workbench, wear approved gloves. When handling liquid or when applying it at unexhausted workbench, wear approved gloves and goggles. Dispose of liquid-soaked rags in approved metal container.



CORROSION PREVENTIVE COMPOUND, MIL-C-27725

Corrosion preventive compound is flammable. Keep away from ignition sources. Overexposure may cause headache, dizziness, nausea, skin drying, eye irritation, and respiratory irritation. Corrosion preventive compound may also cause narcotic effects, shortness of breath and could affect the central nervous system. Thoroughly wash with soap and water and apply emollient cream or lotion and immediately flush eyes with water for 15 minutes. If inhaled move to fresh air. In all cases get immediate medical attention. When working with corrosion preventive compound, wear approved protective gloves, goggles, and clothing. Use in a well-ventilated area. If adequate ventilation is not available, wear approved respirator.



CORROSION REMOVING AND METAL CONDITIONING COMPOUND

Corrosion removing and steel protecting compound causes skin irritation. Avoid contact with skin and eyes. If irritation occurs, get immediate medical attention. Wear approved gloves and goggles or faceshield when handling. Wash hands thoroughly after handling.



DENATURED ETHYL ALCOHOL

Denatured ethyl alcohol and its vapor are flammable and explosive — do not use it where others are smoking. POISON — do not ingest. Ingestion will cause vomiting, stupor, and collapse. Inhalation of vapor may cause headache and drowsiness. If vapors cause drowsiness, go to fresh air. Immediately remove wet clothing. When working with denatured ethyl alcohol, wear approved respirator, gloves, and goggles. If splashing could occur, wear an approved faceshield over the goggles. In case of contact with eyes, flush with water for at least 20 minutes and obtain medical attention. Dispose of liquid soaked rags in approved metal container. Metal containers must be grounded to maintain electrical continuity.



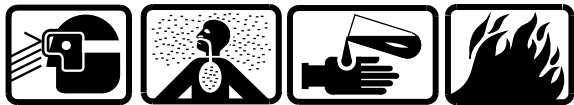
DRILLING OPERATIONS

Metallic structures drilling operations produce airborne metallic dust particles that are harmful to respiratory tract and eyes. Avoid breathing dust and use eye protection when drilling. Avoid composite materials that are toxic to skin, eyes and respiratory tract. When drilling advanced composite materials, avoid inhalation of dust and wear protective gloves and eye protection.



DRY LUBRICANT

Overexposure can cause nausea, vomiting, and irritation of skin, eyes, and respiratory system. If symptoms occur, seek fresh air. Wash affected skin with soap and water. Flush eyes with water for 15 minutes. If ingested do not induce vomiting. In all cases, seek medical attention. Wear approved protective gloves, goggles, and respirator.



DRYCLEANING SOLVENT

Drycleaning solvent is combustible; do not use near open flames, near welding areas, or on hot surfaces. Prolonged contact of skin with liquid can cause skin irritation. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness. If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air. In all cases get immediate medical attention. When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves. When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator and goggles.



DYNASOLVE 165

Dynasolve 165 contains powerful organic solvents. It is harmful if inhaled or swallowed. Avoid breathing vapors or mist. Keep away from heat and flame. Avoid contact with eyes and skin. Wear gloves, safety goggles, and protective clothing when handling. Use with adequate ventilation. Contact of skin with liquid or inhalation of vapor can cause severe burns, and respiratory system irritation. If any solution, liquid, or vapor contacts skin or eyes, flush affected areas thoroughly with water. Immediately change any contaminated clothing. If vapors are inhaled, go to fresh air. In all cases get immediate medical attention.



ELECTRIC SHOCK

To prevent electric shock, ensure electrical power is off before working on helicopter. Remove watches, rings and other jewelry before working on electrical circuits. Voltage and/or current may be contacted that could present a threat to your health or life. If voltage/current is contacted and

breathing ceases, CPR must be administered by qualified personnel. Seek medical aid. For electrical shock safety steps and procedures, refer to TM 1-1500-204-23 and TB 385-4.



EPOXY PRIMER COATING

Epoxy primer coating is flammable. It contains lead and may cause irritation of nose, throat, eyes, skin, respiratory system, and nervous system. Overexposure may result in headache, narcotic effect, nervousness, drying of skin, and possible death. Thoroughly wash skin area with soap and water and immediately flush eyes with water for 15 minutes. If ingested, do not induce vomiting. In all cases get immediate medical attention. When working with epoxy primer coating wear approved respirator, chemical splash goggles, solvent resistant gloves, apron, protective clothing, and barrier cream. Work in a well-ventilated area.



EPOXY RESIN

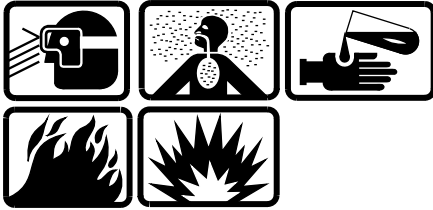
Filled epoxy resin may cause skin and eye irritation. Thoroughly wash skin area with soap and warm water and immediately flush eyes with water for 15 minutes. In all cases get immediate medical attention. When working with epoxy resin, wear approved protective gloves and goggles. Use in a well-ventilated area and avoid breathing vapors.



FINGERPRINT REMOVER

Fingerprint remover is flammable. Do not use near heat or flames. Overexposure may cause skin and eye irritation, dizziness, headache and nausea. Thoroughly wash skin area with soap and water and immediately flush eyes with water for 15 minutes. If inhaled, move to fresh air. In all cases get immediate medical attention. When working with fingerprint remover wear approved solvent

resistant gloves, goggles or faceshield, and respirator.



FLUORESCENT PENETRANT

Prolonged or repeated inhalation of powders and vapors of cleaning solvent, developers, and emulsifiers used in fluorescent penetrant inspection can irritate mucous membrane areas of the body. Continual exposure to penetrant inspection materials can irritate the skin. Direct exposure of eyes to light and prolonged exposure of skin to light can inflame and damage eyes and skin. Wear approved neoprene gloves when handling penetrant inspection materials. Keep insides of gloves clean. Store all pressurized spray cans containing penetrants, developers, and emulsifiers in a cool, dry area protected from direct sunlight, heat, and open flames. Temperatures higher than 120 °F (49 °C) may cause pressurized can to burst and cause injury. If direct eye contact with light causes eye problems, get immediate medical attention. When using black light for fluorescent inspections, wear approved safety glasses.



GREASE

Avoid any skin contact with grease. Wash hands thoroughly with soap and water after handling grease.



HYDRAULIC FLUID, MIL-H-5606

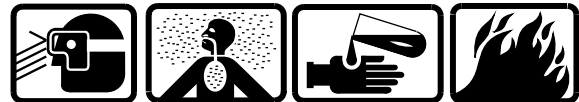
MIL-H-5606 hydraulic fluid is flammable. Flashpoint is 180 °F (82 °C). When hydraulic fluid is decomposed by heat, toxic gases are released. Prolonged contact with liquid or mist can cause skin irritation. If there is any prolonged contact with skin, wash contacted area with soap and water. If liquid contacts eyes, flush eyes with water immediately. Remove saturated clothing. If

fluid is swallowed, do not try to vomit. In all cases get immediate medical attention. When handling liquid, wear approved rubber gloves. If prolonged contact with mist is likely, wear approved respirator.



HYDRAULIC FLUID, MIL-H-83282

MIL-H-83282 hydraulic fluid is flammable. Flashpoint is 400 °F (204 °C). When hydraulic fluid is decomposed by heat, toxic gases are released. Prolonged contact with liquid or mist can cause skin irritation. If there is any prolonged contact with skin, wash contacted area with soap and water. If liquid contacts eyes, flush eyes with water immediately. Remove saturated clothing. If fluid is swallowed, do not try to vomit. In all cases get immediate medical attention. When handling liquid, wear approved rubber gloves. If prolonged contact with mist is likely, wear approved respirator.



ISOPROPYL ALCOHOL

Isopropyl alcohol is flammable; do not use near open flames, near welding areas, or on hot surfaces. Do not use while smoking or while others are smoking. Inhalation of vapors can cause drowsiness, dizziness, and headache. Contact with skin may cause irritation. If liquid touches skin or eyes, flush thoroughly with water. Remove contaminated clothing. If vapors cause drowsiness, go to fresh air. When handling large quantities (greater than 1 gallon), work at air-exhausted workbench or covered tank. Store solvent and liquid-soaked clothes in an approved, grounded metal container.



JET FUEL

Jet fuel is flammable; do not use near open flames, welding areas, or on hot surfaces. Do not

handle or store near strong oxidants, e.g., liquid oxygen or hypochlorite. Do not smoke when using jet fuel and do not use it where others are smoking. Contact of eyes with liquid can cause severe irritation and blurred vision. Inhalation of vapor may cause irritation, headache, nausea, and dizziness. If liquid contacts eyes, flush eyes thoroughly with water for a minimum of 15 minutes. Immediately remove fuel-saturated clothing. If vapors cause dizziness, go to fresh air. If liquid is swallowed, do not try to vomit. In all cases get immediate medical attention. When handling large quantities of liquid (more than 1 gallon) at an unexhausted workbench, wear approved respirator and goggles or faceshield. Dispose of liquid-soaked rags in approved metal container. Contaminated clothing shall be laundered prior to reuse. Metal containers of fuel must be closed and grounded to maintain electrical continuity.



LUBRICANT, SOLID FILM

Solid film lubricant is flammable. Do not use near fire or open flame. Lubricant may cause irritation to skin and upper respiratory system. Inhalation may cause a narcotic effect and light headedness. Swallowing may be fatal. Thoroughly wash skin area with soap and water and immediately flush with water for 15 minutes. If ingested, do not induce vomiting. In all cases get immediate medical attention. When working with lubricant, wear approved rubber gloves, respirator, and safety glasses or goggles with unperforated side shields. Work in a well-ventilated area.



LUBRICATING OIL

The laser rangefinder/designator (LRF/D) is very dangerous. Looking at the laser beam or its reflection from a shiny surface can cause permanent blindness. Under noncombat conditions, the laser shall be used only in controlled areas and at times specified by a range control officer.

If lubricating oil is decomposed by heat, toxic gases are released. Prolonged contact with liquid or mist may cause skin irritation. If there is any prolonged contact with skin, wash area with soap and water. If oil contacts eyes, flush eyes with water immediately. Remove saturated clothing. If oil is swallowed, do not try to vomit. In all cases get immediate medical attention. When handling liquid, wear approved rubber gloves. If prolonged contact with mist is likely, wear approved respirator.



LHE CADMIUM SOLUTION

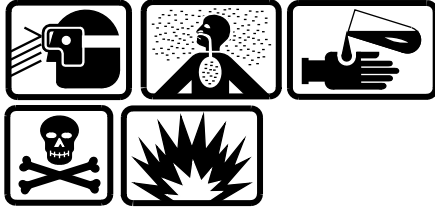
Cadmium brush plating solution is toxic and may cause damage to skin, eyes, and mucous membranes. Overexposure may cause skin sensitization and skin irritation. Thoroughly wash skin area with water and immediately flush eyes with water for 15 minutes. If vapor causes drowsiness, go to fresh air. In all cases get immediate medical attention. Wear approved rubber gloves, apron, boots, goggles or faceshield, and activated carbon respirator. Work in well-ventilated area. Wash hands thoroughly before eating or smoking.



NAPHTHA/NAPHTHALENE

Naphtha/Naphthalene is combustible; do not use it near welding areas, near flames, or on hot surfaces. Avoid prolonged or repeated contact with liquid. Contact of skin with liquid can cause irritation. Inhalation of vapors can cause irritation, giddiness, and drowsiness. If liquid contacts eyes, flush eyes thoroughly with water. If there is any prolonged skin contact, wash contacted area with

soap and water. If vapors cause drowsiness, go to fresh air. Remove solvent-saturated clothing. If liquid is swallowed, do not try to vomit. In all cases get immediate medical attention. When handling liquid in an air-exhausted, partially covered tank, wear approved gloves. When handling liquid in an open, unexhausted container, wear approved rubber gloves and goggles. If contact with vapor is likely, wear an approved respirator. Dispose of liquid-soaked rags in approved metal container. Metal containers of liquid must be grounded to maintain electrical continuity.



NITRIC ACID

Nitric acid is highly reactive; do not mix with combustible organics or other oxidizable materials such as wood, paper, and cloth. When heated, toxic gases are released. When mixing solutions, add acid slowly to water, not water to acid. Contact of skin with liquid or inhalation of mist can cause severe burns, respiratory system irritation, and chronic bronchitis. If any solution, liquid, or mist contacts skin or eyes, flush affected area thoroughly with water for a minimum of 15 minutes. Immediately change any contaminated clothing. If mist is inhaled, go to fresh air. In all cases get immediate medical attention. If handling solution or concentrated liquid in air-exhausted covered tank, wear approved gloves and apron, and wear approved goggles or faceshield. When handling solution or concentrated liquid in open tank, wear approved respirator, full-body clothing, gloves, and goggles.



NOISE HAZARD

Personnel hearing can be PERMANENTLY DAMAGED if exposed to constant high noise levels of 85 dB (A) or greater. Wear approved hearing protection devices when working in high noise level areas. Hearing loss occurs gradually

but becomes permanent over time. Hearing protection is required.



PAINT REMOVER

Paint remover can cause severe burns, narcotic effects, headache, dizziness, and nausea. In some cases it may cause elevated blood pressure, unconsciousness, shock, and death. Contact with eyes may cause blindness. Avoid contact with flammable liquids. Contact with alkali metals, powdered magnesium, and aluminum may cause a violent reaction. Thoroughly wash skin area with water and immediately flush eyes with water for 15 minutes. In all cases get immediate medical attention. When working with paint remover wear approved respirator (manufacturer recommends approved fresh air mask), approved faceshield or goggles, neoprene or Viton gloves, solvent resistant boots, and apron. Work in a well-ventilated area. Read manufacturers label for specific instruction due to variations of each product.



PLASTIC POLISH COMPOUND

Plastic polish compound is flammable. Keep away from heat, open flame or other sources of ignition. Plastic polish compound may be poisonous if inhaled or absorbed through the skin. Vapors may cause dizziness or suffocation and are an irritant to the skin and eyes. Move to fresh air and thoroughly wash skin with water and flush eyes with water for 15 minutes. In all cases, get immediate medical attention. Wear approved safety glasses or goggles and gloves. Use in a well-ventilated area.



POLYURETHANE COATING

Polyurethane coating is flammable. Keep away from open flame, sparks, heat, and organic material. Exposure can cause skin, eye, nose, throat, and respiratory system irritation. Prolonged exposure may cause headache, allergic sensitivity, narcotic effect, nausea, and vomiting. Ingestion causes lead poisoning. Thoroughly wash skin area with soap and water and immediately flush eyes with water for 15 minutes. If inhaled, move to fresh air. In all cases get immediate medical attention. When working with polyurethane coating, wear approved chemical resistant rubber gloves, goggles, respirator, and protective clothing. Use in a well-ventilated area.



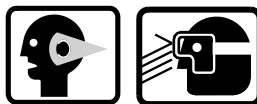
POLYURETHANE CONDUCTIVE COATING

Polyurethane conductive coating is flammable; do not use near open flames, near welding areas, or on hot surfaces. Contact with liquid or vapor can cause skin or eye irritation. Prolonged overexposure can result in kidney and liver damage, headache, nausea, vomiting, dizziness or loss of consciousness. Prolonged occupational overexposure can result also with permanent brain and nervous system damage. Deliberately concentrating and inhaling the contents may be harmful or fatal. After prolonged skin contact, wash contacted area with lukewarm water for 15 minutes. Remove contaminated clothing promptly. If vapors cause dizziness, go to fresh air, in all cases get immediate medical attention. Dispose of contents in approved metal container. Follow approved toxic waste disposal procedures.



RESINS AND HARDENERS

Resins and hardeners are flammable; do not use near open flames, welding areas, or on hot surfaces. When decomposed by heating, toxic fumes are released. Inhalation of vapor can cause irritation, drowsiness, and headache. Contact with eyes can cause severe burns. Flush eyes with water for at least 15 minutes. Wash skin immediately with soap and water. In all cases get immediate medical attention. When mixing or applying liquid in air-exhausted paint spray booth, wear approved gloves and goggles. When mixing or applying liquid in unexhausted work area, wear approved gloves, long sleeves, apron, goggles, and respirator. Metal containers of solution must be grounded to maintain electrical continuity.



RIVETING OPERATIONS

Bucking rivets produces high levels of noise. Hearing can be PERMANENTLY DAMAGED if exposed to constant high noise levels of 85 dB (A) or greater. Wear approved hearing protection devices when working in high noise level areas. Hearing loss occurs gradually but becomes permanent over time. Hearing protection is required. Wear goggles or faceshield when riveting to prevent damaging eyes.



SANDING OPERATIONS

Avoid prolonged or repeated contact with sanding, power grinding, or drilling dust. Inhalation of dust may cause temporary coughing and wheezing, respiratory system irritation, and permanent lung problems. If dust contacts eyes, flush them thoroughly with water. If coughing or wheezing persists, get immediate medical attention. When using an air-exhausted grinding wheel, wear approved respirator and goggles or faceshield.



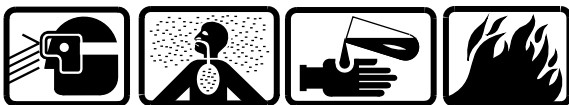
SEALING COMPOUND, MIL-S-22473

Anaerobic sealing compound is flammable; do not use near open flames or welding areas. Avoid prolonged exposure to light. Avoid materials such as peroxide or other strong oxidizing agents, iron rust or carbon monoxide/dioxide. Anaerobic sealing compound can cause dermatitis. It may also cause delayed eye and skin irritations and skin sensitivity. Thoroughly wash skin area with water and immediately flush eyes with water for at least 15 minutes. If ingested, do not induce vomiting. Keep individual calm. In all cases, get immediate medical attention. When working with anaerobic sealing compound, wear approved rubber apron, boots, gloves, and goggles or faceshield in well-ventilated area.



SEALING COMPOUND, MIL-S-8784, MIL-S-8802, MIL-S-83249

Sealing compound is flammable. Do not use near heat, open flames, or sparks. Overexposure can cause irritation of skin and eyes, headache, nausea, vomiting, and systemic problems. Thoroughly wash skin area with soap and water and immediately flush eyes with water for 15 minutes. In all cases get immediate medical attention. Wear approved protective gloves and goggles. Avoid breathing of vapors and prolonged or repeated skin contact.



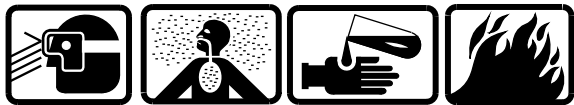
SHELLAC

Shellac is flammable. Keep away from heat, sparks, and open flame. All electrical equipment must be explosion proof. Shellac may cause irritation of eyes, nose, and throat. Headache, intoxication, and drowsiness may occur. In case of skin contact, flush contact area thoroughly with water. For inhalation, remove to fresh air and give oxygen. In all cases, get immediate medical attention. Use shellac in well-ventilated area. When handling wear approved rubber gloves and safety goggles.



SILICONE

Conformal coating is flammable. Do not use near open flame or high temperatures. Repeated or prolonged contact or inhalation of vapors can cause skin and eye irritation, or damage to lungs, blood, liver, kidneys, and nervous system. Existing eye, skin, and respiratory disorders can be aggravated. Short-term inhalation of vapors can cause drowsiness and irritation of nose and throat. Use only in a well-ventilated area. If vapors are inhaled, go to fresh air. Short-term skin contact can cause irritation, redness, and swelling. Wipe off skin contact area and flush with fresh water. Flush eyes with with fresh water for 15 minutes. Get immediate medical attention if irritation develops or ill effects persist. If swallowed, do not induce vomiting. Vomiting can cause serious lung damage. If vomiting occurs, keep head below hips to prevent entry of liquid into lungs. When handling, wear approved protective gloves, goggles, and respirator with organic vapor cartridge. Metal storage containers must be grounded to eliminate static electricity fire hazard.



THINNER

Paint thinner is flammable; do not use near open flames, near welding areas, or on hot surfaces. Do not smoke when using paint thinner, and do not use it where others are smoking. Contact with liquid or vapor can cause skin, nose, throat, and eye irritation, drowsiness, headache, nausea, and vomiting. After any prolonged contact of liquid with skin, wash contacted area with soap and water. Remove solvent-saturated clothing. If vapors cause drowsiness, go to fresh air. In all cases get immediate medical attention. When handling liquid at air-exhausted workbench wear approved gloves, goggles, and long sleeves. When handling liquid or liquid-soaked cloth in open unexhausted area, wear approved respirator, gloves, and goggles. Dispose of liquid-soaked rags in approved metal container. Metal containers must be grounded to maintain electrical continuity.



URETHANE ADHESIVE

Urethane Adhesive Components A and B are flammable. Keep away from heat, sparks, or any source of ignition.

Overexposure to Component A may cause headache, nausea, and skin irritation and is an irritant to the upper respiratory system. In case of skin or eye contact, flush thoroughly with water. If inhaled remove to fresh air. If swallowed give large amounts of water. In all cases get immediate medical attention.

Overexposure to Component B, which is mildly toxic, may cause headache and mild irritation of nose, throat, and eyes. Contact with skin may cause irritation and dryness. Ingestion may cause vomiting and stomach cramps. In case of ingestion, get immediate medical attention. If inhaled remove to fresh air and give artificial respiration. In case of skin contact, remove contaminated clothing and wash with soap and water. Flush eyes immediately with large quantities of water. In all cases get immediate

medical attention. Use in well-ventilated area and wear approved respirator, goggles, and rubber gloves.



ZINC CHROMATE PRIMER

Zinc chromate primer is flammable; do not use near open flames, near welding areas, or on hot surfaces. Do not smoke when using zinc chromate primer, and do not use it where others are smoking. Contact with liquid or vapor can cause skin or eye irritation, dizziness, and headache. Prolonged inhalation can result in kidney and liver damage. After prolonged skin contact, wash contacted area with soap and water. If vapors cause dizziness, go to fresh air. In all cases get immediate medical attention. When handling small quantities (less than 1 gallon), wear approved gloves. When handling large quantities of liquid (greater than 1 gallon), at unexhausted workbench, wear approved respirator, gloves, goggles, apron, and long sleeves. Do not eat, smoke, or carry smoking materials in areas where liquid is handled. Dispose of liquid-soaked rags in approved metal container. Zinc chromate primer contains chromates. Follow approved toxic waste disposal procedures.



ZINC CHROMATE PUTTY

Zinc chromate putty is flammable; do not use near open flames, near welding areas, or on hot surfaces. Do not smoke when using zinc chromate putty, and do not use it where others are smoking. Contact with liquid or vapor can cause skin or eye irritation, dizziness, and headache. Prolonged inhalation can result in kidney and liver damage. After prolonged skin contact, wash contacted area with soap and water. If vapors cause dizziness, go to fresh air. In all cases get immediate medical attention. When handling small quantities (less than 1 gallon), wear approved gloves. Do not eat, smoke, or carry smoking materials in areas where putty is handled. Dispose of putty in approved

metal container. Zinc chromate putty contains chromates. Follow approved toxic waste disposal procedures.

4. SAFETY PRECAUTIONS.

The following safety precautions shall be observed while performing procedures in this manual.

- Dangerous voltages are present at system connectors. Ensure power is OFF prior to connecting or disconnecting cables.
- Do not wear metal frame glasses, rings, watches, or other metal jewelry while working on electronic equipment.
- Some cleaning materials specified herein are flammable and/or toxic. Keep away from open flame or other ignition sources. Provide adequate ventilation and avoid skin/eye exposure.
- Cleaning with compressed air can create airborne particles that may enter eyes or penetrate skin. Pressure shall not exceed 30 psig. Wear goggles. Do not direct compressed air against skin.
- For electrical shock safety steps and procedures, refer to TM 1-1500-204-23 and TB 385-4.

CHAPTER 11

FLIGHT CONTROLS

11-1. **FLIGHT CONTROLS**

Maintenance procedures for the OH-58D and OH-58D(R) flight control systems are included in sections I through V.

		Page
Section I	Rigging	11-2
Section II	Collective Controls	11-55
Section III	Cyclic Control System	11-209
Section IV	Directional Controls	11-417
Section V	Component Inspection	11-521

Section I. RIGGING

11-2. RIGGING

OH-58D(R) helicopters. Standard torques are provided in Appendix P and TM 1-1500-204-23.

11-3. INTRODUCTION

This section includes procedures for rigging the collective control system, cyclic control system, and directional control system for the OH-58D and

11-4. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Collective Control System (OH-58D) — Rigging	11-1-1	11-3
Collective Control System (OH-58D(R)) — Rigging	11-1-2	11-16
Cyclic Controls — Rigging	11-1-3	11-30
Directional Controls — Rigging	11-1-4	11-45

11-1-1. COLLECTIVE CONTROL SYSTEM (OH-58D) — RIGGING

This task covers: Rigging (On Helicopter)

INITIAL SETUP

Applicable Configurations:
OH-58D

Tools:

Electrical Repairer Tool Kit (B177)
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B238)
Torque Wrench (B235)
Spring Scale (B120)
Shear Bolt (B8)
Hydraulic Test Stand
Digital Multimeter (B98)
Workaid (H-227)

Material:

Corrosion Preventive Compound (D83)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer (2)
68F Aircraft Electrician
Maintenance Test Pilot

References:

TM 1-1520-248-MTF

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)
Forward Fairing Assembly Removed
(Task 2-2-47)

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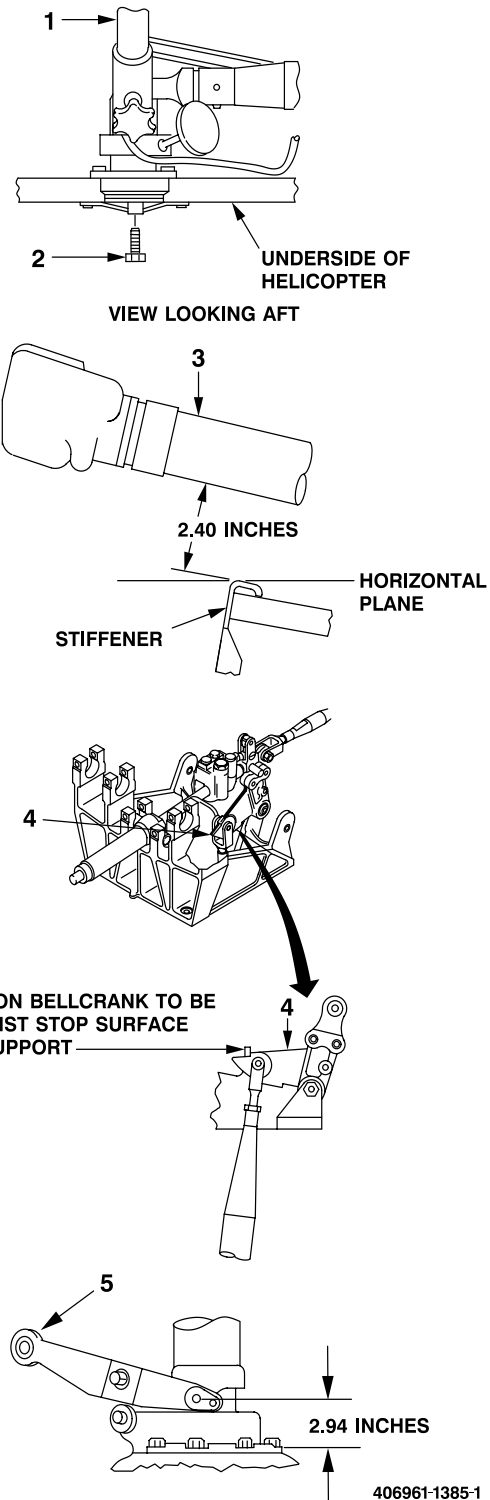
11-1-1. COLLECTIVE CONTROL SYSTEM (OH-58D) — RIGGING (CONT)

PRE-RIGGING CHECK

WARNING

- Ensure that no one operates controls from inside of helicopter during rigging of collective control system. Physical injury can occur. If injury occurs, seek medical aid. A 'DO NOT MOVE CONTROLS' sign shall be displayed in the cockpit during the performance of this task.
- Do not drop tools in centerpost (vertical tunnel). Tools can jam or damage controls. Loss of controls can result in helicopter crash and loss of lives.

1. Center pilot cyclic stick (1).
2. Install shear bolt (B8) (2) in bottom of fuselage in base of cyclic stick (1).
3. A measurement of **2.40 inches** from bottom of pilot collective stick (3) to stiffener must be attained.
4. Verify bellcrank (4) is against down collective stop as shown.
5. A measurement of **2.94 inches** must be attained from centerline of pivot pin to surface area (under nut) of support assembly for collective lever assembly (5).
6. If measurements in above steps fail to meet stated requirements, proceed with complete rigging of collective control system.
7. If measurements are correct, remove shear bolt (B8) (2). No further action is required.



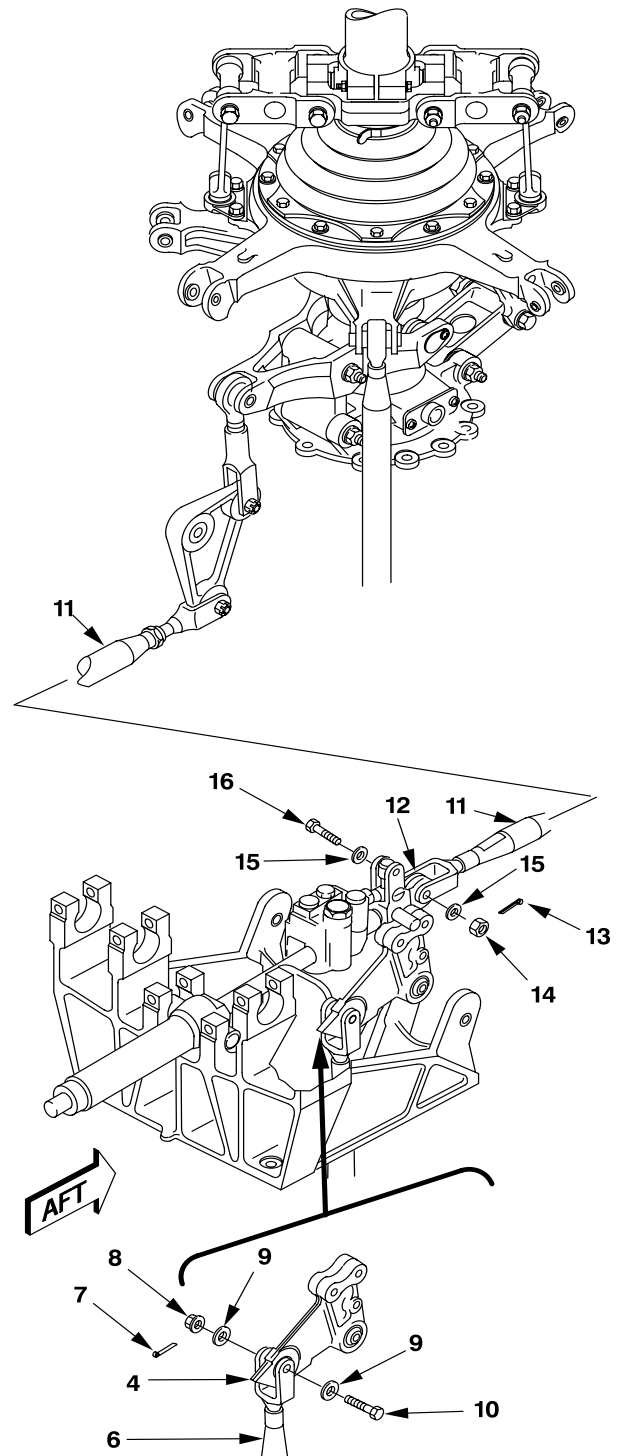
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11-1-1. COLLECTIVE CONTROL SYSTEM (OH-58D) — RIGGING (CONT)

RIGGING

8. Disconnect tube assembly (6) from collective servoactuator bellcrank (4) by removing cotter pin (7), nut (8), two washers (9), and bolt (10). Discard cotter pin (7).

9. Disconnect collective servoactuator tube assembly (11) from actuator valve (12) by removing cotter pin (13), nut (14), two washers (15), and bolt (16). Discard cotter pin (13).



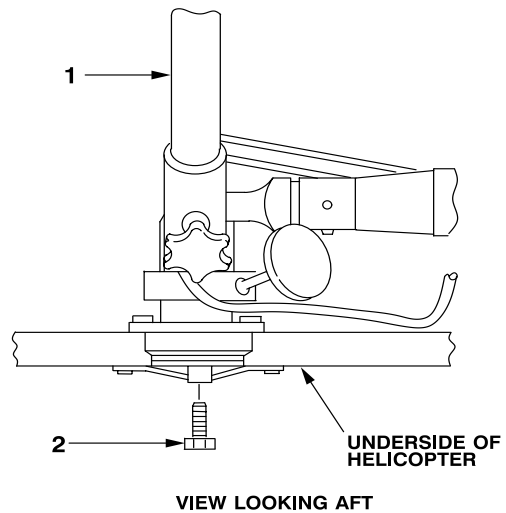
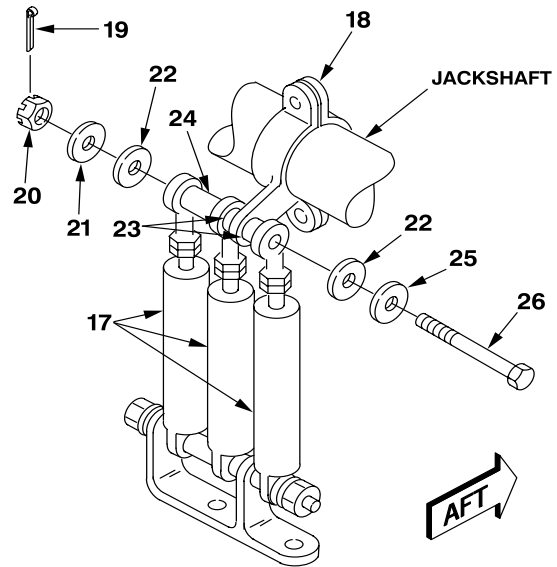
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11-1-1. COLLECTIVE CONTROL SYSTEM (OH-58D) — RIGGING (CONT)

10. Disconnect three collective transducers (17) from clamp (18) by removing cotter pin (19), nut (20), washer (21), two spacers (22), two spacers (23), spacer (24), washer (25), and bolt (26). Discard cotter pin (19).

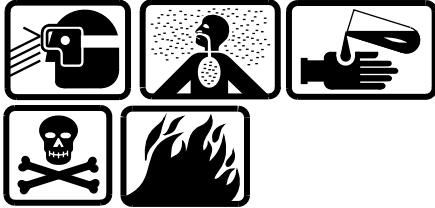
11. Center the pilot cyclic stick (1) and install shear bolt (B8) (2) into bottom of cyclic stick (1) from underside of helicopter.



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11-1-1. COLLECTIVE CONTROL SYSTEM (OH-58D) — RIGGING (CONT)



Corrosion Preventive Compound

CAUTION

Do not exceed one inch of exposed threads on adjustable control tube rod ends.

NOTE

- Corrosion preventive compound (D83) shall be applied to threads of all adjustable rod end bearings and clevises.
- After adjustment, each control tube assembly must be free to rotate several degrees about its longitudinal axis.

12. Set collective stick (3) as shown.

13. Position bellcrank (4) against down collective stop as shown.

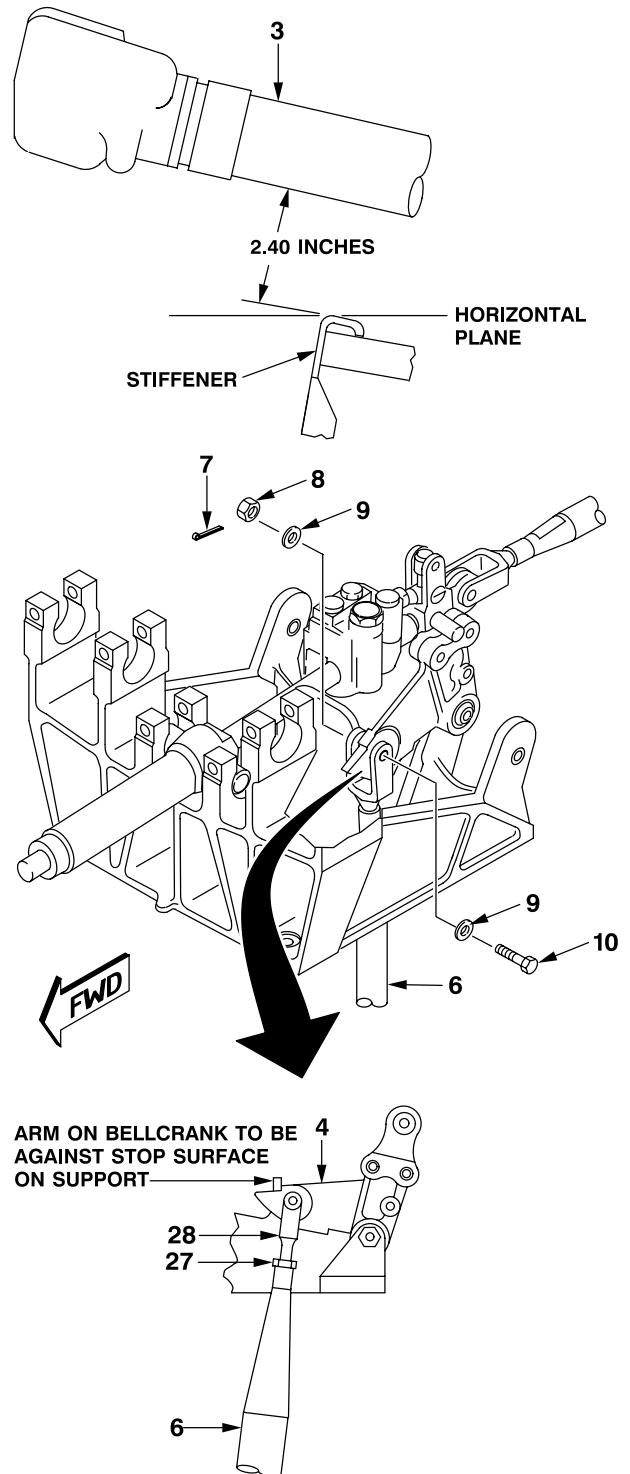
14. Adjust tube assembly (6) to bellcrank (4) by breaking jamnut (27) torque on tube assembly (6).

15. Adjust clevis (28) of tube assembly (6) to bellcrank (4).

16. Torque jamnut (27) **80 TO 100 INCH-POUNDS**.

17. Connect tube assembly (6) to bellcrank (4) with bolt (10), two washers (9), and nut (8). Torque nut (8) **30 TO 40 INCH-POUNDS**.

18. Install cotter pin (7) through nut (8).

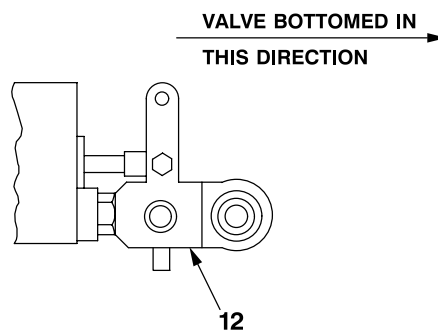
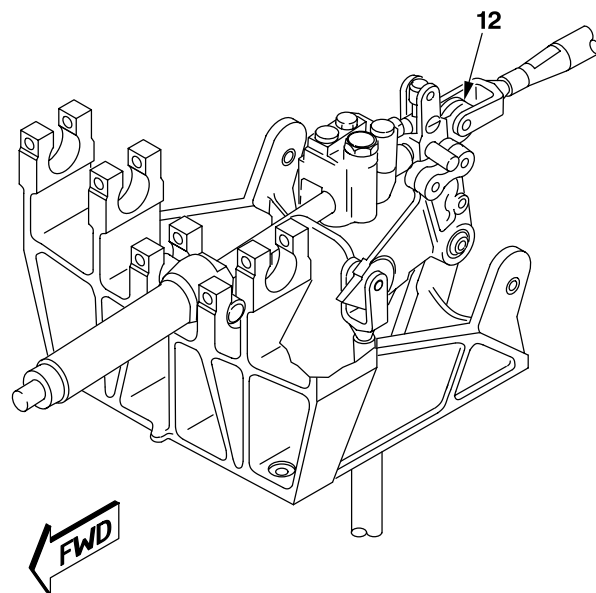
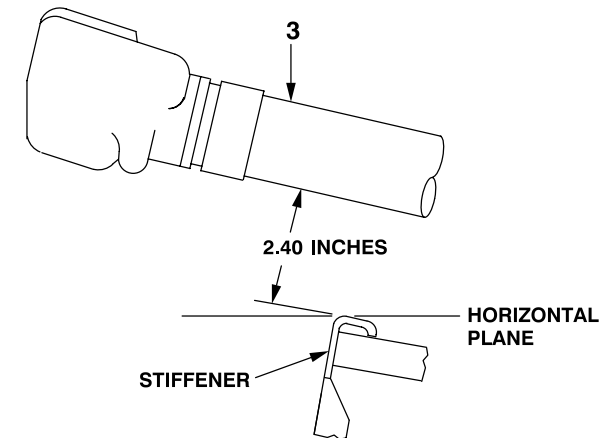


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11-1-1. COLLECTIVE CONTROL SYSTEM (OH-58D) — RIGGING (CONT)

19. Move collective stick (3) **4 inches** up (approximately), then down to get collective actuator valve (12) in position, hold collective stick (3) against low stop, bottom actuator valve (12). Disconnect main rotor pitch links at bottom end (Task 5-2-1).



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11-1-1. COLLECTIVE CONTROL SYSTEM (OH-58D) — RIGGING (CONT)

NOTE

Measurements are taken from centerline of pivot pin to surfaced area (under nut) of support assembly.

20. Set collective lever assembly (5) to **2.94 inches** as shown.

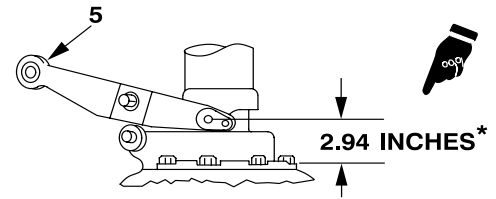
21. Adjust tube assembly (11) to actuator valve (12) by breaking torque on jamnut (29).

22. Adjust tube assembly (11) to actuator valve (12).

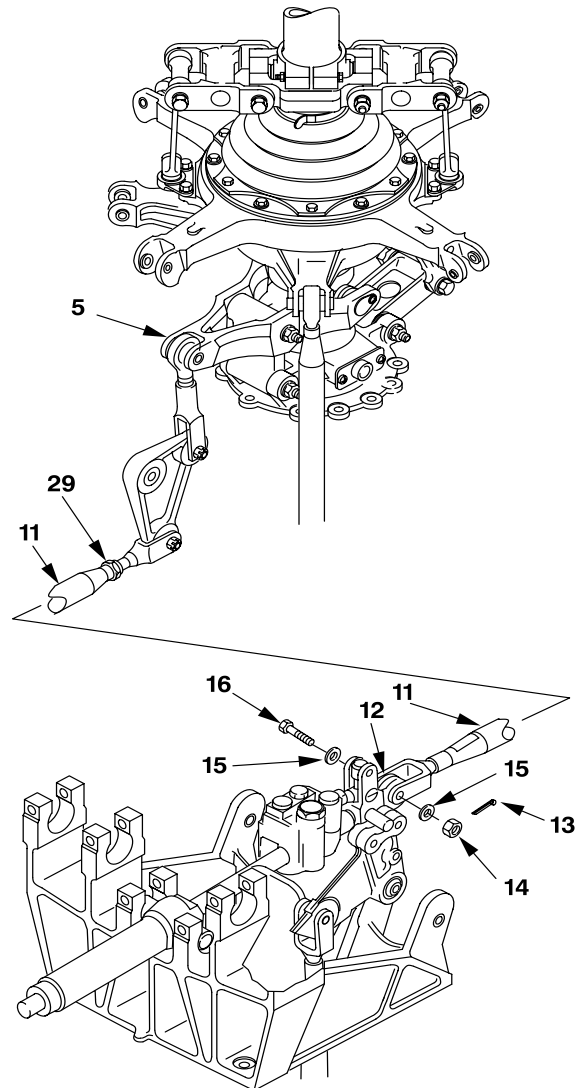
23. Torque jamnut (29) on tube assembly (11) **80 TO 100 INCH-POUNDS**.

24. Connect tube assembly (11) to actuator valve (12) with bolt (16), two washers (15), and nut (14). Torque nut (14) **65 TO 85 INCH-POUNDS** and install cotter pin (13) through nut (14).

25. Install pitch change rod to swashplate (Task 5-2-3).



* THIS DIMENSION COMPENSATES FOR 0.035 INCH HYDRAULIC ACTUATOR TRAVEL, CORRESPONDING TO 0.016 INCH VALVE TRAVEL.



406401-7
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11-1-1. COLLECTIVE CONTROL SYSTEM (OH-58D) — RIGGING (CONT)

26. Remove shear bolt (B8) (2) from bottom of pilot cyclic stick (1).

CAUTION

To avoid damaging transducers, the rest of the collective control system must have been rigged properly.

27. Adjust three transducers (17) to obtain **6.18-inch** dimension between centers of grounded bearing (30) and adjustable rod end bearing (31) with transducer movable rods (32) at midstroke position.

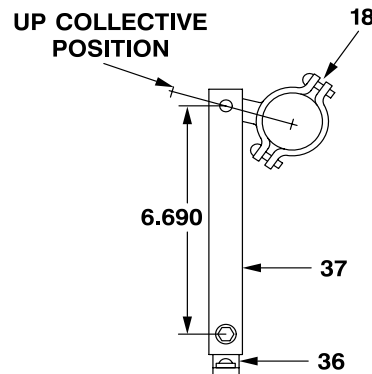
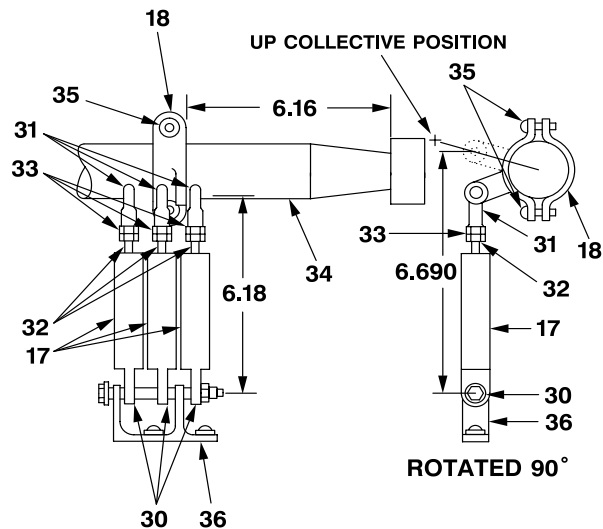
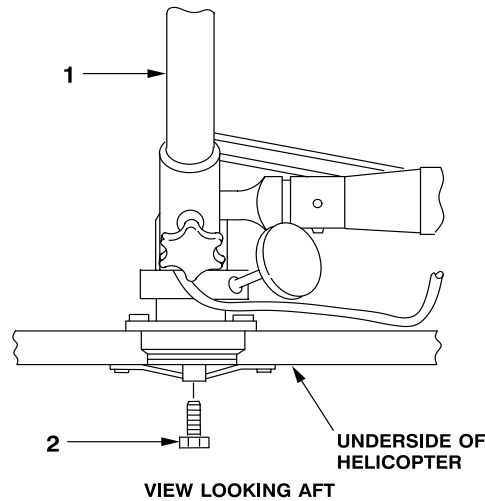
28. After achieving proper dimensions, torque jamnuts (33) **12 TO 15 INCH-POUNDS**.

29. Position pilot collective stick against full up stop. Hold in position with collective friction.

30. Loosen clamp (18) on jackshaft (34) by loosening two screws (35).

31. Rotate clamp (18) on jackshaft (34) to obtain **6.69-inch** dimension from transducers support (36) or install workaid (H-227) (37) to position clamp (18).

32. Position clamp (18) laterally on jackshaft (34) to obtain **6.16-inch** dimension. Tighten screws (35) on clamp (18) maintaining equal gaps between two clamp halves to prevent clamp distortion. Do not tighten screws (35) more than necessary to hold adjustment.

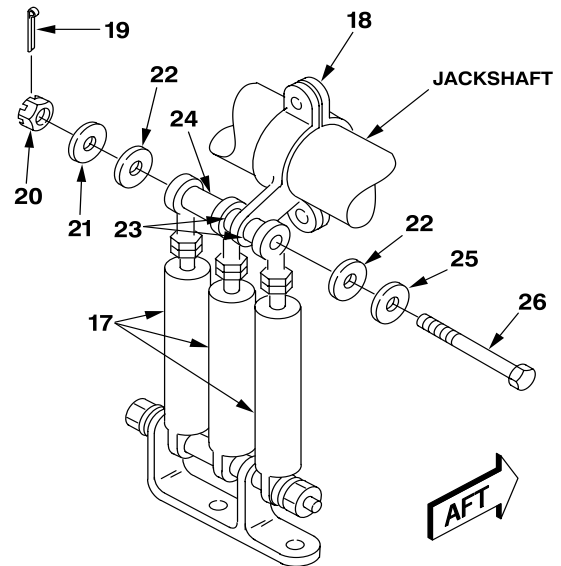
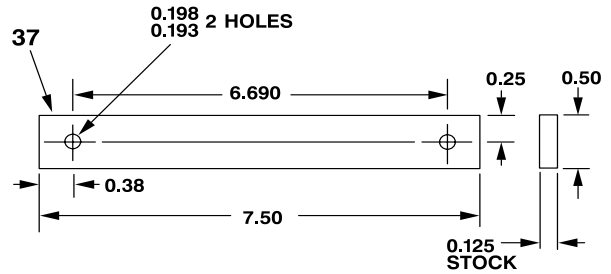


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11-1-1. COLLECTIVE CONTROL SYSTEM (OH-58D) — RIGGING (CONT)

33. Remove workaid (H-227) (37), if installed, and connect three transducers (17) to clamp (18) with bolt (26), thick steel washer (25), two spacers (22), two spacers (23), spacer (24), thin steel washer (21), and nut (20). Torque nut (20) **12 TO 15 INCH-POUNDS** and install cotter pin (19) through nut (20).



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11-1-1. COLLECTIVE CONTROL SYSTEM (OH-58D) — RIGGING (CONT)

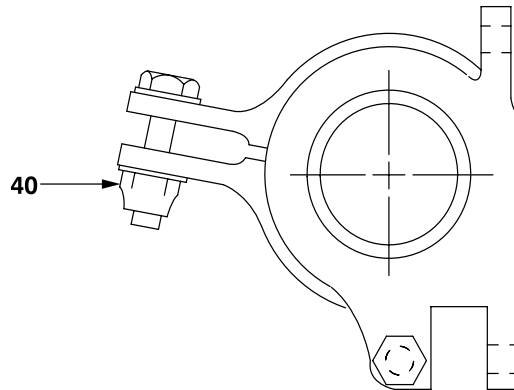
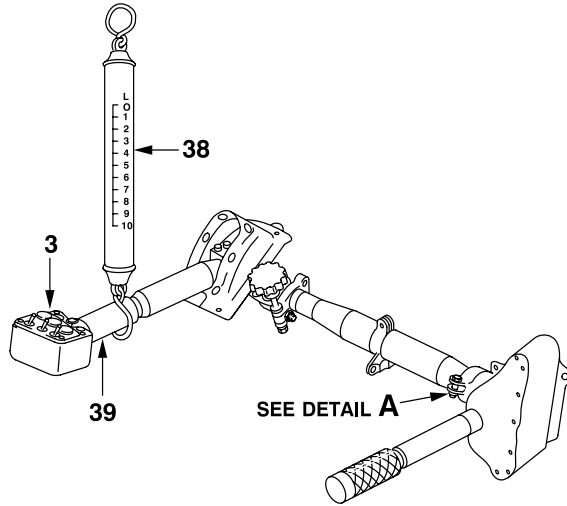
ADJUST MINIMUM FRICTION

34. Connect hydraulic test stand to helicopter and operate (Task 7-2-1).

35. Connect spring scale (B120) (38) to center of throttle grip (39) on pilot collective stick (3).

36. Adjust nut (40) until a force of 2 to 6 pounds is required to move collective stick (3).

INSPECT



DETAIL A

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11-1-1. COLLECTIVE CONTROL SYSTEM (OH-58D) — RIGGING (CONT)

TRANSDUCER RIGGING

NOTE

Rigging procedure involves making resistance measurements of the collective transducer through the aircraft harness connector (41) at the electronic supervisory control (42). The transducer mounting position (rod end) is adjustable to set the measured resistances (across pin 6 and 7) to be within limits with the electronic supervisory control lever set at flat pitch and full pitch positions.

37. Disconnect connector (41) from electronic supervisory control (42).

38. Using multimeter (B98), measure resistance across pins 5 and 7 of connector (41). This is total transducer resistance R5-7. Record this value.

39. Position collective to flat position; using multimeter (B98), measure resistance across pins 6 and 7. This is R6-7 flat pitch. Record this value.

40. Plot R5-7 on transducer rigging line of chart A.

41. On chart A, read R6-7 flat pitch value to left of plotted R5-7 value of transducer rigging line. Measured R6-7 value (see step 39) should be within (\pm) 20Ω of charted R6-7 value. If not, adjust rod end on transducer accordingly.

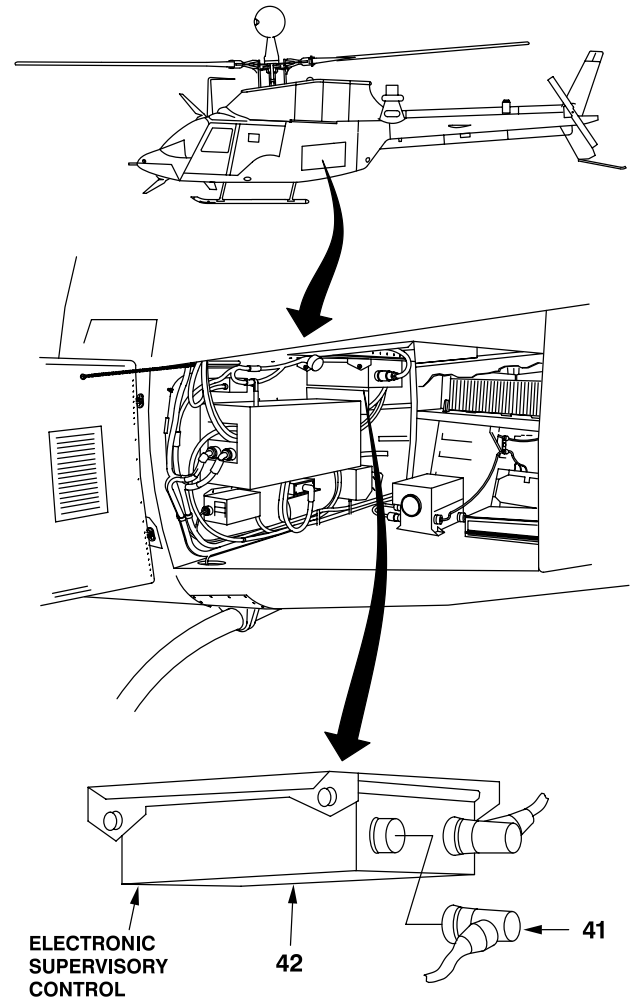
42. Check full pitch transducer reading by positioning collective in the full up position. Using multimeter (B98), measure resistance across pins 6 and 7. This is R6-7 full pitch. Record this value.

43. On chart A, read R6-7 full pitch value to the right of plotted R5-7 on transducer rigging line. Measured R6-7 full pitch value (see step 41) should be within $+60\Omega$ or -20Ω of charted R6-7 value. If not, adjust rod end on transducer accordingly.

NOTE

The resistance at flat pitch should be the primary set point, while the resistance at full pitch should be used only to check for being within limits.

44. After transducer has been adjusted, connect connector (41).



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11-1-1. COLLECTIVE CONTROL SYSTEM (OH-58D) — RIGGING (CONT)

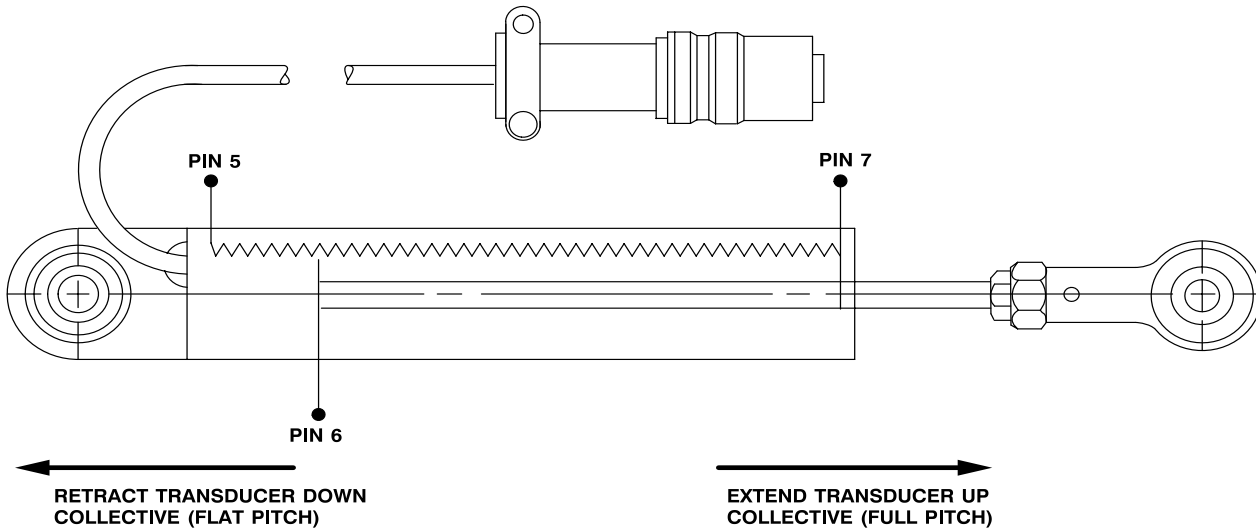
45. Disconnect hydraulic test stand from helicopter (Task 7-2-1).

FOLLOW-ON MAINTENANCE

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Install forward fairing assembly (Task 2-2-47).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).

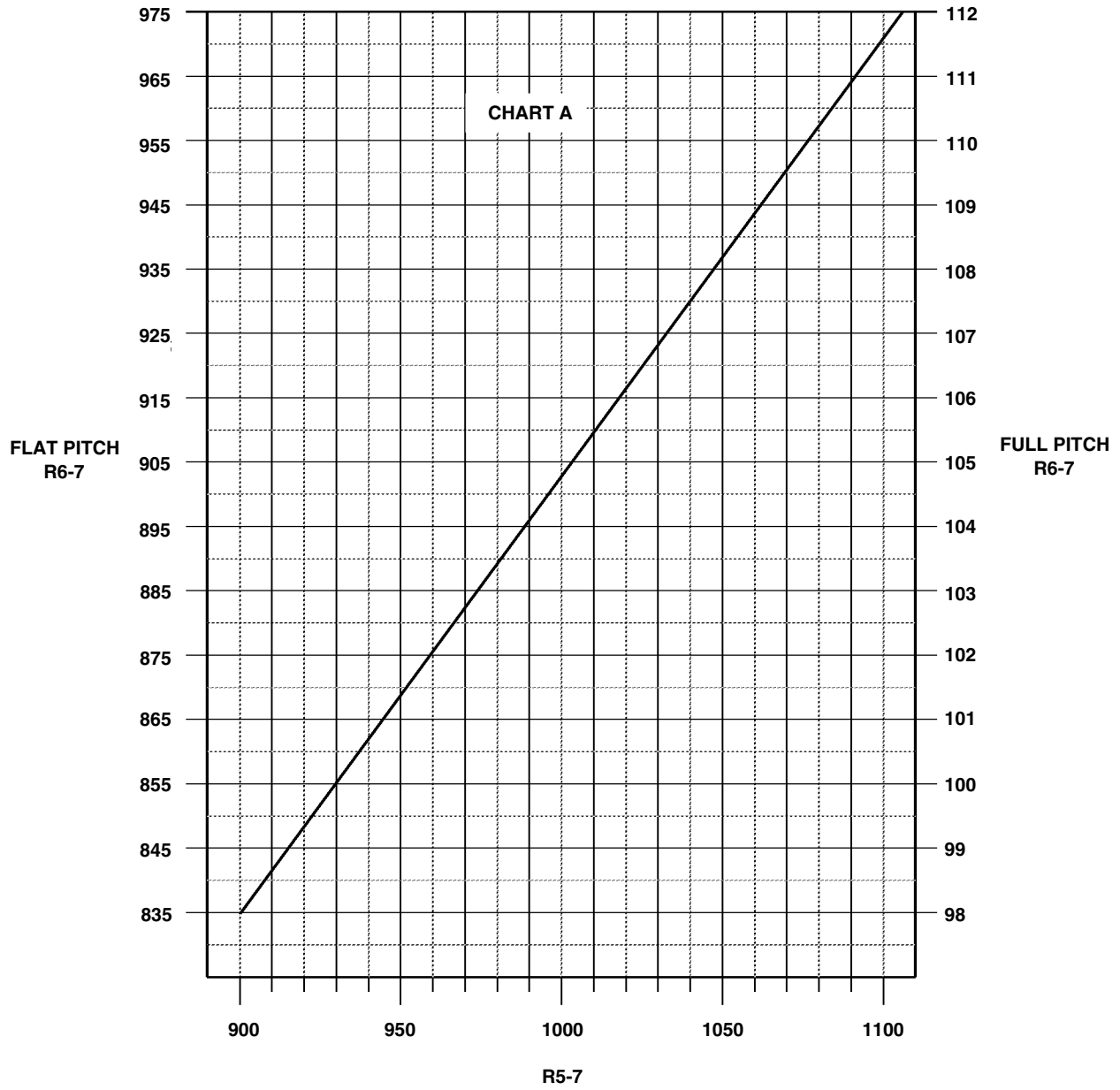


COLLECTIVE TRANSDUCER FOR FUEL DEMAND INPUT TO ELECTRONIC SUPERVISORY CONTROL

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11-1-1. COLLECTIVE CONTROL SYSTEM (OH-58D) — RIGGING (CONT)



ELECTRONIC SUPERVISORY CONTROL TOTAL RESISTANCE CHECK

406075-483
J0519

END OF TASK

11-1-2. COLLECTIVE CONTROL SYSTEM (OH-58D(R)) — RIGGING

This task covers: Rigging (On Helicopter)

INITIAL SETUP

Applicable Configurations:
OH-58D(R)

Tools:

Electrical Repairer Tool Kit (B177)
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B238)
Torque Wrench (B235)
Spring Scale (B120)
Shear Bolt (B8)
Goggles (B55)
Digital Multimeter (B98)
Hydraulic Test Stand
Workaid (H-227)

Material:

Corrosion Preventive Compound (D83)
Gloves (D111)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer (2)
68F Aircraft Electrician
Maintenance Test Pilot

References:

TM 1-1520-248-MTF

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)
Forward Fairing Assembly Removed
(Task 2-2-47)

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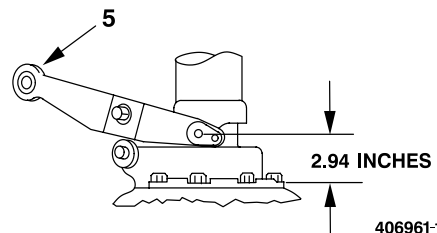
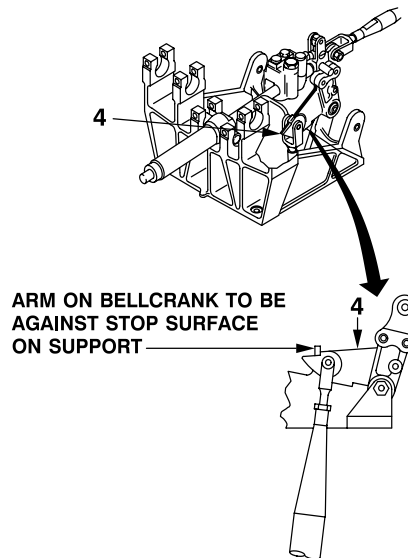
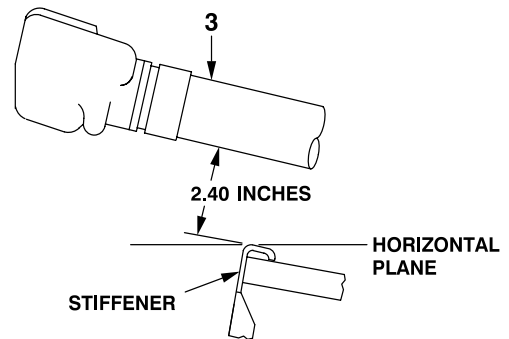
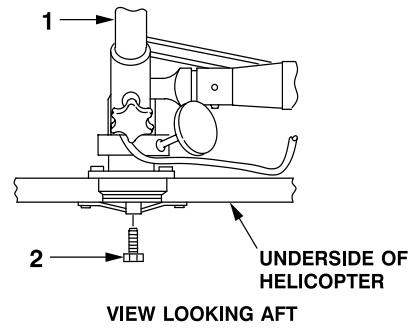
11-1-2. COLLECTIVE CONTROL SYSTEM (OH-58D(R)) — RIGGING (CONT)

PRE-RIGGING CHECK

WARNING

- Ensure that no one operates controls from inside of helicopter during rigging of collective control system. Physical injury can occur. If injury occurs, seek medical aid. A 'DO NOT MOVE CONTROLS' sign shall be displayed in the cockpit during the performance of this task.
- Do not drop tools in centerpost (vertical tunnel). Tools can jam or damage controls. Loss of controls can result in helicopter crash and loss of lives.

1. Center pilot cyclic stick (1).
2. Install shear bolt (B8) (2) in bottom of fuselage in base of cyclic stick (1).
3. A measurement of **2.40 inches** from bottom of pilot collective stick (3) to stiffener must be attained.
4. Verify bellcrank (4) is against down collective stop as shown.
5. A measurement of **2.94 inches** must be attained from centerline of pivot pin to surface area (under nut) of support assembly for collective lever assembly (5).
6. If measurements in above steps fail to meet stated requirements, proceed with complete rigging of collective control system.
7. If measurements are correct, remove shear bolt (B8) (2). No further action is required.



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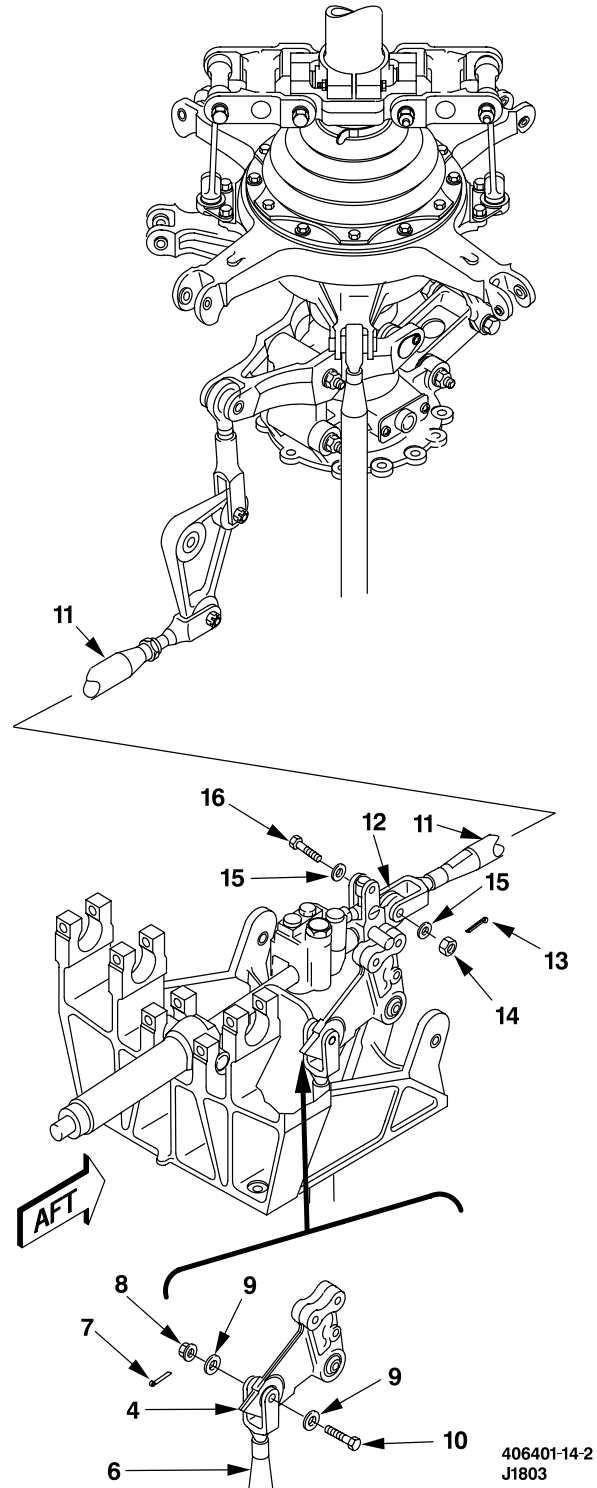
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11-1-2. COLLECTIVE CONTROL SYSTEM (OH-58D(R)) — RIGGING (CONT)

RIGGING

8. Disconnect tube assembly (6) from collective servoactuator bellcrank (4) by removing cotter pin (7), nut (8), two washers (9), and bolt (10). Discard cotter pin (7).

9. Disconnect collective servoactuator tube assembly (11) from actuator valve (12) by removing cotter pin (13), nut (14), two washers (15), and bolt (16). Discard cotter pin (13).



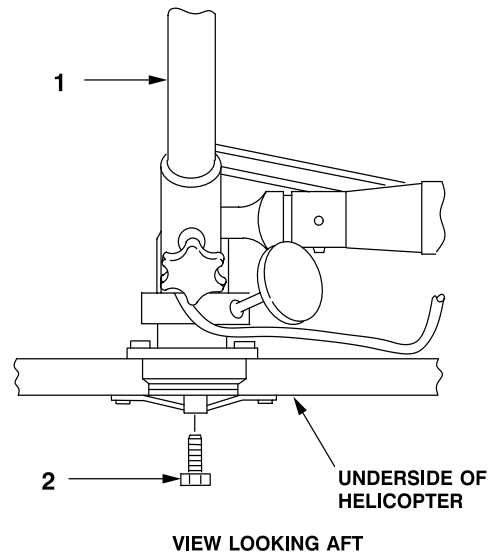
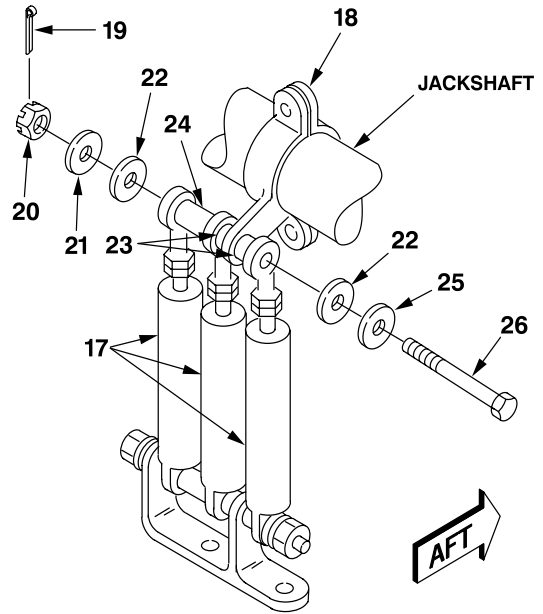
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11-1-2. COLLECTIVE CONTROL SYSTEM (OH-58D(R)) — RIGGING (CONT)

10. Disconnect three collective transducers (17) from clamp (18) by removing cotter pin (19), nut (20), washer (21), two spacers (22), two spacers (23), spacer (24), washer (25), and bolt (26). Discard cotter pin (19).

11. Center the pilot cyclic stick (1) and insert shear bolt (B8) (2) into bottom of cyclic stick (1) from underside of helicopter and secure.



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J1803

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11-1-2. COLLECTIVE CONTROL SYSTEM (OH-58D(R)) — RIGGING (CONT)



Corrosion Preventive Compound

CAUTION

Do not exceed one inch of exposed threads on adjustable control tube rod ends.

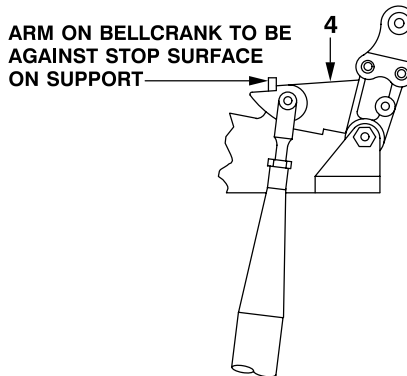
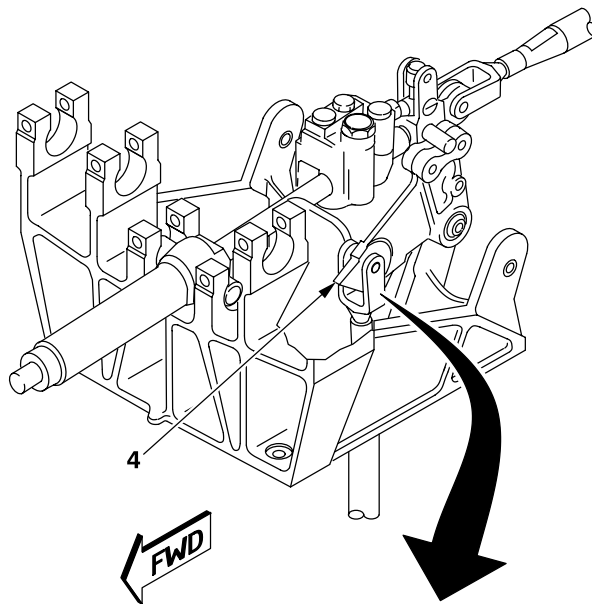
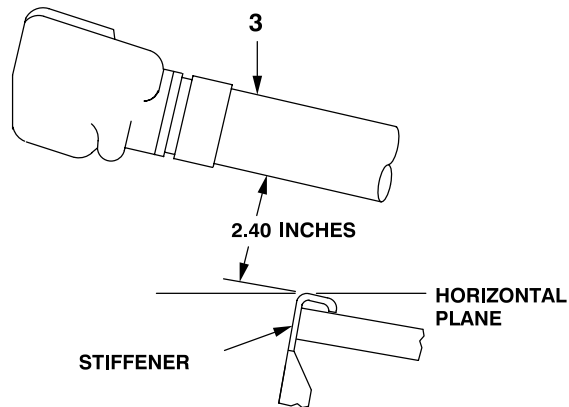
NOTE

- Corrosion preventive compound (D83) shall be applied to threads of all adjustable rod end bearings and clevises.
- After adjustment, each control tube assembly must be free to rotate several degrees about its longitudinal axis.

12. Position bellcrank (4) against down collective stop as shown.

13. Raise pilot collective stick (3) to 12 degrees above horizontal.

14. Attain measurement **2.40 inches** from bottom of pilot collective stick (3) to stiffener.



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11-1-2. COLLECTIVE CONTROL SYSTEM (OH-58D(R)) — RIGGING (CONT)

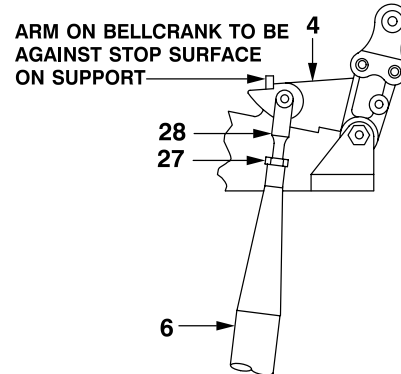
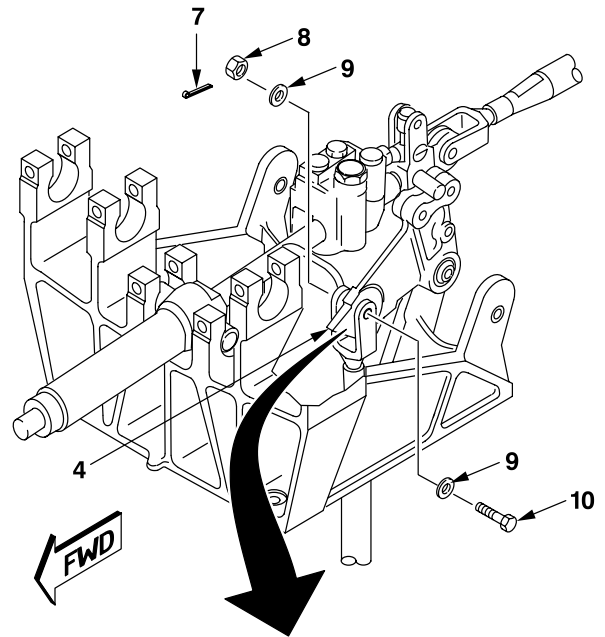
15. Adjust tube assembly (6) to bellcrank (4) by breaking jamnut (27) torque on tube assembly (6).

16. Adjust clevis (28) of tube assembly (6) to bellcrank (4).

17. Torque jamnut (27) **80 TO 100 INCH-POUNDS**.

18. Connect tube assembly (6) to bellcrank (4) with bolt (10), two washers (9), and nut (8). Torque nut (8) **30 TO 40 INCH-POUNDS**.

19. Secure nut (8) with cotter pin (7).



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J1803

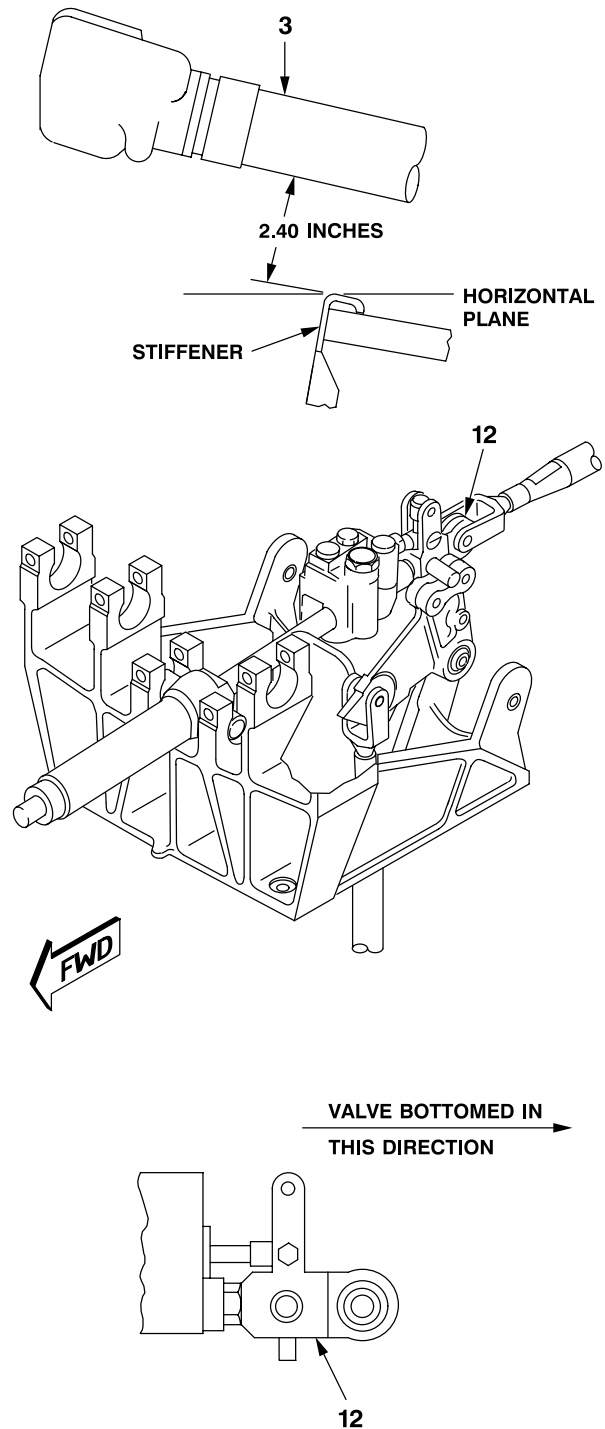
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11-1-2. COLLECTIVE CONTROL SYSTEM (OH-58D(R)) — RIGGING (CONT)

20. Move collective stick (3) **4 inches** up (approximately), then down to get collective actuator valve (12) in position.

21. Hold collective stick (3) against low stop, bottom actuator valve (12).

22. Disconnect main rotor pitch links at bottom end (Task 5-2-1).



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J1803

GO TO NEXT PAGE

11-1-2. COLLECTIVE CONTROL SYSTEM (OH-58D(R)) — RIGGING (CONT)

23. Set collective lever assembly (7) to obtain **2.94-inch** clearance between centerline of pivot pin (5) and surface area (under nut) of support assembly (6) as shown.

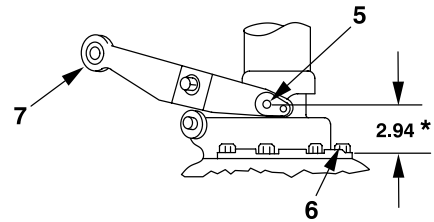
24. Adjust tube assembly (11) to actuator valve (12) by breaking torque on jamnut (27).

25. Adjust tube assembly (11) to actuator valve (12).

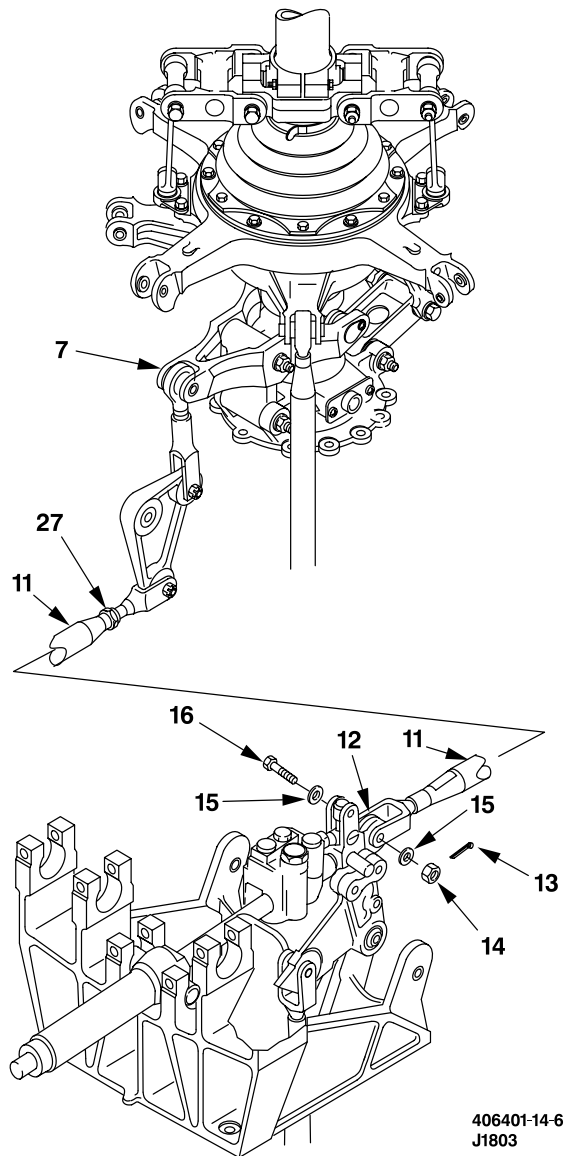
26. Torque jamnut (27) on tube assembly (11) **80 TO 100 INCH-POUNDS**.

27. Connect tube assembly (11) to actuator valve (12) with bolt (16), two washers (15), and nut (14). Torque nut (14) **65 TO 85 INCH-POUNDS** and secure nut (14) with cotter pin (13).

28. Connect main rotor pitch link at bottom end (Task 5-2-3).



* THIS DIMENSION COMPENSATES FOR 0.035 INCH HYDRAULIC ACTUATOR TRAVEL, CORRESPONDING TO 0.016 INCH VALVE TRAVEL.



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J1803

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11-1-2. COLLECTIVE CONTROL SYSTEM (OH-58D(R)) — RIGGING (CONT)

29. Remove shear bolt (B8) (2) from bottom of pilot cyclic stick (1).

30. Loosen three jamnuts (29).

CAUTION

To avoid damaging transducers, the rest of the collective control system must have been rigged properly.

31. Adjust three transducers (17) to obtain **6.18-inch** dimension between centers of grounded bearing (30) and adjustable rod end bearing (31) with transducer movable rods (32) at midstroke position.

32. After achieving proper dimensions, torque jamnuts (29) **12 TO 15 INCH-POUNDS**.

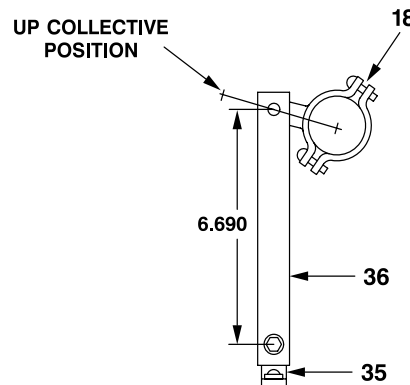
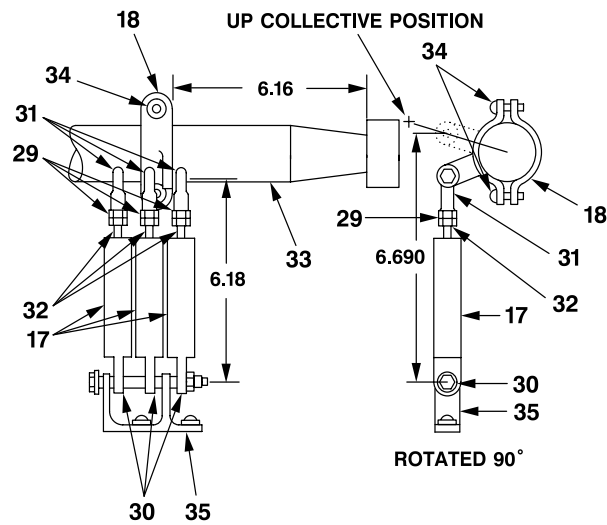
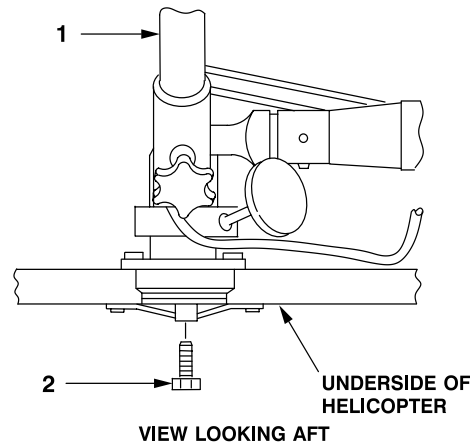
33. Position pilot collective stick against full up stop. Hold in position with collective friction.

34. Loosen clamp (18) on jackshaft (33) by loosening two screws (34).

35. Rotate clamp (18) on jackshaft (33) to obtain **6.690-inch** dimension from transducers support (35) or install workaid (H-227) (36) to position clamp (18).

36. Position clamp (18) laterally on jackshaft (33) to obtain **6.16-inch** dimension. Tighten screws (34) on clamp (18) maintaining equal gaps between clamp halves to prevent clamp distortion. Do not tighten screws (34) more than necessary to hold adjustment.

37. Remove workaid (H-227) (36), if installed.



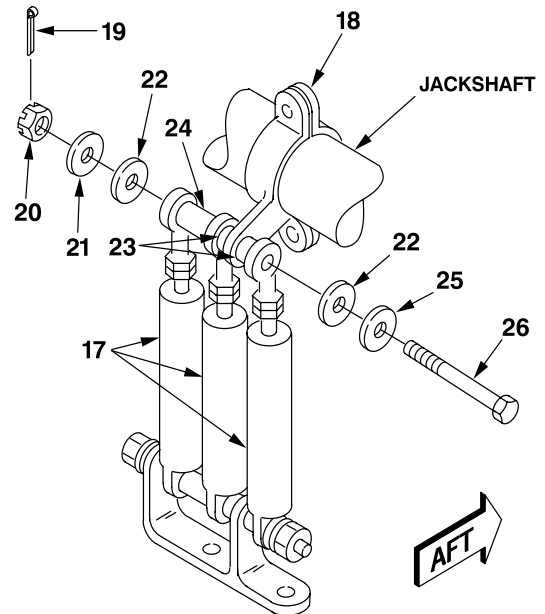
406401-14-7
J1803

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11-1-2. COLLECTIVE CONTROL SYSTEM (OH-58D(R)) — RIGGING (CONT)

38. Install three transducers (17) on clamp (18) with bolt (26), washer (25), spacer (22), two spacers (23), spacer (24), spacer (22), washer (21) and nut (20). Torque nut (20) **12 TO 15 INCH-POUNDS**.

39. Install cotter pin (19).



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J1803

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11-1-2. COLLECTIVE CONTROL SYSTEM (OH-58D(R)) — RIGGING (CONT)

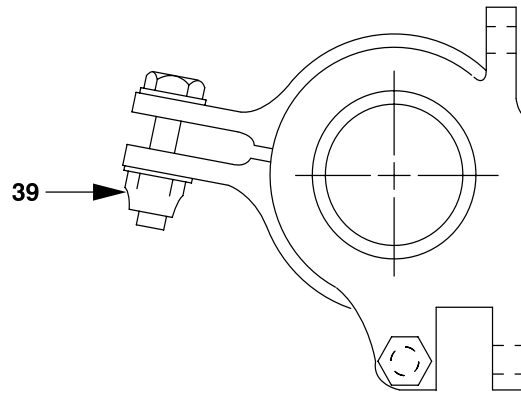
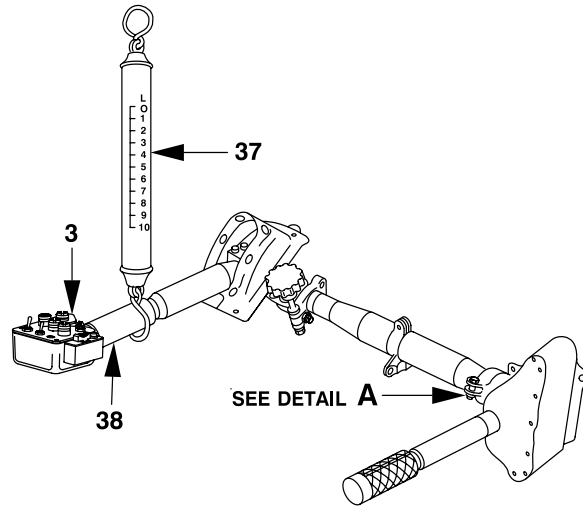
ADJUST MINIMUM FRICTION

40. Connect hydraulic test stand to helicopter and operate (Task 7-2-1).

41. Connect spring scale (B120) (37) to center of throttle grip (38) on pilot collective stick (3).

42. Adjust nut (39) until a force of 2 to 6 pounds is required to move collective stick (3).

INSPECT



DETAIL A

406401-14-9
J1803

GO TO NEXT PAGE

11-1-2. COLLECTIVE CONTROL SYSTEM (OH-58D(R)) — RIGGING (CONT)

TRANSDUCER RIGGING

NOTE

- Rigging procedure involves making resistance measurements of the collective transducer (412-074-101-101) through the aircraft harness connector at the electronic control unit.
- The transducer mounting position (rod end) is adjusted to cause measured resistance to fall within allowable limits with collective lever in full down and full up position.

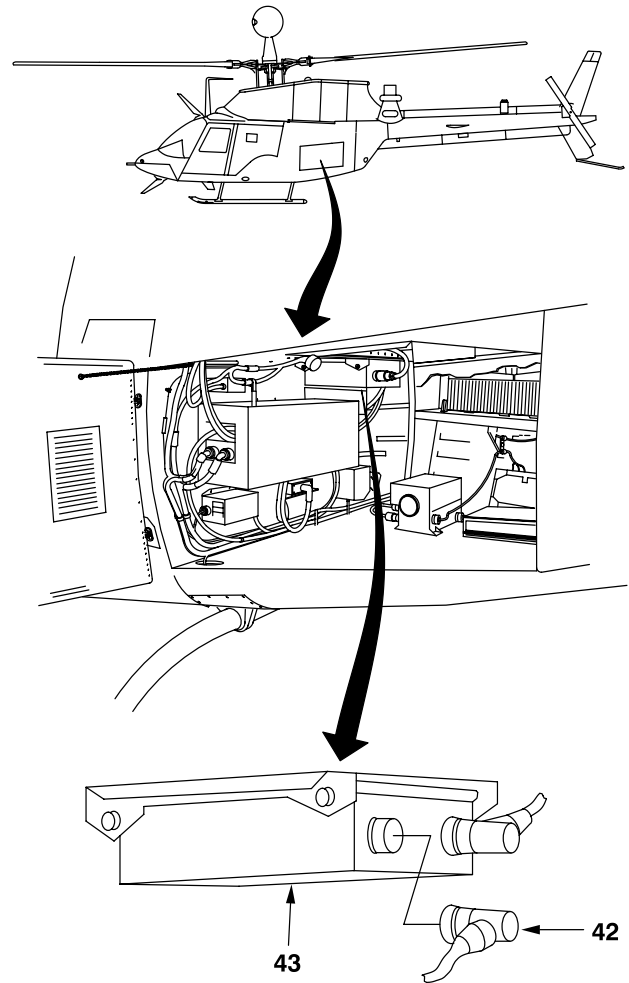
43. Disconnect connector (40) from electronic control unit (ECU) (41).

44. Using digital multimeter (B98), measure resistance across pins 64 and 65 of connector (40). This is total transducer resistance. Record this value.

45. With hydraulic power applied, position collective to full down and using digital multimeter (B98), measure resistance across pins 63 and 65.

46. Plot value on chart A from step 45. using total resistance from step 44.

47. Value of step 46. should be between minimum and maximum lines on chart A. If not rod end must be adjusted accordingly.



406075-481-1
J1803

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11-1-2. COLLECTIVE CONTROL SYSTEM (OH-58D(R)) — RIGGING (CONT)

48. Position collective to full up and using digital multimeter (B98), measure resistance across pins 63 and 65.

49. Plot value on chart B from step 48. using total resistance from step 44.

50. Value of step 49. should be between minimum and maximum lines on chart B. If not rod end must be adjusted accordingly.

NOTE

Resistance at full down position will be primary set point, and resistance at full up position will be used only to check limits.

51. Connect connector (40) at ECU (41).

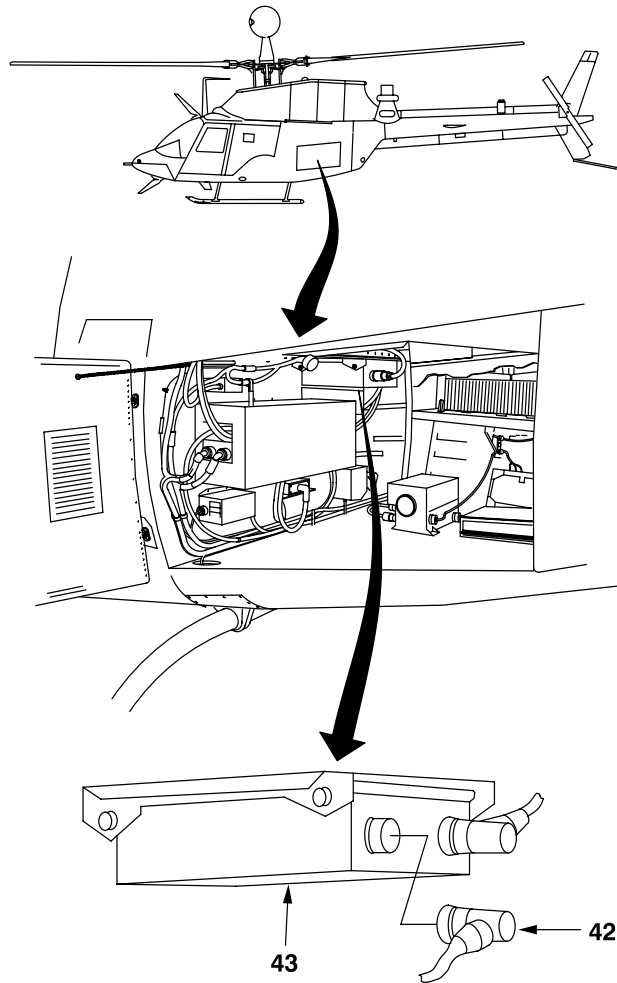
52. Disconnect hydraulic test stand from helicopter (Task 7-2-1).

FOLLOW-ON MAINTENANCE

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Install forward fairing assembly (Task 2-2-47).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).

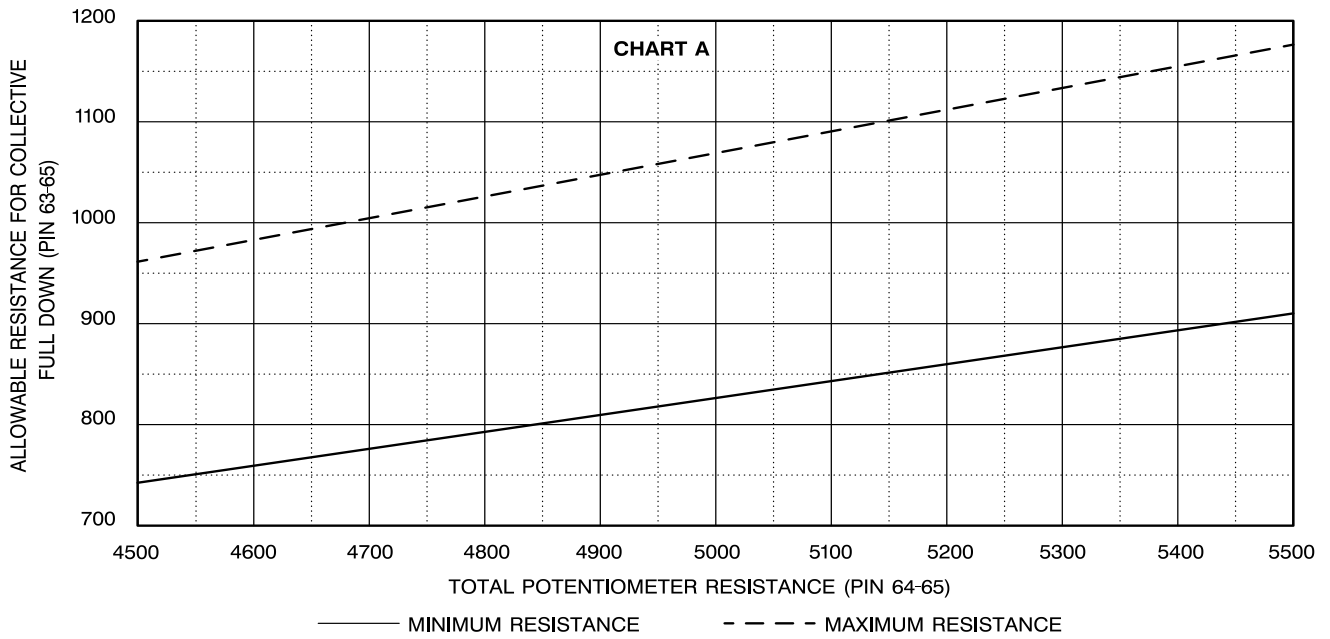


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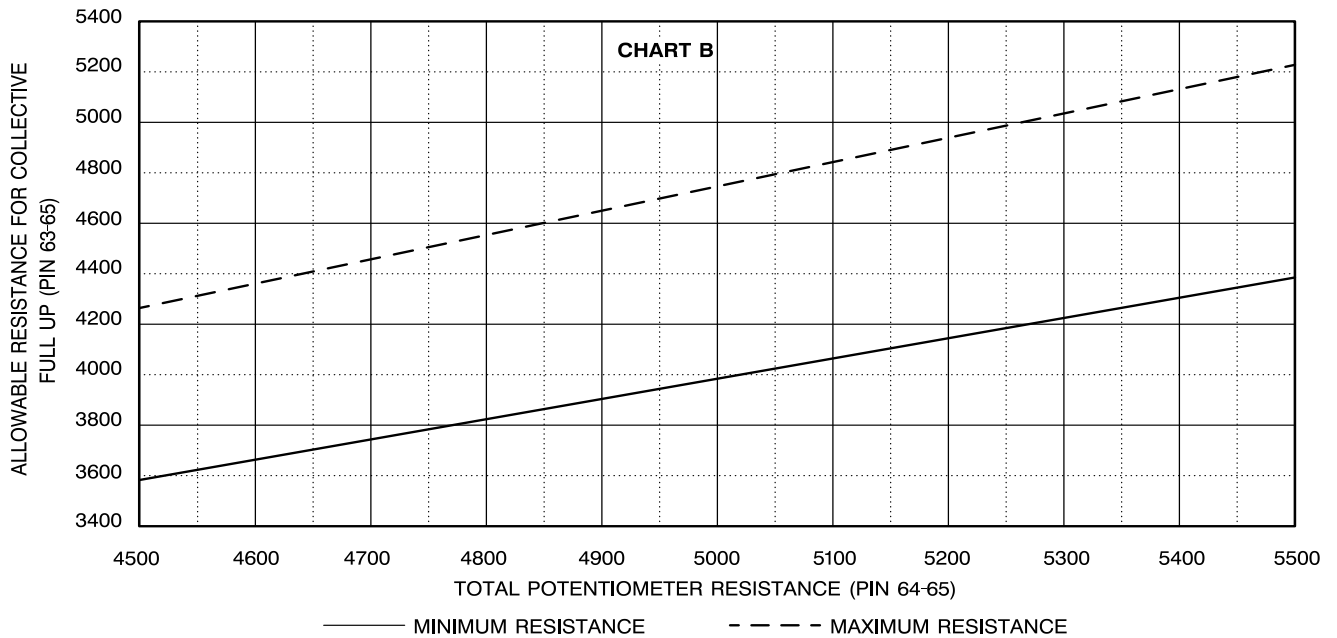
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11-1-2. COLLECTIVE CONTROL SYSTEM (OH-58D(R)) — RIGGING (CONT)

FULL DOWN COLLECTIVE POTENTIOMETER RESISTANCE VALUES



FULL UP COLLECTIVE POTENTIOMETER RESISTANCE VALUES



406075-1547-1
J1078

END OF TASK

11-1-3. CYCLIC CONTROLS — RIGGING

This task covers: Rigging (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

- General Mechanic Tool Kit (B178)
- Shear Bolt (B8)
- Torque Wrench (B237)
- Torque Wrench (B238)
- Spring Scale (B120)
- Hydraulic Test Stand
- Workaid (H-230)

Personnel Required:

- 67S Scout Helicopter Technical Inspector (TI)
- 67S Scout Helicopter Repairer
- Maintenance Test Pilot

References:

- TM 1-1520-248-MTF
- TM 1-1500-204-23

Equipment Condition:

- Helicopter Safed (Task 1-6-7)
- Forward Fairing Assembly Removed (Task 2-2-47)
- Collective Controls Rigged (Task 11-1-1 or 11-1-2)
- Copilot/Gunner Collective Stick Assembly Removed (Task 11-2-15)
- Crew Seat and Armor Seat Panel Removed (Task 2-2-33) or Seat Pan Assembly Removed (Task 2-2-34)
- Center Console Top Cover Removed (Task 2-2-99)

GO TO NEXT PAGE

11-1-3. CYCLIC CONTROLS — RIGGING (CONT)

WARNING

- Ensure that no one operates controls from inside of helicopter during rigging of collective control system. Physical injury can occur. If injury occurs, seek medical aid. A 'DO NOT MOVE CONTROLS' sign shall be displayed in the cockpit during the performance of this task.
- Do not drop tools in centerpost (vertical tunnel). Tools can jam or damage controls. Loss of controls can result in helicopter crash and loss of lives.

PRE-RIGGING CHECK

NOTE

Collective controls must be rigged before cyclic controls.

1. Center pilot cyclic stick (1). Insert shear bolt (B8) (2) through hole in bottom of fuselage in base of cyclic stick.

NOTE

Use hydraulic test stand or disconnect main rotor pitch links to ensure bellcrank is bottomed out on stop.

2. Pull collective stick to full-up position so that collective input valve bellcrank (3) contacts stop (4) on actuator support (5).

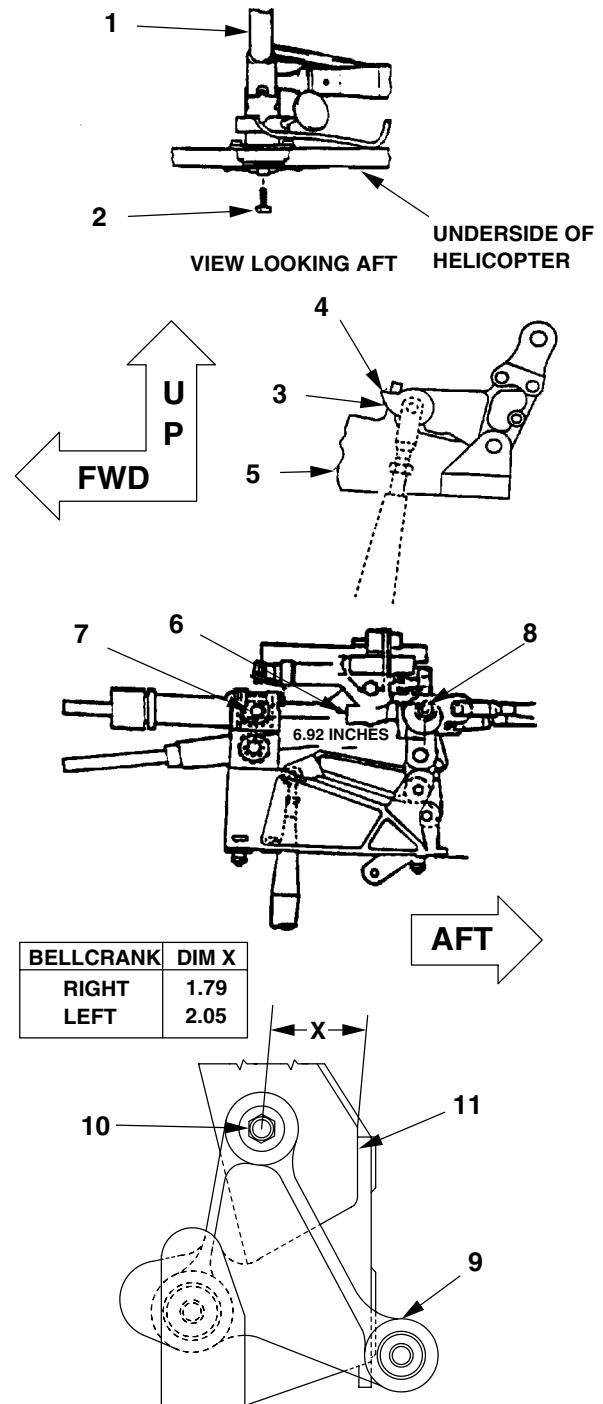
3. Using workaid (H-230), measure both cyclic servo actuators (6) for a dimension of **6.92 inches**, measured between center of support assembly attaching point (7) and center of input bellcrank attaching point (8) as shown.

4. Push collective stick to full-down position. A measurement of **1.79 inches** is required for right cyclic boosted bellcrank (9) and **2.05 inches** for left cyclic boosted bellcrank (9) at centerline of cyclic short tube bolt hole (10) to near edge of transmission flight control support (11) at hardware mating surface as shown.

5. If measurements in above steps fail to meet stated requirements, proceed with complete rigging of cyclic control system.

6. If measurements are correct, remove shear bolt (B8) (2). No further action is required.

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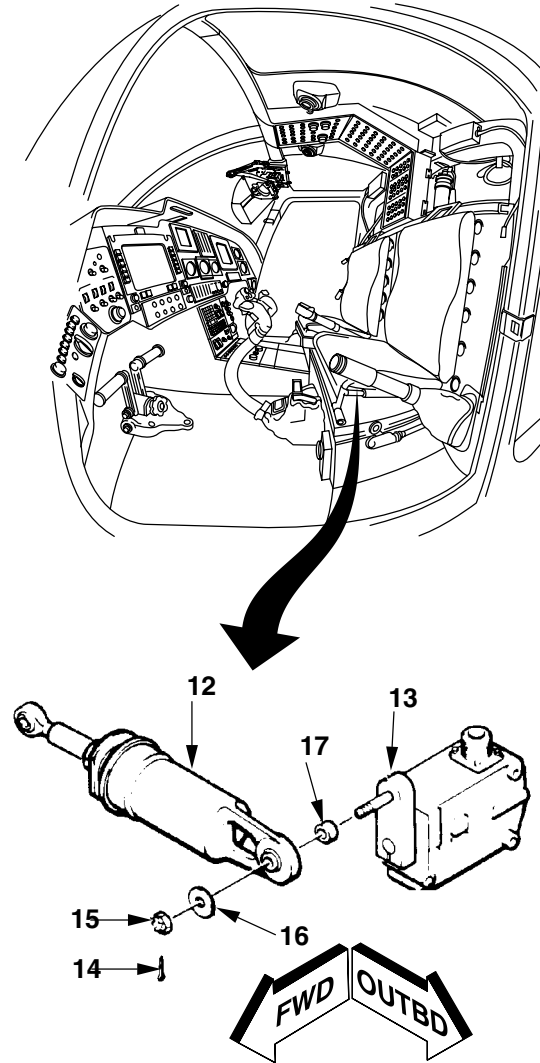


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11-1-3. CYCLIC CONTROLS — RIGGING (CONT)

DISCONNECT

7. Disconnect lateral force gradient (12) from magnetic brake arm (13) by removing cotter pin (14), nut (15), washer (16), and spacer (17). Discard cotter pin.



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J0519

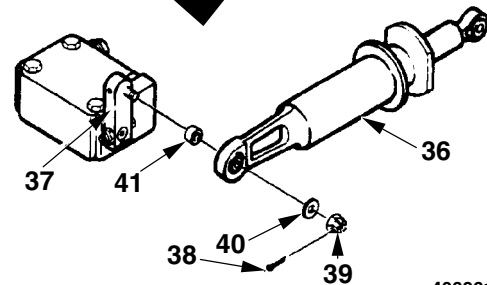
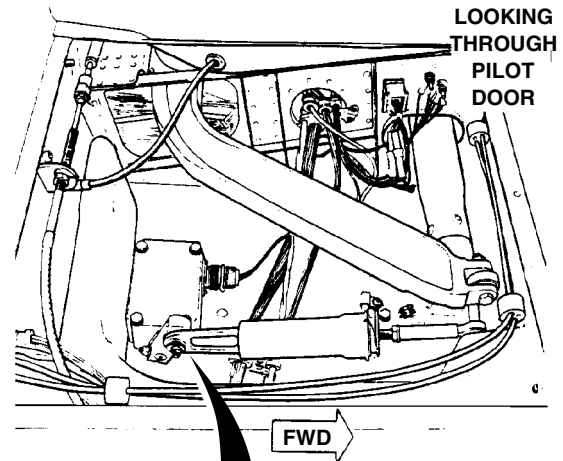
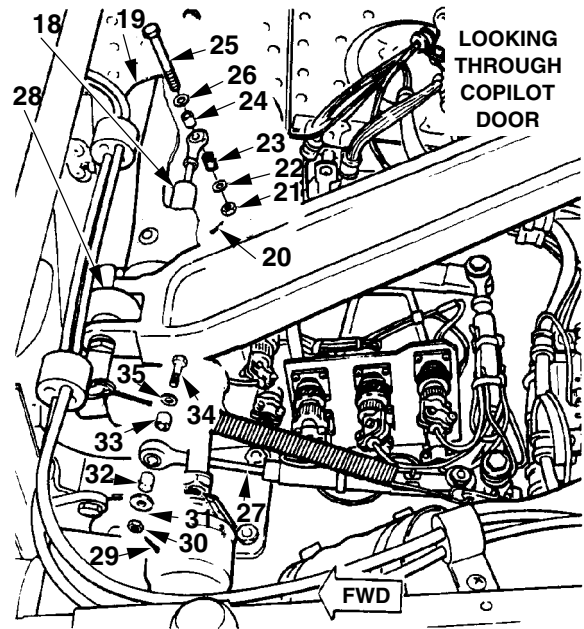
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11-1-3. CYCLIC CONTROLS — RIGGING (CONT)

8. Disconnect lateral transducer (18) from cyclic torque tube (19) by removing cotter pin (20), nut (21), spacers (22, 23, and 24), bolt (25), and washer (26). Discard cotter pin.

9. Disconnect fore-and-aft transducer (27) from copilot/gunner cyclic stick fitting assembly (28) by removing cotter pin (29), nut (30), spacers (31, 32, and 33), bolt (34), and washer (35). Discard cotter pin.

10. Disconnect fore-and-aft force gradient (36) from magnetic brake arm (37) by removing cotter pin (38), nut (39), washer (40) and spacer (41). Discard cotter pin.



406961-274
J0519

GO TO NEXT PAGE

11-1-3. CYCLIC CONTROLS — RIGGING (CONT)

11. Disconnect upper end of both cyclic long tubes (42) from both cyclic input bellcranks (43) by removing two cotter pins (44), two nuts (45), two washers (46), and two bolts (47). Discard cotter pins.

12. Disconnect aft end of both cyclic short tubes (48) from both cyclic boosted bellcranks (9) by removing two cotter pins (49), two nuts (50), four washers (51), and two bolts (52). Discard cotter pins.

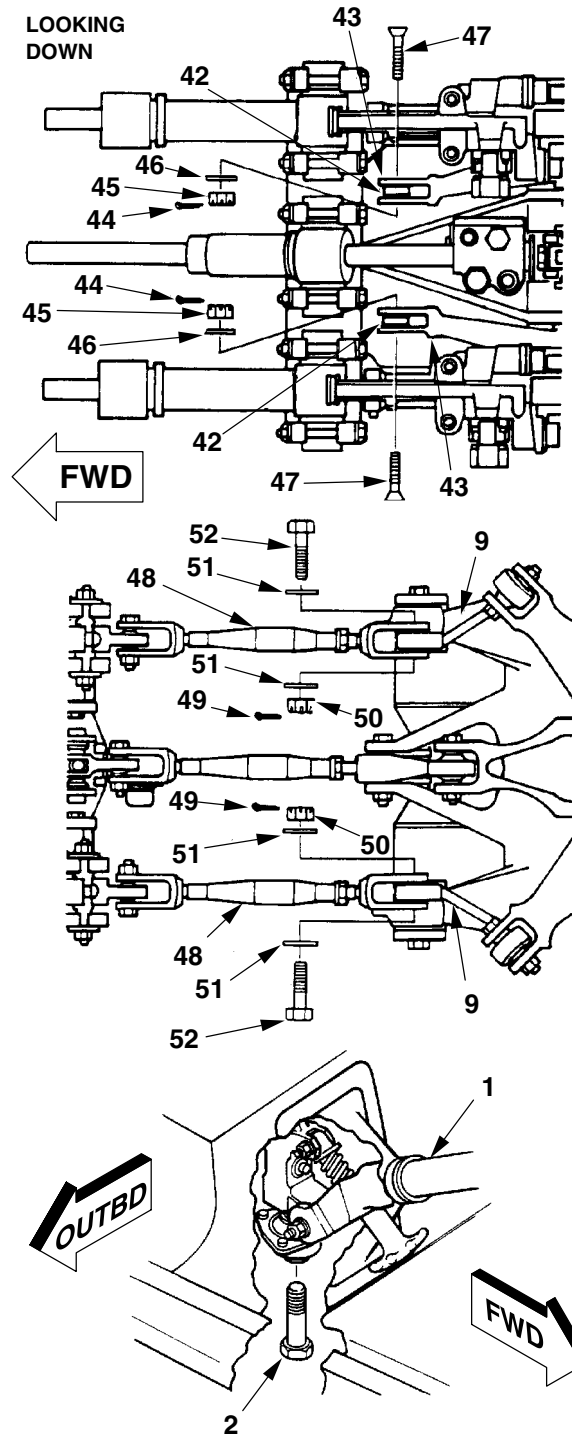
RIG

NOTE

The collective controls must be rigged before cyclic controls.

13. Disconnect main rotor pitch links at swashplate (Task 5-2-1).

14. Center pilot cyclic stick (1). Insert shear bolt (B8) (2) through hole in bottom of fuselage into base of cyclic stick (1).



406961-275
J1878

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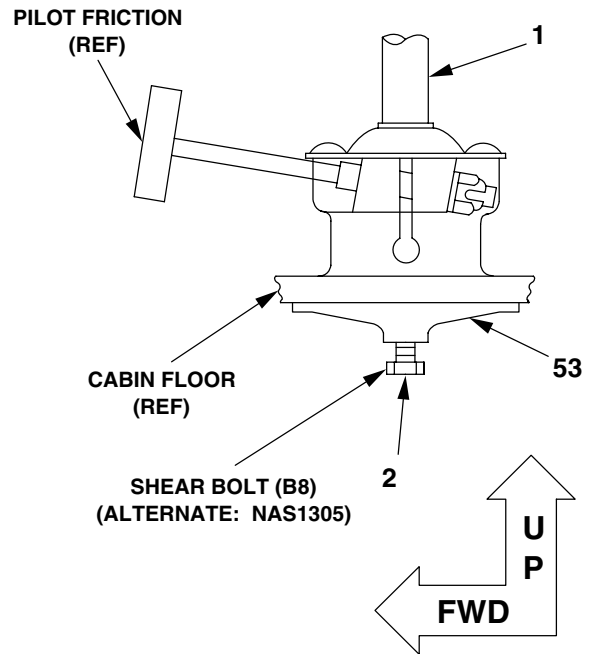
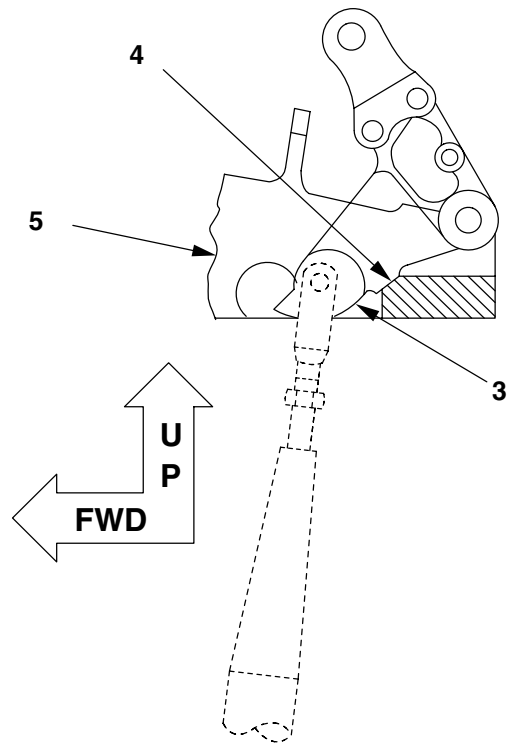
11-1-3. CYCLIC CONTROLS — RIGGING (CONT)

15. Push cyclic stick (1) forward in centered position until freeplay between cover (53) and cyclic stick (1) is eliminated.

16. Secure cyclic stick (1) in position with cyclic friction knob.

17. Pull collective stick to full-up position so that collective input valve bellcrank (3) contacts stop (4) on actuator support (5).

18. Hold collective stick in this position with pilot friction knob.



LOOKING OUTBOARD

406961-276
J1878

GO TO NEXT PAGE

11-1-3. CYCLIC CONTROLS — RIGGING (CONT)

19. Using workaid (H-230), position both servo actuators (6) to obtain dimension of **6.92 inches** measured between center of support assembly attaching point (7) and center of input bellcrank attaching point (8) as shown.

CAUTION

Exposed threads on adjustable control tube rod ends shall not exceed **1 inch**.

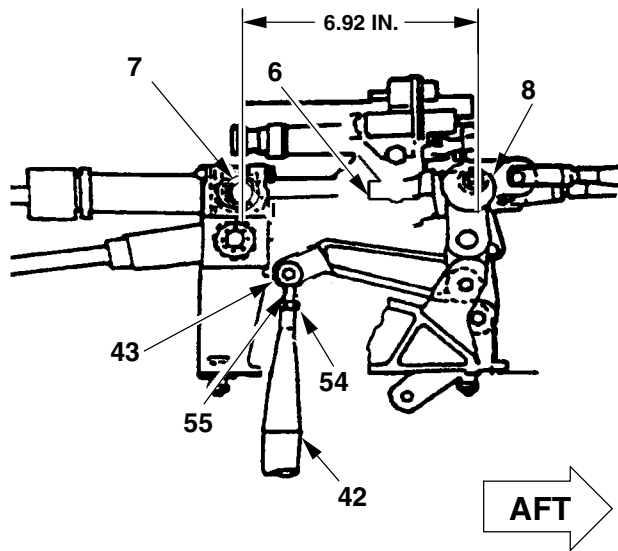
20. Loosen jamnut (54) on left cyclic long tube (42). Adjust length of tube to fit left cyclic input bellcrank (43) by threading rod end bearing (55) in or out of tube, until bolt holes in rod end bearing (55) and bellcrank (43) are aligned.

21. Torque jamnut (54) **80 TO 100 INCH-POUNDS**.

CAUTION

Exposed threads on adjustable control tube rod ends shall not exceed **1 inch**.

22. Repeat steps 20. and 21. for opposite side.



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J1878

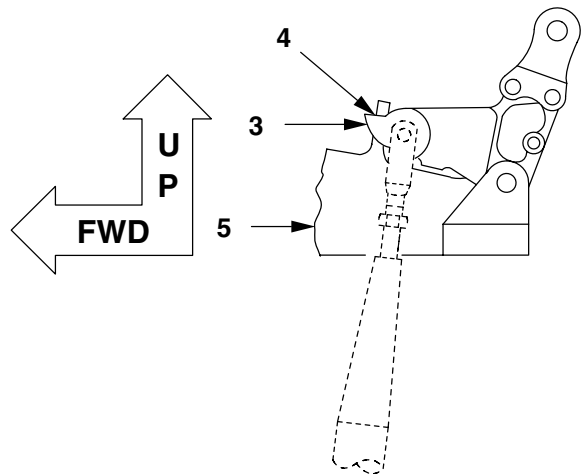
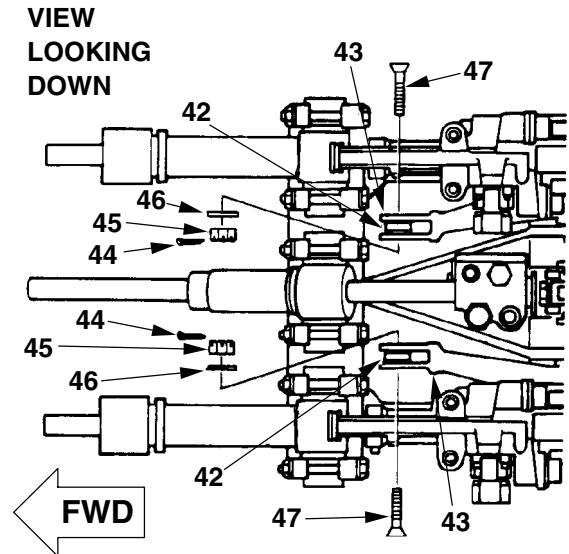
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11-1-3. CYCLIC CONTROLS — RIGGING (CONT)

23. Connect upper end of both cyclic long tubes (42) to both cyclic input bellcranks (43) with two bolts (47), two washers (46), and two nuts (45). Torque nuts (45) **30 TO 40 INCH-POUNDS**.

24. Install cotter pins (44) through nuts (45).

25. Move collective stick to the full-down position so that collective input valve bellcrank (3) contacts stop (4) on actuator support (5).



406961-1374
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11-1-3. CYCLIC CONTROLS — RIGGING (CONT)

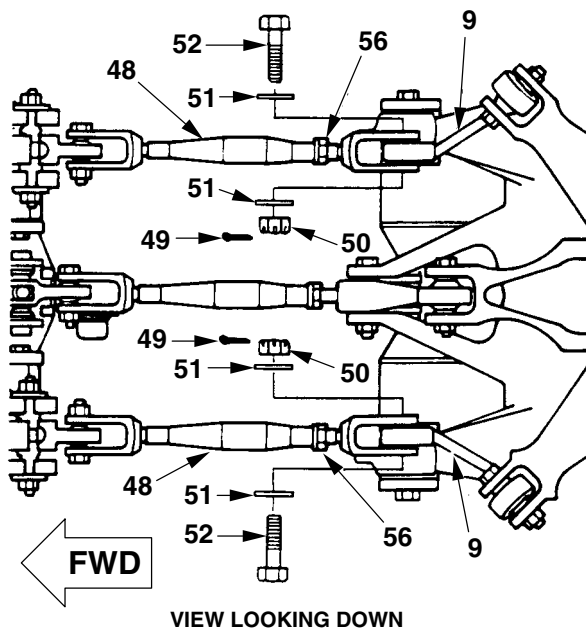
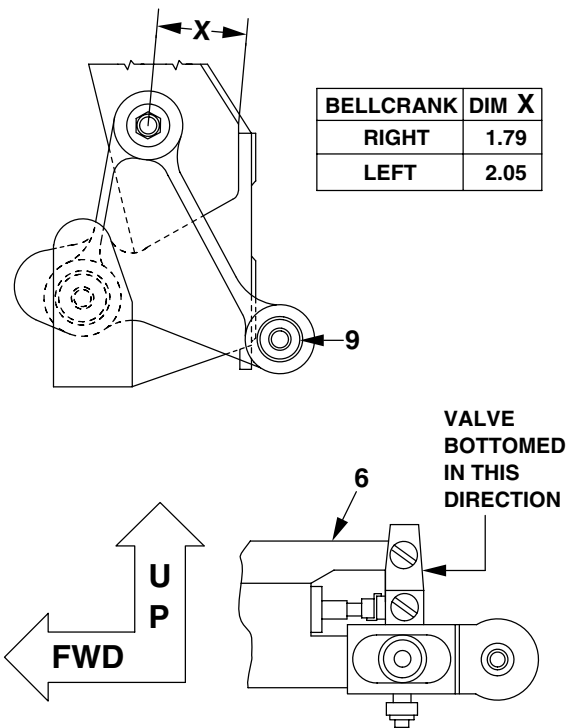
26. Set both cyclic boosted bellcranks (9) to dimension X as shown.

27. Bottom out both servo actuators (6) in direction as shown.

28. Adjust and connect aft end of both cyclic short tubes (48) to both cyclic boosted bellcranks (9) by installing two bolts (52), four washers (51), two nuts (50). Torque nuts (50) **65 TO 85 INCH-POUNDS** and secure with two cotter pins (49).

29. Torque jamnuts (56) on both cyclic short tubes (48) **60 TO 100 INCH-POUNDS**.

30. Reconnect main rotor pitch links at swashplate (Task 5-2-3).



406961-1329
J1878

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11-1-3. CYCLIC CONTROLS — RIGGING (CONT)

31. Orient lateral magnetic brake arm (13 by aligning mark "L" on arm three teeth clockwise from mark on shaft as shown.

NOTE

- Arm may be moved one tooth left or right from this position if necessary.
- Ensure index mark on shaft of magnetic brake is parallel with the split line of the magnetic brake body when rigging lateral force gradient.

32. Loosen jamnut (57) on lateral force gradient (12). Adjust length of force gradient to fit lateral magnetic brake arm (13) by rotating force gradient.

33. Torque jamnut (57) **95 TO 110 INCH-POUNDS** after adjustment.

34. Connect lateral force gradient (12) to lateral magnetic brake arm (13) with spacers (17 and 16) and nut (15). Torque nut (15) **30 TO 40 INCH-POUNDS**.

35. Install cotter pin (14) through nut (15).

36. Orient fore-and-aft magnetic brake arm (37) by aligning mark "F" on arm 90° clockwise from mark on shaft as shown.

NOTE

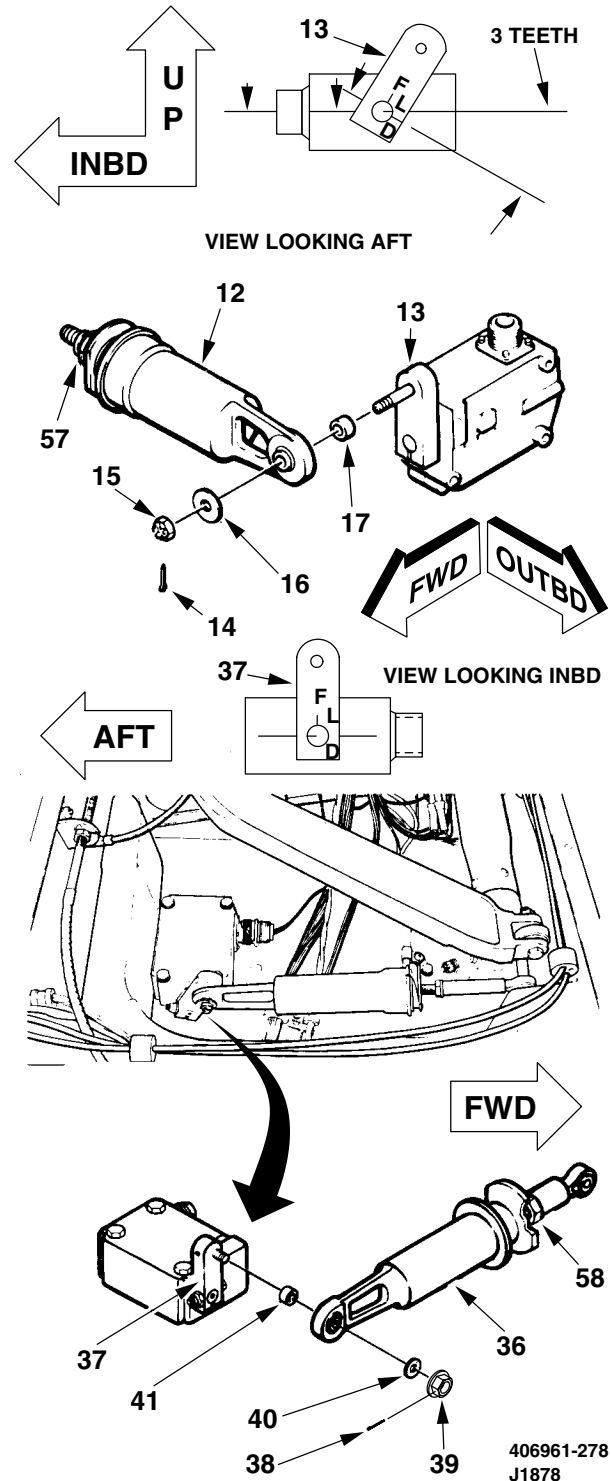
- Arm may be moved one tooth left or right from this position if necessary.
- Ensure index mark on shaft of magnetic brake is parallel with the split line of the magnetic brake body when rigging fore-and-aft force gradient.

37. Loosen fore-and-aft force gradient jamnut (58). Adjust length of fore-and-aft force gradient (36) to fit fore-and-aft magnetic brake arm (37) by rotating force gradient.

38. Torque jamnut (58) **95 TO 110 INCH-POUNDS** after adjustment.

39. Connect fore-and-aft force gradient (36) to fore-and-aft magnetic brake arm (37) with spacers (41 and 40) and nut (39). Torque nut (39) **30 TO 40 INCH-POUNDS**.

40. Install cotter pin (38) through nut (39).



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11-1-3. CYCLIC CONTROLS — RIGGING (CONT)

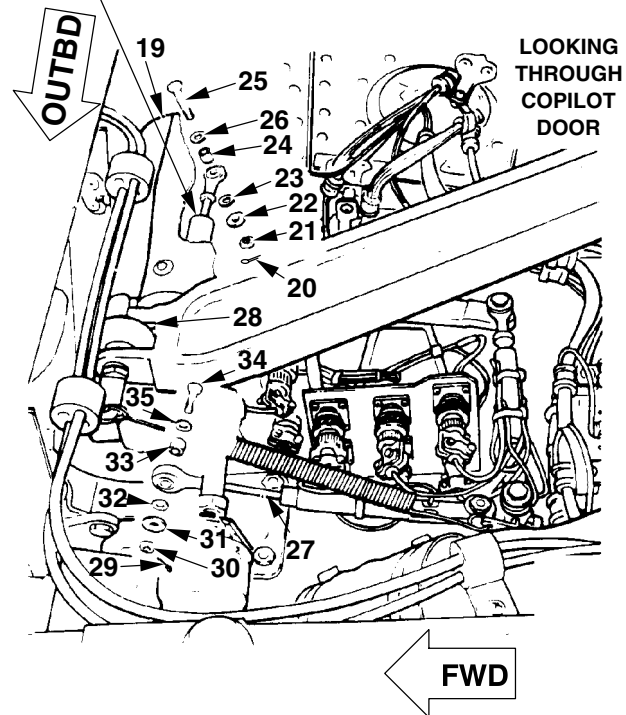
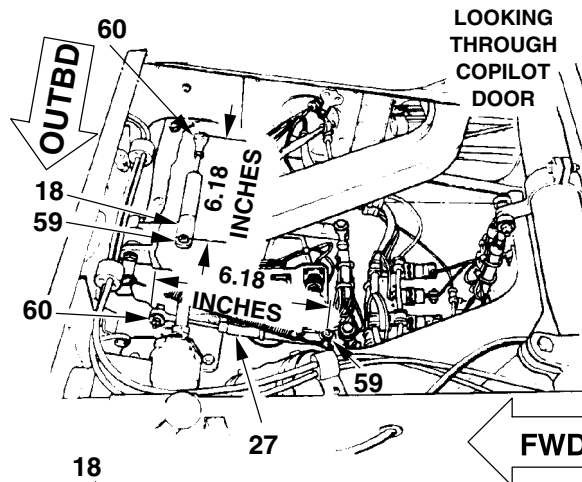
41. Adjust lateral transducer (18) and fore-and-aft transducer (27) to obtain a dimension of **6.18 inches** between centers of the grounded bearing (59) and adjustable rod end bearing (60) with transducer moveable rod at mid stroke position.

42. Connect lateral transducer (18) to cyclic torque tube (19) with bolt (25), washer (26), spacers (24, 23, and 22), and nut (21). Torque nut (21) **12 TO 15 INCH-POUNDS**.

43. Install cotter pin (20) through nut (21).

44. Connect fore-and-aft transducer (27) to copilot/gunner cyclic stick fitting assembly (28) with bolt (34), washer (35), spacers (33, 32, and 31), and nut (30). Torque nut (30) **12 TO 15 INCH-POUNDS**.

45. Install cotter pin (29) through nut (30).



406961-279
J1878

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11-1-3. CYCLIC CONTROLS — RIGGING (CONT)

46. Remove shear bolt (B8) (2) from bottom of cyclic stick (1) and lower collective stick.

47. Connect hydraulic test stand to helicopter and operate (Task 7-2-1).

48. Adjust friction knob (61) to obtain a breakout force of 0.5 to 1.5 pounds measured at center of cyclic grip using spring scale (B120).

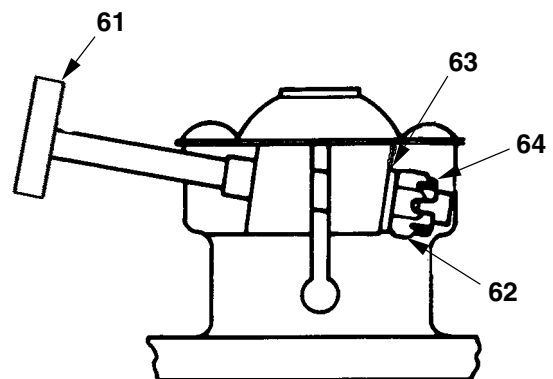
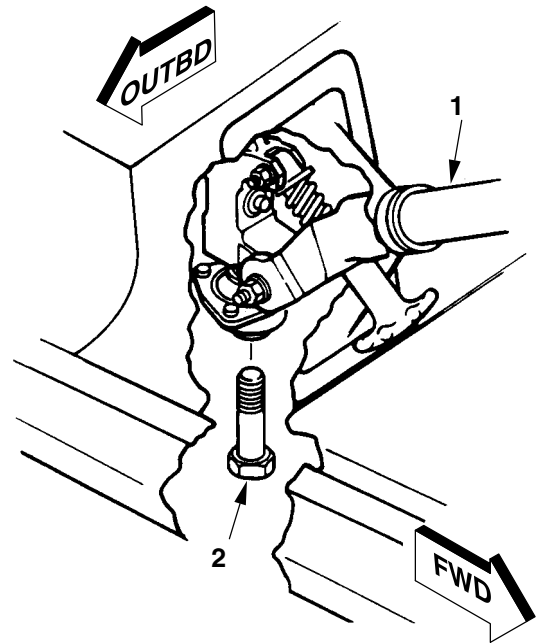
NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

49. After adjusting friction knob (61), tighten nut (62) finger tight. Add washers (63), as required, to align castellations on nut (62). Maximum of six washers (63) allowed.

50. Install cotter pin (64) through nut (62).

51. Disconnect hydraulic test stand from helicopter (Task 7-2-1).



406961-280
J0520

GO TO NEXT PAGE

11-1-3. CYCLIC CONTROLS — RIGGING (CONT)

CYCLIC STICK BALANCE SPRING

CHECK

WARNING

To prevent loss of control, extreme care must be exercised when releasing the cyclic controls.

52. Ensure engagement of copilot/gunner stick assembly.

53. Maintenance test pilot ground run helicopter at 98% (TM 1-1520-248-MTF).

- a. Position hydraulic boost ON.
- b. Position force trim OFF.
- c. Adjust cyclic friction control for minimum friction.

54. Center cyclic control stick and form circle with hands around stick. Tap cyclic forward then aft, if cyclic creeps or motors forward, adjust preload on spring (65) as outlined in step 55.a. If cyclic creeps or motors aft, adjust preload on spring (65) as outlined in step 55.b.

ADJUST

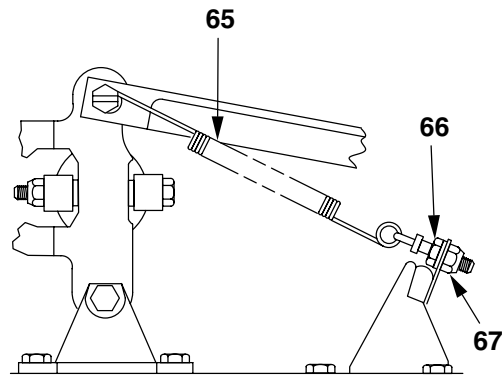
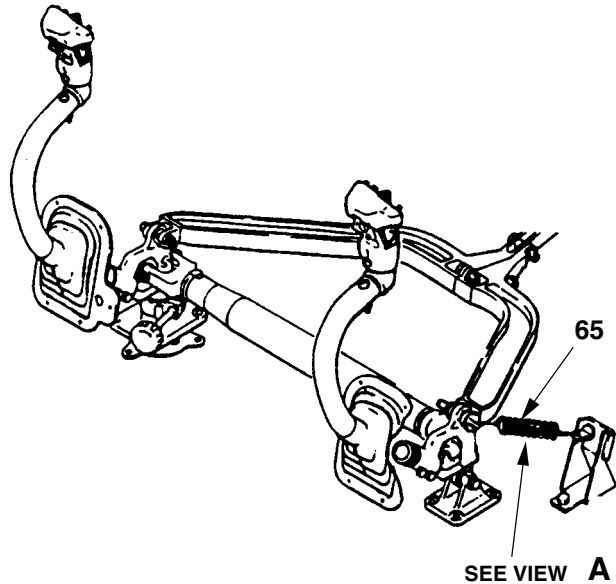
55. Adjust preload on spring (65) as follows:

a. To correct forward motoring, back off nut (66) **0.250 to 0.500 inch**. Tighten nut (67) until balance is obtained. Tighten nut (66) to standard torque.

b. To correct aft motoring, back off nut (67) until balance is obtained. Tighten nut (66) to standard torque.

NOTE

If balance cannot be obtained by procedure outlined in step 55., remove spring (65) and check spring tension as outlined in step 57.



VIEW A

406001-207-1
J1878

GO TO NEXT PAGE

11-1-3. CYCLIC CONTROLS — RIGGING (CONT)

c. Increase or decrease tension of balance spring (65) as required to eliminate any tendency for cyclic controls to move fore-and-aft when cyclic controls are released by pilot.

INSPECT

REMOVAL

56. Remove cyclic stick balance spring (65) as follows:

- a. Remove nut (67), two washers (68), and eyebolt (69) from bracket (70).
- b. Remove spring (65) from eyebolt (71).

INSPECT

57. Inspect balance spring (65) as follows:

- a. Inspect spring (65) and eyebolts (71) and (69) visually for obvious damage.

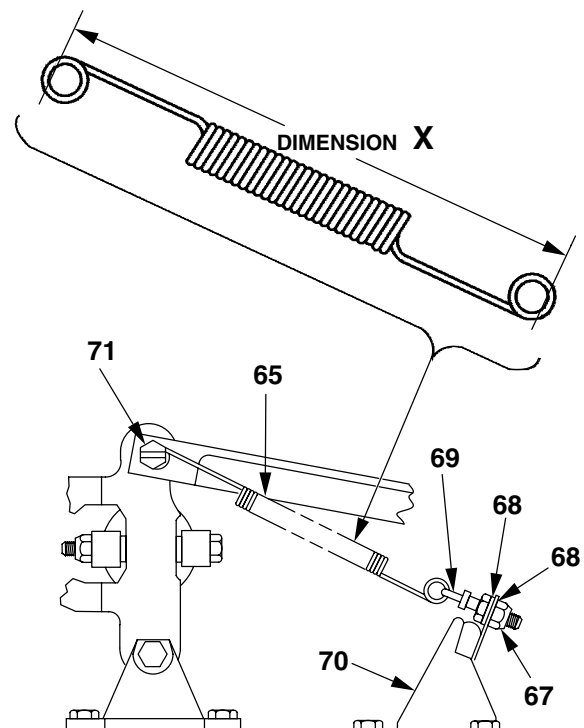
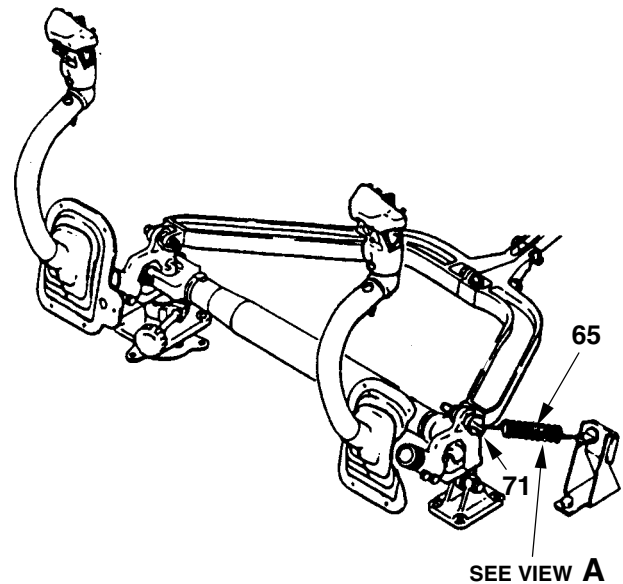
NOTE

Spring must be removed to check dimension X of **5.130 to 5.430 inches**.

- b. If spring (65) is suspected of losing tension, measure overall length of spring (dimension X). Spring should measure **5.130 to 5.430 inches** long. Record length of spring.

c. Support spring (65) in a suitable fixture and apply a load to extend the spring to **1.120 inches**. The load required to extend the spring must be 1.490 ± 0.15 pounds.

d. Replace spring (65) if it does not pass inspection.



406001-207-2
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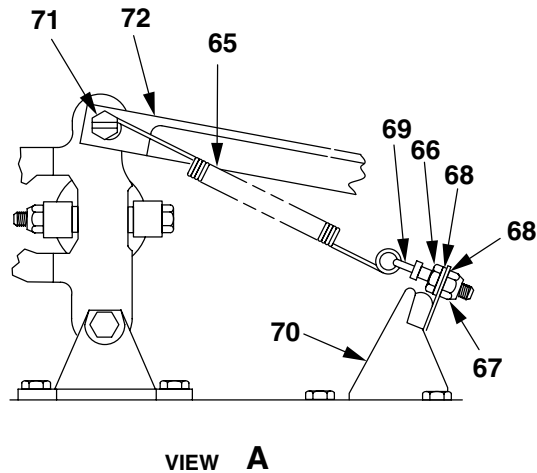
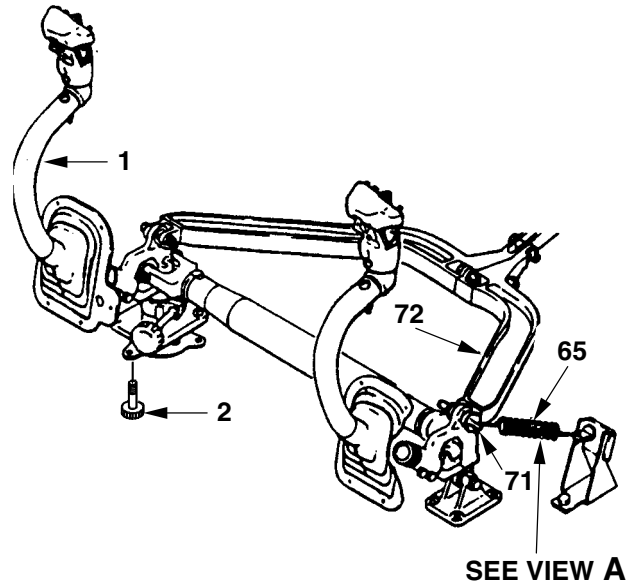
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11-1-3. CYCLIC CONTROLS — RIGGING (CONT)

INSTALLATION

58. Install cyclic stick balance spring (65) as follows:

- a. Ensure attaching eyebolt (71) is secure at cyclic yoke (72) and install spring (65) in eyebolt (71).
- b. Install eyebolt (69) on aft end of spring (65).
- c. Thread nut (66) on eyebolt (69).
- d. Install shear bolt (B8) (2) in bottom of cyclic stick (1).
- e. Position eyebolt (69) in bracket (70) with aluminum washers (68) on either side of bracket (70) and install nut (67).
- f. Remove shear bolt (B8) (2).
- g. Check spring adjustment (steps 52 through 54).



406001-207-3
J1878

INSPECT

FOLLOW-ON MAINTENANCE

Install copilot/gunner collective stick assembly (Task 11-2-15).

Install center console top cover (Task 2-2-99).

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Install forward fairing assembly (Task 2-2-47).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).

END OF TASK

11-1-4. DIRECTIONAL CONTROLS — RIGGING

This task covers: Rigging (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Protractor (B109)
Torque Wrench (B236)
Torque Wrench (B238)
Rigging Tool (B201)
Centering Tool (B195)
Workaid (H-17)
Hydraulic Test Stand

Material:

Lockwire (D132)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer (2)
Maintenance Test Pilot

References:

TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Taillight Support Removed (Task 2-3-31) ■

GO TO NEXT PAGE

11-1-4. DIRECTIONAL CONTROLS — RIGGING (CONT)

WARNING

Ensure that no one operates controls from inside of helicopter during rigging of directional controls. Physical injury can occur. If injury occurs, seek medical aid. A 'DO NOT MOVE CONTROLS' sign shall be displayed in the cockpit during the performance of this task.

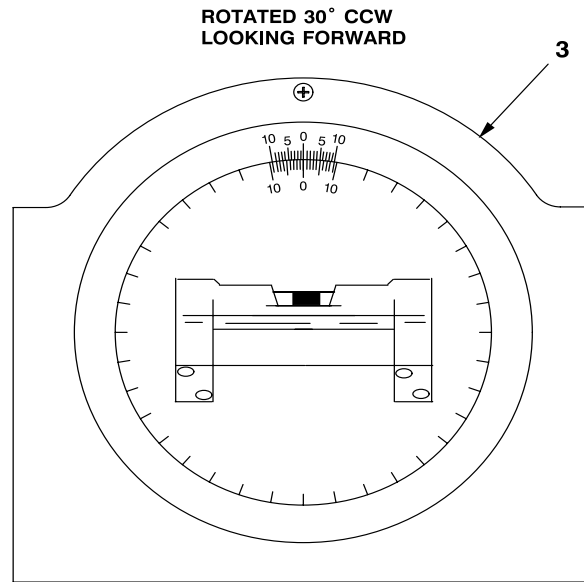
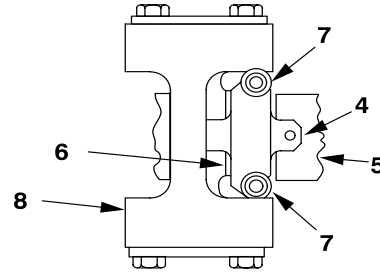
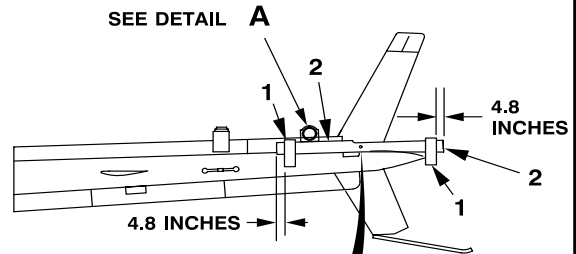
PRE-RIGGING CHECK

1. Position and hold pilot left pedal against extreme forward left pedal stop.
2. Install rigging tools (B201) (1) on forward and aft tail rotor blades (2), **4.8 inches** from blade tips as shown. Position blades to horizontal plane within 1/2 degree using protractor (B109) (3).
3. Position centering tool (B195) (4) around tail rotor gearbox shaft (5) over spacer (6).
4. Install two screws (7) but do not tighten.

NOTE

Ensure centering tool is tight against yoke and no flapping action in tail rotor.

5. Push centering tool (B195) (4) outboard until both halves of tool contact tail rotor yoke (8). Tighten two screws (7).



DETAIL A

406961-1385-4
J2798

GO TO NEXT PAGE

11-1-4. DIRECTIONAL CONTROLS — RIGGING (CONT)

6. Keep tail rotor blade (2) in position established as shown in steps 2 through 5. Place protractor (B109) (3) on outboard surface of rigging tool (B201) (1) and zero protractor.

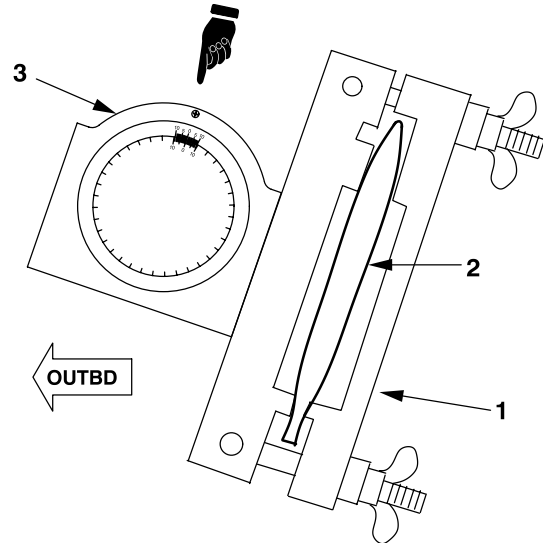
NOTE

The term 'DELTA blade angle' is used to describe the difference in blade angle between the forward and aft blades, measured in degrees.

7. Place protractor (B109) (3) on outboard surface of rigging tool (B201) (1) on other blade (2). Verify DELTA blade angle of 55.0 to 57.0 degrees.

8. Connect hydraulic test stand and operate (Task 7-2-1).

9. Repeat steps 6. and 7. with hydraulics on and full left pedal.



LOOKING FORWARD

NOTE

- Directional controls must be rigged before adjusting SCAS stop bolts.
- If measurements in above steps fail to meet stated requirements, proceed with complete rigging of directional controls.

10. If measurements are correct, no further rigging is required. Remove rigging tools and centering tool.

DISCONNECT RIGGING POINTS

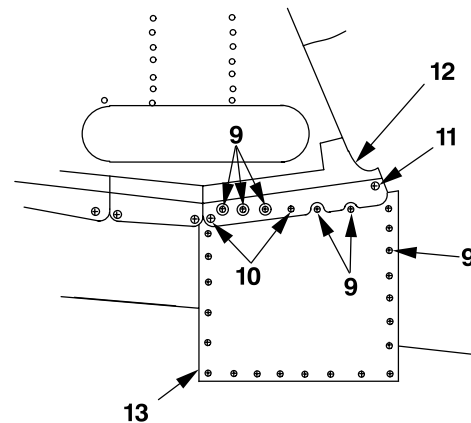
11. Turn off hydraulic test stand (Task 7-2-1) but do not disconnect if rigging is required.

12. Identify location and length of screws (9), (10), and (11) to aid in reinstallation.

13. Loosen screw (11) on countermeasures set AN/ALQ-144 IR jammer mount (12).

14. Remove 25 screws (9) and 2 screws (10) from right side tailboom access panel (13).

15. Remove tailboom access panel (13).



406961-1385-5
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11-1-4. DIRECTIONAL CONTROLS — RIGGING (CONT)

16. Remove left side access panel (14) (Task 2-2-83).

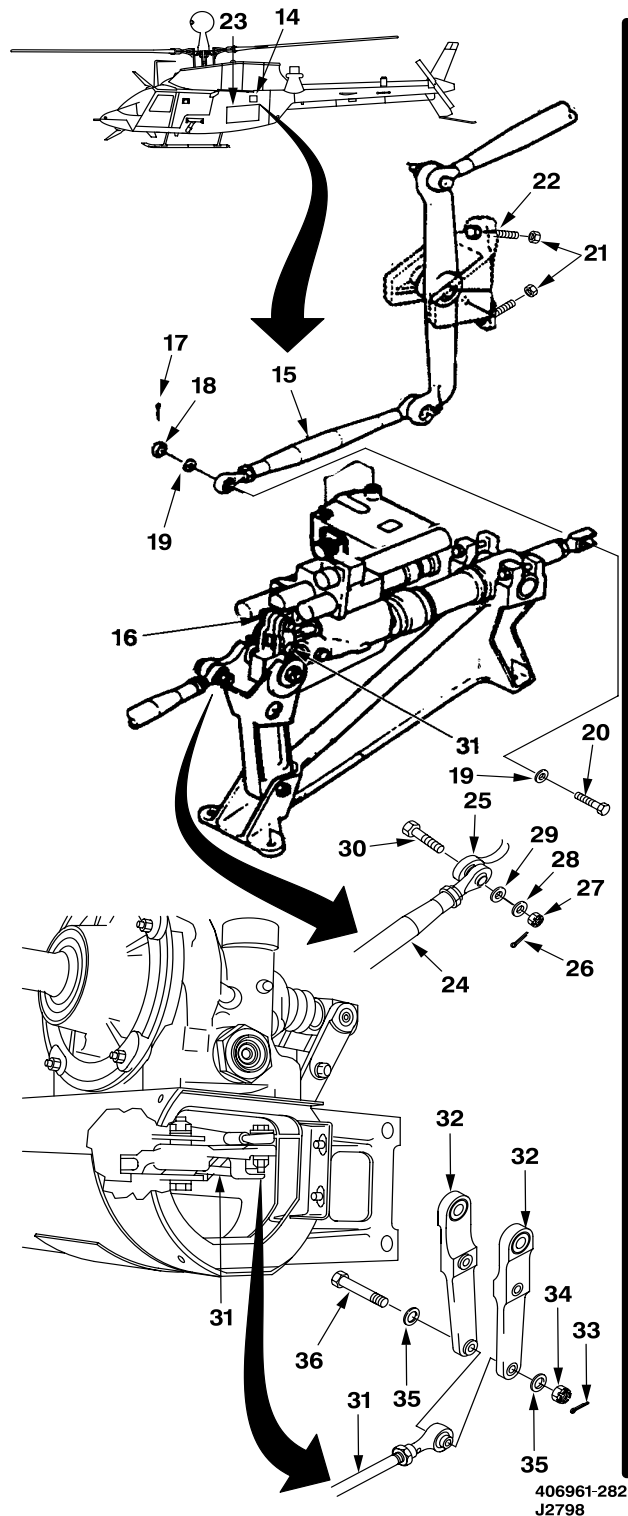
17. Disconnect boosted tube (15) from aft end of servoactuator (16) by removing cotter pin (17), nut (18), washers (19), and bolt (20). Discard cotter pin.

18. Cut lockwire and loosen two jamnuts (21). Thread both directional SCAS stop bolts (22) in as far as possible.

19. Open aft electrical compartment door (23).

20. Disconnect nonboosted tube (24) from actuator input idler (25) by removing cotter pin (26), nut (27), washer (28), spacer (29), and bolt (30). Discard cotter pin.

21. Disconnect tail rotor pitch change rod assembly (31) from pitch change levers (32) by removing cotter pin (33), nut (34), two washers (35), and bolt (36). Discard cotter pin.



GO TO NEXT PAGE

11-1-4. DIRECTIONAL CONTROLS — RIGGING (CONT)

RIG

22. Operate hydraulic test stand (Task 7-2-1).
23. Position and hold pilot left pedal against extreme forward left pedal stop.

NOTE

Servoactuator shall be bottomed out in full forward position.

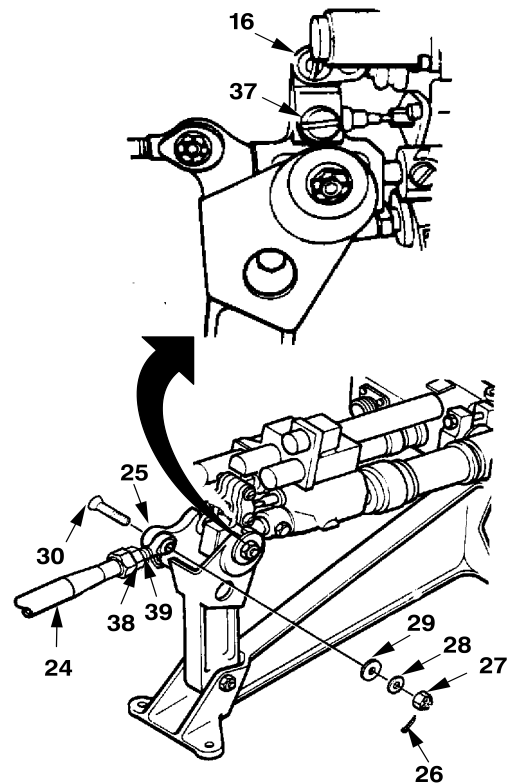
24. Push servoactuator (16) fully forward, and verify input valve (37) is centered.

NOTE

Ensure servoactuator does not move from bottomed position when initially adjusting nonboosted tube.

25. Loosen nonboosted tube jamnut (38). With servoactuator (16) and input valve (37) positioned as in step 24, adjust length of nonboosted tube (24) to fit idler (25) by threading rod end bearing (39) in or out of tube. When bolt holes in rod end bearing (39) and idler (25) are aligned, lengthen nonboosted tube (24) by 7.5 complete turns of rod end bearing (39). Ensure **1.0 inch** maximum exposed threads after adjustment.

26. Torque jamnut (38) **80 TO 100 INCH-POUNDS**.



406961-283
J2798

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT
PART (FSCAP)

Correct installation of directional control rigging is a critical flight safety task.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

27. Connect nonboosted tube (24) to idler (25) with bolt (30), spacer (29), washer (28), and nut (27).
28. Torque nut (27) **50 TO 70 INCH-POUNDS**.
29. Install cotter pin (26) through nut (27).

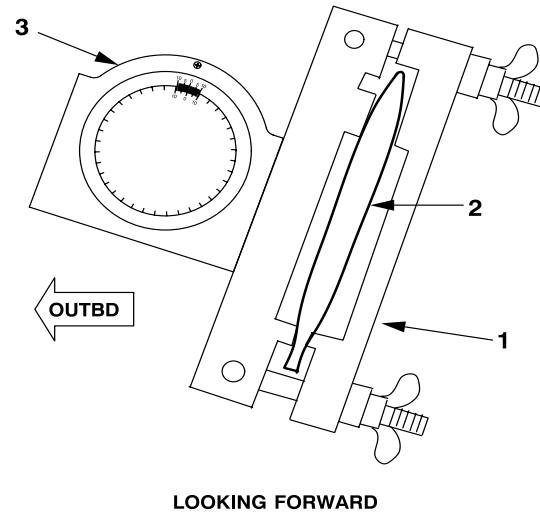
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11-1-4. DIRECTIONAL CONTROLS — RIGGING (CONT)

30. Keep tail rotor blade (2) in position established in step 2. Place protractor (B109) (3) on outboard surface of rigging tool (B201) (1) as shown.

31. Move tail rotor crosshead inboard or outboard as required to obtain blade angle of 27.5 to 28.5 degrees.

32. Verify blade angle of 27.5 to 28.5 degrees on other blade.



406401-6
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GO TO NEXT PAGE

11-1-4. DIRECTIONAL CONTROLS — RIGGING (CONT)

33. Position bellcrank (40) **0.15 inch** aft of aft face of web on casting in tail rotor gearbox support using work aid manufactured in accordance with Figure H-17. Bellcrank is properly positioned when it touches back of cutout in work aid.

34. Maintaining dimensions in steps 1. through 3., loosen jamnut (41) on tail rotor pitch change rod assembly (31) and adjust rod end to fit tail rotor pitch change levers (32).

35. Connect pitch change rod assembly (31) to pitch change levers (32) with bolt (36), two washers (35), and nut (34).

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Correct torquing of nut (34) and correct installation of cotter pin (33) are characteristics critical to flight safety.

36. Verify **0.15 inch** dimension for bellcrank (40) and verify both blade angles before proceeding.

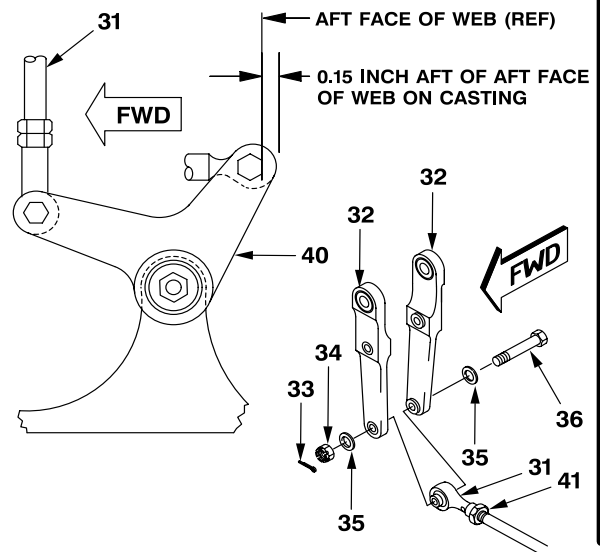
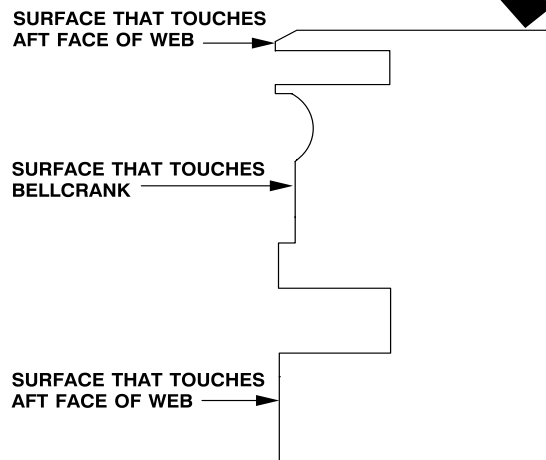
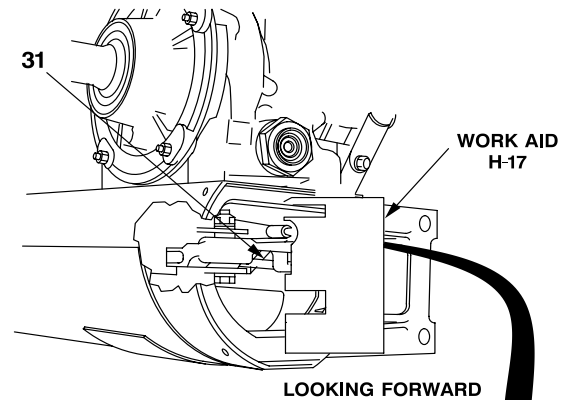
37. Torque nut (34) **60 TO 80 INCH-POUNDS**. Install cotter pin (33) through nut (34).

38. Torque jamnut (41) **80 TO 100 INCH-POUNDS**.

NOTE

Servoactuator will be moved to correct position by servoactuator valve.

39. With tail rotor positioned as in step 33., move pilot right directional control pedal to forward stop to shift valve. Then position and hold pilot left pedal against extreme forward stop.



406961-284
J2798

GO TO NEXT PAGE

11-1-4. DIRECTIONAL CONTROLS — RIGGING (CONT)

40. Loosen boosted tube jamnut (42) on forward end of tube and adjust tube length to fit aft end of servoactuator (16).

41. After adjusting tube to prescribed length, torque jamnut (42) **95 TO 110 INCH-POUNDS** to secure rod end (43).

42. Connect boosted tube (15) to aft end of servoactuator (16) with bolt (20), washers (19), and nut (18).

43. Torque nut (18) **30 TO 40 INCH-POUNDS**. Install cotter pin (17) through nut (18).

44. Keep tail rotor blade (2) in position established as shown in steps 2 through 5. Place protractor (B109) (3) on outboard surface of rigging tool (B201) (1) and zero protractor.

NOTE

The term 'DELTA blade angle' is used to describe the difference in blade angle between the forward and aft blades, measured in degrees.

45. Place protractor (B109) (3) on outboard surface of rigging tool (B201) (1) on other blade (2). Verify DELTA blade angle of 55.0 to 57.0 degrees.

46. Remove rigging tool and centering tool from tail rotor assembly.

NOTE

Directional controls must be rigged before adjusting SCAS stop bolts.

47. With hydraulic pressure on, hold left pedal against extreme forward stop. Adjust upper SCAS stop bolt (22) to obtain **0.002 to 0.005 inch** clearance with walking beam (44).

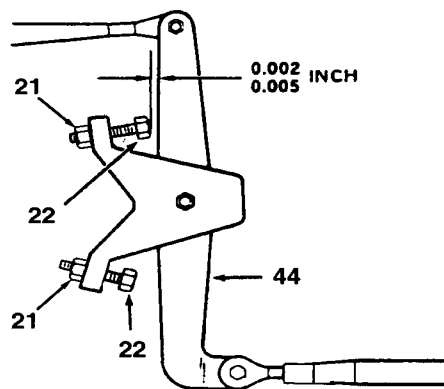
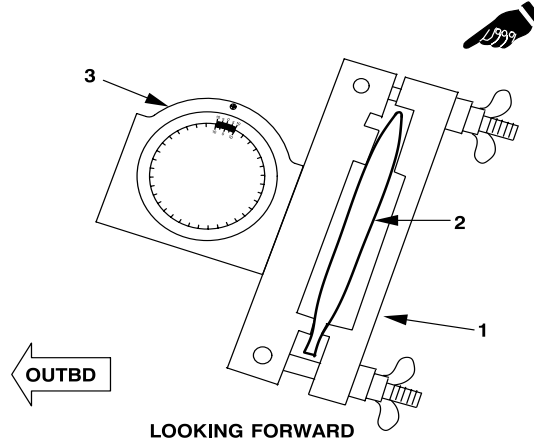
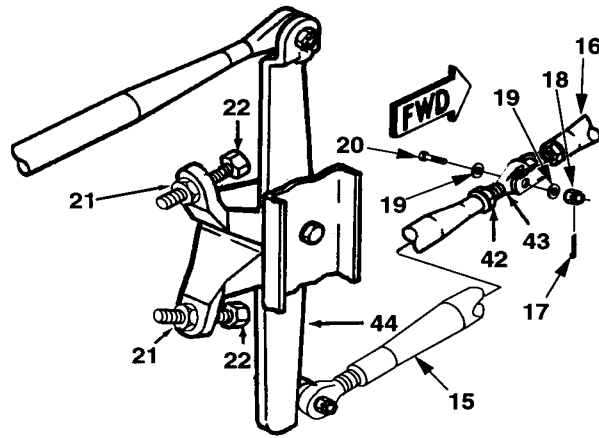
48. Tighten jamnut (21) and secure with lockwire (D132).

49. Repeat step 47. for right pedal and lower SCAS stop bolt (22).

INSPECT

50. Balance directional control pedal forces (Task 11-4-13).

51. Adjust transducers (Task 11-4-18).



406961-285
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GO TO NEXT PAGE

11-1-4. DIRECTIONAL CONTROLS — RIGGING (CONT)

ADJUST DIRECTIONAL ATTITUDE TRIM

52. Position actuator output arm (45) with index mark (46) on arm 90 degrees (seven teeth) from index mark on shaft (47) of actuator (48).

53. Disconnect force gradient (49) from idler (25) by removing cotter pin (50), nut (51), spacer (52), washer (53), and bolt (54). Discard cotter pin.

54. Position and hold pilot left pedal forward against extreme left pedal stop. Position and hold output arm (45) of actuator (48) against forward stop.

55. Loosen jamnut (55). Adjust length of force gradient (49) to fit idler (25), then lengthen by turning rod end bearing (56) 1.5 turns. Torque jamnut (55) **80 TO 100 INCH-POUNDS**.

WARNING**FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)**

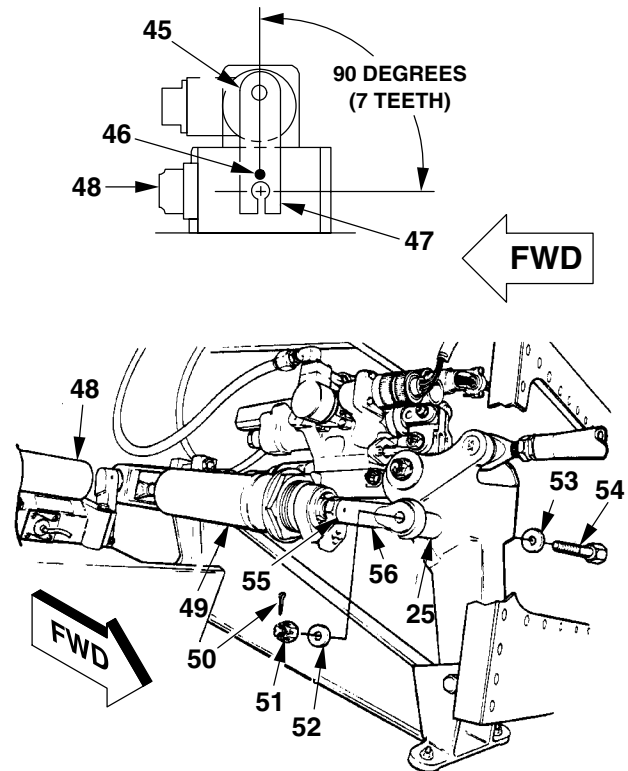
Correct installation of directional control rigging is a critical flight safety task.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

56. Connect force gradient (49) to idler (25) with bolt (54), washer (53), spacer (52), and nut (51). Torque nut (51) **30 TO 40 INCH-POUNDS**.

57. Install cotter pin (50) through nut (51).



406961-286
J1878

GO TO NEXT PAGE

11-1-4. DIRECTIONAL CONTROLS — RIGGING (CONT)

INSPECT

58. Turn off hydraulic test stand and disconnect from helicopter.

59. Install left side access panel (14) (Task 2-2-83).

INSPECT

CAUTION

Screws (9), (10), and (11) are different sizes. To prevent damage to aircraft structure, ensure screws are used in correct location.

60. Secure tailboom access panel (13) with 25 screws (9) and 2 screws (10).

61. Tighten screw (11) on countermeasures set AN/ALQ-144 IR jammer mount (12).

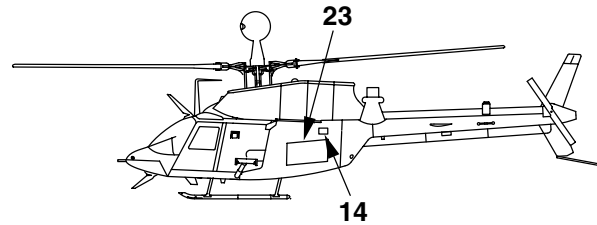
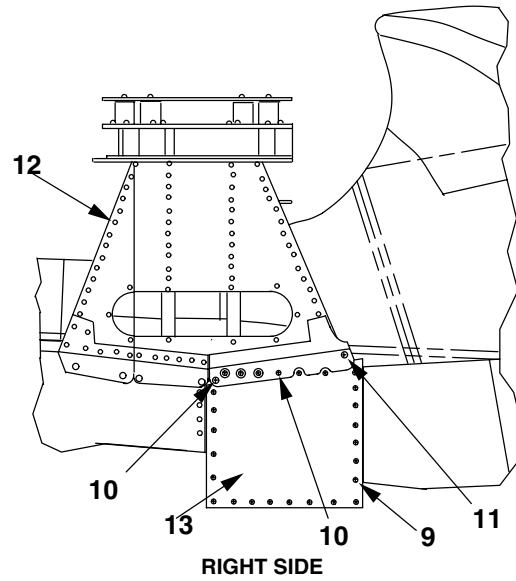
INSPECT

62. Close aft electrical compartment door (23).

FOLLOW-ON MAINTENANCE

Install taillight support (Task 2-3-31).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



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END OF TASK

Section II. COLLECTIVE CONTROLS

11-5. COLLECTIVE CONTROLS

11-6. INTRODUCTION

This section includes procedures for cleaning, inspection, removal, repair, adjustment, and installation of various parts of the collective controls for OH-58D and OH-58D(R) helicopters.

See figure Collective Controls for the components of the collective controls system:

Collective stick (1) — Provides means for crew inputs to collective control system.

Collective pitch link (fixed) assembly (2) — Provides interconnect between collective jackshaft and collective lever.

Mixing lever support (3) — Provides fixed-base pivot point in collective control mechanism. Typical of supports and mounts required throughout the collective control system.

Trunnion bearing assembly (4) — Provides universal connection in cyclic/collective control mechanism.

Collective transducers (5) — Provide input signal to yaw SCAS to compensate for collective pitch change during heading hold or bob-up maneuvers. Provide input to electronic fuel control system.

Collective jackshaft assembly (6) — Connects pilot collective stick and copilot collective stick to collective control system.

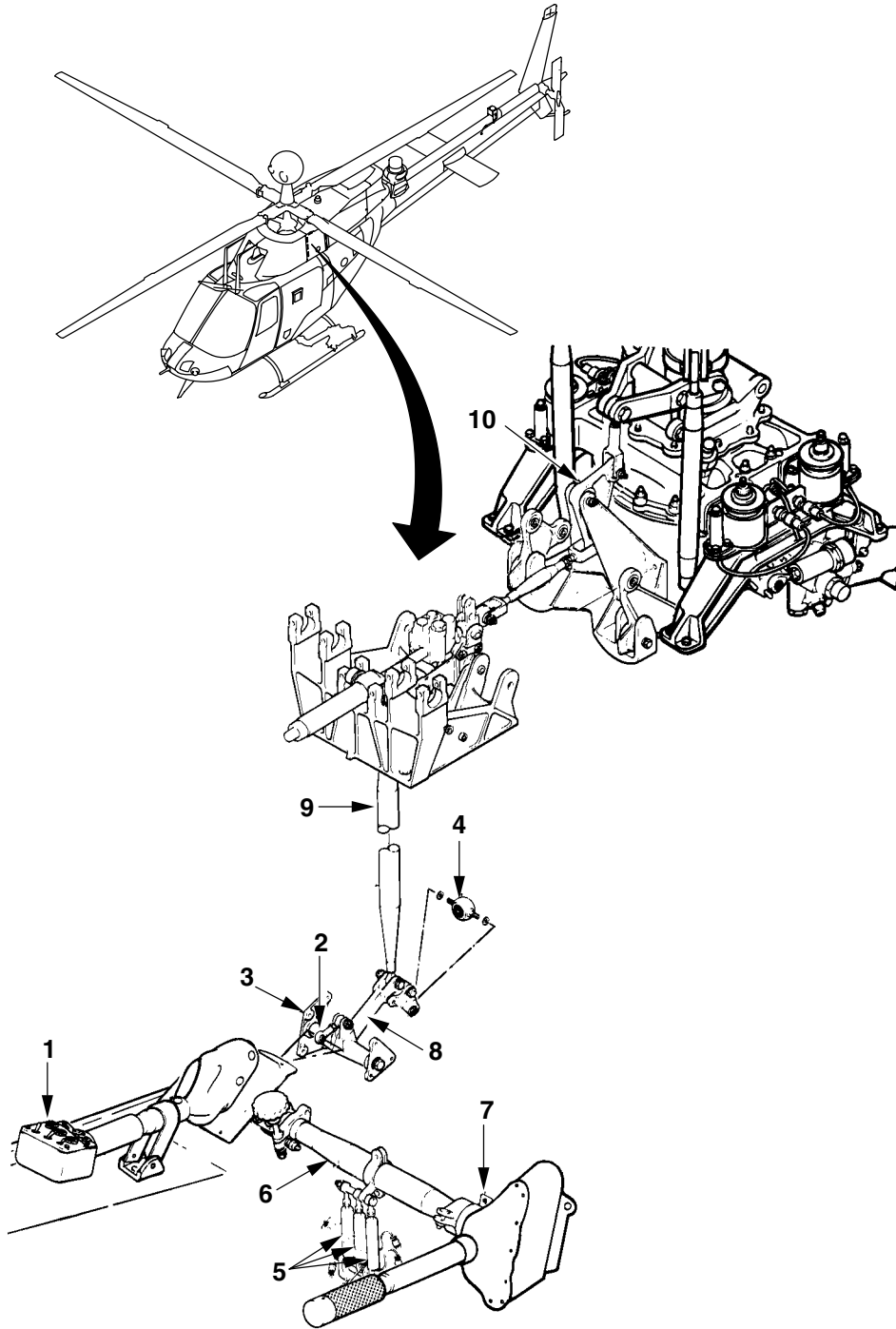
Jackshaft support assembly (7) — Provides mount for collective jackshaft assembly (6).

Collective lever assembly (8) — Ensures coordinated movement of the cyclic control system with collective input.

Adjustable collective tube assembly (9) — Part of the collective control vertical linkage. Other adjustable collective tube assemblies are included in the collective control linkage.

Bellcrank (10) — Typical of mechanical devices used to achieve changes in motion in the collective control linkage.

Standard torques are provided in Appendix P and TM 1-1500-204-23.



406961-353
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Collective Controls

11-7. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Collective Controls — Cleaning/Inspection/Repair	11-2-1	11-59
Collective Stick Tiedown Strap — Removal/Installation	11-2-2	11-66
Pilot Collective Stick Cover — Removal/Installation	11-2-3	11-67
Collective Pitch Link Assembly — Removal/Installation	11-2-4	11-68
Collective Pitch Link Assembly — Cleaning/Inspection/Repair	11-2-5	11-70
Mixing Lever Supports — Removal/Installation	11-2-6	11-72
Trunnion Bearing Assembly — Removal/Installation	11-2-7	11-75
Trunnion Bearing Assembly — Cleaning/Inspection/Repair	11-2-8	11-78
Collective Transducers — Removal/Installation	11-2-9	11-80
Copilot/Gunner Collective Stick Assembly Plug — Removal/Installation	11-2-10	11-82
Copilot/Gunner Collective Stick Tube Assemblies — Removal/Installation	11-2-11	11-83
Copilot/Gunner Collective Grip Assembly — Cleaning/Inspection/Repair	11-2-12	11-84
Copilot/Gunner Collective Stick Inner Tube Assembly — Cleaning/Inspection/Repair	11-2-13	11-86
Copilot/Gunner Collective Stick Outer Tube Assembly — Cleaning/Inspection/Repair	11-2-14	11-88
Copilot/Gunner Collective Stick Assembly — Removal/Installation	11-2-15	11-90
Collective Jackshaft Assembly — Removal/Installation	11-2-16	11-92
Collective Jackshaft — Cleaning/Inspection/Repair	11-2-17	11-95
Collective Jackshaft Adjustment Nut — Removal/Installation	11-2-18	11-97
Collective Jackshaft Friction Adjustment Bearing — Removal/Installation	11-2-19	11-99
Collective Jackshaft Shim and Spacer — Removal/Installation	11-2-20	11-100
Collective Jackshaft Spacer — Cleaning/Inspection/Repair	11-2-21	11-102
Collective Jackshaft Throttle Tube Assembly — Removal/Installation	11-2-22	11-104
Collective Jackshaft Friction Clamp — Removal/Installation	11-2-23	11-105
Minimum Friction on Collective System — Adjusting	11-2-24	11-107
Collective Friction Clamp — Cleaning/Inspection/Repair	11-2-25	11-108
Pilot Collective Stick Assembly — Removal/Installation	11-2-26	11-110
Pilot Collective Stick Assembly Miscellaneous Parts — Removal/Installation	11-2-27	11-115
Pilot Collective Stick Control Panel Box — Cleaning/Inspection/Repair	11-2-28	11-120
Pilot Collective Stick Throttle Friction Plug — Cleaning/Inspection/Repair	11-2-29	11-122
Pilot Collective Stick Detent Button — Cleaning/Inspection/Repair	11-2-30	11-124
Pilot Collective Stick Throttle Grip Assembly — Cleaning/Inspection/Repair	11-2-31	11-126
Pilot Collective Stick Outer Tube Assembly — Cleaning/Inspection/Repair	11-2-32	11-128

LIST OF TASKS (CONT)

TASK	TASK NUMBER	PAGE NUMBER
Pilot Collective Stick Elbow Assembly — Cleaning/Inspection/Repair	11-2-33	11-130
Pilot Collective Stick Inner Tube Assembly — Cleaning/Inspection/Repair	11-2-34	11-132
Pilot Collective Stick Ring Gears — Cleaning/Inspection/Repair	11-2-35	11-134
Pilot Collective Stick Throttle Arm — Cleaning/Inspection/Repair	11-2-36	11-136
Jackshaft Support Assembly — Removal/Installation	11-2-37	11-138
Jackshaft Support Assembly Bearing — Removal/Installation	11-2-38	11-140
Jackshaft Support Assembly and Bearing — Cleaning/Inspection/Repair	11-2-39	11-141
Pilot Collective Elbow Assembly — Removal/Installation	11-2-40	11-143
Pilot Collective Elbow Assembly Bearings — Removal/Installation	11-2-41	11-144
Collective Control Panel Assembly Integrally Lit Panel — Removal/Installation	11-2-42	11-146
Copilot/Gunner Collective Elbow Assembly — Removal/Installation	11-2-43	11-147
Copilot/Gunner Collective Stick Throttle Arm — Cleaning/Inspection/Repair	11-2-44	11-149
Copilot/Gunner Collective Stick Elbow Assembly — Cleaning/Inspection/Repair	11-2-45	11-151
Copilot/Gunner Collective Elbow Assembly Insert — Removal/Installation	11-2-46	11-153
Copilot/Gunner Collective Elbow Assembly Bushing — Removal/Installation	11-2-47	11-154
Collective Mixing Lever Assembly — Removal/Installation	11-2-48	11-155
Collective Mixing Lever Assembly Bushings — Removal/Installation	11-2-49	11-159
Collective Adjustable Tube Assembly — Removal/Installation	11-2-50	11-160
Collective Adjustable Tube Assembly Clevis — Removal/Installation	11-2-51	11-162
Collective Control Link Assembly — Removal/Installation	11-2-52	11-165
Collective Control Link Assembly — Cleaning/Inspection/Repair	11-2-53	11-167
Droop Compensator Potentiometer Arm — Cleaning/Inspection/Repair	11-2-54	11-170
Collective/Cyclic Actuator Mount Bushings — Removal/Installation	11-2-55	11-172
Collective Boosted Bellcrank Assembly — Removal/Installation	11-2-56	11-174
Collective Boosted Bellcrank Assembly (AVIM) — Cleaning/Inspection/Repair	11-2-57	11-177
Control Support Assembly — Removal/Installation	11-2-58	11-181
Control Support Assembly Bushings (AVIM) — Removal/Installation	11-2-59	11-185
Adjustable Tube Assembly — Removal/Installation	11-2-60	11-186
Adjustable Tube Assembly — Disassembly/Assembly	11-2-61	11-188
Actuator Support Assembly — Removal/Installation	11-2-62	11-189
Actuator Support Assembly (AVIM) — Cleaning/Inspection/Repair	11-2-63	11-192
Collective Friction Knob and Shaft — Removal/Installation	11-2-64	11-196
Collective Friction Knob and Shaft Pin — Removal/Installation	11-2-65	11-198
Collective Plate Assembly — Removal/Installation	11-2-66	11-200
Collective Control Input Valve Bellcrank Assembly — Removal/Installation	11-2-67	11-202
Collective Control Input Valve Bellcrank Assembly — Cleaning/Inspection/Repair	11-2-68	11-205

11-2-1. COLLECTIVE CONTROLS — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Material:
Drycleaning Solvent (D199)
Wiping Rags (D164)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-344-23
TM 1-1520-266-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Center Post Duct and Panels Removed
(Task 2-2-69)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)
Forward Fairing Assembly Removed
(Task 2-2-47)

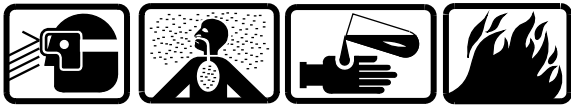
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11-2-1. COLLECTIVE CONTROLS — CLEANING/INSPECTION/REPAIR (CONT)

WARNING

- Ensure that no one operates controls from inside helicopter during cleaning and inspection of collective controls. Physical injury can occur. If injury occurs, seek medical aid. A 'DO NOT MOVE CONTROLS' sign shall be displayed in the cockpit during the performance of this task.

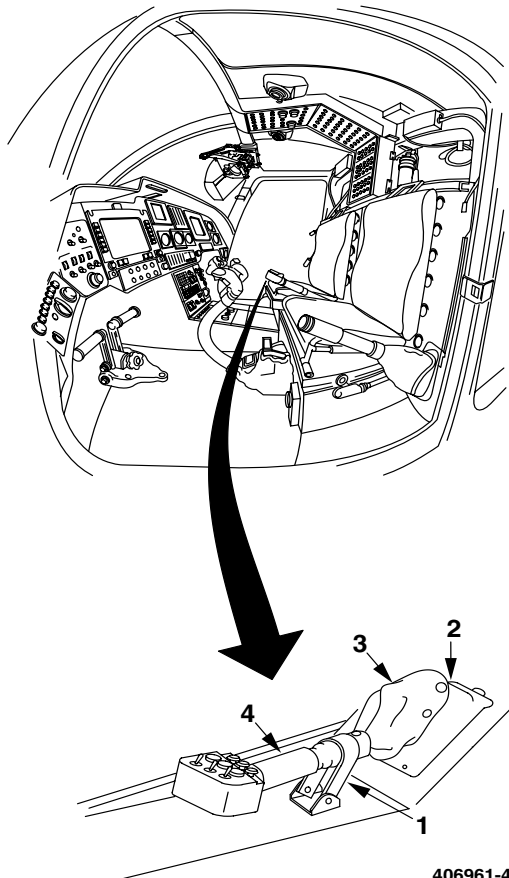
CLEAN

**Drycleaning Solvent**

1. Use drycleaning solvent (D199) and wiping rags (D164) to clean collective controls for inspection.
2. Use wiping rags (D164) to dry collective controls.

INSPECT

3. Inspect collective stick tiedown strap (1) for the following:
 - a. Wear, fraying, and tearing.
 - b. Damaged or missing snap.
 - c. Damaged or missing stud.
 - d. Loose or missing screw, washer, or nut.
 - e. Cracked or corroded fitting.
4. Inspect pilot collective stick cover (2) for the following:
 - a. Wear, cracks, and holes.
 - b. Boot (3) for holes, tears, fraying, and damaged or missing snaps.
 - c. Damaged or missing studs.
5. Inspect pilot collective stick (4) for the following:
 - a. Cracked or otherwise damaged control panel assembly (Task 11-2-28). If cracks are suspected refer to TM 1-1520-266-23.
 - b. Worn, damaged, or missing throttle grip covering (cork material) (Task 11-2-31).

406961-427
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GO TO NEXT PAGE

 11-2-1. COLLECTIVE CONTROLS — CLEANING/INSPECTION/REPAIR (CONT)

c. Bent, dented, cracked, or otherwise damaged outer tube assembly (Task 11-2-32). If cracks are suspected refer to TM 1-1520-266-23.

d. Corrosion (TM 1-1500-344-23).

e. Other damage to collective stick detent button (Task 11-2-30).

6. Inspect copilot/gunner collective stick (5) for the following:

a. Worn, damaged, or missing throttle grip covering (cork material) (Task 11-2-12).

b. Bent, dented, cracked, or otherwise damaged outer tube assembly (Task 11-2-14). If cracks are suspected refer to TM 1-1520-266-23.

c. Corrosion (TM 1-1500-344-23).

d. Boot (6) and cover (7) for holes, tears, and loose or missing snaps.

7. Inspect collective jackshaft (8) for the following:

a. Bent, dented, cracked, or otherwise damaged tube assembly (Task 11-2-17). If cracks are suspected refer to TM 1-1520-266-23.

b. Corrosion (TM 1-1500-344-23).

c. Damaged friction knob and shaft (9).

8. Inspect collective transducers (10) for the following:

a. Bent, dented, cracked, or otherwise damaged tube (Task 11-5-5).

b. Corrosion (TM 1-1500-344-23).

c. Damaged wiring and/or connector (Task 11-5-5).

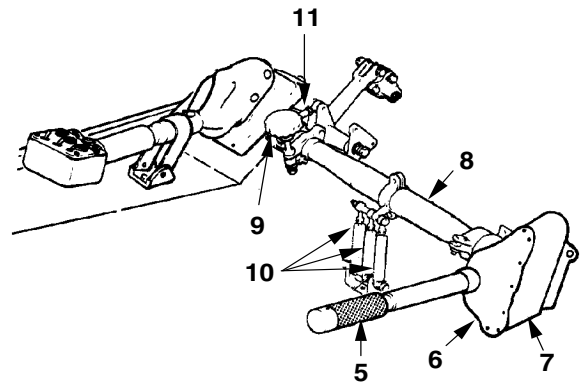
d. Loose or missing hardware.

9. Inspect collective pitch link (11) for the following:

a. Cracks or deep scratches.

b. Corrosion (TM 1-1500-344-23).

c. Other damage (Task 11-2-5).



406961-428
J0515

GO TO NEXT PAGE

11-2-1. COLLECTIVE CONTROLS — CLEANING/INSPECTION/REPAIR (CONT)

10. Inspect collective mixing lever assembly (12) for the following:

- a. Cracks. No cracks allowed. If cracks are suspected refer to TM 1-1520-266-23.
- b. Corrosion (TM 1-1500-344-23).
- c. Other damage (Task 11-5-2).

11. Inspect mixing lever supports (13 and 14) for the following:

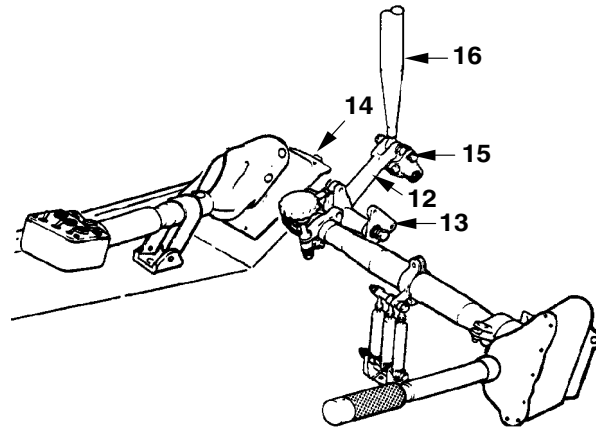
- a. Cracks. No cracks allowed. If cracks are suspected refer to TM 1-1520-266-23.
- b. Corrosion (TM 1-1500-344-23).
- c. Other damage (Task 11-5-3).

12. Inspect trunnion bearing assembly (15) for the following:

- a. Looseness.
- b. Corrosion (TM 1-1500-344-23).
- c. Other damage (Task 11-5-3).

13. Inspect adjustable collective tube assembly (16) for the following:

- a. Damaged clevis.
- b. Loose jamnut.
- c. Bent, dented, cracked, or otherwise damaged tube (Task 11-5-1). If cracks are suspected refer to TM 1-1520-266-23.
- d. Corrosion (TM 1-1500-344-23).
- e. Other damage (Task 11-5-1).



406961-760
J0515

GO TO NEXT PAGE

 11-2-1. COLLECTIVE CONTROLS — CLEANING/INSPECTION/REPAIR (CONT)

14. Inspect actuator support assembly (17) for the following:

- a. Worn bushings (Task 11-2-63).
- b. Cracks. No cracks allowed. If cracks are suspected refer to TM 1-1520-266-23.
- c. Corrosion (TM 1-1500-344-23).
- d. Other damage (Task 11-5-3).

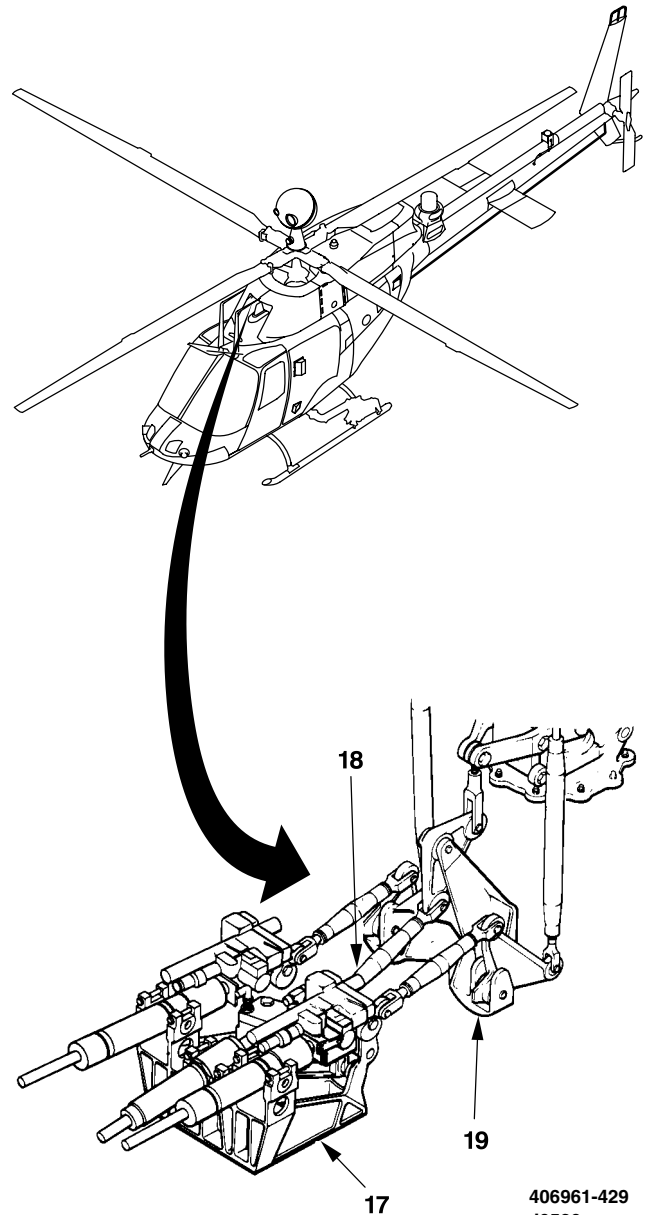
15. Inspect adjustable tube assembly (18) for the following:

- a. Damaged clevis.
- b. Loose jamnut.
- c. Bent, dented, cracked, or otherwise damaged tube (Task 11-5-1). If cracks are suspected refer to TM 1-1520-266-23.
- d. Corrosion (TM 1-1500-344-23).
- e. Other damage (Task 11-5-1).

16. Inspect control support assembly (19) for the following:

- a. Worn bushings (Task 11-5-3).
- b. Cracks. No cracks allowed. If cracks are suspected refer to TM 1-1520-266-23.
- c. Corrosion (TM 1-1500-344-23).
- d. Other damage (Task 11-5-3).

17. Inspect knob and shaft to limits shown. See figure Knob and Shaft — Damage Limits.



406961-429
J0520

GO TO NEXT PAGE

11-2-1. COLLECTIVE CONTROLS — CLEANING/INSPECTION/REPAIR (CONT)

18. Inspect bellcrank assembly (20) for the following:

- a. Cracks. No cracks allowed. If cracks are suspected refer to TM 1-1520-266-23.
- b. Corrosion (TM 1-1500-344-23).
- c. Worn or damaged bearings (Task 11-5-2).
- d. Other damage (Task 11-5-2).

19. Inspect collective control link assembly (21) for the following.

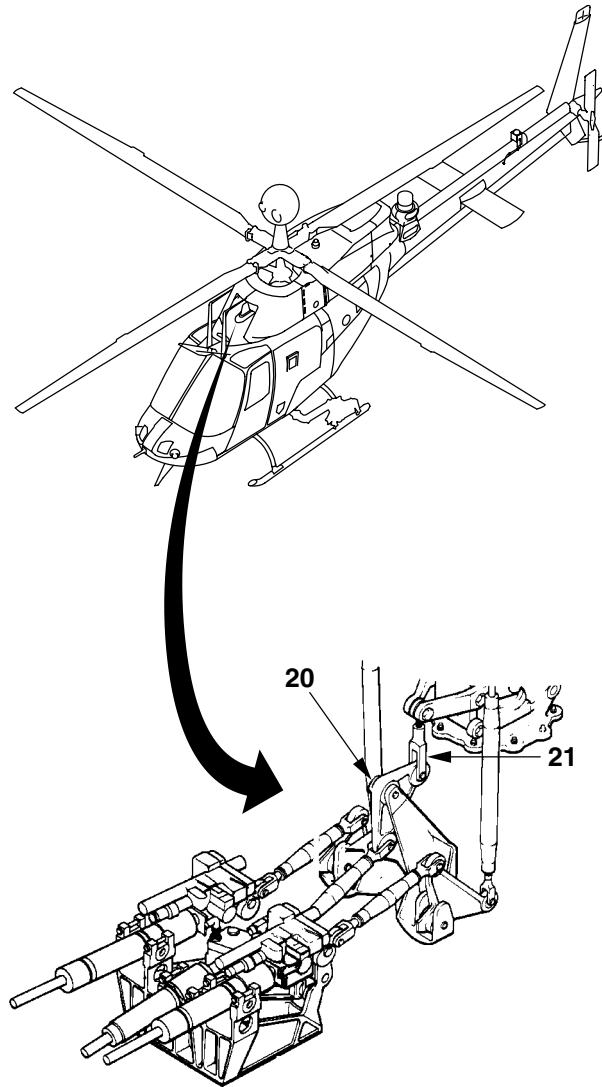
- a. Damaged clevis.
- b. Damaged rod end bearing.
- c. Corrosion (TM 1-1500-344-23).
- d. Other damage (Task 11-2-53).

20. Inspect for missing cotter pins.

REPAIR

21. Repair the following:

- a. Repair collective stick (Task 11-2-30).
- b. Repair collective jackshaft (Task 11-2-17).
- c. Repair friction knob and shaft to limits shown in this task.
- d. Repair collective mixing lever assembly (Task 11-5-2).
- e. Repair mixing lever supports (Task 11-5-3).
- f. Repair trunnion bearing assembly (Task 11-2-8).
- g. Repair adjustable collective tube assembly (Task 11-5-1).
- h. Repair actuator support assembly (Task 11-5-3).
- i. Repair adjustable tube assembly (Task 11-5-1).
- j. Repair control support assembly (Task 11-5-3).
- k. Repair collective control link assembly (21) (Task 11-2-53).



406961-816
J0520

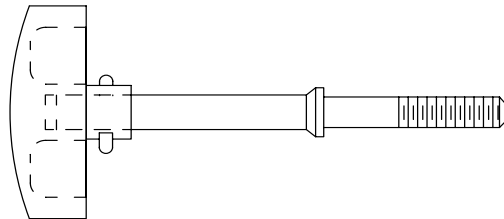
INSPECT

FOLLOW-ON MAINTENANCE

- Install crew seat and armor seat panel (Task 2-2-33) or seat pan assembly (Task 2-2-34).
- Install forward fairing assembly (Task 2-2-47).
- Install center post duct and panels (Task 2-2-69).

GO TO NEXT PAGE

11-2-1. COLLECTIVE CONTROLS — CLEANING/INSPECTION/REPAIR (CONT)



206-001-341 KNOB AND SHAFT

DAMAGE LOCATION SYMBOL



TYPE OF DAMAGE

KNOB:

MECHANICAL AND CORROSION

SHAFT:

MECHANICAL

CORROSION

MAXIMUM AREA PER
FULL DEPTH REPAIR

NUMBER OF REPAIRS

THREAD

Depth
Length
Numbers

MAXIMUM DAMAGE AND REPAIR DEPTH

Not critical as long as it does not
interfere with the fit or function

0.040 in. before and after repair

0.020 in. before and 0.040 in. after repair

0.10 sq. in.

Not critical

One-third of thread

0.180 in.

Two

406001-272
J0515

Knob and Shaft — Damage Limits

END OF TASK

11-2-2. COLLECTIVE STICK TIEDOWN STRAP — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B235)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)

REMOVE

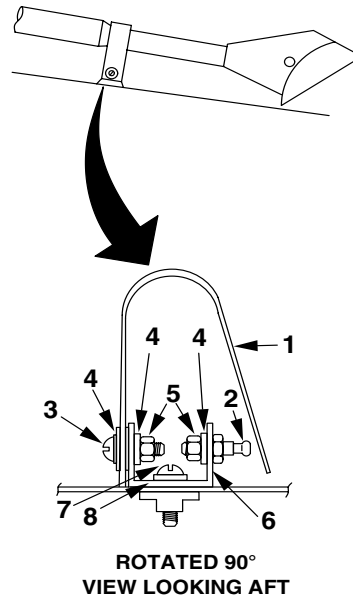
1. Open right crew door.
2. Remove collective stick tiedown strap (1) by unsnapping strap at stud (2) and remove other end of strap by removing screw (3), two washers (4), and nut (5).
3. Remove nut (5) and washer (4) to release stud (2).
4. Remove fitting (6) by removing two screws (7) and two washers (8).

INSTALL

5. Install fitting (6) with two screws (7) and two washers (8).
6. Insert stud (2) in fitting (6) and secure with washer (4) and nut (5). Torque nut (5) **20 TO 25 INCH-POUNDS**.
7. Install collective stick tiedown strap (1) by securing one end with screw (3), two washers (4), and nut (5). Torque nut (5) **20 TO 25 INCH-POUNDS**. Secure other end of strap by snapping onto stud (2).

INSPECT

8. Close right crew door.



406001-189
J0515

END OF TASK

11-2-3. PILOT COLLECTIVE STICK COVER — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Personnel Required:
67S Scout Helicopter Repairer

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)

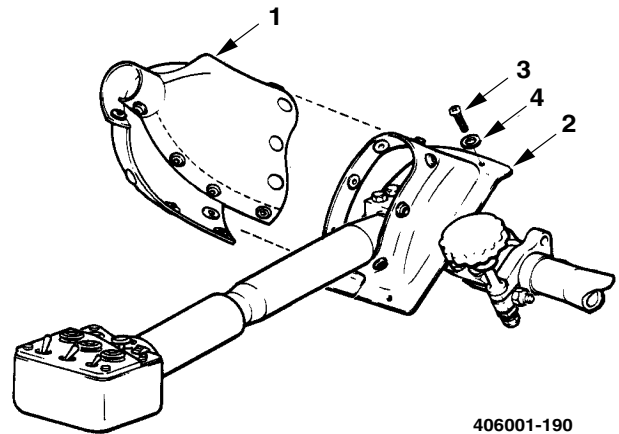
Tools:
General Mechanic Tool Kit (B178)

REMOVE

1. Open right crew door.
2. Remove pilot collective stick boot (1) by unsnapping.
3. Remove cover (2) by removing five screws (3) and five washers (4).

INSTALL

4. Install pilot collective stick cover (2) on collective stick and secure with five screws (3) and five washers (4).
5. Install pilot collective stick boot (1) by snapping in place.
6. Close right crew door.



406001-190
J0515

END OF TASK

11-2-4. COLLECTIVE PITCH LINK ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

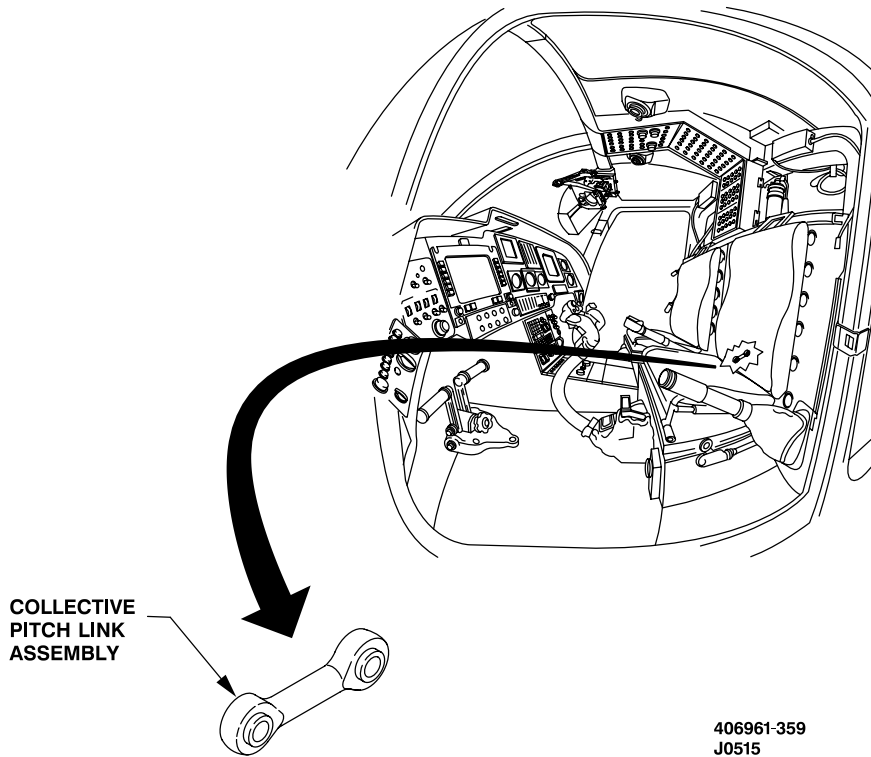
Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B237)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:
TM 1-1520-248-10
TM 1-1520-248-CL
TM 1-1500-204-23

Equipment Condition:
Helicopter Saved (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)
Center Post Duct and Panels Removed
(Task 2-2-69)



GO TO NEXT PAGE

 11-2-4. COLLECTIVE PITCH LINK ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Disconnect collective pitch link assembly (1) from elbow assembly (2) and lever assembly (3) by removing two cotter pins (4), two nuts (5), four washers (6), and two bolts (7). Discard cotter pins (4).

2. Inspect link assembly for wear and damage limits (Task 11-2-5). Replace if necessary.

INSTALL

WARNING

**FLIGHT SAFETY CRITICAL AIRCRAFT
PART (FSCAP)**

Correct installation of collective pitch link to elbow is a critical flight safety task. Ensure nut and cotter pin are secure.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

3. Connect collective pitch link assembly (1) to elbow assembly (2) and lever assembly (3) by installing two bolts (7), four washers (6), and two nuts (5). Torque nuts (5) **50 TO 70 INCH-POUNDS**.

4. Install cotter pins (4) through nuts (5).

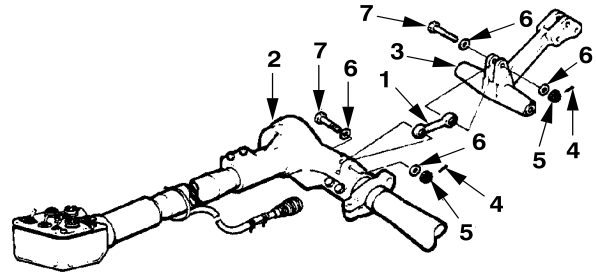
INSPECT

FOLLOW-ON MAINTENANCE

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Install center post duct and panels (Task 2-2-69).

Pilot perform MOC (TM 1-1520-248-10/CL).


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J0515

END OF TASK

11-2-5. COLLECTIVE PITCH LINK ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Rubber Gloves (D111)
Drycleaning Solvent (D199)

Wiping Rag (D164)
Sandpaper (D175)
Epoxy Primer Coating (D98)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

CLEAN



Drycleaning Solvent

1. Clean link assembly surface with drycleaning solvent (D199).
2. Dry link assembly with a wiping rag (D164).

INSPECT

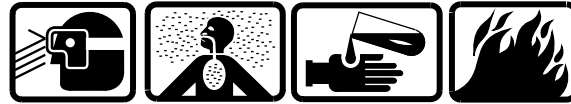
3. Inspect link assembly to limits shown. See figure Collective Pitch Link Assembly — Damage Limits.

REPAIR



Sanding Operations

4. Remove nicks, scratches, and corrosion on link assembly surface with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

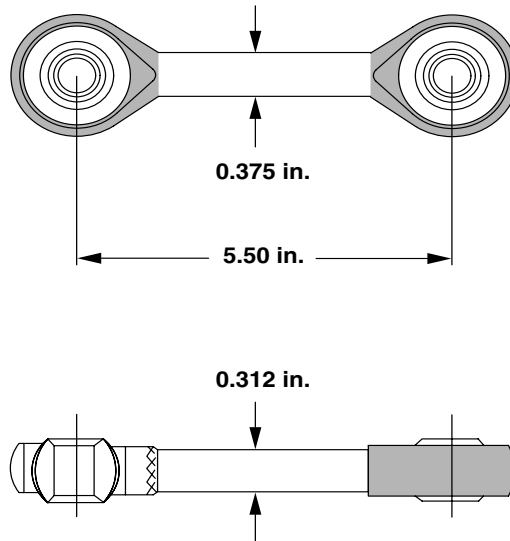


Epoxy Primer Coating

6. Touch up repaired areas with epoxy primer coating (D98).
7. Replace link assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-5. COLLECTIVE PITCH LINK ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



TYPE OF DAMAGE	DAMAGE LOCATION SYMBOLS	
	MAXIMUM DAMAGE	DEPTH
MECHANICAL DAMAGE	0.010 in.	0.020 in.
CORROSION DAMAGE	0.005 in.	0.010 in.
BORES	0.002 in. for 1/4 circumference	
BEARING WEAR:		
Axial:	0.002 in.	
Radial:	0.001 in.	

406961-672
J0515

Collective Pitch Link Assembly — Damage Limits

END OF TASK

11-2-6. MIXING LEVER SUPPORTS — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

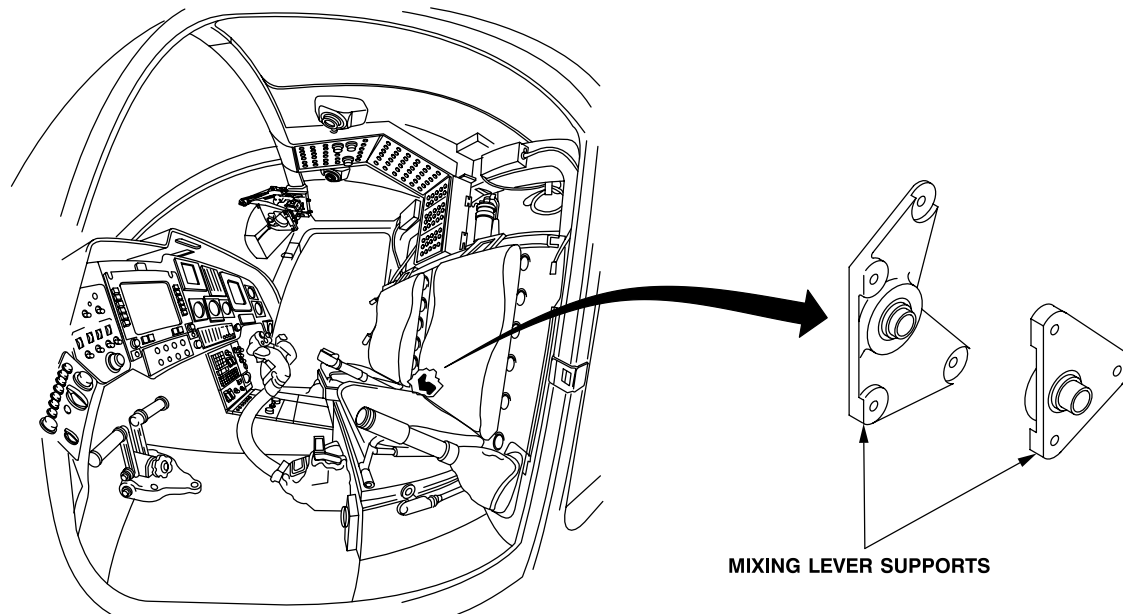
Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B235)
Torque Wrench (B239)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Center Post Duct and Panels Removed
(Task 2-2-69)
Adjustable Tube Assembly Disconnected
(Task 11-2-50)
Trunnion Bearing Assembly Removed
(Task 11-2-7)



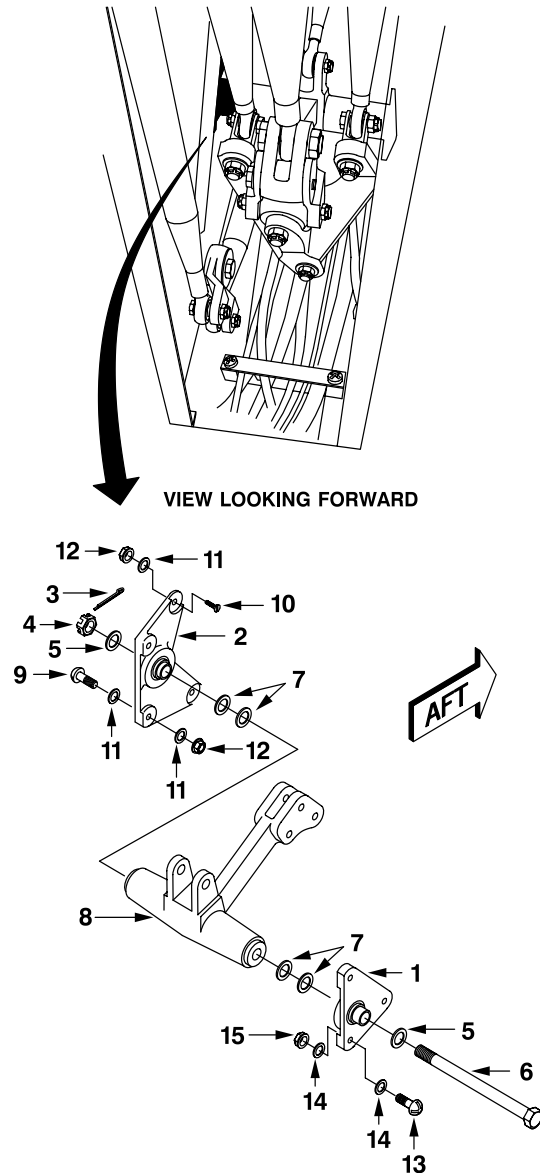
406961-361
J1803

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11-2-6. MIXING LEVER SUPPORTS — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove mixing lever support assemblies (1 and 2) from tunnel by removing cotter pin (3), nut (4), two washers (5), bolt (6), and washers (7) supporting mixing lever (8). Discard cotter pin (3).
2. Remove right mixing lever support assembly (2) by removing two screws (9), two countersunk screws (10), eight washers (11), and four nuts (12).
3. Remove left mixing lever support assembly (1) by removing three screws (13), six washers (14), and three nuts (15).
4. Clean mixing lever support assemblies (1 and 2) (Task 11-5-3).
5. Inspect mixing lever support assemblies for wear and damage limits (Task 11-5-3).
6. Repair mixing lever support assemblies (1 and 2) (Task 11-5-3).



406961-362
J1803

GO TO NEXT PAGE

11-2-6. MIXING LEVER SUPPORTS — REMOVAL/INSTALLATION (CONT)

INSTALL

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Correct installation of directional control rigging is a critical flight safety task. Ensure nut and cotter pin are secure.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

7. Install collective mixing lever support assemblies (1 and 2) into tunnel by installing left support assembly (1) with three screws (13), six washers (14), and three nuts (15). Torque nuts (15) **20 TO 25 INCH-POUNDS**.

8. Install right mixing lever support assembly (2) with two screws (9), two countersunk screws (10), eight washers (11), and four nuts (12). Torque nuts (12) **20 TO 25 INCH-POUNDS**.

NOTE

If necessary, a maximum of two washers (7) per side of mixing lever (8) can be installed to ensure that bearing (16) does not protrude from support assemblies (1 and 2) more than **0.060 inch**. See detail A.

9. Secure mixing lever (8) to support assemblies (1 and 2) with washers (7), bolt (6), two washers (5), and nut (4). Torque nut (4) **100 TO 140 INCH-POUNDS**.

10. Install cotter pin (3) through nut (4).

INSPECT

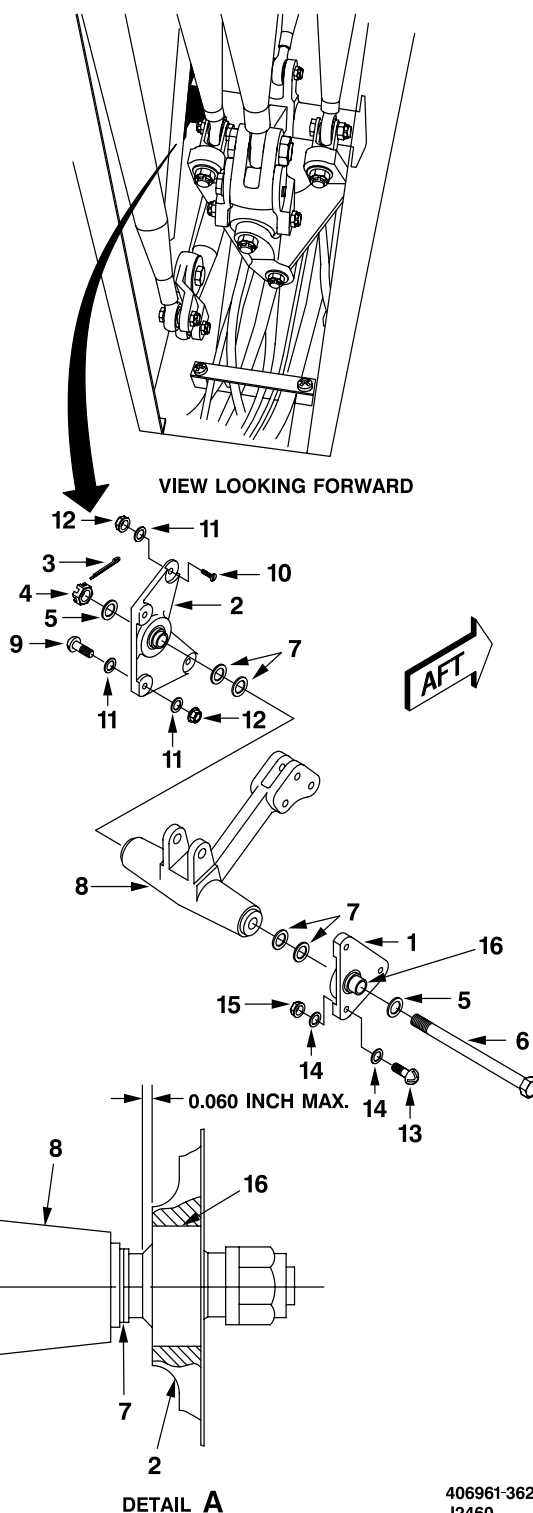
FOLLOW-ON MAINTENANCE

Install trunnion bearing assembly (Task 11-2-7).

Connect adjustable tube assembly (Task 11-2-50).

Install center post duct and panels (Task 2-2-69).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



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J2460

END OF TASK

11-2-7. TRUNNION BEARING ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

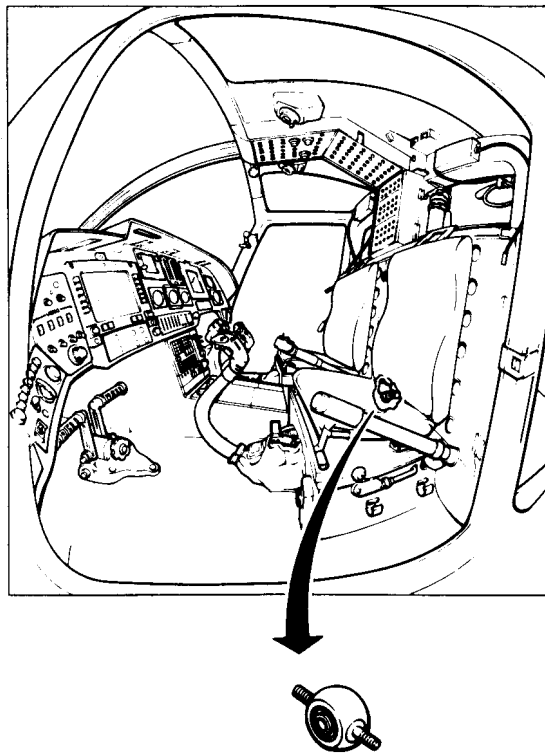
Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B236)
Torque Wrench (B239)

Material:
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Center Post Duct and Panels Removed
(Task 2-2-69)



406961-363
H2034

GO TO NEXT PAGE

11-2-7. TRUNNION BEARING ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Disconnect plate assemblies (1 and 2) from trunnion bearing assembly (3) by removing two cotter pins (4), two nuts (5), and two washers (6). Discard cotter pins (4).

2. Disconnect and remove plate assemblies (1 and 2), two washers (7), and shims (8) from mixing lever (9) by removing lockwire, two bolts (10), and two washers (11).

3. Remove bolt (12) connecting trunnion bearing assembly (3) to bellcrank assembly (13) by removing cotter pin (14), bolt (12), two washers (15), and nut (16). Discard cotter pin (14).

4. Remove trunnion bearing assembly (3).

INSTALL

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Correct installation of trunnion bearing assembly onto bellcrank assembly is a critical flight safety task.

CAUTION

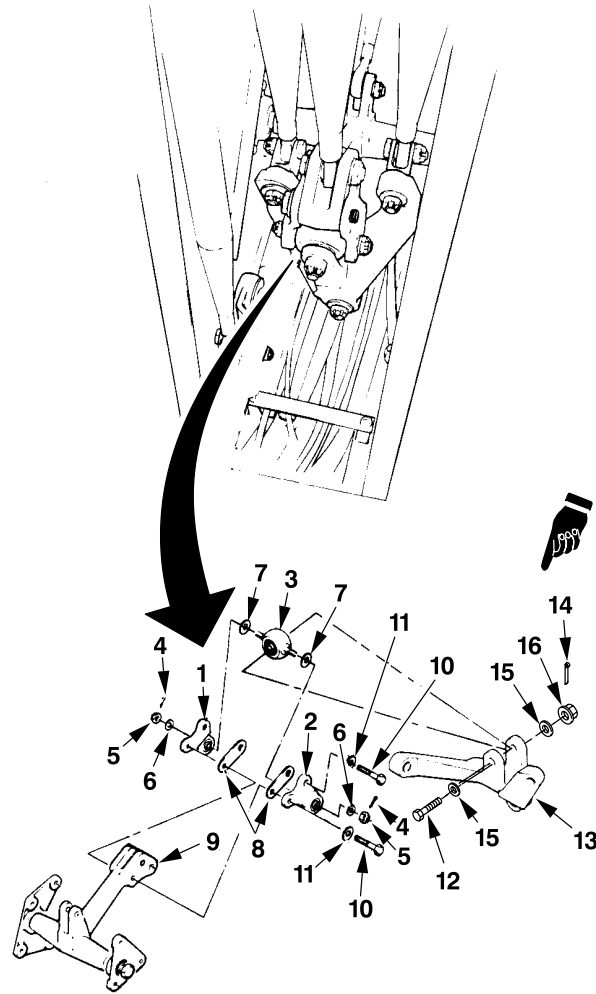
To prevent failure of repair, refer to Task 11-2-8 for cleaning, inspection, and repair of trunnion bearing assembly.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

5. Install trunnion bearing assembly (3) onto bellcrank assembly (13) with bolt (12), two washers (15), and nut (16). Torque nut (16) **100 TO 140 INCH-POUNDS**.

6. Install cotter pin (14) through nut (16).



406961-364
J2758

GO TO NEXT PAGE

11-2-7. TRUNNION BEARING ASSEMBLY — REMOVAL/INSTALLATION (CONT)

7. Verify bolt (12) rotates freely in bellcrank assembly (13).

8. Place plates (1 and 2) and two washers (7) onto trunnion bearing assembly (3).

9. Install two washers (6) and nuts (5) fingertight to trunnion bearing assembly (3).

10. Position plates (1 and 2) over mixing lever (9). Then push on plate (2) and measure gap between plate (1) and mixing lever (9), using feeler gauge.

11. Using feeler gauge dimension from step 10, position shims (8) half against plate (1) and half against plate (2) to within **0.009 inch** of each other.

12. Install shims (8) using two bolts (10) and two washers (11).

13. Tighten nuts (5) and check for **0.002 inch** maximum total gap between trunnion bearing assembly (3) and plates (1 and 2). Adjust shims (8) as necessary to obtain measurement.

14. Torque nuts (5) **20 TO 35 INCH-POUNDS**.

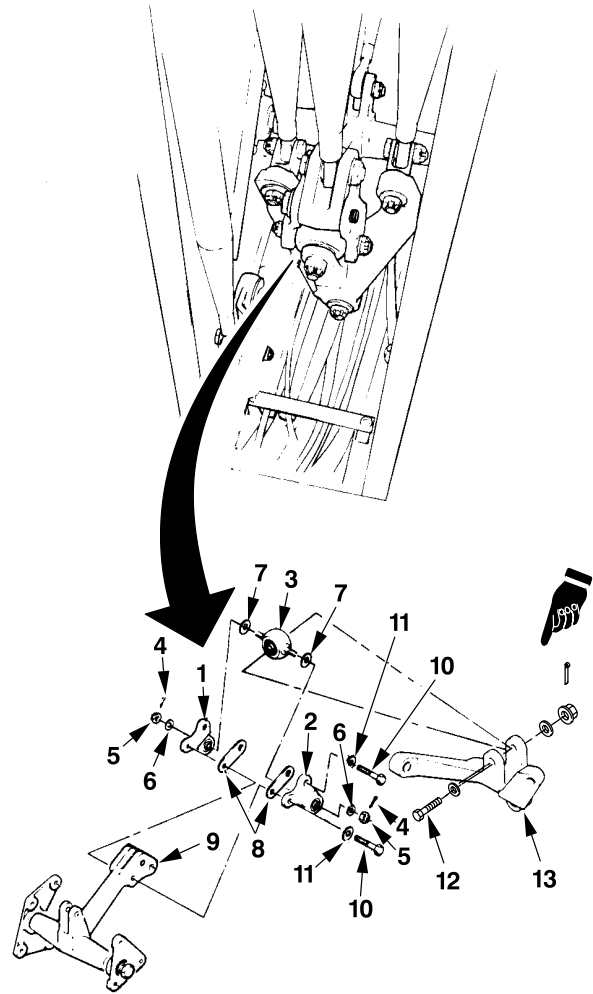
15. Install two cotter pins (4).

16. Lockwire (D132) bolts (10).

INSPECTFOLLOW-ON MAINTENANCE

Install center post duct and panels (Task 2-2-69).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



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J2758

END OF TASK

11-2-8. TRUNNION BEARING ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

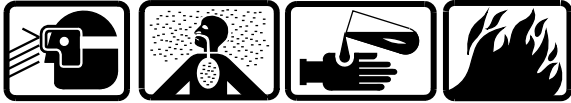
Tools:
General Mechanic Tool Kit (B178)

Material:
Rubber Gloves (D111)
Wiping Rag (D164)
Drycleaning Solvent (D199)

Personnel Required:
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean trunnion bearing surface with drycleaning solvent (D199).

2. Dry trunnion bearing with a wiping rag (D164).

INSPECT

3. Inspect trunnion bearing to limits shown. See figure Trunnion Bearing Assembly — Damage Limits. If cracks in trunnion bearing assembly are suspected perform magnetic particle inspection (TM 1-1520-266-23).

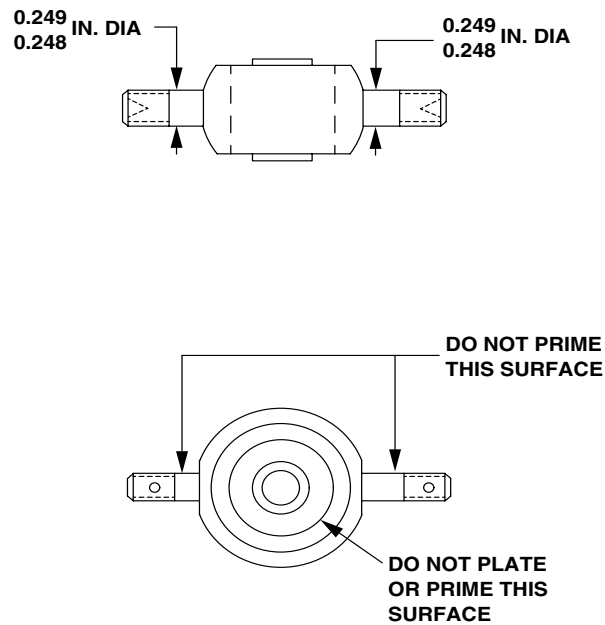
4. Inspect bearing for freedom of movement and condition. Replace trunnion bearing when wear exceeds **0.005 inch** radial or **0.030 inch** axial.

REPAIR

5. No repairs allowed.

GO TO NEXT PAGE

 11-2-8. TRUNNION BEARING ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)

**NOTES:**

1. Inspect bearing magnetically.
2. No cracks permitted.
3. Inspect bearing for freedom of movement and condition.
4. Replace bearing if wear is exceeded

Axial 0.030 in.

Radial 0.005 in.

406001-268
J0515

Trunnion Bearing Assembly — Damage Limits

END OF TASK

11-2-9. COLLECTIVE TRANSDUCERS — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-T
TM 1-1500-204-23

Applicable Configurations:

All

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

Tools:

General Mechanic Tool Kit (B178)
Torque Wrench (B235)

Personnel Required:

67S Scout Helicopter Repairer
67S Scout Helicopter Technical Inspector (TI)

GO TO NEXT PAGE

11-2-9. COLLECTIVE TRANSDUCERS — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Mark transducer position and remove three collective transducers (1) from jackshaft clamp (2) and support assembly (3) by removing two cotter pins (4), two nuts (5), two washers (6), four spacers (7), two spacers (8), four spacers (9), two washers (10), and two bolts (11). Discard cotter pins (4).

2. Tag and identify transducer electrical connectors (12).

3. Disconnect transducer electrical connectors (12).

4. Inspect collective transducers (1) for wear and damage (Task 11-5-5).

INSTALL

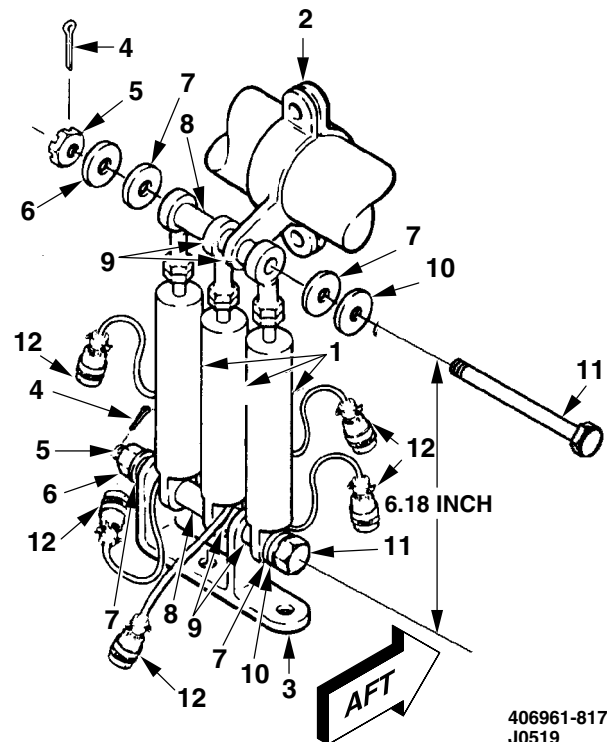
5. Adjust collective transducers (1) to obtain dimension of **6.18 inches** between centers of grounded bearing and adjustable rod end bearing with transducer movable rod at midstroke position.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

6. Install three serviceable collective transducers (1) to support assembly (3) and jackshaft clamp (2) by installing two bolts (11), two washers (10), four spacers (9), two spacers (8), four spacers (7), two washers (6), and two nuts (5). Torque nuts (5) **12 TO 15 INCH-POUNDS**.

7. Install cotter pins (4) through nuts (5).



8. Connect collective transducer electrical connectors (12) and remove identification tags. ■

INSPECT

FOLLOW-ON MAINTENANCE

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34). ■

Perform transducer rigging (Task 11-1-1 or 11-1-2).

Perform operational check of SCAS and hydraulic electrical system (TM 1-1520-248-T).

END OF TASK

11-2-10. COPILOT/GUNNER COLLECTIVE STICK ASSEMBLY PLUG — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Acetone (D2)
Sealing Compound (D184)
Rubber Gloves (D111)

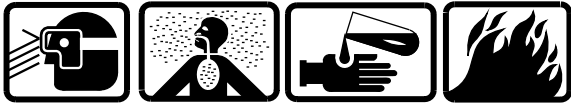
Personnel Required:
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)

REMOVE

1. Open left crew door.
2. Remove plug (1) from copilot collective stick grip (2) by removing adhesive around plug (1) with plastic scraper. Pry plug (1) from stick grip (2).

CLEAN

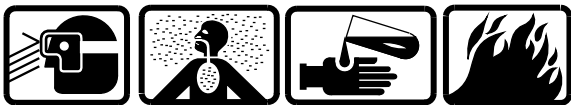


Acetone

CLEAN

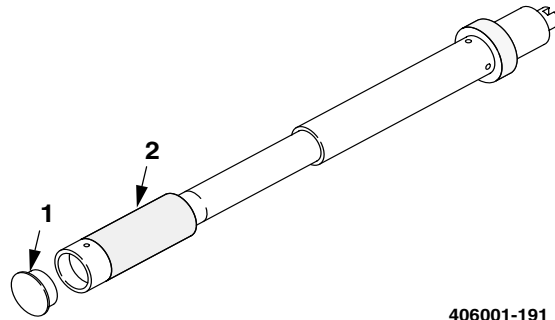
3. Clean plug area with acetone (D2).

INSTALL



Sealing Compound

4. Install plug (1) into copilot collective stick grip (2) by applying sealing compound (D184) between plug (1) and end of grip (2).
5. Close left crew door.



406001-191
J0515

END OF TASK

 11-2-11. COPILOT/GUNNER COLLECTIVE STICK TUBE ASSEMBLIES — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Material:
Sealant (D178)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

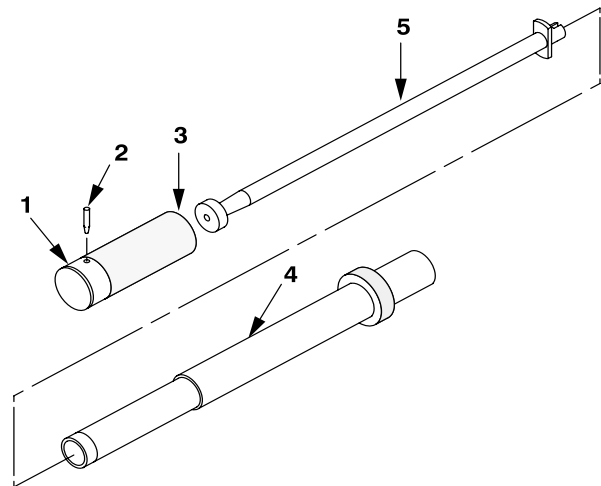
Tools:
General Mechanic Tool Kit (B178)

REMOVE

1. Remove plug (1) (Task 11-2-10).
2. Remove screw (2) and remove grip assembly (3) from outer tube assembly (4).
3. Remove inner tube assembly (5) from outer tube assembly (4).

INSPECT

4. Inspect grip assembly (3) for wear and damage (Task 11-2-12).
5. Inspect inner tube assembly (5) for wear and damage (Task 11-2-13).
6. Inspect outer tube assembly (4) for wear and damage (Task 11-2-14).



406001-192
J0515

INSTALL

7. Install inner tube assembly (5) into outer tube assembly (4).



Sealing Compound

8. Install grip assembly (3) onto outer tube assembly (4) and secure with screw (2) which attaches to inner tube assembly (5). Secure screw (2) with sealant (D178) in screw hole.

INSPECT

9. Install plug (1) into copilot collective stick (Task 11-2-10 step 4).

END OF TASK

11-2-12. COPILOT/GUNNER COLLECTIVE GRIP ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Acetone (D2)
Cork Sheet (D80)
Sandpaper (D175)
Adhesive (D12)
Solid Film Lubricant (D137)

Tools:
General Mechanic Tool Kit (B178)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Material:
Wiping Rag (D164)
Drycleaning Solvent (D199)
Rubber Gloves (D111)

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean grip assembly surface with drycleaning solvent (D199).
2. Dry grip assembly with a wiping rag (D164).

INSPECT

3. Inspect grip assembly to limits shown. See figure Copilot/Gunner Collective Grip Assembly — Damage Limits. If cracks in collective grip assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

4. Replace grip assembly if wear or damage limits are exceeded.

REPAIR

5. If cracked or worn through to base metal, replace throttle grip cover.



Acetone

GO TO NEXT PAGE

- a. Remove worn cork from throttle grip and remove adhesive residue from grip surface with acetone (D2).



Adhesive

- b. Make replacement cover from cork sheet (D80) and apply to grip surface with adhesive (D12).



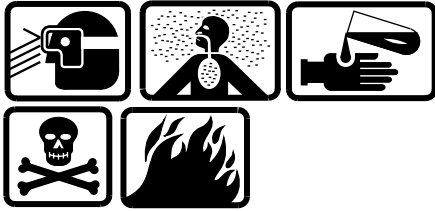
Sanding Operations

6. Remove scratches, nicks and corrosion from metal surfaces of throttle grip assembly with 400 grit sandpaper (D175).

7. Remove sanding residue with wiping rag (D164) moistened with drycleaning solvent (D199).

INSPECT

**11-2-12. COPILOT/GUNNER COLLECTIVE GRIP ASSEMBLY — CLEANING/INSPECTION/REPAIR
(CONT)**

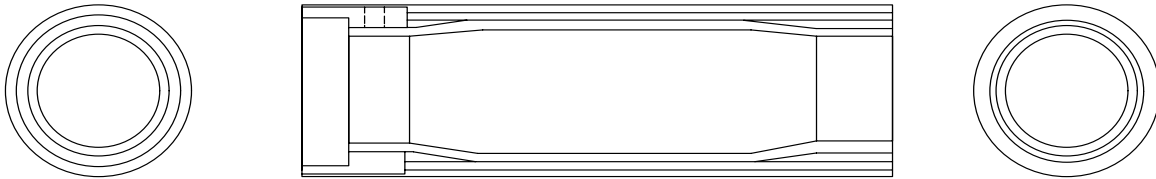
**Lubricant**

8. Apply solid film lubricant (D137) to metal surfaces except ferrule.

9. Replace throttle grip if wear or damage limits are exceeded. See figure Copilot/Gunner Collective Grip Assembly — Damage Limits.

GO TO NEXT PAGE

11-2-12. COPILOT/GUNNER COLLECTIVE GRIP ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MECHANICAL AND CORROSION

MAXIMUM AREA PER FULL DEPTH REPAIR

NUMBER OF REPAIRS

EDGE CHAMFER TO REMOVE DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

**0.010 in. before and
0.020 in. after repair**

0.100 sq. in.

Not critical

0.030 in.

NOTE: No cracks are permitted.

406001-23
J0515

Copilot/Gunner Collective Grip Assembly — Damage Limits

END OF TASK

11-2-13. COPILOT/GUNNER COLLECTIVE STICK INNER TUBE ASSEMBLY — CLEANING/
INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

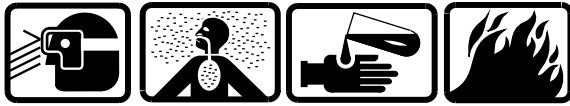
Material:
Sandpaper (D175)
Crocus Cloth (D90)
Epoxy Primer Coating (D98)

Rubber Gloves (D111)
Wiping Rag (D164)
Drycleaning Solvent (D199)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean tube assembly surface with drycleaning solvent (D199).
2. Dry tube assembly with a wiping rag (D164).

INSPECT

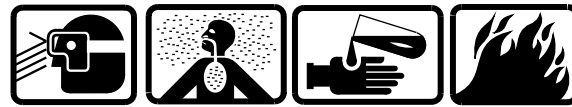
3. Inspect tube assembly to limits shown. See figure Copilot/Gunner Collective Stick Inner Tube Assembly — Damage Limits. If cracks are suspected in copilot/gunner collective stick inner tube assembly perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on tube assembly surface with 400 grit sandpaper (D175). Smooth surface with crocus cloth (D90).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



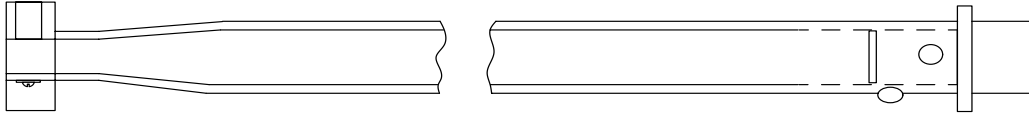
Epoxy Primer Coating

6. Touch up repaired areas of grip assembly with epoxy primer coating (D98).

7. Replace tube assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-13. COPILOT/GUNNER COLLECTIVE STICK INNER TUBE ASSEMBLY — CLEANING/
INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

**MECHANICAL AND
CORROSION**

**0.005 in. before and
0.010 in. after repair**

**MAXIMUM AREA PER
FULL DEPTH REPAIR**

0.50 sq. in.

NUMBER OF REPAIRS

Not critical

**EDGE CHAMFER TO
REMOVE DAMAGE**

0.020 in.

BORES

**0.010 in. for 1/4
circumference**

NOTE: No cracks are permitted.

406001-26
J0515

Copilot/Gunner Collective Stick Inner Tube Assembly — Damage Limits

END OF TASK

11-2-14. COPILOT/GUNNER COLLECTIVE STICK OUTER TUBE ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

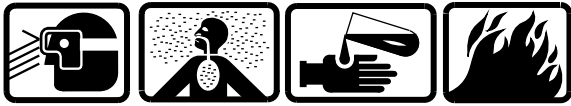
Material:
Sandpaper (D175)
Crocus Cloth (D90)
Epoxy Primer Coating (D98)

Rubber Gloves (D111)
Drycleaning Solvent (D199)
Wiping Rag (D164)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



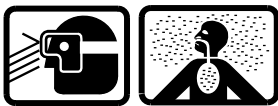
Drycleaning Solvent

1. Clean tube assembly surface with drycleaning solvent (D199).
2. Dry tube assembly with a wiping rag (D164).

INSPECT

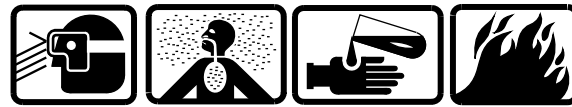
3. Inspect tube assembly to limits shown. See figure Collective Stick Outer Tube Assembly — Damage Limits. If cracks are suspected in collective stick outer tube assembly perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on tube assembly surface with 400 grit sandpaper (D175). Smooth surface with crocus cloth (D90).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



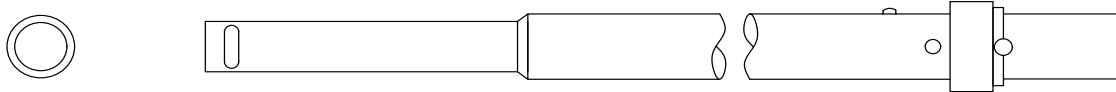
Epoxy Primer Coating

6. Touch up repaired areas of tube assembly with epoxy primer coating (D98).

7. Replace tube assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-14. COPILOT/GUNNER COLLECTIVE STICK OUTER TUBE ASSEMBLY — CLEANING/
INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

**MECHANICAL AND
CORROSION**

**MAXIMUM AREA PER
FULL DEPTH REPAIR**

NUMBER OF REPAIRS

**EDGE CHAMFER TO
REMOVE DAMAGE**

BORES

NOTE: No cracks are permitted.

MAXIMUM DAMAGE AND REPAIR DEPTH

**0.005 in. before and
0.010 in. after repair**

0.50 sq. in.

Not critical

0.030 in.

**0.002 in. for 1/4
circumference**

406001-28
J0515

Collective Stick Outer Tube Assembly — Damage Limits

END OF TASK

11-2-15. COPILOT/GUNNER COLLECTIVE STICK ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

11-2-15. COPILOT/GUNNER COLLECTIVE STICK ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Open left crew door.
2. Unsnap boot (1) from cover (2) from copilot/gunner collective stick (3).
3. Remove pin assembly (4) from copilot/gunner collective stick (3).
4. Loosen knurled nut (5) and remove copilot/gunner collective stick (3) from elbow assembly (6).

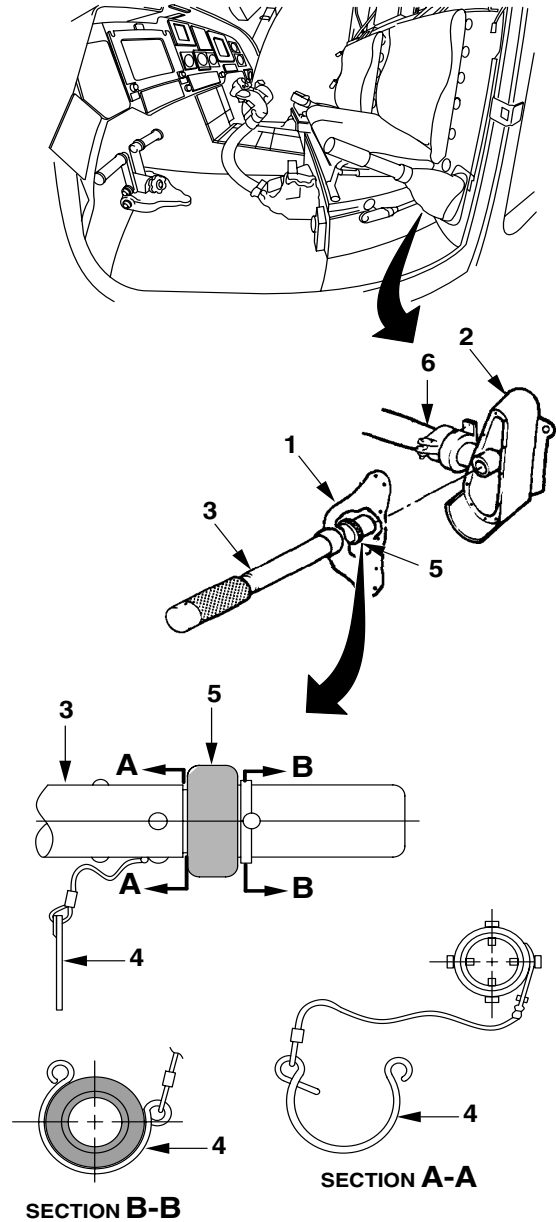
INSTALL

WARNING

When installing copilot collective stick, ensure the alignment notch on the collective stick is aligned with the alignment boss in the elbow assembly before tightening the knurled nut to ensure full throttle travel.

5. Install copilot/gunner collective stick (3) into elbow assembly (6) and secure by tightening knurled nut (5).
6. Install pin assembly (4) to secure copilot/gunner collective stick (3) to elbow assembly (6).
7. Install boot (1) on copilot/gunner collective stick (3) and resnap boot (1) to cover (2).

INSPECT



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J0515

END OF TASK

11-2-16. COLLECTIVE JACKSHAFT ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B235)
Torque Wrench (B237)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Pilot Collective Stick Removed
(Task 11-2-26)
Copilot Collective Stick, Boot, and
Elbow Removed (Tasks 11-2-15 and 11-2-43)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

GO TO NEXT PAGE

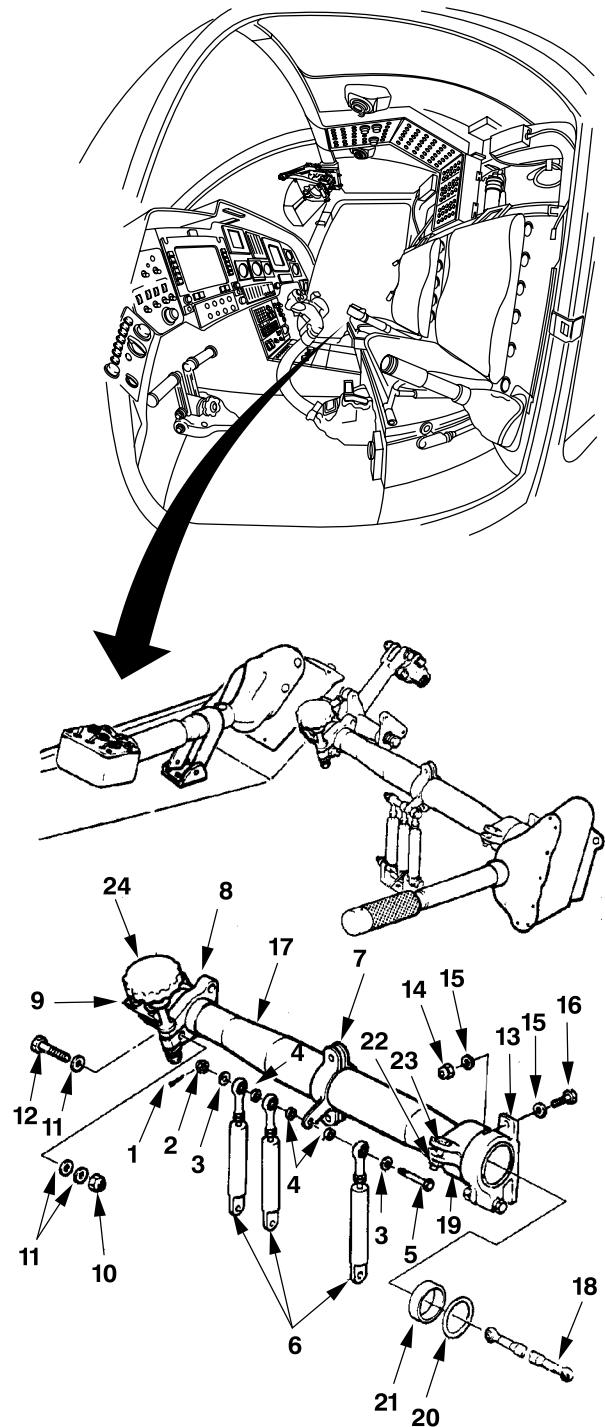
11-2-16. COLLECTIVE JACKSHAFT ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove cotter pin (1) and discard.
2. Remove nut (2), two spacers (3), three spacers (4), and bolt (5) to disconnect three transducers (6) from clamp (7).
3. Disconnect collective jackshaft friction adjustment bearing clamp (8) from support fitting (9) by removing two nuts (10), six washers (11), and two bolts (12).
4. Disconnect collective jackshaft support assembly (13) from bulkhead by removing two nuts (14), four washers (15), and two bolts (16).
5. Remove collective jackshaft (17) from helicopter.
6. Remove throttle tube assembly (18) from collective jackshaft (17) (Task 11-2-22).
7. Remove collective jackshaft support assembly (13) with attached clamp assembly (19), shim (20), and spacer (21) from collective jackshaft (17) by loosening clamp friction nut (22) and bolt (23).
8. Remove collective friction adjustment bearing clamp (8) from collective jackshaft (17) by loosening adjustment knob (24).
9. Inspect collective jackshaft (17) for wear and damage limits (Task 11-2-17).

INSTALL

10. Install collective friction adjustment bearing clamp (8) onto collective jackshaft (17) and secure with minimum friction on adjustment knob (24).
11. Install collective jackshaft support assembly (13) with clamp assembly (19), spacer (21), and shim (20) on collective jackshaft (17) and secure with minimum friction by tightening bolt (23) and clamp friction nut (22).

406001-193
J1866

GO TO NEXT PAGE

11-2-16. COLLECTIVE JACKSHAFT ASSEMBLY — REMOVAL/INSTALLATION (CONT)

12. Place throttle tube assembly (18) into collective jackshaft (17) (Task 11-2-22).

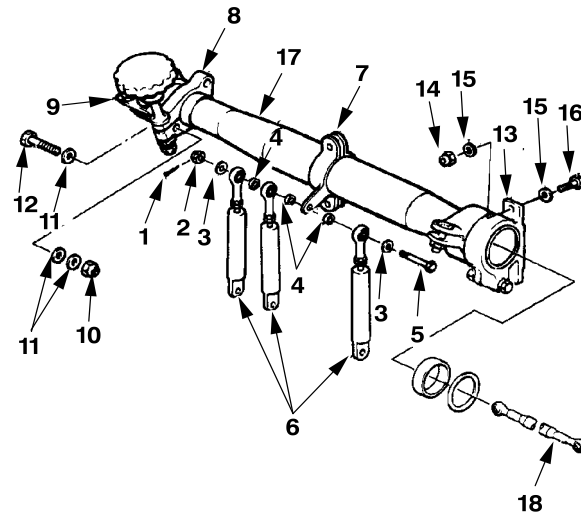
13. Place collective jackshaft (17) in helicopter.

14. Connect collective jackshaft friction adjustment bearing clamp (8) to support fitting (9) with two bolts (12), six washers (11), and two nuts (10). Torque nuts (10) **50 TO 70 INCH-POUNDS**.

15. Connect collective jackshaft support assembly (13) to bulkhead with two bolts (16), four washers (15), and two nuts (14). Torque nuts (14) **50 TO 70 INCH-POUNDS**.

16. Connect three transducers (6) to clamp (7) with bolt (5), two spacers (3), three spacers (4), and nut (2). Torque nut (2) **20 TO 25 INCH-POUNDS**.

17. Install cotter pin (1) through nut (2).



406961-826
J1866

INSPECT

FOLLOW-ON MAINTENANCE

Perform rigging check of jackshaft (Task 11-1-1 or 11-1-2).

Perform friction check and adjustment of collective system (Task 11-2-24).

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Install pilot collective stick (Task 11-2-26).

Install copilot/gunner collective stick, boot, and elbow (Tasks 11-2-15 and 11-2-43).

END OF TASK

11-2-17. COLLECTIVE JACKSHAFT — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

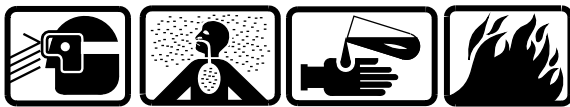
Material:
Sandpaper (D175)
Epoxy Primer Coating (D98)

Rubber Gloves (D111)
Drycleaning Solvent (D199)
Wiping Rag (D164)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean jackshaft surface with drycleaning solvent (D199).
2. Dry jackshaft with a dry wiping rag (D164).

INSPECT

3. Inspect jackshaft to limits shown. See figure Collective Jackshaft — Damage Limits. If cracks in collective jackshaft are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on jackshaft surface with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



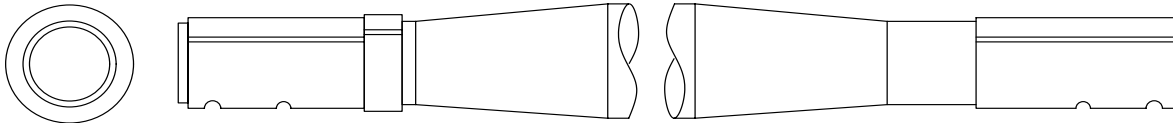
Epoxy Primer Coating

6. Touch up repaired areas of jackshaft with epoxy primer coating (D98).

7. Replace jackshaft if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-17. COLLECTIVE JACKSHAFT — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

**MECHANICAL AND
CORROSION**

**MAXIMUM AREA PER
FULL DEPTH REPAIR**

NUMBER OF REPAIRS

**EDGE CHAMFER TO
REMOVE DAMAGE**

BORES

MAXIMUM DAMAGE AND REPAIR DEPTH

**0.010 in. before and
0.020 in. after repair**

0.50 sq. in.

Not critical

0.050 in. radius

Not critical

NOTE: No cracks are permitted.

406001-27
J0515

Collective Jackshaft — Damage Limits

END OF TASK

11-2-18. COLLECTIVE JACKSHAFT ADJUSTMENT NUT — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

References:
TM 1-1520-248-MTF

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B237)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

GO TO NEXT PAGE

11-2-18. COLLECTIVE JACKSHAFT ADJUSTMENT NUT — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove collective friction adjustment jamnut (1) from knob shaft (2).

2. Remove collective friction adjustment nut (3) and washers (4) from knob shaft (2).

INSTALL

3. Install nut (3) on knob shaft (2) and obtain gap of **0.005 to 0.020 inch**.

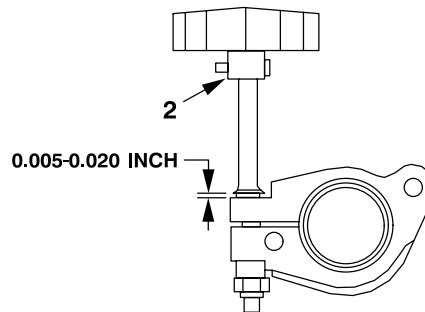
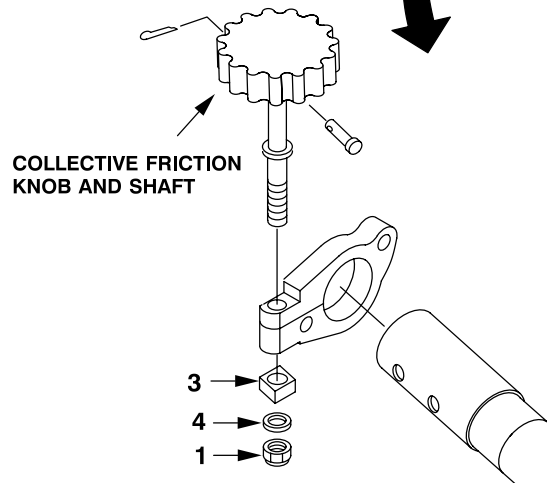
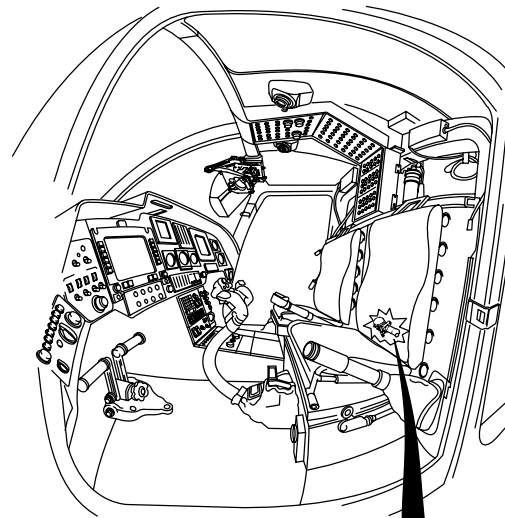
4. Install washer (4) and jamnut (1). Torque jamnut (1) **50 TO 70 INCH-POUNDS**.

INSPECT

FOLLOW-ON MAINTENANCE

Install crew seat and armor seat panel (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



406001-271
J0515

END OF TASK

**11-2-19. COLLECTIVE JACKSHAFT FRICTION ADJUSTMENT BEARING — REMOVAL/
INSTALLATION**

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Personnel Required:

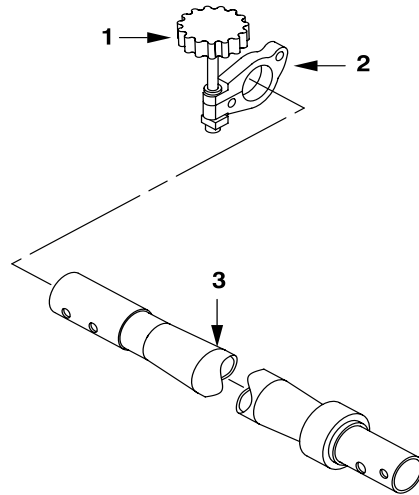
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

REMOVE

1. Turn knob (1) counterclockwise to loosen friction on collective jackshaft friction adjustment bearing (2).
2. Remove collective jackshaft friction adjustment bearing (2) from jackshaft (3).

INSTALL

3. Install collective jackshaft friction adjustment bearing (2) on jackshaft (3) and secure with minimum friction by turning knob (1) clockwise.

INSPECT

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J0515

END OF TASK

11-2-20. COLLECTIVE JACKSHAFT SHIM AND SPACER — REMOVAL/INSTALLATION

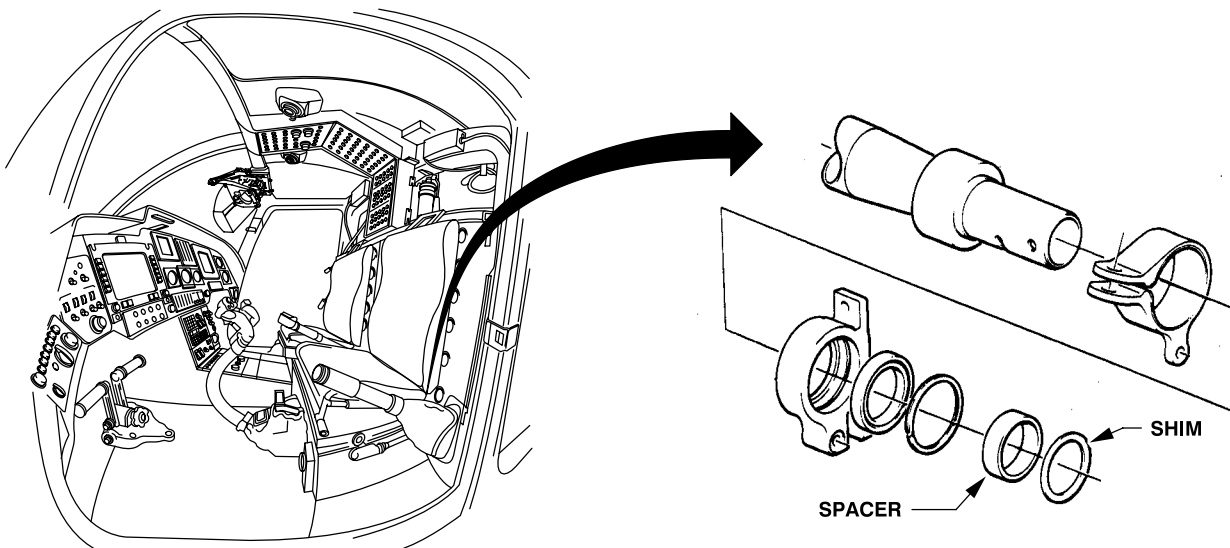
This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
67S Scout Helicopter Repairer

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)



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J0515

GO TO NEXT PAGE

11-2-20. COLLECTIVE JACKSHAFT SHIM AND SPACER — REMOVAL/INSTALLATION (CONT)

REMOVE

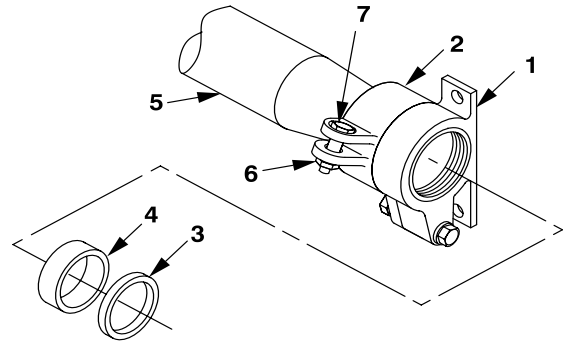
1. Remove support assembly (1) with attached clamp assembly (2), shim (3), and spacer (4) from jackshaft (5) by loosening clamp friction nut (6) and bolt (7).

INSTALL

2. Install support assembly (1) with clamp assembly (2), spacer (4), and shim (3) on jackshaft (5) and secure with minimum friction by tightening clamp friction nut (6) and bolt (7).

INSPECT**FOLLOW-ON MAINTENANCE**

Perform friction check and adjustment of collective system (Task 11-2-24).



406001-196
J0515

END OF TASK

11-2-21. COLLECTIVE JACKSHAFT SPACER — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Rubber Gloves (D111)
Wiping Rag (D164)

Drycleaning Solvent (D199)
Sandpaper (D175)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean spacer surface with drycleaning solvent (D199).
2. Dry spacer with a dry wiping rag (D164).

INSPECT

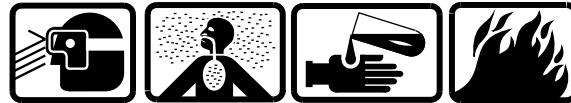
3. Inspect spacer to limits shown. See figure Collective Jackshaft Spacer — Damage Limits. If cracks in collective jackshaft spacer are suspected perform magnetic particle inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on spacer surface with 400 grit sandpaper (D175).



Acetone

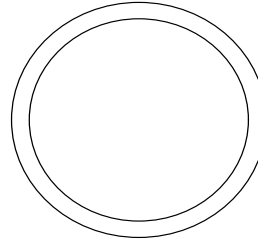
5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

6. Replace spacer if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-21. COLLECTIVE JACKSHAFT SPACER — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

**MECHANICAL AND
CORROSION**

**MAXIMUM AREA PER
FULL DEPTH REPAIR**

NUMBER OF REPAIRS

NOTE: No cracks are permitted.

MAXIMUM DAMAGE AND REPAIR DEPTH

**0.010 in. before and
0.020 in. after repair**

0.125 sq. in.

Not critical

406001-21
J0515

Collective Jackshaft Spacer — Damage Limits

END OF TASK

11-2-22. COLLECTIVE JACKSHAFT THROTTLE TUBE ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B235)

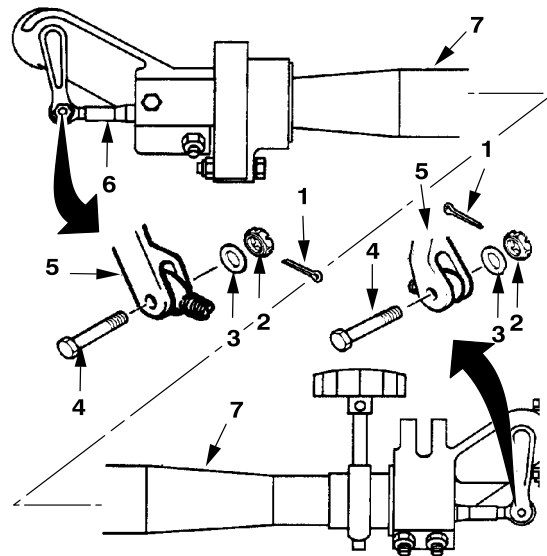
Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

REMOVE

1. Remove cotter pin (1), nut (2), washer (3), and bolt (4) from each of two throttle arms (5).
2. Disengage jackshaft throttle tube assembly (6) from throttle arms (5).
3. Remove jackshaft throttle tube assembly (6) from jackshaft assembly (7).

INSTALL

4. Place jackshaft throttle tube assembly (6) in jackshaft assembly (7).
5. Place jackshaft throttle tube assembly (6) rod end bearings in throttle arms (5) and align holes.
6. Connect jackshaft throttle tube assembly (6) to two throttle arms (5) with two bolts (4), washers (3), nuts (2), and cotter pins (1). Torque nuts (2) **20 TO 25 INCH-POUNDS**.



406001-197
J0515

INSPECT

END OF TASK

11-2-23. COLLECTIVE JACKSHAFT FRICTION CLAMP — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Torque Wrench (B235)
Torque Wrench (B237)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

GO TO NEXT PAGE

11-2-23. COLLECTIVE JACKSHAFT FRICTION CLAMP — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove cotter pin (1), nut (2), washer (3), and bolt (4) from throttle arm (5). Release throttle tube assembly (6) from throttle arm (5) on elbow assembly (7).

2. Remove nut (8), washer (9), and bolt (10) securing elbow assembly (7) and jackshaft (11). Remove nut (12), two washers (13), bolt (14), and shim (15).

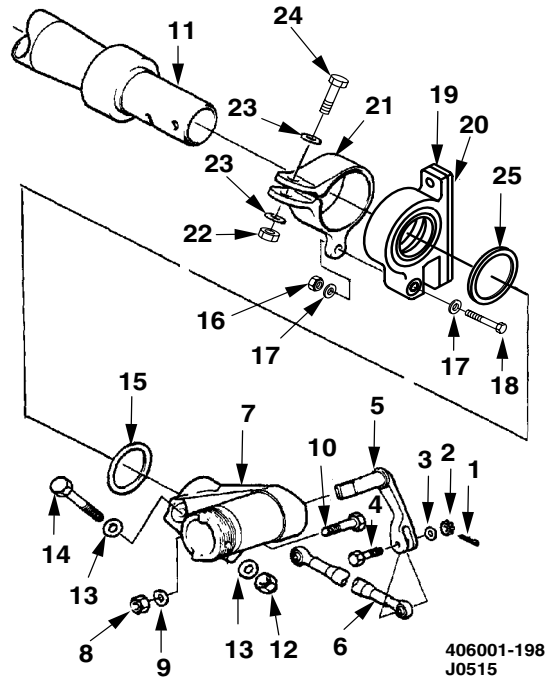
3. Remove elbow (7) from jackshaft (11).

4. Remove nut (16), two washers (17), and bolt (18) securing support (19) with bonded shims (20) and friction clamp (21).

5. Remove nut (22), two washers (23), and bolt (24) securing friction clamp (21).

6. Remove support (19), bonded shims (20), and spacer (25) from jackshaft (11).

7. Remove friction clamp (21) from jackshaft (11).



INSTALL

8. Place friction clamp (21) and support (19) with bonded shims (20) on jackshaft (11) and align holes with support (19) vertical and mounting holes forward.

9. Secure friction clamp (21) and jackshaft (11) with bolt (18), two washers (17), and nut (16). Torque nut (16) **75 TO 95 INCH-POUNDS**.

10. Place bolt (24), two washers (23), and nut (22) on friction clamp (21) and finger tighten nut (22).

11. Place spacer (25) on jackshaft (11) next to support (19).

12. Place elbow (7) over jackshaft (11) and align bolt holes.

13. Place bolts (10 and 14) through holes in elbow (7) and jackshaft (11).

14. Put two washers (13) and nut (12) on bolt (14), and washer (9) and nut (8) on bolt (10).

15. Install shim (15) to obtain **0.006 inch** maximum gap between spacer (25) and elbow (7). Torque nuts (12 and 8) **50 TO 70 INCH-POUNDS**.

16. Engage rod end of tube assembly with throttle arm (5) of elbow (7).

17. Install bolt (4), washer (3), nut (2), and cotter pin (1) in throttle arm (5) on elbow assembly (7). Torque nut (2) **20 TO 25 INCH-POUNDS**.

INSPECT

FOLLOW-ON MAINTENANCE

Perform friction check and adjustment of collective system (Task 11-2-24).

END OF TASK

 11-2-24. MINIMUM FRICTION ON COLLECTIVE SYSTEM — ADJUSTING

This task covers: Adjustment (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Spring Scale (B120)
Hydraulic Test Stand

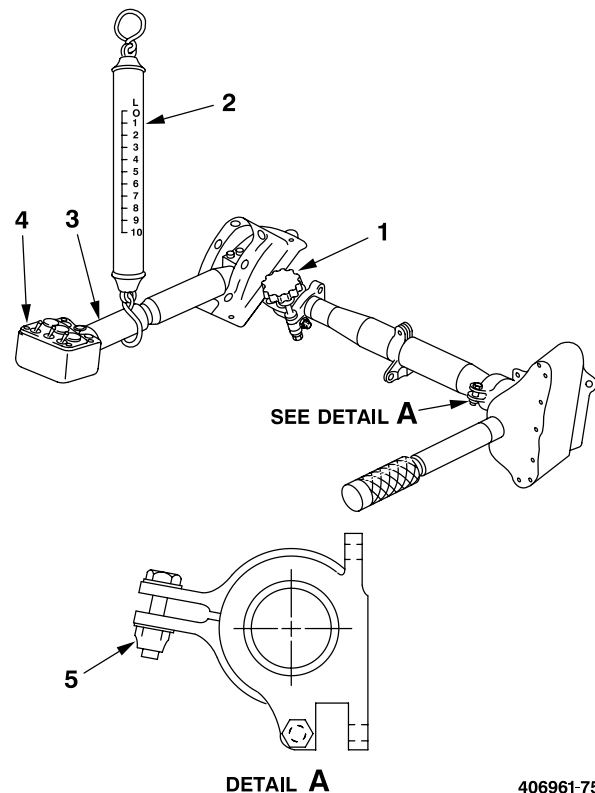
Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)
Forward Fairing Assembly Removed
(Task 2-2-47)

ADJUST MINIMUM FRICTION

1. Release all tension on pilot collective friction knob (1).
2. Connect hydraulic test stand to helicopter (Task 7-2-1) and operate.
3. Connect spring scale (B120) (2) to center of throttle grip (3) on pilot collective stick (4).
4. Adjust nut (5) until a force of 3 to 5 pounds is required to move collective stick (4).
5. Disconnect hydraulic test stand from helicopter (Task 7-2-1).



INSPECT

FOLLOW-ON MAINTENANCE

Install crew seat and armor seat panel (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Install forward fairing assembly (Task 2-2-47).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).

406961-759
J2460

END OF TASK

11-2-25. COLLECTIVE FRICTION CLAMP — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

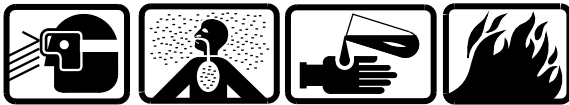
Material:
Sandpaper (D175)
Epoxy Primer Coating (D98)

Rubber Gloves (D111)
Drycleaning Solvent (D199)
Wiping Rag (D164)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean friction clamp exterior surface with drycleaning solvent (D199).
2. Dry friction clamp with a wiping rag (D164).

INSPECT

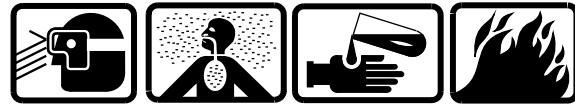
3. Inspect friction clamp to limits shown. See figure Collective Friction Clamp — Damage Limits. If cracks in collective friction clamp are suspected perform magnetic particle inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on friction clamp exterior surface with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



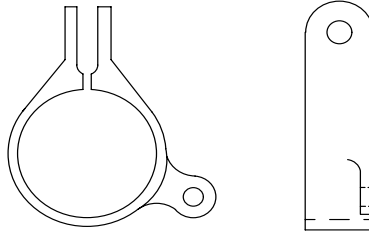
Epoxy Primer Coating

6. Touch up repaired areas of friction clamp with epoxy primer coating (D98).

7. Replace friction clamp if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-25. COLLECTIVE FRICTION CLAMP — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

**MECHANICAL AND
CORROSION**

NUMBER OF REPAIRS

**MAXIMUM AREA OF
FULL DEPTH REPAIR**

**EDGE CHAMFER TO
REMOVE DAMAGE**

**BORES
(INTERNAL)**

NOTE: No cracks are permitted.

MAXIMUM DAMAGE AND REPAIR DEPTH

**0.005 in. before and
0.010 in. after repair**

One

0.10 sq. in.

0.015 in. x 45°

**0.002 in. for 1/4
circumference
One damage area per bore**

406011-4
J0515

Collective Friction Clamp — Damage Limits

END OF TASK

11-2-26. PILOT COLLECTIVE STICK ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Heat Gun (B59)
Torque Wrench (B236)
Torque Wrench (B237)

Material:
Petrolatum (D152)
Adhesive (D24)
Corrosion Preventive Compound (D82)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

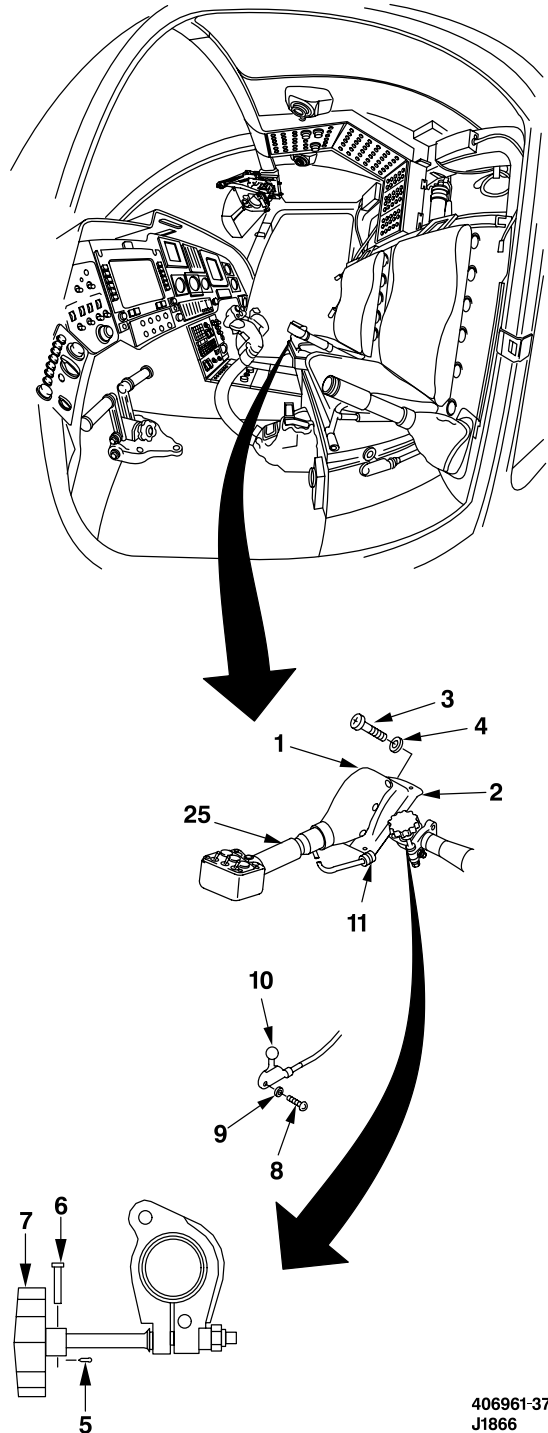
Equipment Condition:
Helicopter Safed (Task 1-6-7)
Electrical Power Removed (Tasks 1-6-5 and 1-6-6)
Crew Seat and Armor Seat Panel Removed (Task 2-2-33) or Seat Pan Assembly Removed (Task 2-2-34)

GO TO NEXT PAGE

 11-2-26. PILOT COLLECTIVE STICK ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Unsnap boot (1) from cover (2).
2. Remove five screws (3) with five washers (4) and remove cover (2).
3. Remove cotter pin (5), pin (6), and knob (7) from collective friction shaft. Discard cotter pin.
4. Remove two screws (8) with two washers (9) to disconnect shoulder harness lock (10).
5. Disconnect collective stick electrical connector (11).

406961-378
J1866

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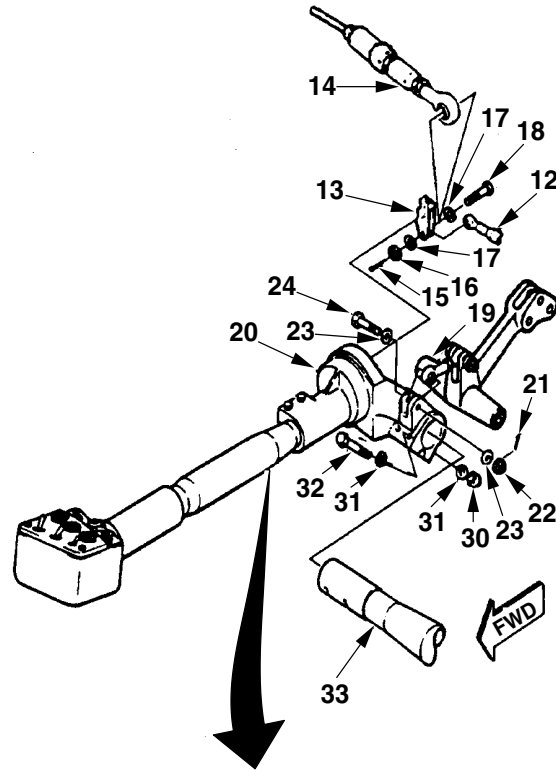
11-2-26. PILOT COLLECTIVE STICK ASSEMBLY — REMOVAL/INSTALLATION (CONT)

6. Disconnect throttle linkage (12) from collective stick throttle arm (13) and NG throttle cable (14) by removing cotter pin (15), nut (16), two washers (17), and bolt (18). Discard cotter pin.

7. Disconnect collective pitch link (19) from elbow (20) by removing cotter pin (21), nut (22), two washers (23), and bolt (24). Discard cotter pin.

8. Remove collective stick (25) from elbow (20) by removing two nuts (26), three washers (27), electrical cable clamp (28), and two bolts (29).

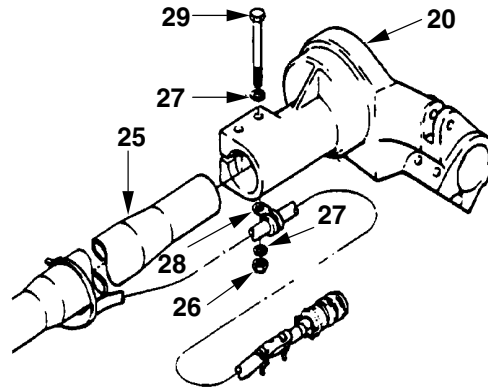
9. Remove two nuts (30), four washers (31), and two bolts (32) securing jackshaft (33) to elbow (20).



CAUTION

To avoid damage to adjacent components, heat used to break bond shall not exceed 200 °F.

10. Raise collective stick (25) to maximum up position, tap elbow (20) with rubber mallet to break existing bond between elbow (20) and jackshaft (33).



INSTALL

11. Install collective stick (25) in elbow (20) with two bolts (29), three washers (27), electrical cable clamp (28), and two nuts (26). Torque nuts (26) **75 TO 95 INCH-POUNDS**.



Adhesive

12. Apply thin layer of adhesive (D24) to faying surfaces of elbow (20) and jackshaft (33). Wipe off excess adhesive material.

406001-313
J1866

GO TO NEXT PAGE

11-2-26. PILOT COLLECTIVE STICK ASSEMBLY — REMOVAL/INSTALLATION (CONT)

13. Slide elbow (20) onto end of jackshaft (33).

14. Lubricate bolts (32) with petrolatum (D152) so bolts are not bonded to elbow assembly.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

15. Install two bolts (32), four washers (31), and two nuts (30).

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Correct installation of collective pitch link to elbow is a critical flight safety task. Ensure nut and cotter pin are secure.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

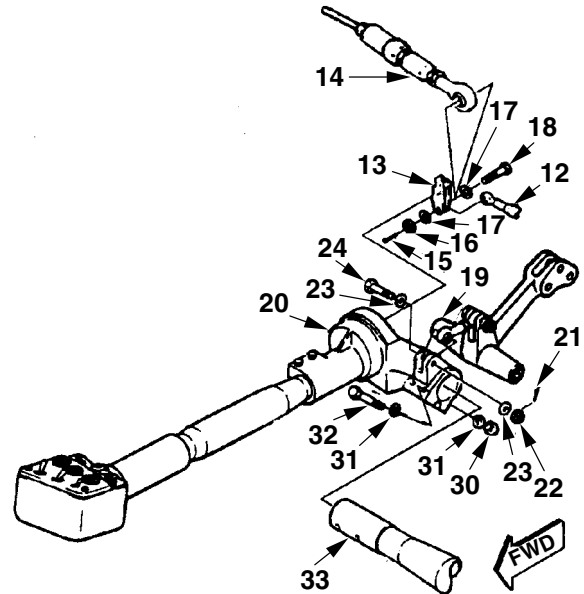
16. Connect collective pitch link (19) to elbow (20) with bolt (24), two washers (23), and nut (22).
 ■ Torque nut (22) **50 TO 70 INCH-POUNDS**.

17. Install cotter pin (21) through nut (22).

INSPECT

18. Connect throttle linkage (12) to collective stick throttle arm (13) and Ng throttle cable (14) with bolt (18), two washers (17), and nut (16).
 ■ Torque nut (16) **30 TO 40 INCH-POUNDS**.

19. Install cotter pin (15) through nut (16).



406001-199
J1866

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11-2-26. PILOT COLLECTIVE STICK ASSEMBLY — REMOVAL/INSTALLATION (CONT)

20. Connect collective stick electrical connector (11).

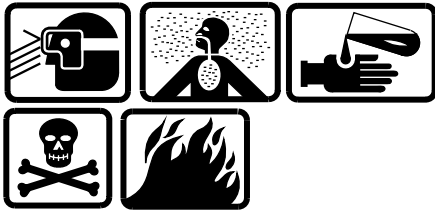
21. Connect shoulder harness lock (10) with two screws (8) and two washers (9).

22. Install knob (7) on collective friction shaft.

23. Install cotter pin (5) through pin (6).

24. Install cover (2) with screws (3) and washers (4).

25. Install boot (1) on collective stick (25) and secure with snaps.

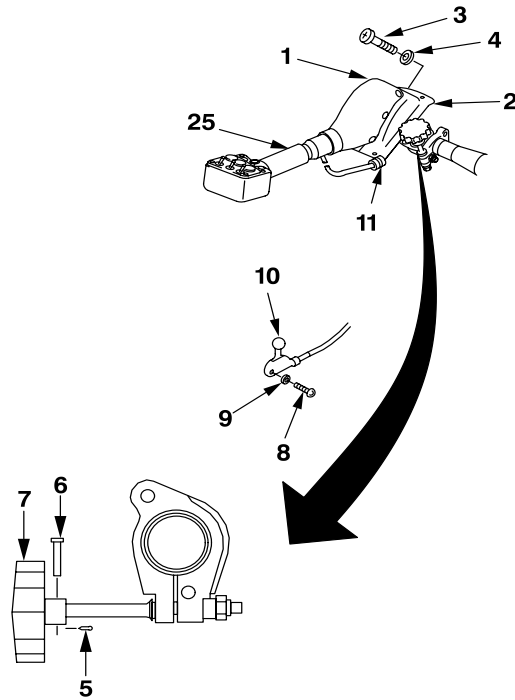


Corrosion Preventive Compound

CAUTION

To prevent premature bearing failure, do not allow corrosion preventive compound to enter metallic or elastomeric bearings.

26. After assembly, apply a light coat of corrosion preventive compound (D82) to external areas and exposed threads, excluding any metallic or elastomeric bearings or seals.



406961-818
J2460

INSPECT

FOLLOW-ON MAINTENANCE

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Perform MOC/MTF (TM 1-1520-248-MTF).

END OF TASK

**11-2-27. PILOT COLLECTIVE STICK ASSEMBLY MISCELLANEOUS PARTS — REMOVAL/
INSTALLATION**

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Electrical Repairer Tool Kit (B177)
Drive Pin Punch Set (B131)
Torque Wrench (B235)
Torque Wrench (B237)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68F Aircraft Electrician
Maintenance Test Pilot

References:

TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:

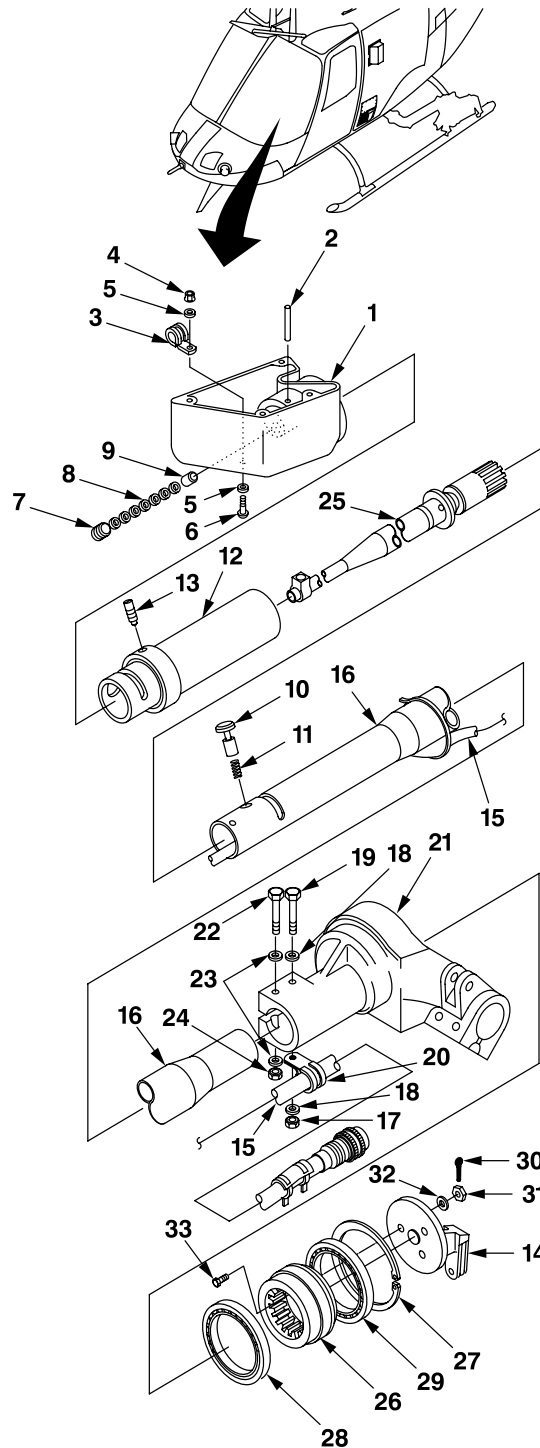
Collective Control Panel Assembly Removed
(Task 9-6-41)

GO TO NEXT PAGE

11-2-27. PILOT COLLECTIVE STICK ASSEMBLY MISCELLANEOUS PARTS — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove control box (1) by removing two pins (2).
2. Remove clamp (3) by removing nut (4), two washers (5), and screw (6).
3. Remove friction setscrew (7), then remove seven washers (8) and plug (9).
4. Remove detent button (10) and spring (11).
5. Remove throttle grip assembly (12) by removing grip tube attaching screw (13).
6. Scribe the throttle arm (14) position with throttle control at full INCREASE and remove cable assembly (15) from outer tube assembly (16) by removing nut (17), two washers (18), and bolt (19) securing clamp (20) to elbow assembly (21).
7. Remove outer tube assembly (16) from elbow assembly (21) by removing bolt (22), two washers (23), and nut (24).
8. Remove inner tube assembly (25) from ring gear (26).
9. Remove ring gear (26) with throttle arm (14) from elbow assembly (21) by removing lockring (27).
10. Remove forward ring gear bearing (28) from ring gear (26).
11. Remove aft ring gear bearing (29) from ring gear (26) by removing throttle arm (14) from ring gear (26) with removal of three cotter pins (30), three nuts (31), and three washers (32) from three bolts (33). Discard cotter pins (30).



406961-849-2
J1835

GO TO NEXT PAGE

11-2-27. PILOT COLLECTIVE STICK ASSEMBLY MISCELLANEOUS PARTS — REMOVAL/INSTALLATION (CONT)

12. Inspect control panel box (1) for wear and damage (Task 11-2-28).

13. Inspect plug (9) for wear and damage (Task 11-2-29).

14. Inspect detent button (10) for wear and damage (Task 11-2-30).

15. Inspect throttle grip assembly (12) for wear and damage (Task 11-2-31).

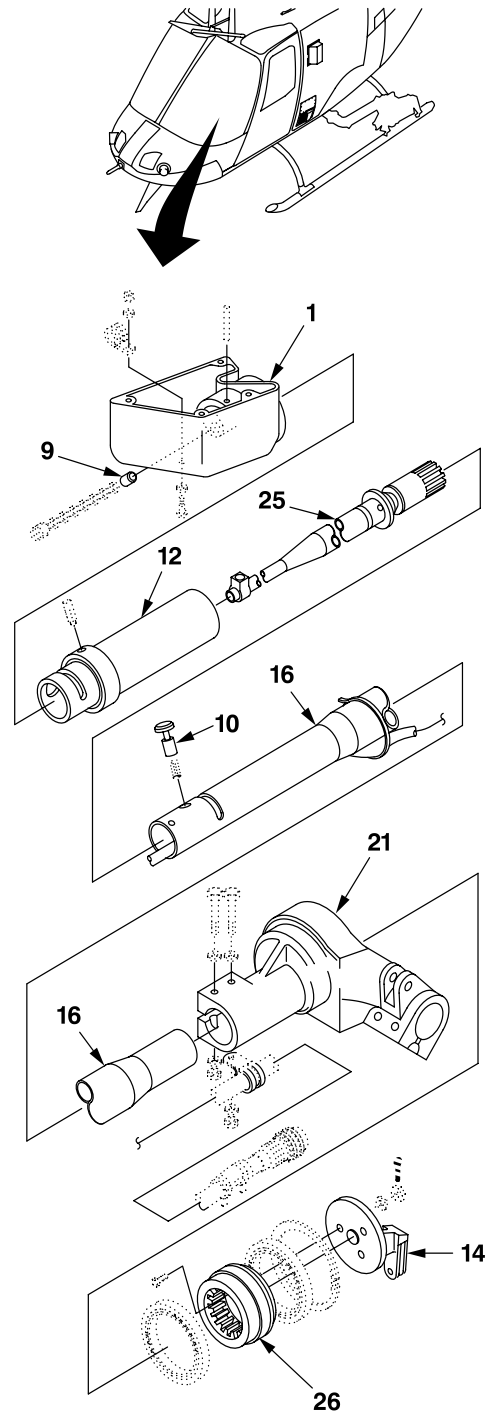
16. Inspect outer tube assembly (16) for wear and damage (Task 11-2-32).

17. Inspect elbow assembly (21) for wear and damage (Task 11-2-33).

18. Inspect inner tube assembly (25) for wear and damage (Task 11-2-34).

19. Inspect ring gear (26) for wear and damage (Task 11-2-35).

20. Inspect throttle arm (14) for wear and damage (Task 11-2-36).



406961-849-1
J1835

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11-2-27. PILOT COLLECTIVE STICK ASSEMBLY MISCELLANEOUS PARTS — REMOVAL/
INSTALLATION (CONT)

INSTALL

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT
PART (FSCAP)

Correct installation of ring gear and bearing is a critical flight safety task. Ensure nuts and cotter pins are secure.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

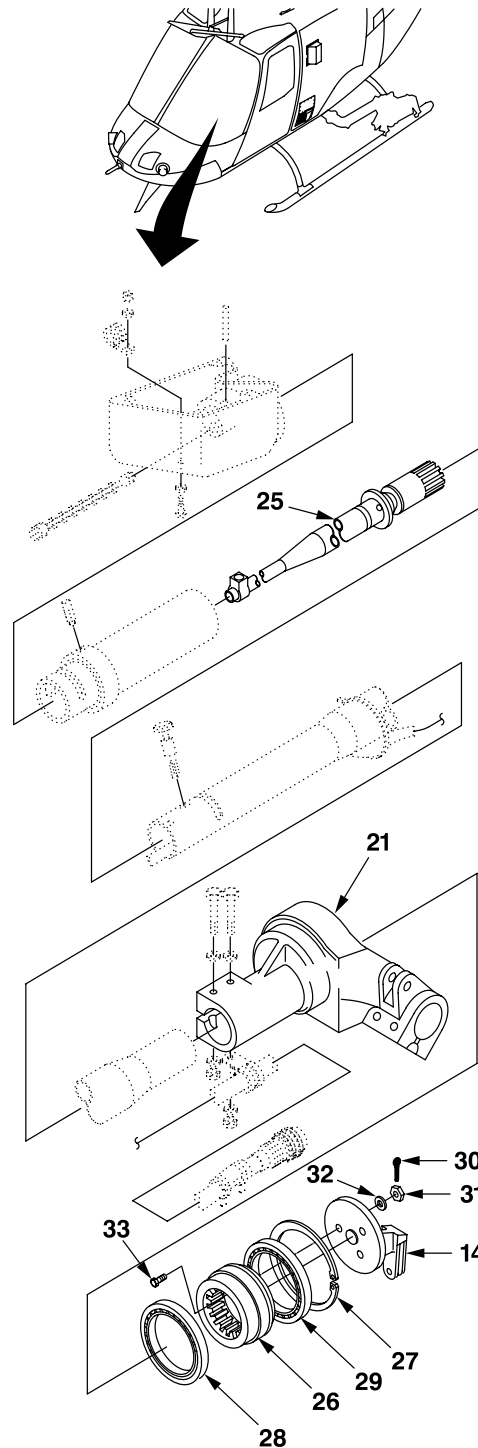
21. Install aft ring gear bearing (29) on ring gear (26) and secure with throttle arm (14) with three bolts (33), three washers (32), and three nuts (31). Torque nuts (31) **20 TO 25 INCH-POUNDS**.

22. Install three cotter pins (30) through three nuts (31).

23. Install forward ring gear bearing (28) on ring gear (26).

24. Align throttle arm (14) scribe mark, with throttle arm control at full INCREASE and install ring gear (26) with throttle arm (14) into elbow assembly (21) and secure by inserting locking (27).

25. Install inner tube assembly (25) into ring gear (26) and position throttle arm (14) at 6 o'clock position.



406961-848
J0520

GO TO NEXT PAGE

11-2-27. PILOT COLLECTIVE STICK ASSEMBLY MISCELLANEOUS PARTS — REMOVAL/INSTALLATION (CONT)

26. Install outer tube assembly (16) into elbow assembly (21) and secure with bolt (22), two washers (23), and nut (24). Torque nut (24) **50 TO 70 INCH-POUNDS**.

27. Install cable assembly (15) in outer tube assembly (16).

28. Install throttle grip assembly (12) on outer tube assembly (16) and secure with grip tube attaching screw (13).

NOTE

Tighten setscrew only enough that slight friction can be detected when grip is rotated. Final adjustment may be made to suit pilot during initial flights. If setscrew is driven too far in, it may be necessary to remove washers and restack or replace them.

29. Install friction setscrew (7) by first installing plug (9), seven washers (8), then setscrew (7).

30. Install detent button (10) and spring (11) by pressing detent button (10) and sliding control panel box (1) into position and releasing detent button (10).

31. Secure control panel box (1) with two pins (2).

32. Install clamp (3) with screw (6), two washers (5), and secure with nut (4).

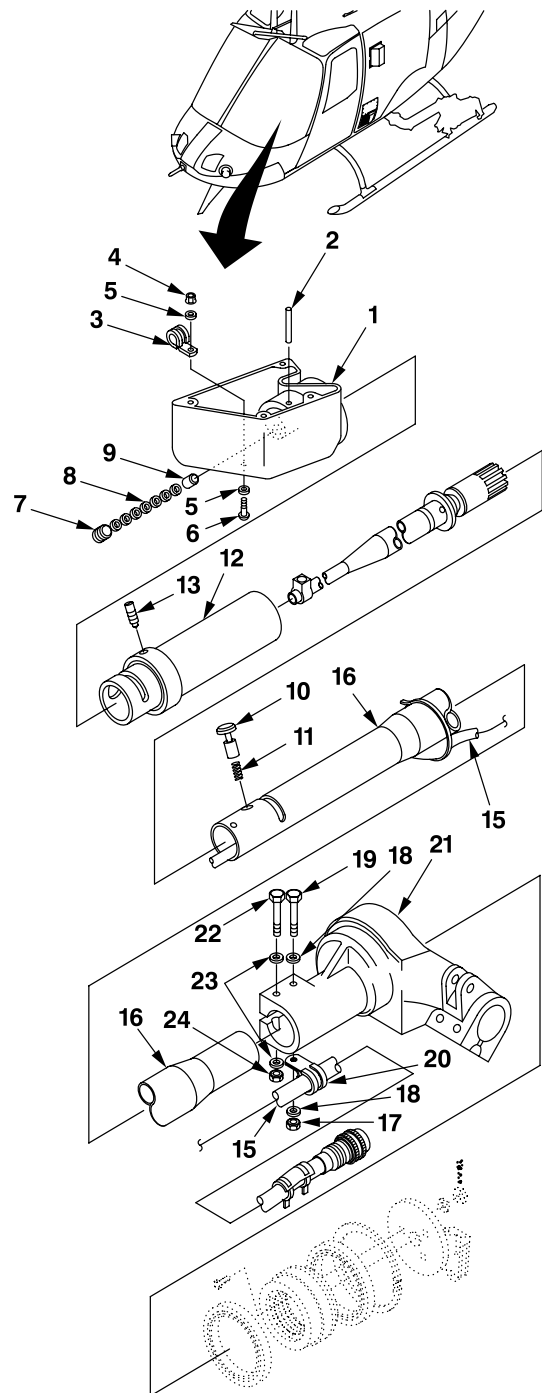
33. Secure cable assembly (15) to elbow assembly (21) with clamp (20), bolt (19), two washers (18), and nut (17). Torque nut (17) **75 TO 95 INCH-POUNDS**.

INSPECT

FOLLOW-ON MAINTENANCE

Install collective control panel assembly (Task 9-6-41).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



406961-995
J0520

END OF TASK

11-2-28. PILOT COLLECTIVE STICK CONTROL PANEL BOX — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Wiping Rag (D164)
Drycleaning Solvent (D199)

Rubber Gloves (D111)
Sandpaper (D175)
Epoxy Primer Coating (D98)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean control panel box surface with drycleaning solvent (D199).
2. Dry control panel box with a wiping rag (D164).

INSPECT

3. Inspect control panel box to limits shown. See figure Pilot Collective Stick Control Panel Box — Damage Limits. If cracks in collective stick control panel box are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

4. Replace control panel box if wear or damage limits are exceeded.

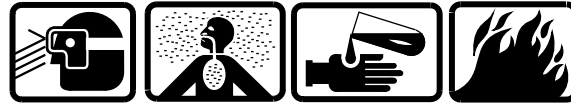
REPAIR



Sanding Operations

GO TO NEXT PAGE

5. Remove scratches, nicks, and corrosion on control panel box surface with 400 grit sandpaper (D175).



Acetone

6. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

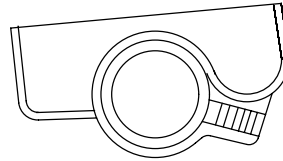
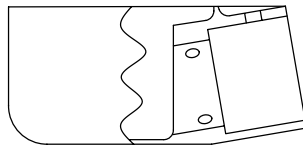
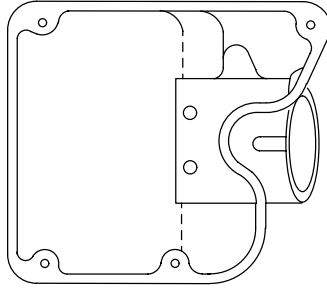


Epoxy Primer Coating

7. Touch up repaired areas of control panel box with epoxy primer coating (D98).

8. Replace control panel box if wear or damage limits are exceeded.

11-2-28. PILOT COLLECTIVE STICK CONTROL PANEL BOX — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOL



TYPE OF DAMAGE

MECHANICAL AND CORROSION

MAXIMUM AREA PER FULL DEPTH REPAIR

NUMBER OF REPAIRS

EDGE CHAMFER TO REMOVE DAMAGE

BORES

THREAD DAMAGE

Depth
Length
Number

MAXIMUM DAMAGE AND REPAIR DEPTH

**0.005 in. before and
0.010 in. after repair**

0.25 sq. in.

Not critical

0.015 x 45°

0.002 in. for 1/4 circumference

1/3 of thread
0.187 in.
One per threaded segment

NOTE

No cracks are permitted.

406001-43
J1803

Pilot Collective Stick Control Panel Box — Damage Limits

END OF TASK

11-2-29. PILOT COLLECTIVE STICK THROTTLE FRICTION PLUG — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Wiping Rag (D164)
Drycleaning Solvent (D199)

Rubber Gloves (D111)
Sandpaper (D175)
Epoxy Primer Coating (D98)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean friction plug surface with drycleaning solvent (D199).
2. Dry friction plug with a wiping rag (D164).

INSPECT

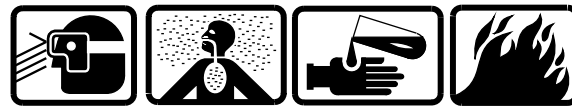
3. Inspect friction plug to limits shown. See figure Pilot Collective Stick Throttle Friction Plug — Damage Limits. If cracks in pilot collective stick throttle friction plug are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on friction plug surface with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



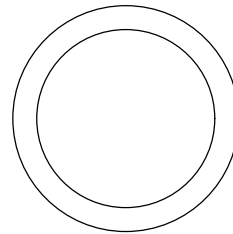
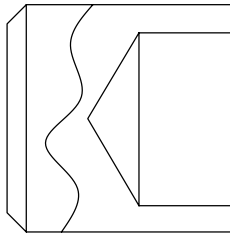
Epoxy Primer Coating

6. Touch up repaired areas of friction plug with epoxy primer coating (D98).

7. Replace friction plug if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-29. PILOT COLLECTIVE STICK THROTTLE FRICTION PLUG — CLEANING/INSPECTION/
REPAIR (CONT)



DAMAGE LOCATION SYMBOL



TYPE OF DAMAGE

MECHANICAL AND
CORROSION

MAXIMUM AREA PER
FULL DEPTH REPAIR

NUMBER OF REPAIRS

EDGE CHAMFER TO
REMOVE DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

0.010 in. before and
0.020 in. after repair

0.125 sq. in.

Not critical

0.030 in. x 45°

NOTE

No cracks are permitted

406001-48
J1803

Pilot Collective Stick Throttle Friction Plug — Damage Limits

END OF TASK

11-2-30. PILOT COLLECTIVE STICK DETENT BUTTON — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

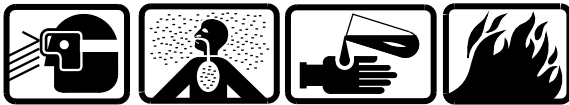
Material:
Wiping Rag (D164)
Drycleaning Solvent (D199)

Rubber Gloves (D111)
Sandpaper (D175)
Epoxy Primer Coating (D98)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean detent button surface with drycleaning solvent (D199).
2. Dry detent button with a wiping rag (D164).

INSPECT

3. Inspect detent button to limits shown. See figure Pilot Collective Stick Detent Button — Damage Limits. If cracks in pilot collective stick detent button are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on detent button surface with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



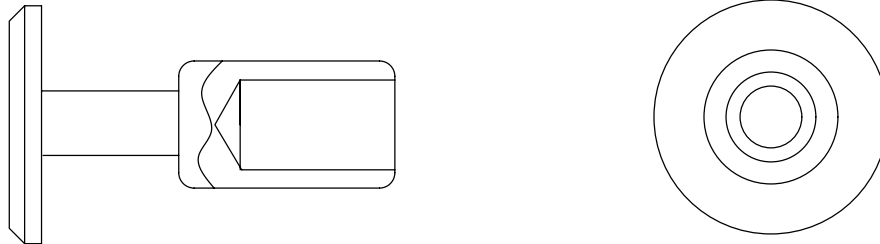
Epoxy Primer Coating

6. Touch up repaired areas of detent button with epoxy primer coating (D98).

7. Replace detent button if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-30. PILOT COLLECTIVE STICK DETENT BUTTON — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOL



TYPE OF DAMAGE

MECHANICAL AND CORROSION

MAXIMUM AREA PER FULL DEPTH REPAIR

NUMBER OF REPAIRS

EDGE CHAMFER TO REMOVE DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

0.010 in. before and 0.020 in. after repair

0.125 sq. in.

Not critical

0.030 in. x 45°

NOTE

No cracks are permitted

406001-49
J1803

Pilot Collective Stick Detent Button — Damage Limits

END OF TASK

11-2-31. PILOT COLLECTIVE STICK THROTTLE GRIP ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

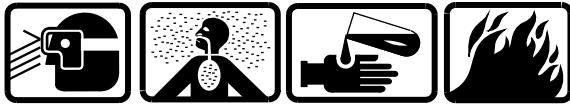
Material:
Wiping Rag (D164)
Drycleaning Solvent (D199)
Rubber Gloves (D111)

Acetone (D2)
Cork Sheet (D80)
Sandpaper (D175)
Adhesive (D12)
Solid Film Lubricant (D137)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean throttle grip assembly surface with drycleaning solvent (D199).
2. Dry throttle grip assembly with a wiping rag (D164).

INSPECT

3. Inspect throttle grip assembly to limits shown. See figure Pilot Collective Stick Throttle Grip Assembly — Damage Limits. If cracks in pilot collective stick throttle grip assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR

4. If cracked or worn through to base metal, replace throttle grip cover.



Acetone

a. Remove worn cork from throttle grip and remove adhesive residue from grip surface with acetone (D2).



Adhesive

b. Make replacement cover from cork sheet (D80) and apply to grip surface with adhesive (D12).



Sanding Operations

5. Remove scratches, nicks, and corrosion from metal surfaces of throttle grip assembly with 400 grit sandpaper (D175).
6. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



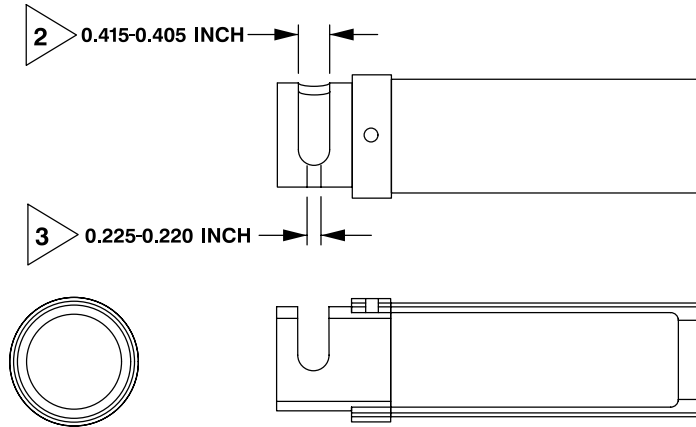
Lubricant

7. Apply solid film lubricant (D137) to metal surfaces except ferrule.

8. Replace throttle grip if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-31. PILOT COLLECTIVE STICK THROTTLE GRIP ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOL



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL AND CORROSION	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.50 sq. in.
NUMBER OF REPAIRS	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in.

NOTE

No cracks are permitted

LIMITS:

1. BORE DAMAGE NOT TO EXCEED 0.002 INCH FOR 1/4 CIRCUMFERENCE, LIMIT ONE REPAIR PER BORE.
2. SLOTTED AREA NOT TO EXCEED 0.490 INCH WITH WIDTH OF 0.415-0.405 INCH.
3. SLOTTED AREA NOT TO EXCEED 0.265 INCH WITH WIDTH OF 0.225-0.220 INCH.



406001-39
J1803

Pilot Collective Stick Throttle Grip Assembly — Damage Limits

END OF TASK

11-2-32. PILOT COLLECTIVE STICK OUTER TUBE ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Wiping Rag (D164)
Drycleaning Solvent (D199)

Rubber Gloves (D111)
Sandpaper (D175)
Polyamide Epoxy Primer (D98)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean outer tube assembly surface with drycleaning solvent (D199).
2. Dry outer tube assembly with a wiping rag (D164).

INSPECT

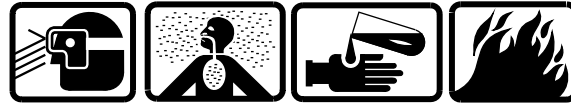
3. Inspect outer tube assembly to limits shown. See figure Pilot Collective Stick Outer Tube Assembly — Damage Limits. If cracks in pilot collective stick outer tube assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on outer tube assembly surface with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



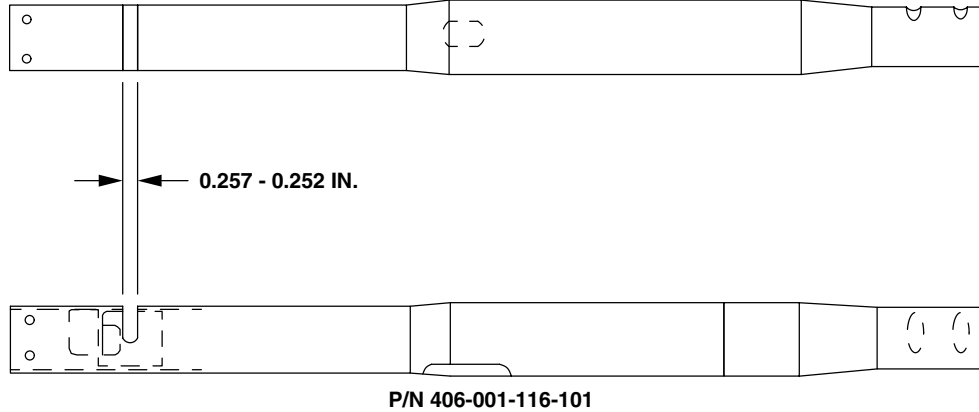
Epoxy Primer Coating

6. Touch up repaired areas of outer tube assembly with epoxy primer (D98).

7. Replace outer tube assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-32. PILOT COLLECTIVE STICK OUTER TUBE ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MECHANICAL AND CORROSION

MAXIMUM AREA PER FULL DEPTH REPAIR

NUMBER OF REPAIRS

EDGE CHAMFER TO REMOVE DAMAGE

NOTE: No cracks are permitted

MAXIMUM DAMAGE AND REPAIR DEPTH

**0.005 in. before and
0.010 in. after repair**

0.50 sq. in.

Not critical

0.030 in.

LIMIT:

**SLOTTED AREA NOT TO EXCEED 0.300 INCH WIDTH.
BORE DAMAGE NOT TO EXCEED 0.002 INCH FOR
1/4 CIRCUMFERENCE.
LIMIT ONE REPAIR.**

406001-46
J0519

Pilot Collective Stick Outer Tube Assembly — Damage Limits

END OF TASK

11-2-33. PILOT COLLECTIVE STICK ELBOW ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Wiping Rag (D164)
Drycleaning Solvent (D199)

Rubber Gloves (D111)
Sandpaper (D175)
Epoxy Primer Coating (D98)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean elbow assembly surface with drycleaning solvent (D199).
2. Dry elbow assembly with a wiping rag (D164).

INSPECT

3. Inspect elbow assembly to limits shown. See figure Pilot Collective Stick Elbow Assembly — Damage Limits. If cracks in pilot collective stick elbow assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on elbow assembly surface with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



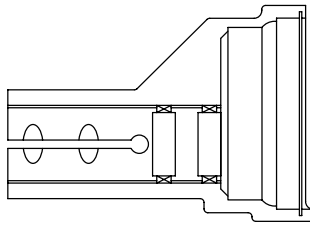
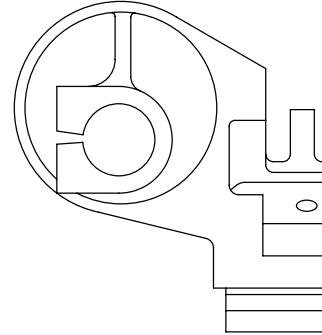
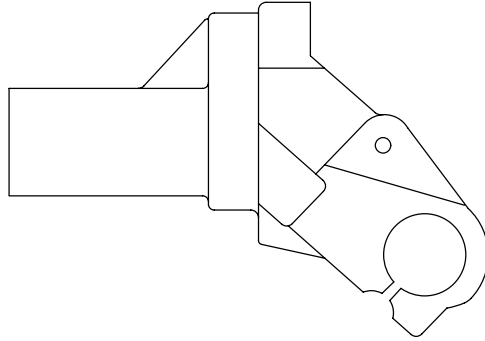
Epoxy Primer Coating

6. Touch up repaired areas of elbow assembly with epoxy primer coating (D98).

7. Replace elbow assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-33. PILOT COLLECTIVE STICK ELBOW ASSEMBLY — CLEANING/INSPECTION/REPAIR
(CONT)



DAMAGE LOCATION SYMBOL



TYPE OF DAMAGE

MECHANICAL AND
CORROSION

MAXIMUM AREA PER
FULL DEPTH REPAIR

NUMBER OF REPAIRS

EDGE CHAMFER TO
REMOVE DAMAGE

BORES

MAXIMUM DAMAGE AND REPAIR DEPTH

0.010 in. before and
0.020 in. after repair

0.50 sq. in.

Not critical

0.030 in. x 45°

0.002 in. for 1/4 circumference
One repair per bore

406001-40
J1803

Pilot Collective Stick Elbow Assembly — Damage Limits

END OF TASK

11-2-34. PILOT COLLECTIVE STICK INNER TUBE ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

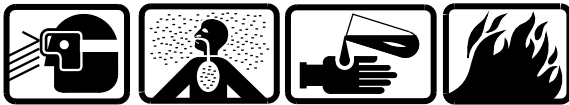
Material:
Rubber Gloves (D111)
Wiping Rag (D164)

Drycleaning Solvent (D199)
Sandpaper (D175)
Polyamide Epoxy Primer (D98)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean tube assembly surface with drycleaning solvent (D199).
2. Dry tube assembly with a wiping rag (D164).

INSPECT

3. Inspect tube assembly to limits shown. See figure Pilot Collective Stick Inner Tube Assembly — Damage Limits. If cracks in pilot collective stick inner tube assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on tube assembly surface with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



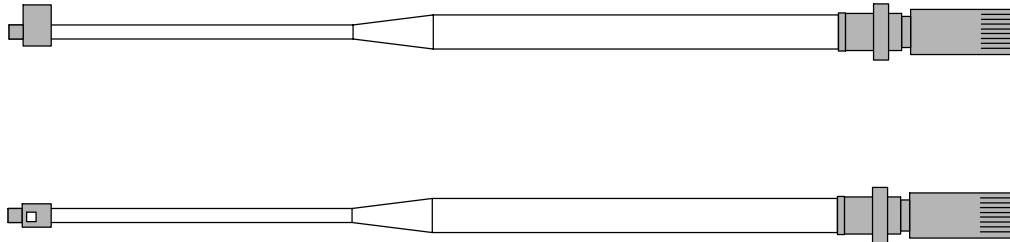
Epoxy Primer Coating

6. Touch up repaired areas of tube assembly with epoxy primer (D98).

7. Replace tube assembly if wear or damaged limits are exceeded.

GO TO NEXT PAGE

11-2-34. PILOT COLLECTIVE STICK INNER TUBE ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



P/N 406-001-112-101

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	Shaded Symbol	White Symbol
MECHANICAL AND CORROSION	0.005 in. before and 0.010 in. after repair	0.005 in. before and 0.010 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.15 sq. in.	0.25 sq. in.
NUMBER OF REPAIRS	Two per area	Five per area
EDGE CHAMFER TO REMOVE DAMAGE	0.020 in.	0.020 in.
SPLINE DAMAGE:		
Depth:	1/3 spline	
Length:	1/3 spline	
Number:	Two	
THREAD DAMAGE:		
Depth:	1/3 of thread	
Length:	0.250 inch	
Number:	One per threaded segment	

406001-38
J0519

Pilot Collective Stick Inner Tube Assembly — Damage Limits

END OF TASK

11-2-35. PILOT COLLECTIVE STICK RING GEARS — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

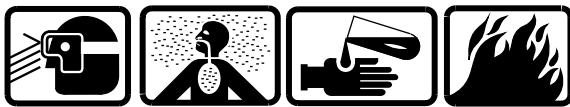
Tools:
General Mechanic Tool Kit (B178)

Material:
Rubber Gloves (D111)
Wiping Rag (D164)

Drycleaning Solvent (D199)
Sandpaper (D175)
Epoxy Primer Coating (D98)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

CLEAN



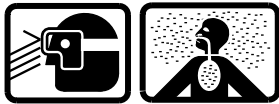
Drycleaning Solvent

1. Clean ring gears surface with drycleaning solvent (D199).
2. Dry ring gears with a wiping rag (D164).

INSPECT

3. Inspect ring gears to limits shown. See figure Pilot Collective Stick Ring Gears — Damage Limits.

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on ring gears surface with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

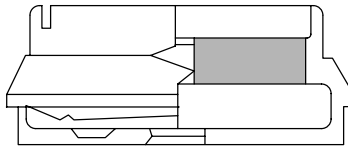
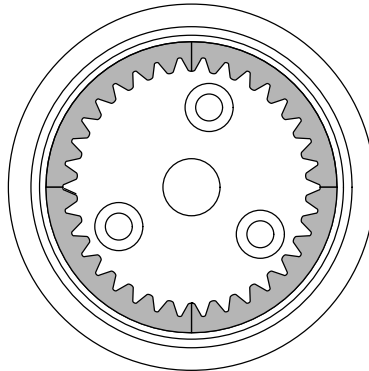


Epoxy Primer Coating

6. Touch up repaired areas of ring gear with epoxy primer coating (D98).
7. Replace ring gear if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-35. PILOT COLLECTIVE STICK RING GEARS — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
MECHANICAL	0.002 in. before and 0.004 in. after repair	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR		0.25 sq. in.
NUMBER OF REPAIRS		Not critical
SPLINE DAMAGE		
Depth	1/3 spline	
Length	1/3 spline	
Number	Three splines	

406001-41
J1803

Pilot Collective Stick Ring Gears — Damage Limits

END OF TASK

11-2-36. PILOT COLLECTIVE STICK THROTTLE ARM — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

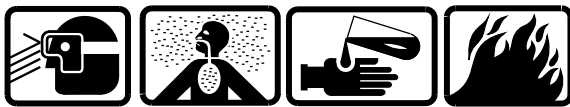
Material:
Rubber Gloves (D111)
Wiping Rag (D164)

Drycleaning Solvent (D199)
Sandpaper (D175)
Epoxy Primer Coating (D98)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean throttle arm surface with drycleaning solvent (D199).
2. Dry throttle arm with a wiping rag (D164).

INSPECT

3. Inspect throttle arm to limits shown. See figure Pilot Collective Stick Throttle Arm — Damage Limits. If cracks in pilot collective stick throttle arm are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on throttle arm surface with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



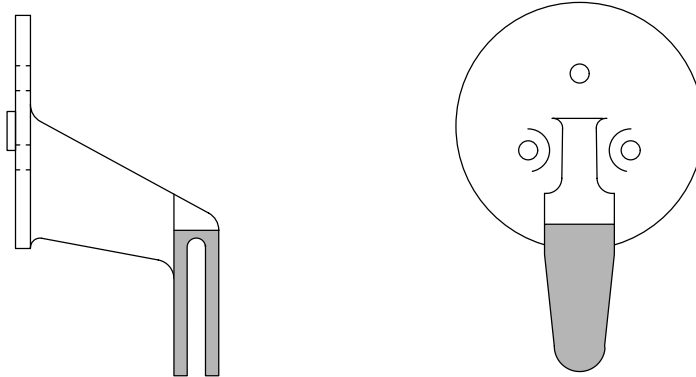
Epoxy Primer Coating

6. Touch up repaired areas of throttle arm with epoxy primer coating (D98).

7. Replace throttle arm if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-36. PILOT COLLECTIVE STICK THROTTLE ARM — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	0.010 in. before and 0.020 in. after repair	0.010 in. before and 0.020 in. after repair
MECHANICAL AND CORROSION	0.010 in. before and 0.020 in. after repair	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.25 sq. in.	0.50 sq. in.
NUMBER OF REPAIRS	One per surface	
EDGE CHAMFER TO REMOVE DAMAGE	0.035 in.	0.035 in.

NOTE

No cracks are permitted

406001-42
J1803

Pilot Collective Stick Throttle Arm — Damage Limits

END OF TASK

11-2-37. JACKSHAFT SUPPORT ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B237)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Copilot/Gunner Collective Elbow Assembly
Removed (Task 11-2-43)

GO TO NEXT PAGE

11-2-37. JACKSHAFT SUPPORT ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Disconnect friction collar (1) from support assembly (2) by removing bolt (3), two washers (4), and nut (5).

2. Remove two bolts (6), four washers (7), and two nuts (8) attaching support assembly (2) and bonded shims (9) to airframe. Tap support assembly (2) and bonded shims (9) off jackshaft (10).

INSTALL

3. Position support assembly (2) with bonded shims (9) on jackshaft (10) and tap into place. Install two bolts (6), four washers (7), and two nuts (8) and secure support assembly (2) to airframe. Torque nuts (8) **50 TO 70 INCH-POUNDS**.

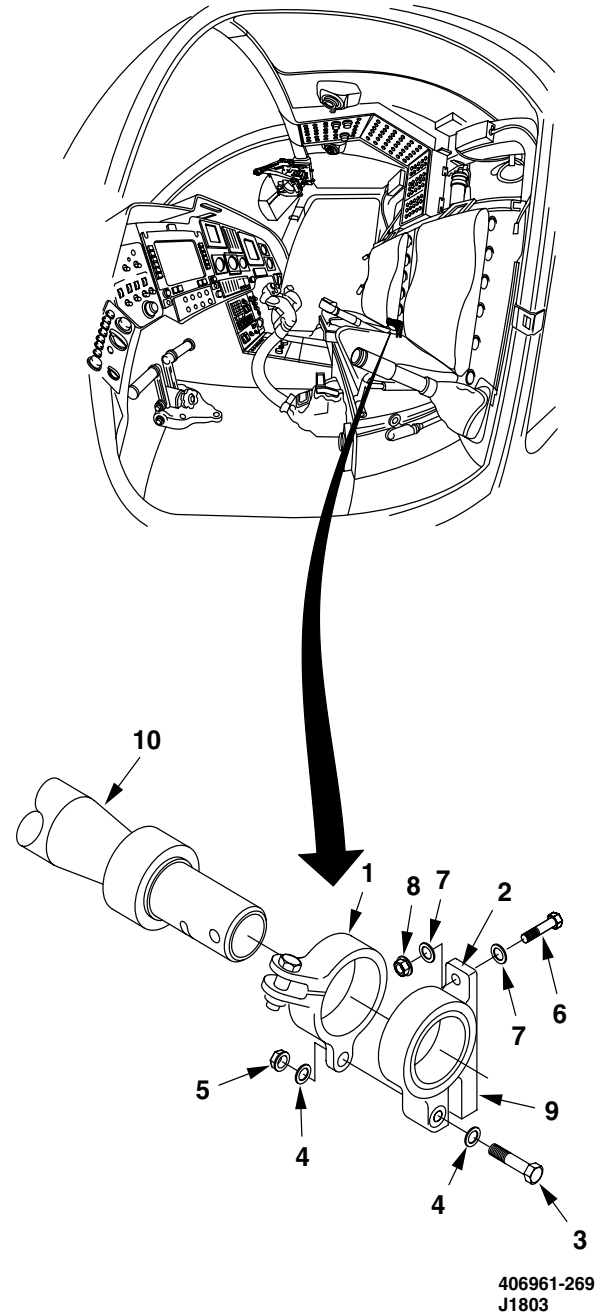
4. Connect friction collar (1) to support assembly (2) with bolt (3), two washers (4), and nut (5).

INSPECT

FOLLOW-ON MAINTENANCE

Install copilot/gunner collective elbow assembly (Task 11-2-43).

Perform friction check and adjustment of collective system (Task 11-2-24).



END OF TASK

11-2-38. JACKSHAFT SUPPORT ASSEMBLY BEARING — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

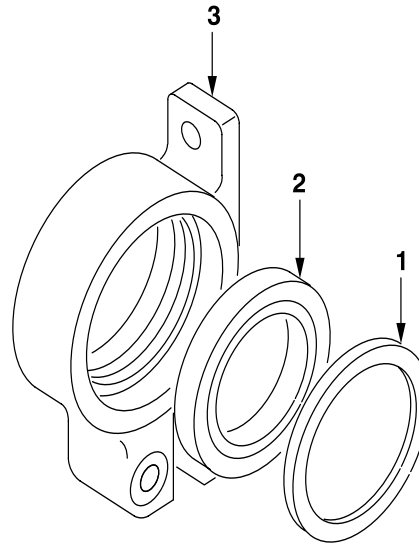
REMOVE

1. Remove bearing retaining ring (1). Remove bearing (2) from support assembly (3) by tapping with plastic mallet if necessary.

INSTALL

2. Position bearing (2) in jackshaft support assembly (3) and secure with bearing retaining ring (1).

INSPECT



406961-202
J1803

END OF TASK

11-2-39. JACKSHAFT SUPPORT ASSEMBLY AND BEARING — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Dial Indicating Depth Gage (B49)

Material:
Crocus Cloth (D90)
Sandpaper (D175)

Drycleaning Solvent (D199)
Epoxy Primer Coating (D98)
Wiping Rag (D164)
Rubber Gloves (D111)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean support surface with drycleaning solvent (D199).
2. Dry support with wiping rag (D164).

INSPECT

3. Inspect support to limits shown. Replace support if limits are exceeded. See figure Jackshaft Support Assembly and Bearing — Damage Limits. If cracks in jackshaft support assembly and bearing are suspected perform magnetic particle inspection (TM 1-1520-266-23).

4. Inspect bearing for freedom of movement and condition. Bearing wear not to exceed **0.005 inch** radial or **0.030 inch** axial.

REPAIR



Sanding Operations

GO TO NEXT PAGE

5. Repair damage within limits shown using 400 grit sandpaper (D175). Smooth surface with crocus cloth (D90).



Acetone

6. Remove sanding residue with cloth moistened with acetone (D2).

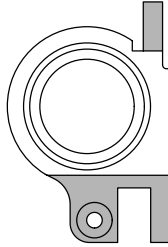
INSPECT



Epoxy Primer Coating

7. Apply epoxy primer coating (D98) to repaired areas which were previously primed.

11-2-39. JACKSHAFT SUPPORT ASSEMBLY AND BEARING — CLEANING/INSPECTION/REPAIR
(CONT)



SUPPORT ASSEMBLY
206-001-019

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	0.005 in. before and 0.010 in. after repair	0.010 in. before and 0.020 in. after repair
MECHANICAL AND CORROSION	0.005 in. before and 0.010 in. after repair	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	0.25 sq. in.
NUMBER OF REPAIRS	One per area	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.015 in. x 45°	0.030 in. x 45°
BORES (INTERNAL)	0.002 in for 1/4 of circumference: one damaged area per bore	
BEARING		
Axial	0.030 in.	
Radial	0.005 in.	

NOTE

No cracks are permitted

406001-274
J1803

Jackshaft Support Assembly and Bearing — Damage Limits

END OF TASK

 11-2-40. PILOT COLLECTIVE ELBOW ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Torque Wrench (B237)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

REMOVE

1. Scribe mark throttle arm position with throttle control at full increase and remove pilot collective stick tube assemblies (1 and 2) (Task 11-2-26) from elbow assembly (3) by removing two bolts (4), three washers (5), clamp (6), and two nuts (7).

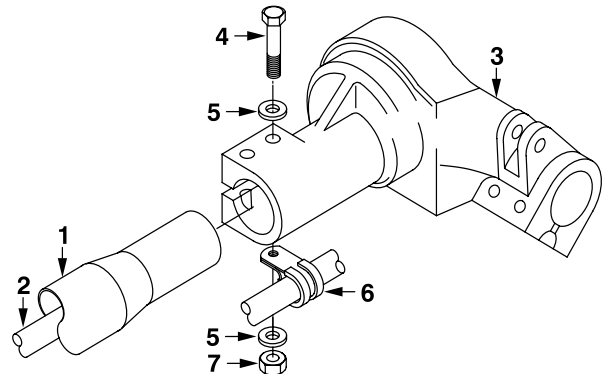
INSTALL

2. Align throttle arm scribe mark with throttle control to full increase and install elbow assembly (3) on pilot collective stick tube assemblies (1 and 2) with two bolts (4), three washers (5), clamp (6), and two nuts (7) (Task 11-2-26). Torque nuts (7) **75 TO 95 INCH-POUNDS**.

INSPECT

FOLLOW-ON MAINTENANCE

Perform throttle rigging check (Task 4-6-2 or 4-6-3).



406961-203
J1803

END OF TASK

11-2-41. PILOT COLLECTIVE ELBOW ASSEMBLY BEARINGS — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Heat Gun (B59)
Asbestos Gloves (B53)
Torque Wrench (B235)

Material:

Acetone (D2)
Abrasive Mats (D1)
Retaining Compound (D169)
Rubber Gloves (D111)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:

TM 1-1500-204-23

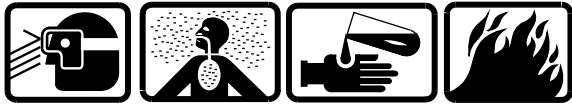
REMOVE

1. Remove lockring (1). Remove two bearings (2), ring gear (3), and throttle arm (4) from elbow assembly (5).

2. Remove throttle arm (4) from ring gear (3) by removing three cotter pins (6), three nuts (7), three washers (8), and three bolts (9). Discard cotter pins (6).

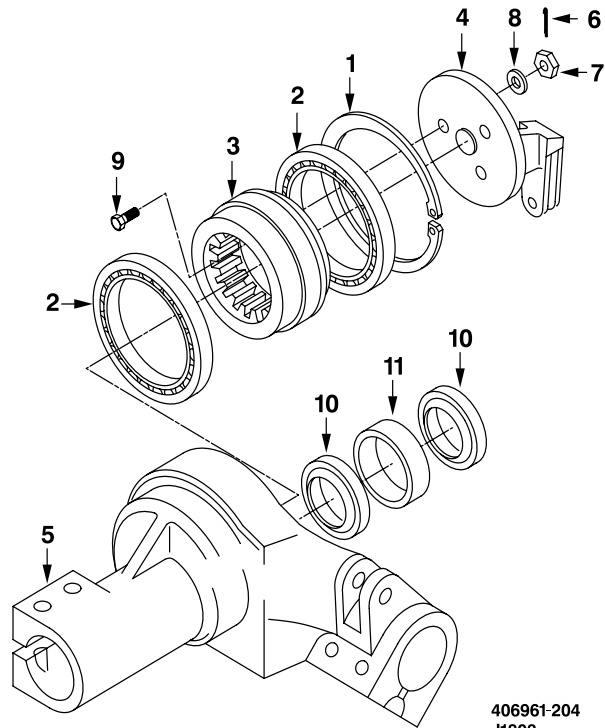
3. Press out two bearings (10) and spacer (11).

CLEAN



Acetone

4. Clean retaining compound from elbow assembly (5) with acetone (D2) and abrasive mat (D1).



406961-204
J1803

GO TO NEXT PAGE

11-2-41. PILOT COLLECTIVE ELBOW ASSEMBLY BEARINGS — REMOVAL/INSTALLATION (CONT)

INSTALL

**Retaining Compound**

5. Press two bearings (10) and spacer (11) into elbow assembly (5) and apply retaining compound (D169).

6. Align bearings (10) and spacer (11) during cure cycle so that a **0.8743 inch** minimum diameter shaft will pass through bearings (10).

WARNING

Use care when handling heat gun and heated parts. Wear asbestos gloves to avoid burns. If burn occurs, seek medical aid.

7. Cure retaining compound (D169) at 300 °F for 5 minutes using heat gun.

8. Install bearings (2) on ring gear (3).

WARNING**FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)**

Correct installation of throttle arm onto ring gear is a critical flight safety task. Ensure nuts and cotter pins are secure.

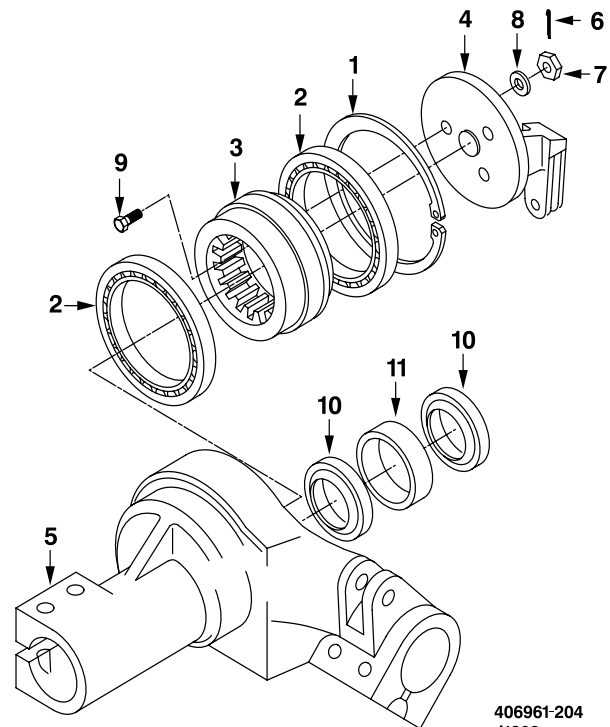
NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

9. Install throttle arm (4) onto ring gear (3) with three bolts (9), three washers (8), and three nuts (7). Torque nuts (7) **20 TO 25 INCH-POUNDS**.

10. Install three cotter pins (6) through nuts (7).

11. Install two bearings (2), ring gear (3), and throttle arm (4) into elbow assembly (5) and secure with lockring (1).

INSPECT406961-204
J1803

END OF TASK

11-2-42. COLLECTIVE CONTROL PANEL ASSEMBLY INTEGRALLY LIT PANEL — REMOVAL/
INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
68F Aircraft Electrician

References:
TM 1-1520-248-T

Equipment Condition:
Helicopter Safed (Task 1-6-7)

REMOVE

1. Gain access to control panel assembly (1) by opening right crew door.
2. Remove integrally lit panel (2) by removing three screws (3).

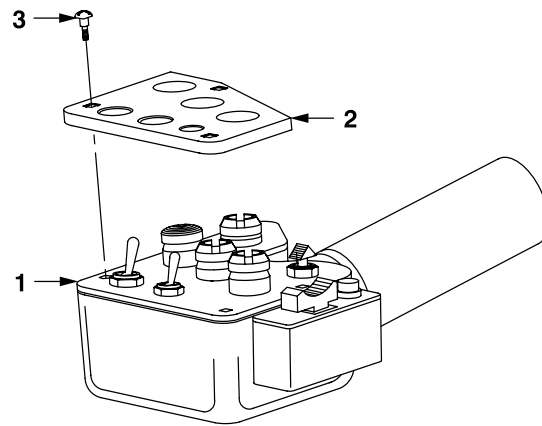
INSTALL

3. Install integrally lit panel (2) on control panel assembly (1) and secure with three screws (3).

INSPECT

FOLLOW-ON MAINTENANCE

Perform operational check (TM 1-1520-248-T).



406001-212
J1803

END OF TASK

11-2-43. COPILOT/GUNNER COLLECTIVE ELBOW ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

References:
TM 1-1500-204-23

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)
Copilot/Gunner Collective Stick Assembly
Removed (Task 11-2-15)

Tools:

General Mechanic Tool Kit (B178)
Drive Pin Punch Set (B131)
Torque Wrench (B235)
Torque Wrench (B237)

Personnel Required:

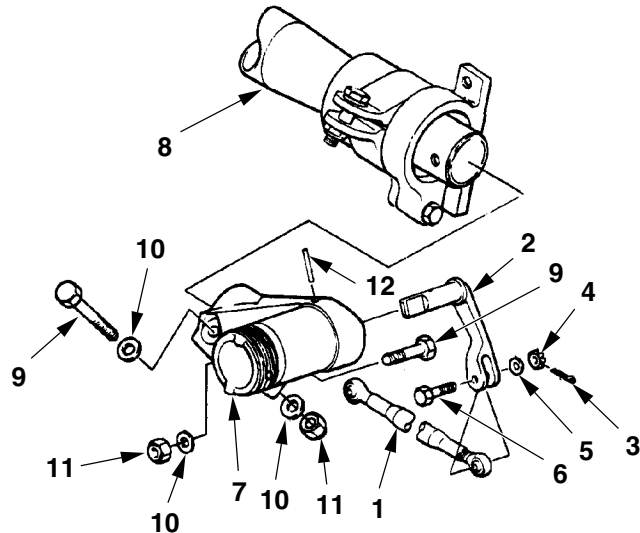
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

GO TO NEXT PAGE

11-2-43. COPILOT/GUNNER COLLECTIVE ELBOW ASSEMBLY — REMOVAL/INSTALLATION
(CONT)

REMOVE

1. Open left crew door.
2. Disconnect throttle tube assembly (1) from throttle arm (2) by removing cotter pin (3), nut (4), washer (5), and bolt (6). Discard cotter pin (3).
3. Remove elbow assembly (7) from jackshaft tube assembly (8) by removing two bolts (9), three washers (10), and two nuts (11).
4. Remove throttle arm (2) from elbow assembly (7) by removing pin (12).
5. Inspect throttle arm (2) for wear and damage limits (Task 11-2-44).
6. Inspect elbow assembly (7) for wear and damage limits (Task 11-2-45).



406001-213
J0516

INSTALL

7. Place throttle arm (2) into elbow assembly (7) and secure with pin (12) through hole in elbow assembly (7).
8. Install elbow assembly (7) onto jackshaft tube assembly (8) and secure with two bolts (9), three washers (10), and two nuts (11). Torque nuts (11) **50 TO 70 INCH-POUNDS**.

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT
PART (FSCAP)

Correct installation of throttle tube assembly is a critical flight safety task. Ensure nut and cotter pin are secure.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

9. Connect throttle tube assembly (1) with bolt (6), washer (5), and nut (4). Torque nut (4) **20 TO 25 INCH-POUNDS**.

10. Install cotter pin (3) through nut (4).

INSPECT

FOLLOW-ON MAINTENANCE

Perform throttle rigging check (Task 4-6-2 or 4-6-3).

Install crew seat and armor seat panel (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Install copilot/gunner collective stick assembly (Task 11-2-15).

END OF TASK

11-2-44. COPILOT/GUNNER COLLECTIVE STICK THROTTLE ARM — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

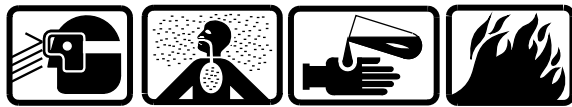
Material:
Rubber Gloves (D111)
Wiping Rag (D164)

Drycleaning Solvent (D199)
Sandpaper (D175)
Epoxy Primer Coating (D98)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean throttle arm surface with drycleaning solvent (D199).
2. Dry throttle arm with a wiping rag (D164).

INSPECT

3. Inspect throttle arm to limits shown. See figure Copilot/Gunner Collective Stick Throttle Arm — Damage Limits. If cracks in copilot/gunner collective stick throttle arm are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on throttle arm surface with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



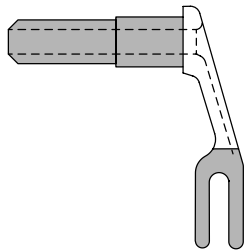
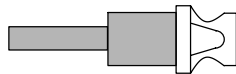
Epoxy Primer Coating

6. Touch up repaired areas of throttle arm with epoxy primer coating (D98).

7. Replace throttle arm if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-44. COPILOT/GUNNER COLLECTIVE STICK THROTTLE ARM — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL AND CORROSION

0.005 in. before and
0.010 in. after repair

0.010 in. before and
0.020 in. after repair

MAXIMUM AREA PER FULL DEPTH REPAIR

0.032 sq. in.

0.062 sq. in.

NUMBER OF REPAIRS

One per area

Two per area

EDGE CHAMFER TO REMOVE DAMAGE

0.020 in.

0.020 in.

BORE DAMAGE

1/3 of circumference

NOTE

No cracks are permitted

406001-22
J1910

Copilot/Gunner Collective Stick Throttle Arm — Damage Limits

END OF TASK

11-2-45. COPILOT/GUNNER COLLECTIVE STICK ELBOW ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Rubber Gloves (D111)
Wiping Rag (D164)

Drycleaning Solvent (D199)
Sandpaper (D175)
Epoxy Primer Coating (D98)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean elbow assembly surface with drycleaning solvent (D199).
2. Dry elbow assembly with a wiping rag (D164).

INSPECT

3. Inspect elbow assembly to limits shown. See figure Copilot/Gunner Collective Stick Elbow Assembly — Damage Limits. If cracks in copilot/gunner collective stick elbow assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on elbow assembly surface with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

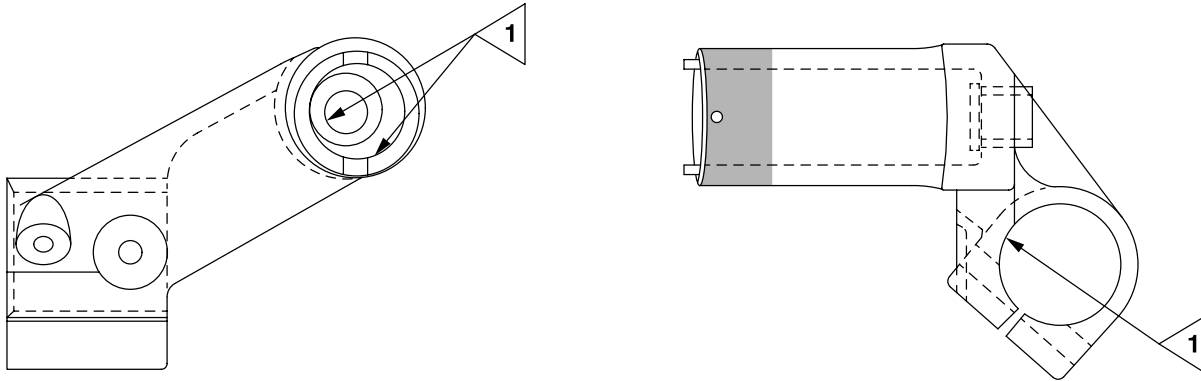


Epoxy Primer Coating

6. Touch up repaired areas of elbow assembly with epoxy primer coating (D98).
7. Replace elbow assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-45. COPILOT/GUNNER COLLECTIVE STICK ELBOW ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL AND CORROSION

0.005 in. before and 0.010 in. after repair

0.010 in. before and 0.020 in. after repair

MAXIMUM AREA PER FULL DEPTH REPAIR

1.0 sq. in.

Not critical

NUMBER OF REPAIRS

One

Not critical

EDGE CHAMFER TO REMOVE DAMAGE

0.030 in.

0.045 in.

1 BORES

0.002 in. for 1/4 circumference

THREAD DAMAGE

Depth
Length
Number

1/3 of thread
1/4 of circumference
One per threaded segment

406961-32
J1803

Copilot/Gunner Collective Stick Elbow Assembly — Damage Limits

END OF TASK

 11-2-46. COPILOT/GUNNER COLLECTIVE ELBOW ASSEMBLY INSERT — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Material:
Adhesive (D10)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Tools:
General Mechanic Tool Kit (B178)

REMOVE

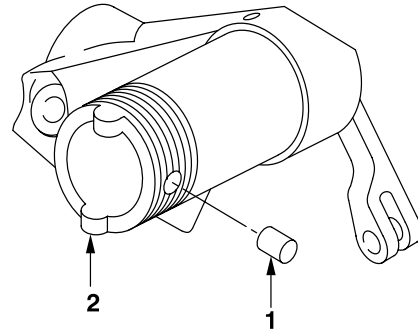
1. Remove insert (1) from elbow assembly (2).

INSTALL



Adhesive

2. Install insert (1) into elbow assembly (2) with adhesive (D10) and cure for 24 hours at 72 °F.
3. Cut to contour threads to leave insert protruding **0.005 to 0.015 inch** above threads.



INSPECT

406961-220
J1803

END OF TASK

11-2-47. COPILOT/GUNNER COLLECTIVE ELBOW ASSEMBLY BUSHING — REMOVAL/
INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Hand Arbor Press (B107)

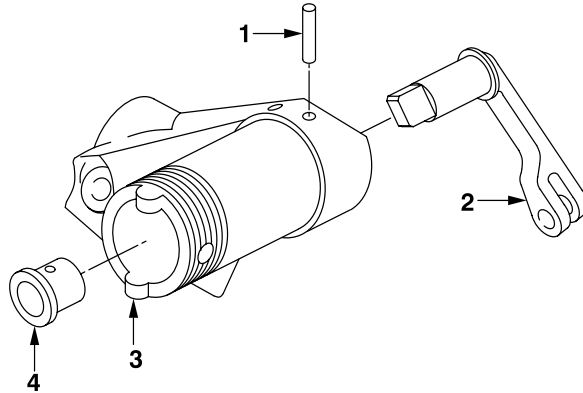
Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

REMOVE

1. Drive roll pin (1) from throttle arm shaft (2).
2. Remove throttle arm shaft (2) from elbow assembly (3).
3. Press bushing (4) from elbow assembly (3) using hand arbor press (B107).

INSTALL

4. Press bushing (4) into elbow assembly (3) using hand arbor press (B107).
5. Install throttle arm shaft (2) into elbow assembly (3).
6. Align hole and insert roll pin (1).



406001-221
J1803

INSPECT

END OF TASK

11-2-48. COLLECTIVE MIXING LEVER ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

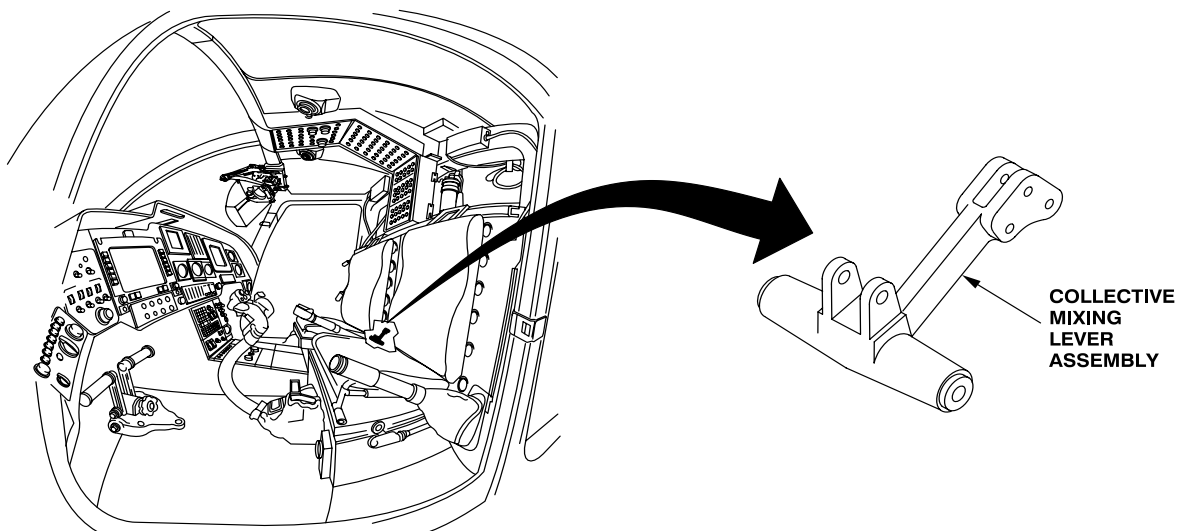
Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B237)
Torque Wrench (B239)

Material:
Lockwire (D132)
Zinc Chromate Primer (D161)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Center Post Duct and Panels Removed
(Task 2-2-69)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)



406961-390
J1866

GO TO NEXT PAGE

11-2-48. COLLECTIVE MIXING LEVER ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Disconnect tube assembly (1) by removing cotter pin (2), nut (3), two washers (4), and bolt (5). Discard cotter pin.

2. Disconnect plates (6 and 7) and shims (8) by removing lockwire, two bolts (9), and two washers (10).

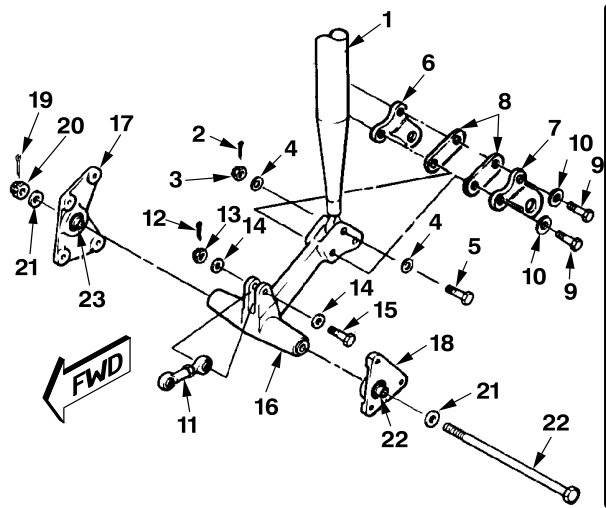
3. Disconnect link assembly (11) by removing cotter pin (12), nut (13), two washers (14), and bolt (15). Discard cotter pin.

4. Remove mixing lever assembly (16) from support assemblies (17 and 18) by removing cotter pin (19), nut (20), two washers (21), and bolt (22). Discard cotter pin.

5. Check mixing lever assembly (16) for wear and damage (Task 11-5-2).

6. Check bearings (23) for wear and binding, (Task 11-5-3).

7. If bearings (23) require replacement, remove bearings (23) from support assemblies (17 and 18) using suitable press.



406961-391-1
J2742

INSTALL

8. Ensure bearing bore is clean and within limits (Task 11-5-3).



Zinc Chromate Primer

9. Apply coat of undiluted zinc chromate primer (D161) to inside diameter of bore.

10. Press bearings (23) into supports (17 and 18), taking care excess zinc chromate primer (D161) does not enter bearing. Carefully wipe off excess zinc chromate primer (D161).

GO TO NEXT PAGE

11-2-48. COLLECTIVE MIXING LEVER ASSEMBLY — REMOVAL/INSTALLATION (CONT)

WARNING**FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)**

Correct installation of collective pitch link to elbow is a critical flight safety task. Ensure nut and cotter pin are secure.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

11. Install mixing lever assembly (16) between support assemblies (17 and 18) with bolt (22), two washers (21), and nut (20). Torque nut (19) **100 TO 140 INCH-POUNDS**.

12. If necessary, install washer(s) (24), a maximum of two washers per side of mixing lever assembly (16), to ensure that bearing (23) does not protrude from support (17 or 18) more than **0.060 inch**. See detail A.

13. Install cotter pin (19) through nut (20).

14. Connect link assembly (11) with bolt (15), two washers (14), and nut (13). Torque nut (13) **50 TO 70 INCH-POUNDS**.

15. Install cotter pin (12) through nut (13).

16. Position plates (6 and 7) over mixing lever assembly (16). Then push on plate (7) and measure gap between plate (6) and mixing lever assembly (16), using feeler gauge.

17. Using feeler gauge dimension from step 16, position shims (8), half against plate (6) and half against plate (7) to within **0.009 inch** of each other.

18. Install shims (8) using two bolts (9) and washers (10).

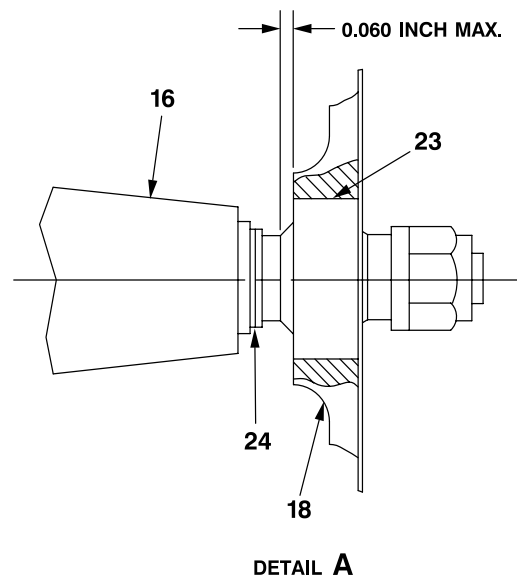
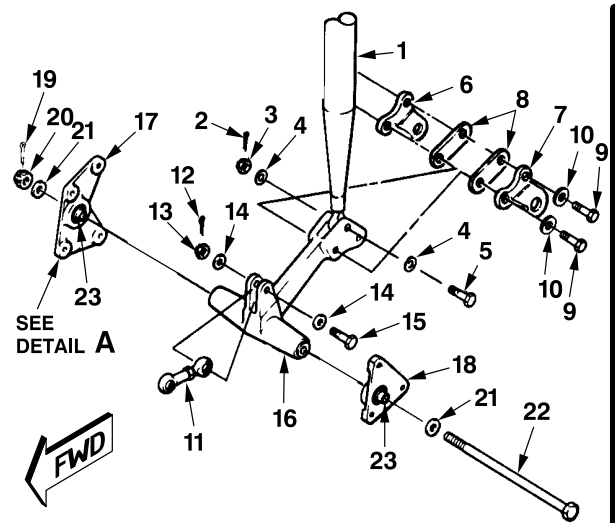
19. Lockwire (D132) bolts (9).

20. Connect tube assembly (1) with bolt (5), two washers (4), and nut (3). Torque nut (3) **50 TO 70 INCH-POUNDS**.

21. Install cotter pin (2) through nut (3).

INSPECT

GO TO NEXT PAGE



406961-391-2
J2742

11-2-48. COLLECTIVE MIXING LEVER ASSEMBLY — REMOVAL/INSTALLATION (CONT)

FOLLOW-ON MAINTENANCE

Install center post duct and panels (Task 2-2-69).

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).

END OF TASK

11-2-49. COLLECTIVE MIXING LEVER ASSEMBLY BUSHINGS — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Hand Arbor Press (B107)
Reamer Set (B114)

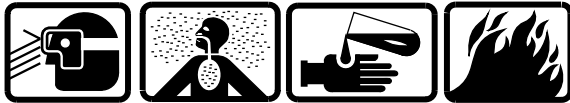
Material:
Acetone (D2)
Abrasive Mats (D1)
Wiping Rag (D164)
Zinc Chromate Primer (D161)
Low-Lint Cleaning Cloth (D67)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

REMOVE

1. Press bushings (1) from lever assembly (2).

CLEAN



Acetone

2. Clean primer from bores of lever assembly using acetone (D2) and abrasive mat (D1) and wipe dry with wiping rag (D164).

3. Check bores for damage after cleanup and smooth out (Task 11-5-2).

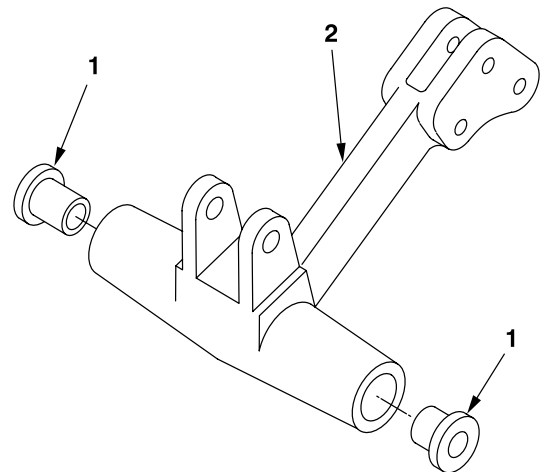
INSTALL



Zinc Chromate Primer

4. Apply a coat of zinc chromate primer (D161) to outside surface of bushings (1) and bores in lever assembly (2).

5. Press bushings (1) in lever assembly (2) until the flange is flush with surface of lever assembly (2).



406961-214
J1803

6. Wipe off excess primer with low-lint cleaning cloth (D67) dampened with acetone (D2).

7. Line ream bushings to **0.313 inch** and deburr. Use reamer part of shop set (B114).

INSPECT

END OF TASK

11-2-50. COLLECTIVE ADJUSTABLE TUBE ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

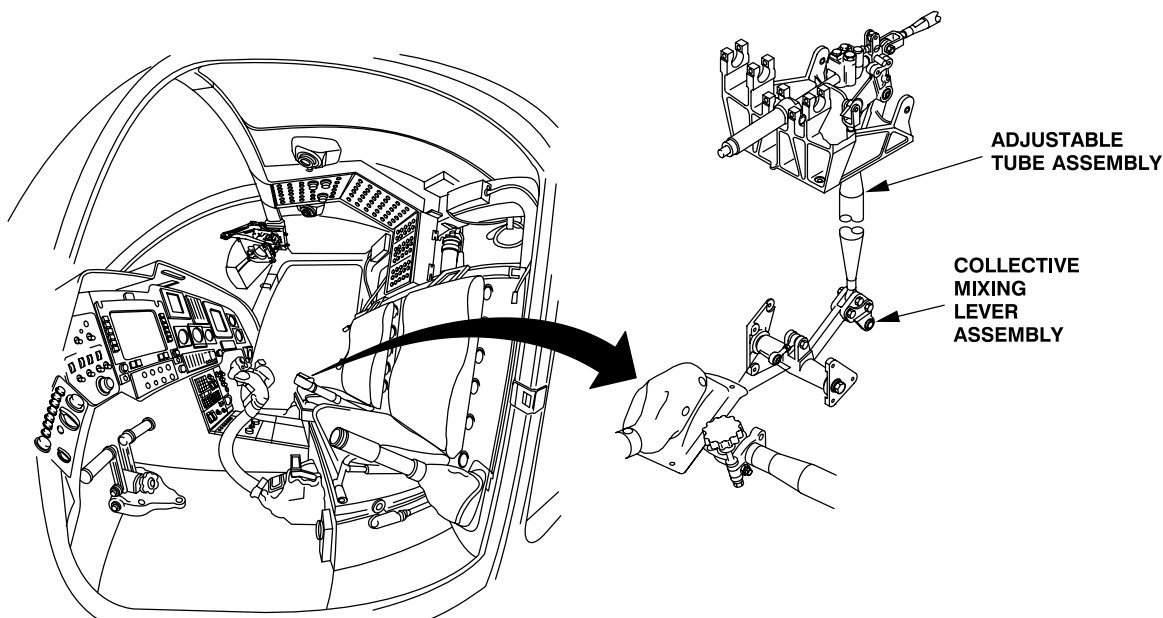
Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B236)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Center Post Duct and Panels Removed
(Task 2-2-69)
Forward Fairing Assembly Removed
(Task 2-2-47)



406961-821
J0516

GO TO NEXT PAGE

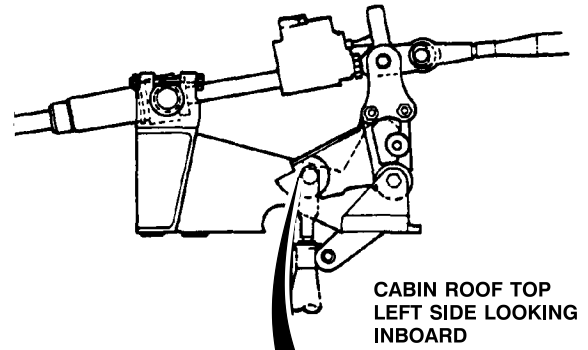
11-2-50. COLLECTIVE ADJUSTABLE TUBE ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Disconnect lower end of tube assembly (1) from mixing lever (2) by removing cotter pin (3), nut (4), two washers (5), and bolt (6). Discard cotter pin (3).

2. Disconnect upper end of tube assembly (1) from bellcrank assembly (7) by removing cotter pin (8), nut (9), two washers (10), and bolt (11). Discard cotter pin (8).

3. Remove tube assembly (1) by pulling tube assembly (1) up through cabin roof.



INSTALL

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT
PART (FSCAP)

Correct installation of tube assembly on bellcrank is a critical flight safety task. Ensure nut and cotter pin are secure.

NOTE

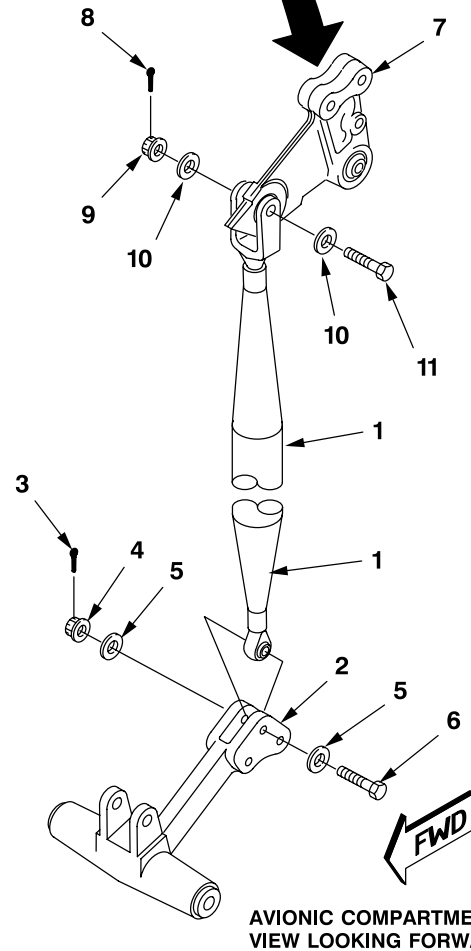
Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

4. Position upper end of tube assembly (1) on bellcrank (7) and secure with bolt (11), two washers (10), and nut (9). Torque nut (9) **30 TO 40 INCH-POUNDS**.

5. Install cotter pin (8) through nut (9).

6. Secure lower end of tube assembly (1) to mixing lever (2) with bolt (6), two washers (5), and nut (4). Torque nut (4) **30 TO 40 INCH-POUNDS**.

7. Install cotter pin (3) through nut (4).



INSPECT

FOLLOW-ON MAINTENANCE

Check rigging of collective system (Task 11-1-1 or 11-1-2).

- Install forward fairing assembly (Task 2-2-47).
- Install center post duct and panels (Task 2-2-69).

406961-899
J0516

END OF TASK

11-2-51. COLLECTIVE ADJUSTABLE TUBE ASSEMBLY CLEVIS — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

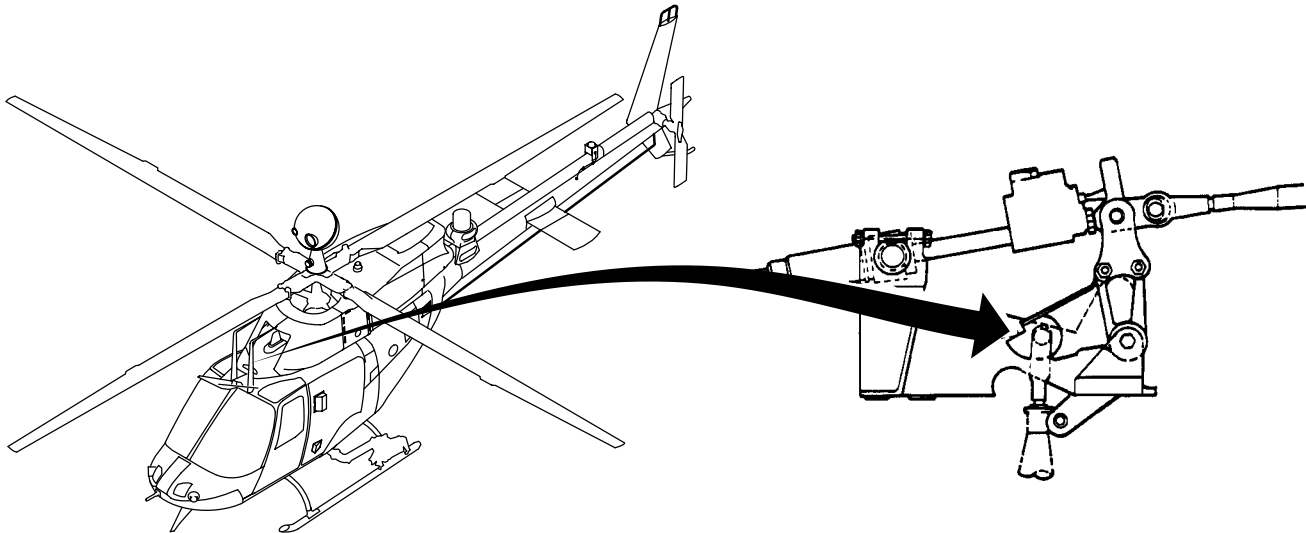
Applicable Configurations:
All

Tools:
Torque Wrench (B238)
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B236)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)



406961-392
J1844

GO TO NEXT PAGE

 11-2-51. COLLECTIVE ADJUSTABLE TUBE ASSEMBLY CLEVIS — REMOVAL/INSTALLATION
 (CONT)

REMOVE

1. Position maintenance stand (B162) next to helicopter.
2. Count and record number of exposed threads on clevis (1). Loosen jamnut (2).
3. Disconnect clevis (1) from bellcrank (3) by removing cotter pin (4), nut (5), two washers (6), and bolt (7). Discard cotter pin (4).
4. Remove clevis (1) from tube assembly (8) and remove jamnut (2) and washer (9).

INSTALL

CAUTION

Do not exceed **one inch** of exposed threads on adjustable control tube rod ends.

5. Install washer (9) and jamnut (2) on clevis (1) and screw clevis (1) into tube assembly (8). Establish correct number of exposed threads as previously recorded.

WARNING
**FLIGHT SAFETY CRITICAL AIRCRAFT
 PART (FSCAP)**

Correct installation of tube assembly to bellcrank is a critical flight safety task. Ensure nut and cotter pin are secure.

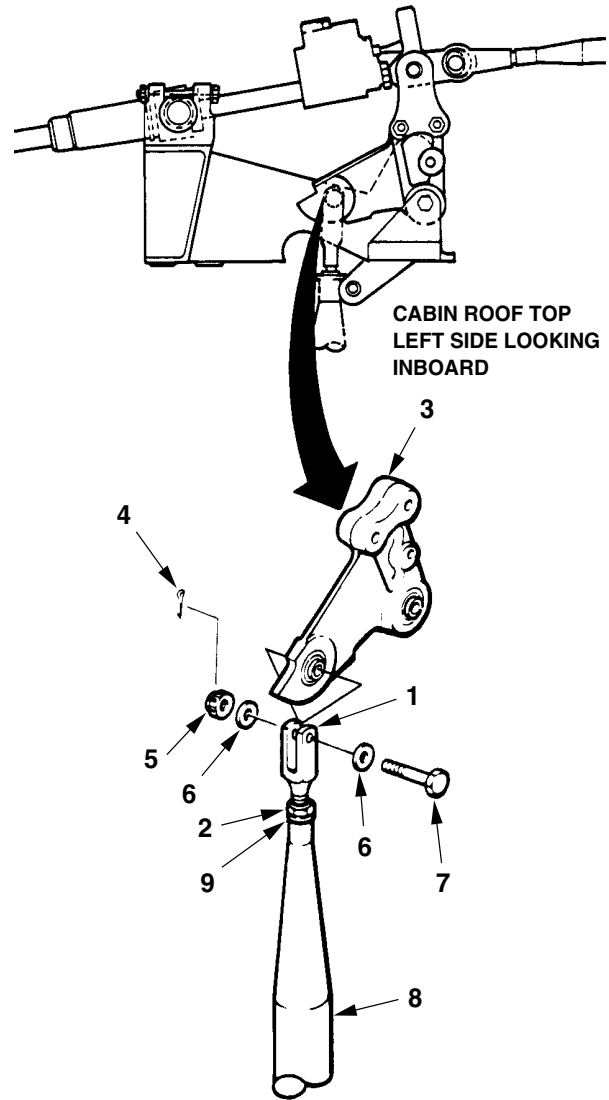
NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

6. Secure tube assembly (8) to bellcrank (3) with bolt (7), two washers (6), and nut (5). Torque nut (5) **30 TO 40 INCH-POUNDS**.
7. Install cotter pin (4) through nut (5).
8. Torque jamnut (2) on end of tube assembly (8) to **80 TO 100 INCH-POUNDS**.

INSPECT

GO TO NEXT PAGE

406961-393
J0516

11-2-51. COLLECTIVE ADJUSTABLE TUBE ASSEMBLY CLEVIS — REMOVAL/INSTALLATION
(CONT)

FOLLOW-ON MAINTENANCE

Check rigging of collective control system (Task 11-1-1 or 11-1-2).

- Install forward fairing assembly (Task 2-2-47).

END OF TASK

11-2-52. COLLECTIVE CONTROL LINK ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

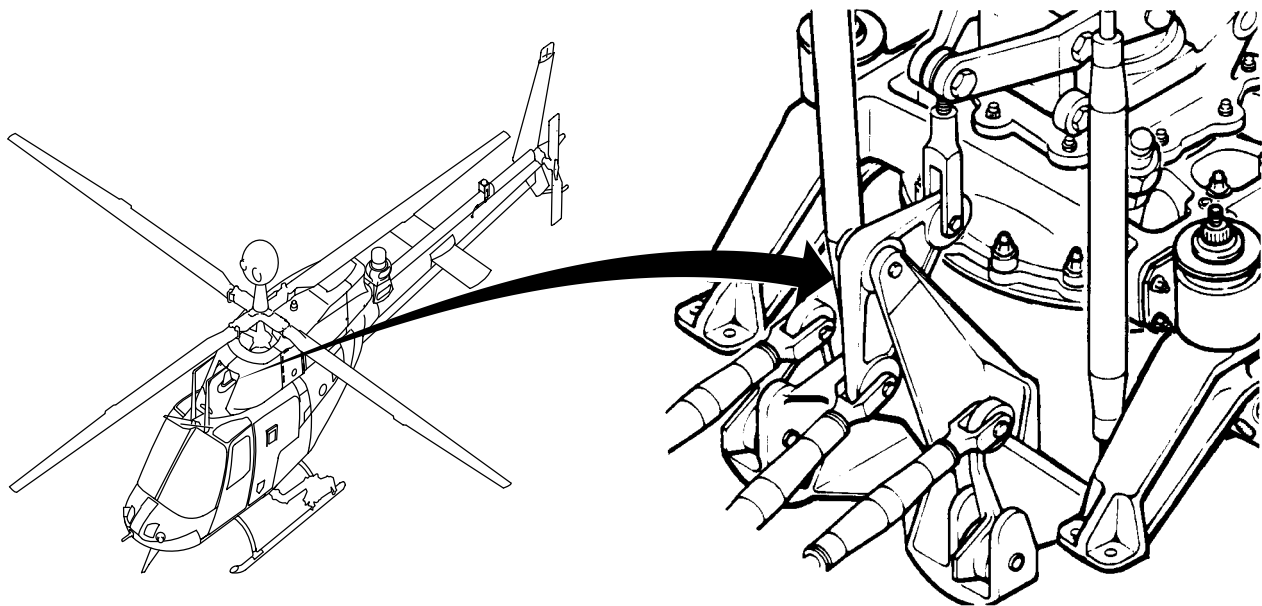
Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
■ Torque Wrench (B237)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)



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J0520

GO TO NEXT PAGE

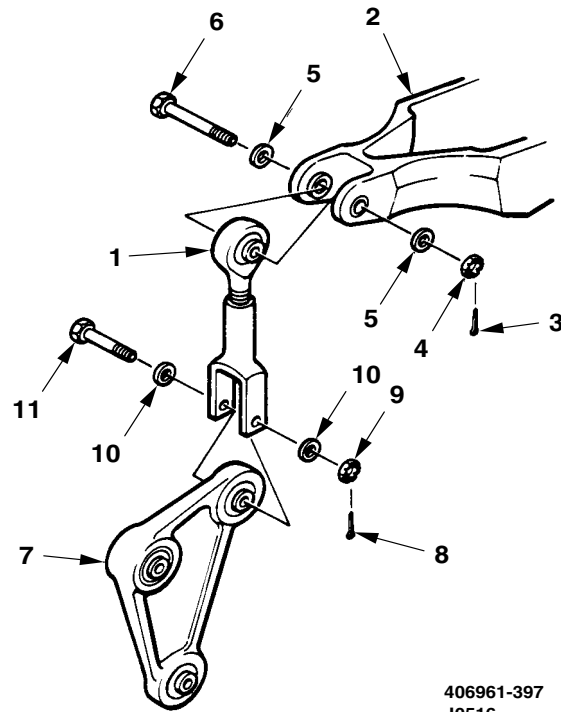
11-2-52. COLLECTIVE CONTROL LINK ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Position maintenance stand (B162) next to helicopter.

2. Disconnect link assembly (1) from the collective lever (2) by removing cotter pin (3), nut (4), two washers (5), and bolt (6). Discard cotter pin (3).

3. Disconnect lower end of link assembly (1) at bellcrank (7) by removing cotter pin (8), nut (9), two washers (10), and bolt (11). Discard cotter pin (8).



406961-397
J0516

INSTALL

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Correct installation of link assembly to bellcrank is a critical flight safety task. Ensure nut and cotter pin are secure.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

4. Connect link assembly (1) to bellcrank (7) with bolt (11), two washers (10), and nut (9). Torque nut (9) **60 TO 85 INCH-POUNDS**.

5. Install cotter pin (8) through nut (9).

6. Connect link assembly (1) to collective lever (2) with bolt (6), two washers (5), and nut (4). Torque nut (4) **60 TO 85 INCH-POUNDS**.

7. Install cotter pin (3) through nut (4).

INSPECT

FOLLOW-ON MAINTENANCE

- Install forward fairing assembly (Task 2-2-47).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).

END OF TASK

11-2-53. COLLECTIVE CONTROL LINK ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

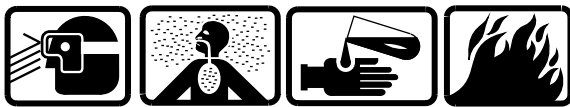
Tools:
General Mechanic Tool Kit (B178)

Material:
Crocus Cloth (D90)
Sandpaper (D175)

Drycleaning Solvent (D199)
Acetone (D2)
Epoxy Primer Coating (D98)
Wiping Rag (D164)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

CLEAN



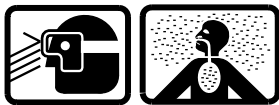
Drycleaning Solvent

1. Clean collective control link clevis surface and rod end bearing surface with drycleaning solvent (D199).
2. Dry surface of collective control link clevis and rod end bearing with wiping rag (D164).

INSPECT

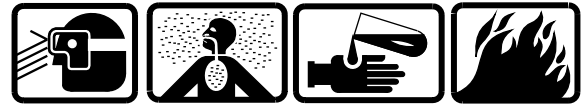
3. Inspect collective control link clevis and rod end bearing for damage to limits shown. See figure Collective Control Link Assembly — Damage Limits.

REPAIR



Sanding Operations

4. Repair damage within specific limits using 400 grit sandpaper (D175). Smooth surface with crocus cloth (D90).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2). Do not allow acetone (D2) to enter bearing of rod end.

INSPECT

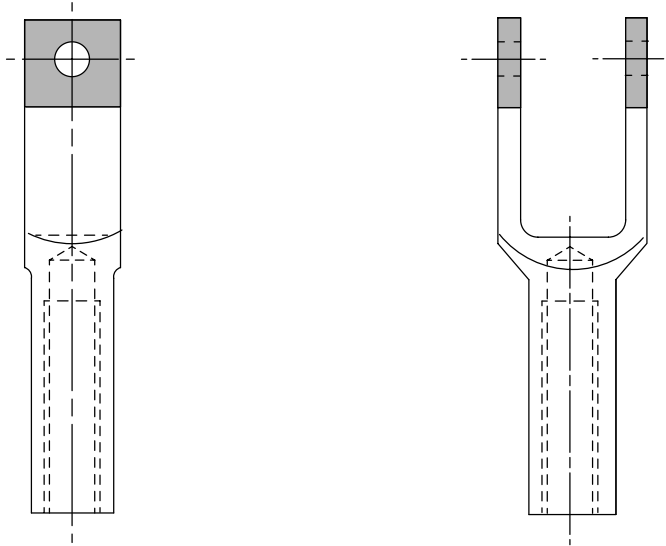


Epoxy Primer Coating

6. Touch up repaired areas with epoxy primer coating (D98).
7. Replace collective control link clevis and rod end bearing if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-53. COLLECTIVE CONTROL LINK ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



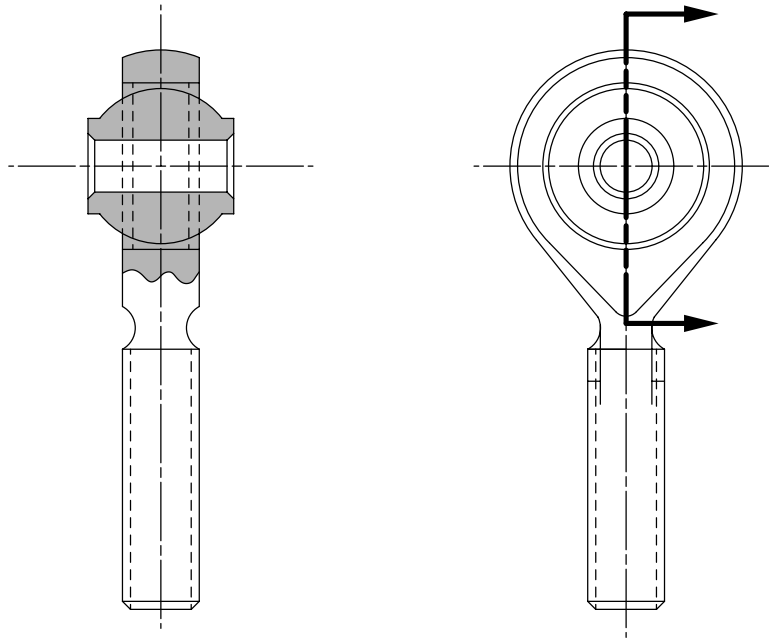
TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
MECHANICAL AND CORROSION	0.005 in. before and after repair	0.010 in. before and after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	0.10 sq. in.
NUMBER OF REPAIRS	One per tang	One per tang
EDGE CHAMFER TO REMOVE DAMAGE	0.010 in. x 45°	0.020 in. x 45°
THREAD DAMAGE Depth Length Number	1/3 Of thread 1/5 Of circumference One per thread	

406001-270
J1803

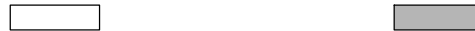
Collective Control Link Assembly — Damage Limits (Sheet 1 of 2)

GO TO NEXT PAGE

11-2-53. COLLECTIVE CONTROL LINK ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL AND CORROSION

0.010 in. before and after repair

0.005 in. before and after repair

MAXIMUM AREA PER FULL DEPTH REPAIR

0.10 sq. in.

0.10 sq. in.

NUMBER OF REPAIRS

One

One

EDGE CHAMFER TO REMOVE DAMAGE

0.020 in. x 45°

BORES

0.020 in. for 1/4 circumference

THREAD DAMAGE

Depth

1/3 of thread

Length

1/5 of circumference

Number

Two

BEARING WEAR

Axial

0.010 in.

Radial

0.005 in.

406310-16
J1803

Collective Control Link Assembly — Damage Limits (Sheet 2 of 2)

END OF TASK

11-2-54. DROOP COMPENSATOR POTENTIOMETER ARM — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Wiping Rag (D164)
Drycleaning Solvent (D199)

Rubber Gloves (D111)
Sandpaper (D175)
Epoxy Primer Coating (D98)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

CLEAN



Drycleaning Solvent

1. Clean arm surface with drycleaning solvent (D199).
2. Dry arm with a wiping rag (D164).

INSPECT

3. Inspect arm to limits shown. See figure Droop Compensator Potentiometer Arm — Damage Limits.

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on arm surface with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

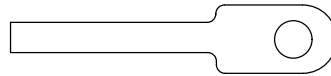
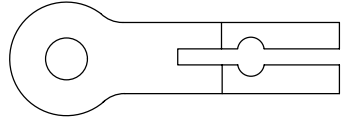


Epoxy Primer Coating

6. Touch up repaired areas of arm with epoxy primer coating (D98).
7. Replace arm if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-2-54. DROOP COMPENSATOR POTENTIOMETER ARM — CLEANING/INSPECTION/REPAIR
(CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

**MECHANICAL AND
CORROSION**

**MAXIMUM AREA PER
FULL DEPTH REPAIR**

NUMBER OF REPAIRS

**EDGE CHAMFER TO
REMOVE DAMAGE**

BORES

MAXIMUM DAMAGE AND REPAIR DEPTH

**0.010 in. before and
0.020 in. after repair**

0.62 sq. in.

Not Critical

0.03 in. x 45°

**0.002 in. for 1/4
circumference**

NOTE

No cracks are permitted

406001-67
J0516

Droop Compensator Potentiometer Arm — Damage Limits

END OF TASK

11-2-55. COLLECTIVE/CYCLIC ACTUATOR MOUNT BUSHINGS — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

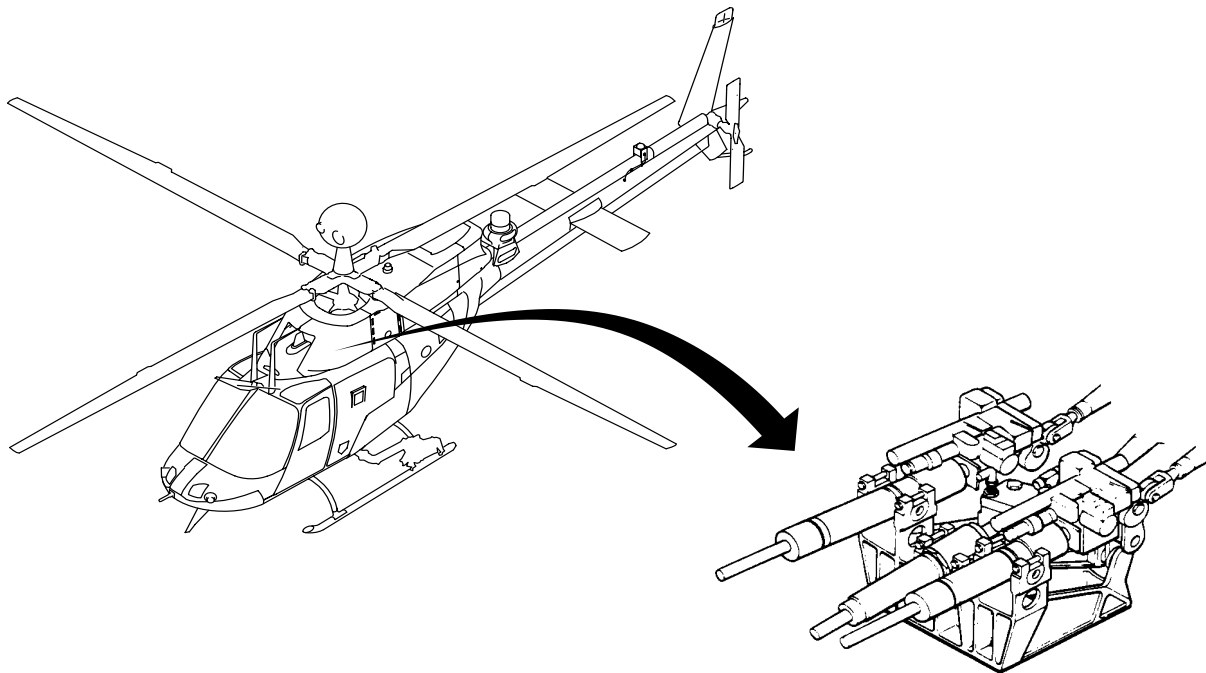
Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B238)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)



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J0520

Collective and Cyclic Actuators — Locator

GO TO NEXT PAGE

 11-2-55. COLLECTIVE/CYCLIC ACTUATOR MOUNT BUSHINGS — REMOVAL/INSTALLATION
 (CONT)

REMOVE

1. Position maintenance stand (B162) next to helicopter.

NOTE

The three actuators are removed in the same manner.

2. Disconnect actuator (1) from support assembly (2) by removing two bolts (3), four washers (4), and two nuts (5) from sides of actuator (1).

3. Turn bushings (6) to align with mounting slots and lift actuator (1) from support assembly (2).

4. Remove bushings (6) from trunnions (7).

NOTE

Bushings must be determined serviceable before reusing.

INSTALL

NOTE

Self-locking nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

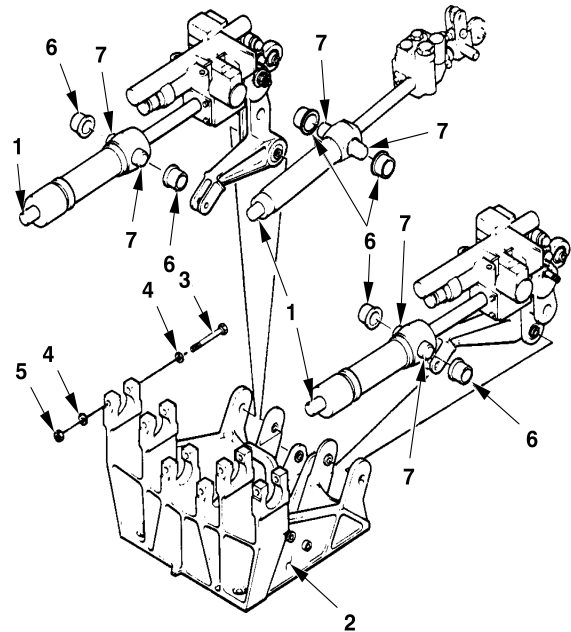
5. Position bushings (6) on trunnions (7) and position actuator (1) in support assembly (2). Secure actuator (1) to support assembly (2) with two bolts (3), four washers (4), and two nuts (5). Torque nuts (5) **75 TO 95 INCH-POUNDS**.

INSPECT

FOLLOW-ON MAINTENANCE

■ Install forward fairing assembly (Task 2-2-47).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



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J0516

END OF TASK

11-2-56. COLLECTIVE BOOSTED BELLCRANK ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

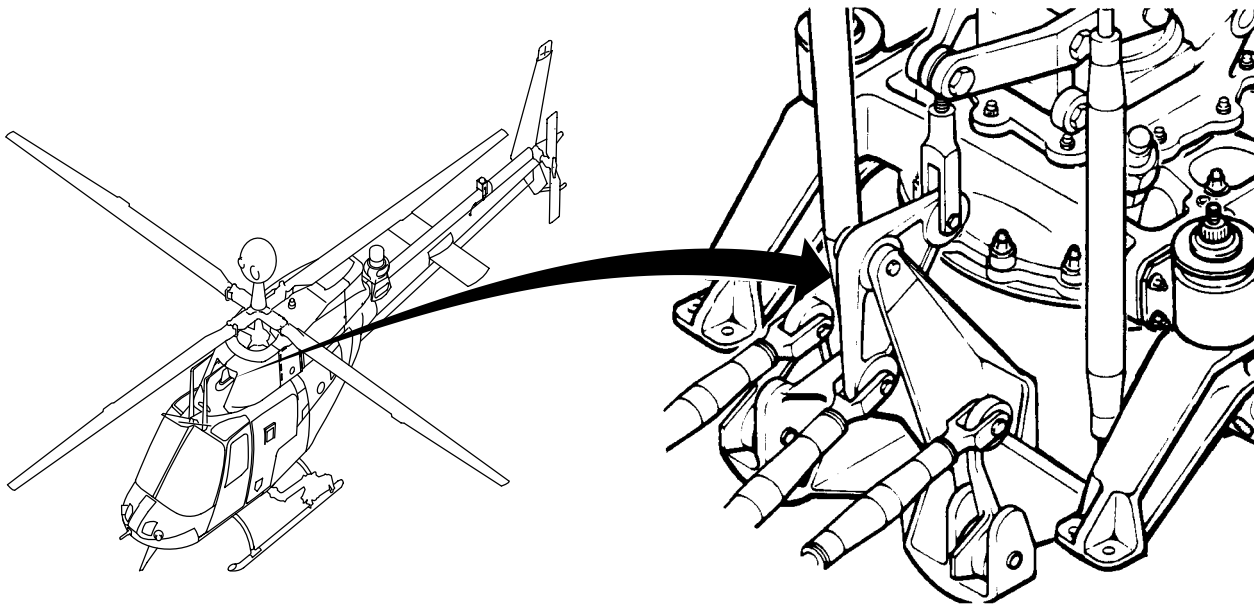
Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B237)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)



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J0520

GO TO NEXT PAGE

11-2-56. COLLECTIVE BOOSTED BELLCRANK ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

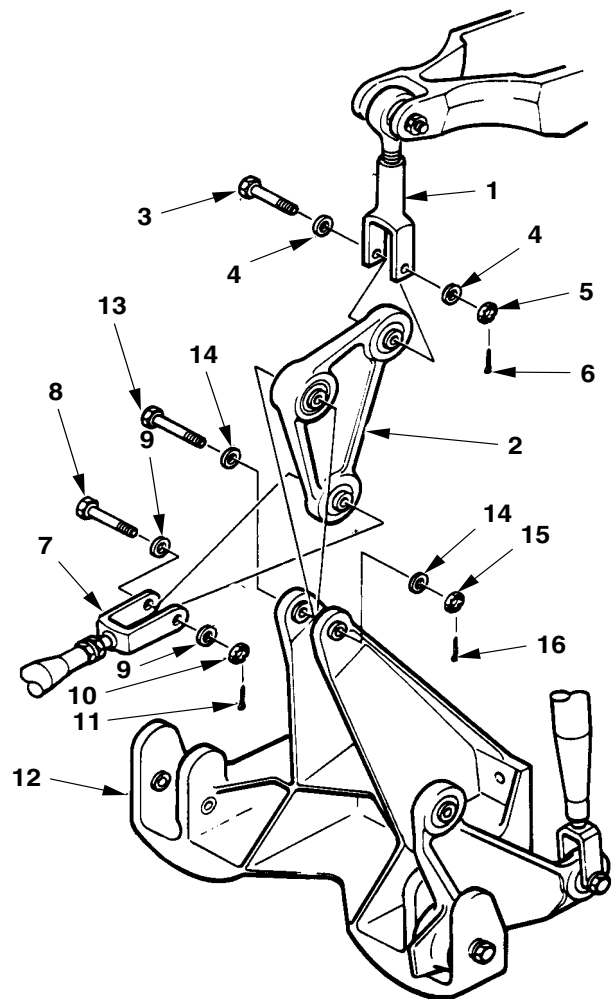
1. Position maintenance stand (B162) next to helicopter.

2. Disconnect link assembly (1) from bellcrank assembly (2) by removing bolt (3), two washers (4), nut (5), and cotter pin (6). Discard cotter pin (6).

3. Disconnect tube assembly (7) from bellcrank assembly (2) by removing bolt (8), two washers (9), nut (10), and cotter pin (11). Discard cotter pin (11).

4. Disconnect bellcrank assembly (2) from support assembly (12) by removing bolt (13), two washers (14), nut (15), and cotter pin (16). Discard cotter pin (16).

5. Inspect bellcrank assembly (2) for wear and damage limits (Task 11-5-2).



406961-403
J0516

GO TO NEXT PAGE

11-2-56. COLLECTIVE BOOSTED BELLCRANK ASSEMBLY — REMOVAL/INSTALLATION (CONT)

INSTALL

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT
PART (FSCAP)

Correct installation of bellcrank assembly into support assembly is a critical flight safety task. Ensure nut and cotter pin are secure.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

6. Position bellcrank assembly (2) in support assembly (12) and attach with bolt (13), two washers (14), and nut (15). Torque nut (15) **60 TO 85 INCH-POUNDS**.

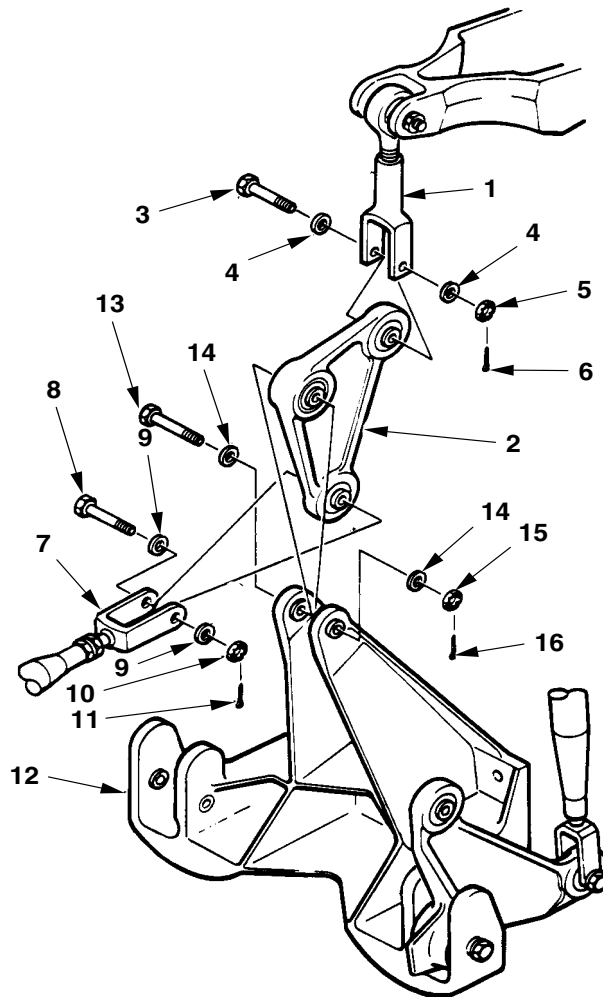
7. Install cotter pin (16) through nut (15).

8. Connect tube assembly (7) to bellcrank assembly (2) with bolt (8), two washers (9), and nut (10). Torque nut (10) **65 TO 85 INCH-POUNDS**.

9. Install cotter pin (11) through nut (10).

10. Connect link assembly (1) to bellcrank assembly (2) with bolt (3), two washers (4), and nut (5). Torque nut (5) **60 TO 85 INCH-POUNDS**.

11. Install cotter pin (6) through nut (5).



INSPECT

FOLLOW-ON MAINTENANCE

Install forward fairing assembly (Task 2-2-47).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).

406961-403
J0516

END OF TASK

11-2-57. COLLECTIVE BOOSTED BELLCRANK ASSEMBLY (AVIM) — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

- Powertrain Repairer Tool Kit (B180)
- Hand Arbor Press (B107)
- Spring Scale (B120)
- Bearing Staking Tool Set (B189)
- Special Bolt (H14)

- Abrasive Mat (D1)
- Retaining Compound (D169)
- Rubber Gloves (D111)
- Sandpaper (D175)
- Crocus Cloth (D90)
- Epoxy Primer Coating (D98)
- Acetone (D2)
- Wiping Rag (D164)

Personnel Required:

- 67S Scout Helicopter Technical Inspector (TI)
- 68D Aircraft Powertrain Repairer

Material:

- Zinc Chromate Primer (D161)
- Drycleaning Solvent (D199)
- Low-Lint Cleaning Cloth (D67)

References:

- TM 55-1500-322-24
- TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean bellcrank surfaces with drycleaning solvent (D199) to remove grease, oil, dirt, and other contaminants. Dry surfaces with clean, dry low-lint cleaning cloth (D67).

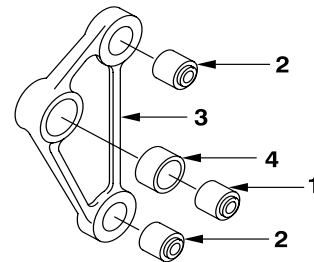
INSPECT

2. Inspect bearings (1 and 2) and bellcrank (3) for condition and tightness.

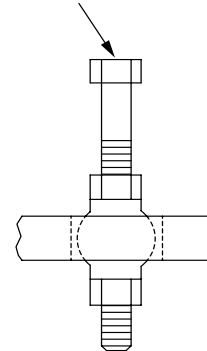
3. Inspect bellcrank to limits shown. See figure Collective Boosted Bellcrank Assembly — Damage Limits. If cracks in collective boosted bellcrank assembly are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR

4. Press bearings (1 and 2) and sleeve (4) from bellcrank (3) using special bolt.



SPECIAL BOLT



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J1841

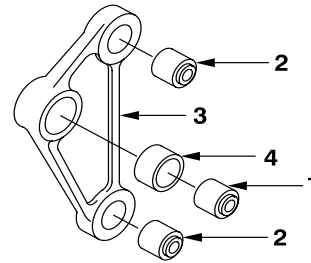
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11-2-57. COLLECTIVE BOOSTED BELLCRANK ASSEMBLY (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

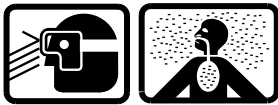
WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Fluorescent penetrant inspection of bellcrank (3) is a characteristic critical to flight safety.

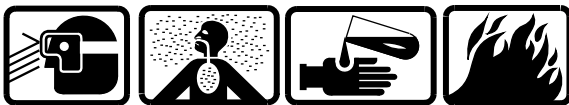
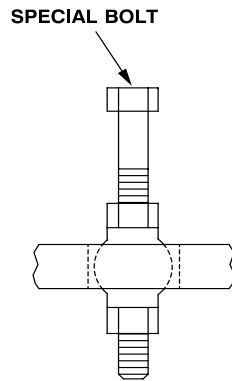


- Fluorescent penetrant inspect bellcrank (3) in accordance with TM 1-1520-266-23.



Sanding Operations

- Remove scratches, nicks, and corrosion on bellcrank surface with 400 grit sandpaper (D175). Smooth bellcrank surface with crocus cloth (D90). Smooth bores with abrasive mat (D1).



Acetone

- Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Maximum chamfer of 45 degrees by **0.035 inch** on both sides of pivot bearing bore is a characteristic critical to flight safety.

- For ring stake bearing (1) chamfer both sides of sleeves (4) **0.005 inch** maximum by 45 degrees.



Epoxy Primer Coating

- Touch up repaired areas of bellcrank with epoxy primer coating (D98).

- Replace bellcrank if wear or damage limits are exceeded.

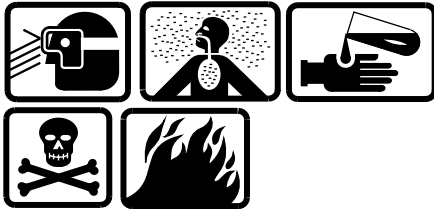
406961-404
J1841

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11-2-57. COLLECTIVE BOOSTED BELLCRANK ASSEMBLY (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



Retaining Compound



Zinc Chromate Primer

11. Apply retaining compound (D169) to all mating surfaces of bearings (2) and apply unreduced zinc chromate primer (D161) to mating surfaces of bearing (1) and sleeve (4).

CAUTION

- Do not allow retaining compound to enter the bearing.
- Do not stake parts after retaining compound has cured.

NOTE

As soon as possible after applying retaining compound, bearings should be pressed into bellcrank. Ring staking must be performed within 30 minutes after application of retaining compound.

12. Press sleeve (4) and bearings (1 and 2) into bellcrank (3) using hand arbor press (B107).

CAUTION

To prevent damage to bearing do not allow acetone to enter bearing.

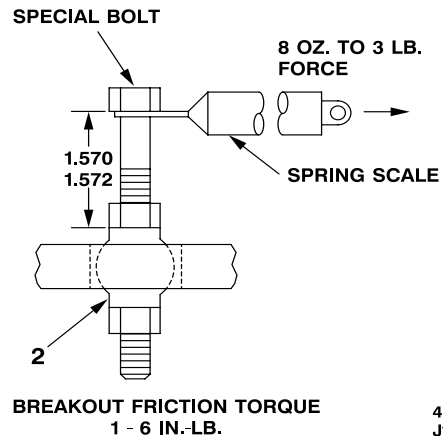
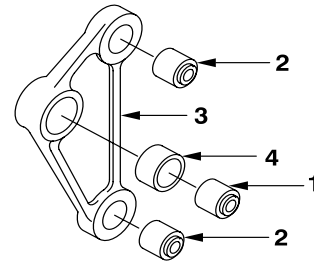
13. Clean excessive retaining compound from bellcrank (3) with acetone (D2) and wiping rag (D164).

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Accomplishment of ring staking to both sides of sleeve (4) and roll staking to both sides of bearings (2) are characteristics critical to flight safety.

GO TO NEXT PAGE



14. Ring stake sleeve (4) and roll stake bearings (2) (TM 55-1500-322-24).

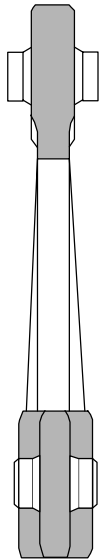
15. Check breakout or misalignment torque of bearings (2) after installation. Breakout or misalignment torque is **1 TO 6 INCH-POUNDS**, using special bolt and spring scale (B120) as shown.

INSPECT

16. Inspect collective boosted bellcrank assembly for any damage that may have occurred during repair. See figure Collective Boosted Bellcrank Assembly - Damage Limits. If cracks in collective boosted bellcrank assembly are suspected perform eddy current inspection (TM 1-1520-266-23).

INSPECT

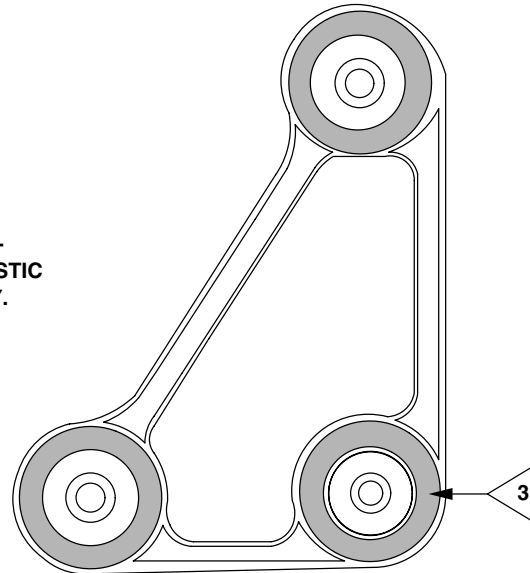
11-2-57. COLLECTIVE BOOSTED BELLCRANK ASSEMBLY (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



WARNING

FLIGHT SAFETY PART

MAXIMUM CHAMFER OF 45 DEGREES BY 0.035 INCH ON BOTH SIDES OF PIVOT BEARING BORE IS A CHARACTERISTIC CRITICAL TO FLIGHT SAFETY.



BELLCRANK ASSEMBLY

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	MECHANICAL	CORROSION
MECHANICAL	0.010 in. before and after repair	0.030 in. before and after repair
CORROSION	0.005 in. before and 0.010 in. after repair	0.015 in. before and 0.030 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	Not critical
NUMBER OF REPAIRS	One per lug	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in.	0.060 in.
BORES	0.002 inch for 1/4 circumference	

- NOTES: 1. No cracks are permitted.
 2. Axial bearing wear shall not exceed 0.030 inch; radial bearing wear shall not exceed 0.005 inch.
 3 Maximum chamfer of 45 degrees by 0.035 inch on both sides of pivot bearing bore.

406001-76
J0519

Collective Boosted Bellcrank Assembly — Damage Limits

END OF TASK

11-2-58. CONTROL SUPPORT ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

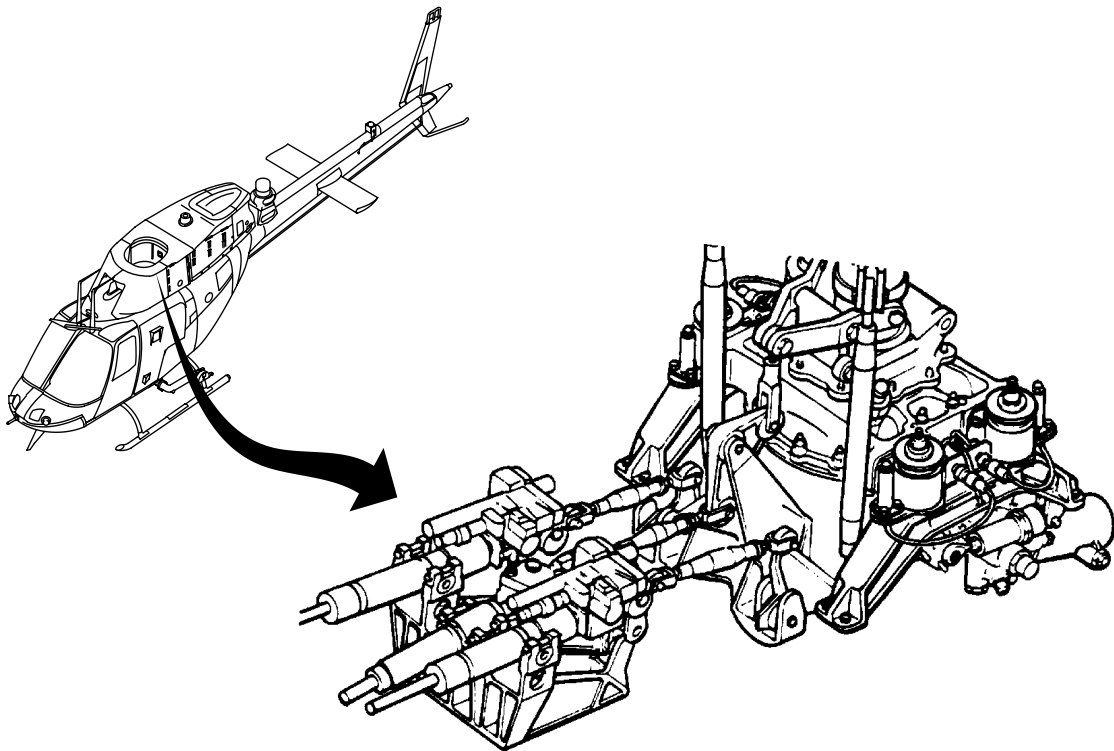
Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B237)
Torque Wrench (B239)

Material:
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)



406961-405
J0520

GO TO NEXT PAGE

11-2-58. CONTROL SUPPORT ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Position maintenance stand (B162) next to helicopter.

2. Remove cotter pin (1), nut (2), two washers (3), and bolt (4) from two cyclic bellcranks (5). Discard cotter pin (1).

3. Remove cotter pin (6), nut (7), two washers (8), and bolt (9) from two cyclic bellcranks (5). Discard cotter pin (6).

4. Remove cotter pin (10), nut (11), two washers (12), and bolt (13) from collective (center) bellcrank (14) on support assembly (15).

5. Remove cotter pin (16), nut (17), two washers (18), and bolt (19) from collective (center) bellcrank (14).

NOTE

Removal of vertical control tubes connected to cyclic bellcranks, and linkage connected to collective bellcrank is not required.

6. Swing the three short actuator tubes (20 and 21) up and forward out of way.

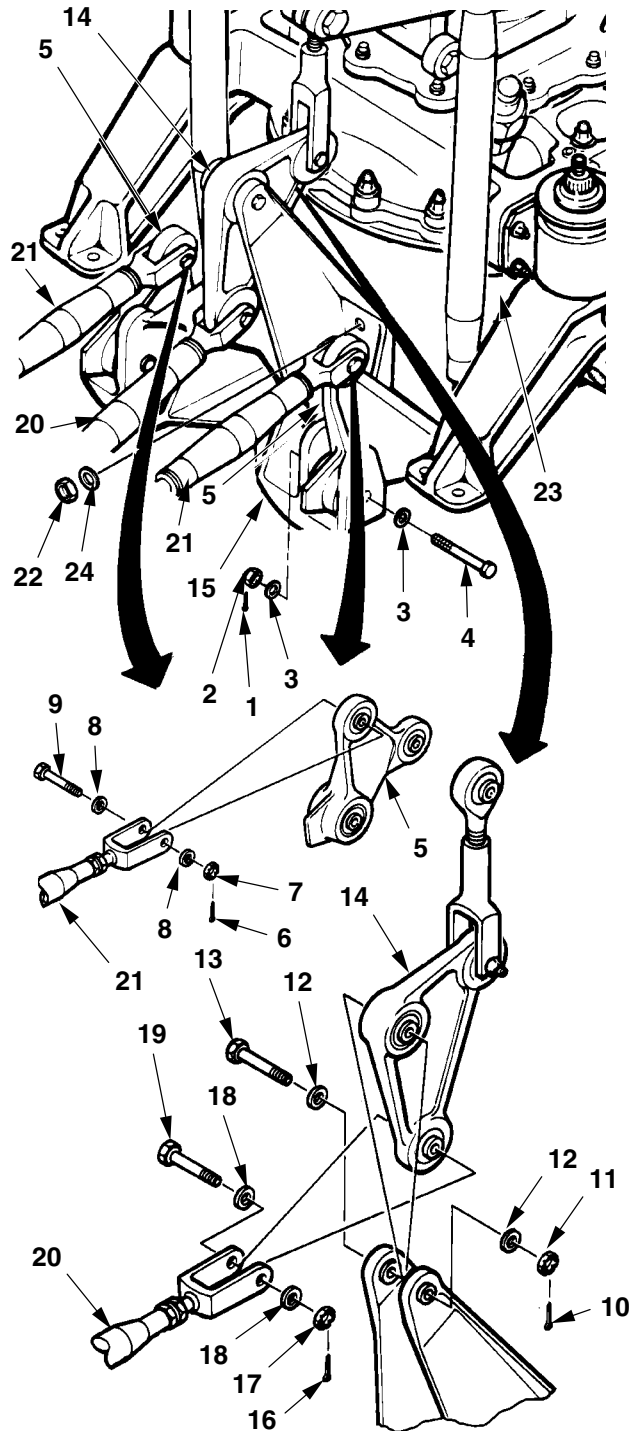
7. Remove lockwire from two top nuts (22) securing collective and cyclic support assembly (15) to forward case of the main transmission (23).

8. Remove six nuts (22) and six washers (24) securing cyclic and collective support assembly (15) to transmission.

9. Lift support assembly (15) up and forward and remove support assembly.

INSTALL

10. Place support assembly (15) in position on transmission (23).



406961-406
J0516

GO TO NEXT PAGE

11-2-58. CONTROL SUPPORT ASSEMBLY — REMOVAL/INSTALLATION (CONT)

11. Install six washers (24) and six nuts (22) to secure support assembly (15) to transmission (23).

12. Torque nuts (22) **100 TO 125 INCH-POUNDS**. Secure top two nuts (22) with lockwire (D132).

WARNING**FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)**

Correct installation of actuator tubes to center bellcrank and bellcrank to support assembly is a critical flight safety task. Ensure nuts and cotter pins are secure.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

13. Install bolt (13), two washers (12), and nut (11) to secure pivot bearing of collective (center) bellcrank (14) to support assembly (15). Torque nut (11) **60 TO 85 INCH-POUNDS**.

14. Install cotter pin (10) through nut (11).

15. Connect actuator tube (20) to collective (center) bellcrank (14) with bolt (19), two washers (18), and nut (17). Torque nut (17) **65 TO 85 INCH-POUNDS**.

16. Install cotter pin (16) through nut (17).

17. Position the two cyclic bellcranks (5) in support assembly (15). Install bolt (4), two washers (3), and nut (2) in each of the pivot bearings. Torque nut (2) **95 TO 110 INCH-POUNDS**.

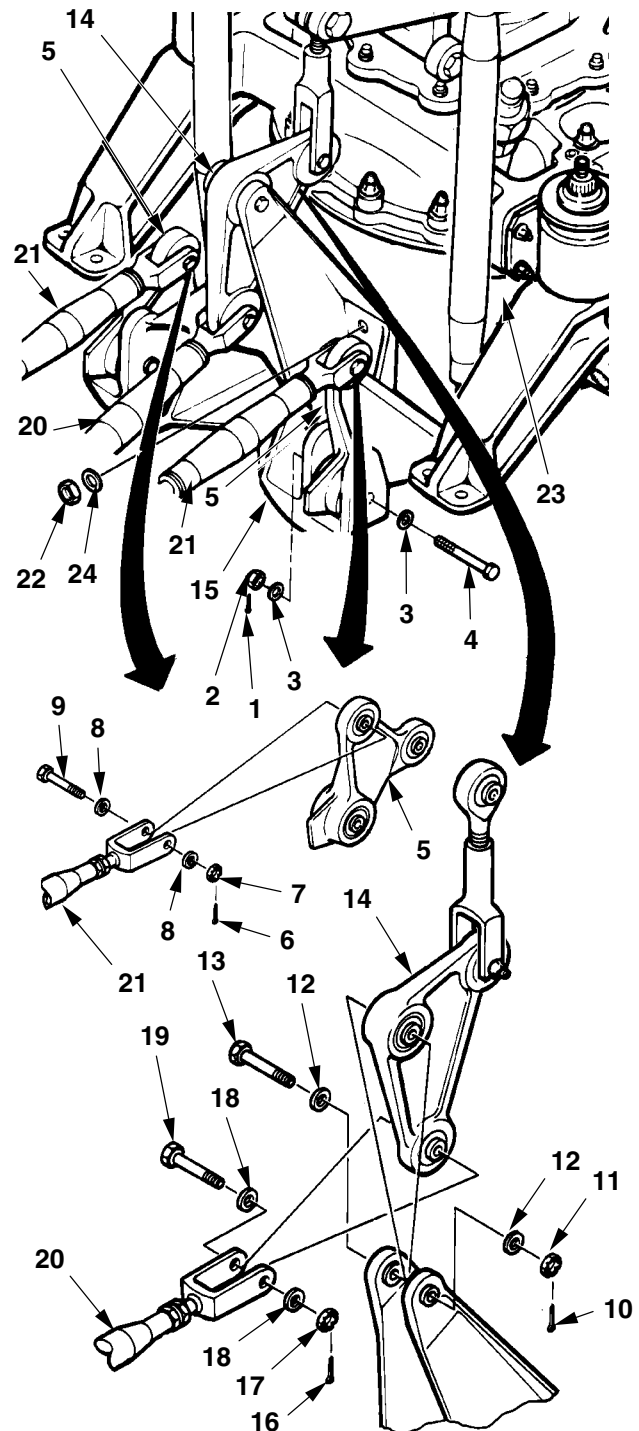
18. Install cotter pin (1) through nut (2).

19. Connect the two actuator tubes (21) to two cyclic bellcranks (5) with two bolts (9), four washers (8), two nuts (7). Torque nuts (7) **65 TO 85 INCH-POUNDS**.

20. Install cotter pins (6) through nuts (7).

INSPECT

21. Check controls for freedom of movement and cotter pins (1, 6, 10, and 16) for proper installation.

406961-406
J0516

GO TO NEXT PAGE

11-2-58. CONTROL SUPPORT ASSEMBLY — REMOVAL/INSTALLATION (CONT)

FOLLOW-ON MAINTENANCE

- Install forward fairing assembly (Task 2-2-47).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).

END OF TASK

11-2-59. CONTROL SUPPORT ASSEMBLY BUSHINGS (AVIM) — REMOVAL/INSTALLATION

This task covers: Remove and Install (Off Helicopter)

INITIAL SETUP

Bearing Staking Tool Set (B189)
Reamer Set (B114)

Applicable Configurations:
All

Personnel Required:
68D Aircraft Powertrain Technical Inspector (TI)
68D Aircraft Powertrain Repairer

Tools:

- Hand Arbor Press (B107)
- Vernier Caliper (B14)
- Telescoping Gage Set (B47)

References:
TM 1-1520-266-23

REMOVE

1. Using hand arbor press (B107), press cyclic bellcrank bushings (1 and 2) and collective bushings (3 and 4) from support assembly (5).

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Fluorescent penetrant inspection of support assembly (5) is a characteristic critical to flight safety.

2. Fluorescent penetrant inspect support assembly (5) in accordance with TM 1-1520-266-23. If cracks in support assembly are suspected perform eddy current inspection (TM 1-1520-266-23).

3. Inspect support assembly (5) bushing bores for damage. Bore damage shall not exceed **0.002 inch** depth of circumference (Task 11-5-3).

INSTALL

WARNING

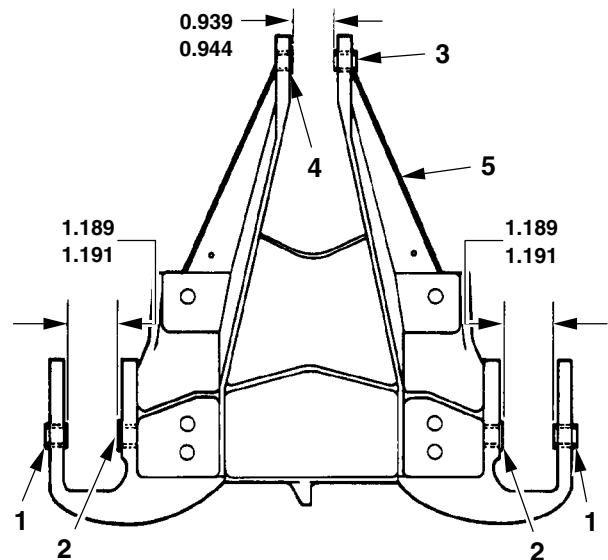
FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

The **0.944 inch** and **1.191 inches** dimensions are characteristics critical to flight safety.

NOTE

Use plug no larger than **1.180 inches** in diameter and no smaller than **0.960 inch** diameter for pressing bushings in place.

4. Press cyclic bellcrank bushings (1 and 2) into support assembly maintaining **1.189 to 1.191 inches** dimension.



406001-216
J0516

5. Using reaming tool (Part of reamer set (B114)), line ream cyclic bushings (1 and 2) after installation to **0.3475 to 0.3755 inch** diameter.

6. Install collective bellcrank bushings (3 and 4) maintaining **0.939 to 0.944 inch** dimension.

7. Using reaming tool (Part of reamer set (B114)), line ream collective bushings (3 and 4) after installation to **0.312 to 0.313 inch** diameter.

INSPECT

END OF TASK

11-2-60. ADJUSTABLE TUBE ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

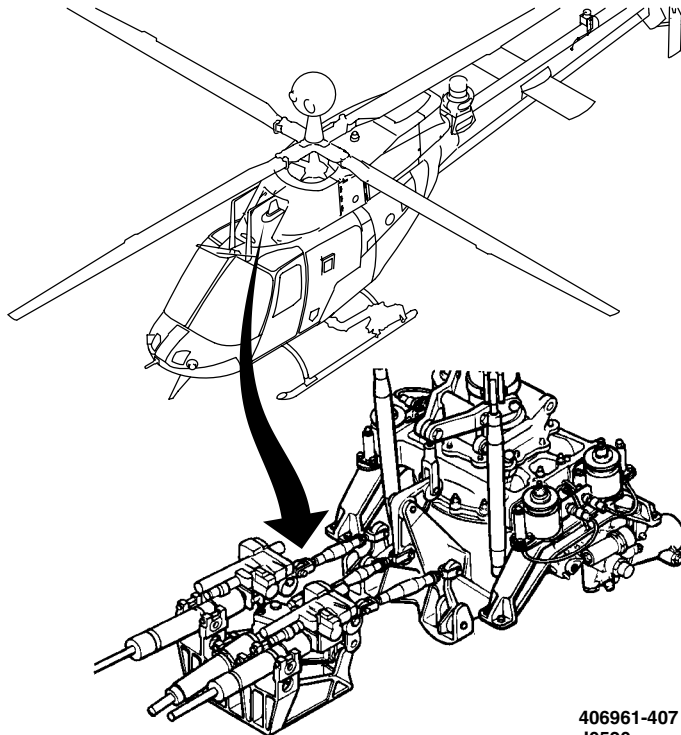
Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B237)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)



406961-407
J0520

GO TO NEXT PAGE

11-2-60. ADJUSTABLE TUBE ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Position maintenance stand (B162) next to helicopter.
2. Disconnect tube assembly (1) by removing two bolts (2), four washers (3), two nuts (4), and two cotter pins (5). Discard cotter pins (5).

INSTALL

3. Check tube assembly (1) for nominal length of **9.77 inches**.

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Correct installation of tube assembly between servoactuator and bellcrank is a critical flight safety task. Ensure nuts and cotter pins are secure.

NOTE

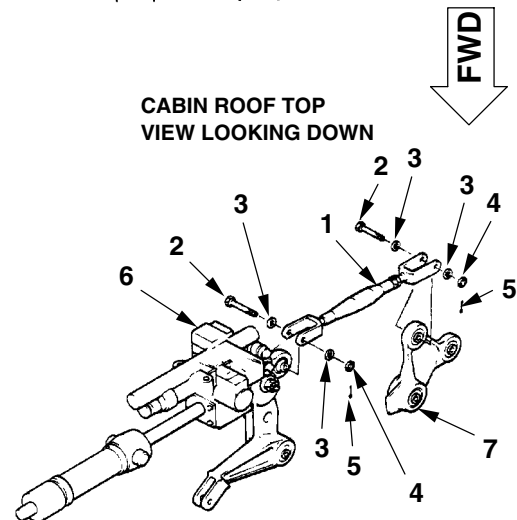
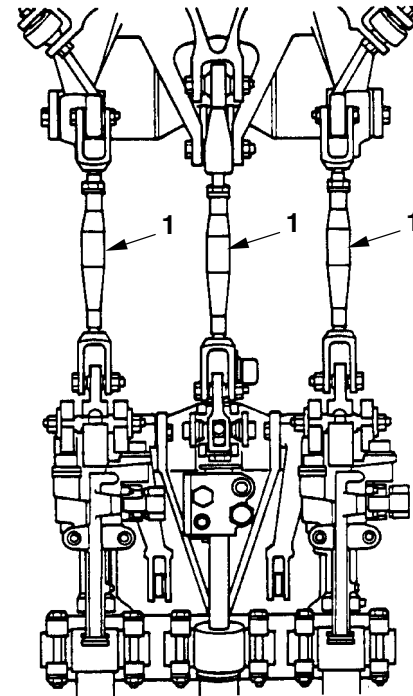
Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

4. Install tube assembly (1) between servoactuator (6) and bellcrank (7) with two bolts (2), four washers (3), and two nuts (4). Torque nuts (4) **65 TO 85 INCH-POUNDS**.
5. Install cotter pins (5) through nuts (4).

INSPECT

FOLLOW-ON MAINTENANCE

- Check rigging (Task 11-1-1 or 11-1-2 or 11-1-3).
- Install forward fairing assembly (Task 2-2-47).



406961-408
J0516

END OF TASK

11-2-61. ADJUSTABLE TUBE ASSEMBLY — DISASSEMBLY/ASSEMBLY

This task covers: Disassembly and Assembly of Adjustable Tube Assemblies (Off Helicopter)

INITIAL SETUP

Material:
Corrosion Preventive Compound (D83)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

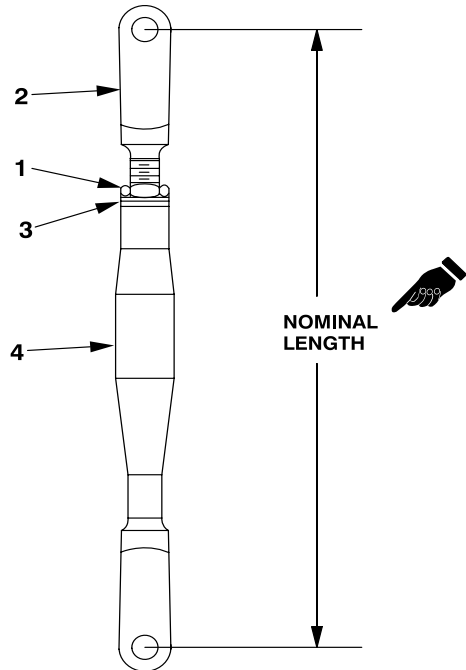
Tools:
General Mechanic Tool Kit (B178)

DISASSEMBLE

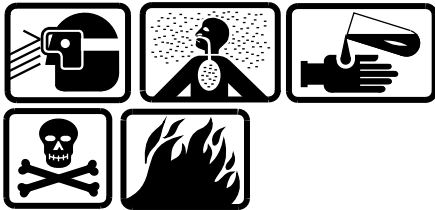
1. Loosen jamnut (1) securing clevis (2).
2. Unscrew clevis (2) and remove washer (3) and jamnut (1). Replace defective clevis (2) or tube assembly (4).

ASSEMBLE

3. Install jamnut (1) and washer (3) on clevis (2).



406001-218
J2062



Corrosion Preventive Compound

4. Coat clevis (2) threads with corrosion preventive compound (D83) and install clevis (2) into tube assembly (4).
5. Adjust clevis (2) until nominal length can be obtained between hole centers.

Part Number	Nominal Length in Inches
406-001-022-101	44.44
406-001-023-113	9.14
406-001-023-119	27.47
406-001-027-101	47.38

6. Tighten clevis jamnut (1). Do not torque until after installation and final adjustment.

INSPECT

END OF TASK

 11-2-62. ACTUATOR SUPPORT ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Torque Wrench (B236)
Torque Wrench (B237)
Torque Wrench (B239)
Plastic Scraper (B123)
Maintenance Stand (B162)

Material:

Acetone (D2)
Wiping Rag (D164)
Sealant (D184)
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Personnel Required:

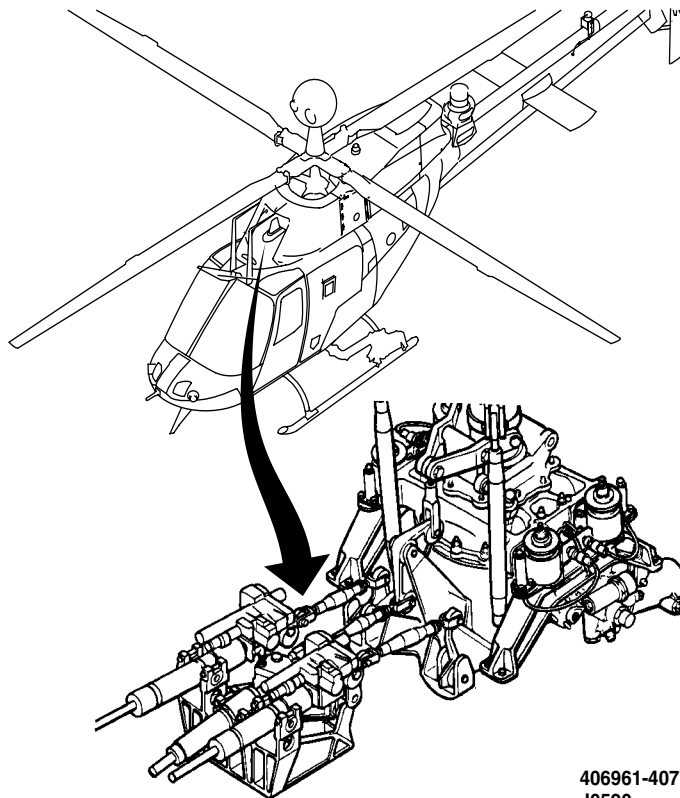
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer (2)

References:

TM 1-1500-204-23

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)
Directional Control Upper Tunnel Bellcrank
Disconnected (Task 11-4-23)
Cyclic Servoactuators Removed (Task 7-1-10)
Collective Servoactuators Removed
(Task 7-1-9)



406961-407
J0520

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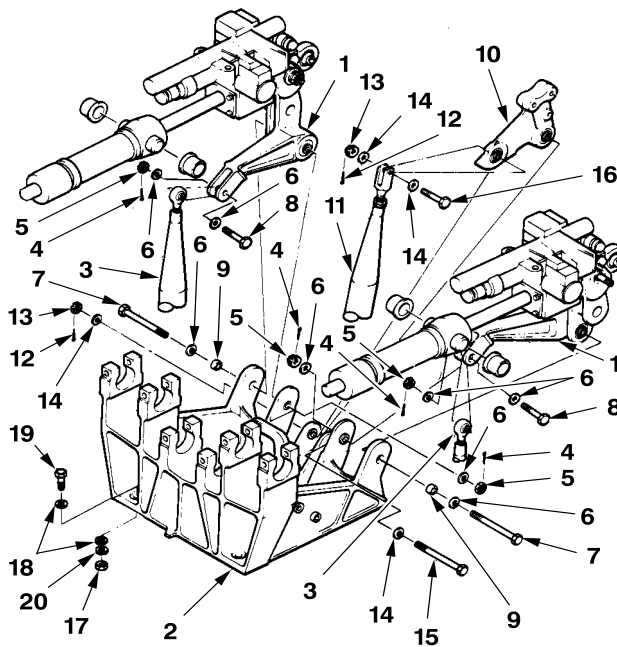
11-2-62. ACTUATOR SUPPORT ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Position maintenance stand (B162) next to helicopter.

2. Remove two cyclic bellcranks (1) from support assembly (2) and control tubes (3) by removing four cotter pins (4), four nuts (5), eight washers (6), two bolts (7), two bolts (8) and two bushings (9). Discard cotter pins (4).

3. Remove collective bellcrank (10) from support assembly (2) and control tube (11) by removing two cotter pins (12), two nuts (13), four washers (14), bolt (15), and bolt (16). Discard cotter pins (12).



406961-819
J0516



Acetone

4. Remove support assembly (2) by removing 4 nuts (17), 10 washers (18), 6 bolts (19), and 4 shims (20). Remove old sealant from cabin roof using plastic scraper (B123) and acetone (D2). Wipe dry with clean wiping rags (D164).

INSTALL

5. Position support assembly (2) on cabin roof and secure with two bolts (19), four washers (18), and two nuts (17) in aft two mounting holes.

6. Torque bolts (19) **20 TO 30 INCH-POUNDS**.

7. Place a 10 to 20 pound weight (shot bags or equivalent), equally distributed, on top of forward end of support assembly (2).

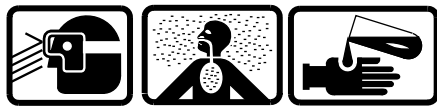
8. Measure shim thickness required for the four mounting bolt holes on the forward end of support assembly (2) by pressing down on upper roof skin in the area of the extreme forward mounting holes. Gap should not exceed **0.001 inch** at each hole.

9. Remove two nuts (17), four washers (18), and two bolts (19) attaching the aft end of support assembly (2) and check the lower mounting surface for scratches in the protective finish as a result of measuring the gap for shims. If scratches are detected, refinish with primer (D98).



Sealing Compound

10. Install support assembly (2) with shims (20) previously measured at appropriate locations. Apply bead of sealant (D184) to faying surfaces of support assembly (2) and cabin roof. Secure support assembly (2) with 6 bolts (19), 10 washers (18), and 4 nuts (17). Torque bolts (19) **120 TO 160 INCH-POUNDS**.



Epoxy Primer Coating

GO TO NEXT PAGE

11-2-62. ACTUATOR SUPPORT ASSEMBLY — REMOVAL/INSTALLATION (CONT)

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT
PART (FSCAP)

Correct installation of collective bellcrank on support assembly is a critical flight safety task. Ensure nut and cotter pin are secure.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

11. Install collective bellcrank (10) on support assembly (2) and secure with bolt (15), two washers (14), and nut (13). Torque nut (13) **50 TO 70 INCH-POUNDS**.

12. Secure collective bellcrank (10) to control tube (11) with bolt (16), two washers (14), and nut (13). Torque nut (13) **50 TO 70 INCH-POUNDS**.

13. Install cotter pins (12) through nuts (13).

14. Install two cyclic bellcranks (1) on support assembly (2) and secure with two bushings (9), two bolts (7), four washers (6), and two nuts (5). Torque nuts (5) **100 TO 140 INCH-POUNDS**.

15. Secure two cyclic bellcranks (1) to two control tubes (3) with two bolts (8), two washers (6), and two nuts (5). Torque nuts (5) **50 TO 70 INCH-POUNDS**.

16. Install cotter pins (4) through nuts (5).

INSPECT**FOLLOW-ON MAINTENANCE**

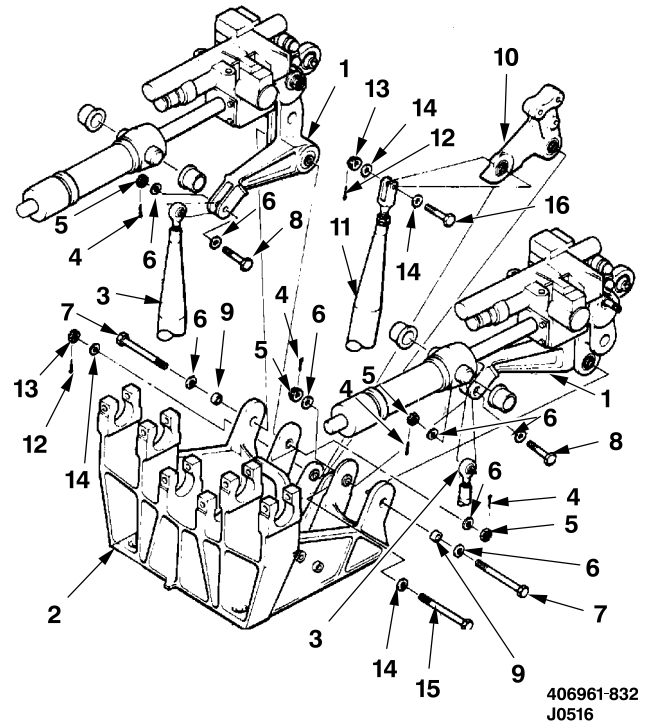
Install collective servoactuator (Task 7-1-9).

Install cyclic servoactuator (Task 7-1-10).

Connect directional control upper tunnel bellcrank (Task 11-4-23).

Bleed hydraulic system (Task 7-2-1).

■ Install forward fairing assembly (Task 2-2-47).



END OF TASK

11-2-63. ACTUATOR SUPPORT ASSEMBLY (AVIM) — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Hand Arbor Press (B107)
Telescoping Gage Set (B47)

Material:
Rubber Gloves (D111)
Wiping Rag (D164)

Drycleaning Solvent (D199)
Abrasive Mat (D1)
Corrosion Preventive Compound (D83)
Zinc Chromate Primer (D161)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:
TM 1-1520-266-23 ■

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11-2-63. ACTUATOR SUPPORT ASSEMBLY (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN



Drycleaning Solvent

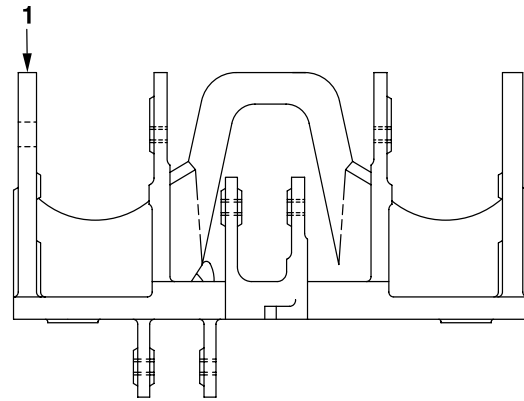
1. Clean actuator support assembly (1) with drycleaning solvent (D199) and a wiping rag (D164).

2. Dry actuator support assembly (1) with a wiping rag (D164).

INSPECT

3. Inspect actuator support assembly (1) for corrosion pitting. Corrosion pitting must not exceed **0.002 inch** after removal of corrosion.

4. Inspect support assembly to limits shown. See figure Actuator Support Assembly — Damage Limits.



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J1803

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART
(FSCAP)

Fluorescent penetrant inspection of actuator support assembly (1) is a characteristic critical to flight safety.

5. Fluorescent penetrant inspect actuator support assembly (1) in accordance with TM 1-1520-266-23. If cracks in actuator support assembly are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR

6. Inspect actuator support assembly (1) for cracks. No cracks are permitted. If cracks in actuator support assembly are suspected perform eddy current inspection (TM 1-1520-266-23).

7. Inspect actuator support assembly (1) bushing bore for damage. Bore damage shall not exceed **0.002 inch** depth for 1/4 of circumference.

8. Fluorescent penetrant inspect area around each hole for cracks in accordance with MIL-STD-6866 after bushing removal (if required). If cracks in actuator support assembly are suspected perform eddy current inspection (TM 1-1520-266-23).

9. Remove corrosion using abrasive mat (D1).



Corrosion Preventive Compound

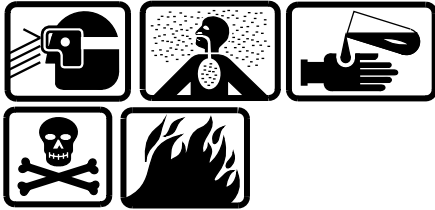
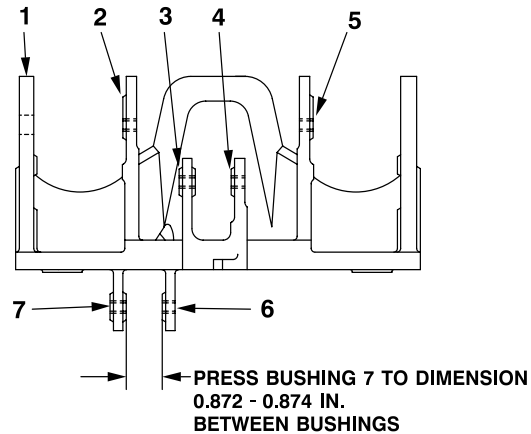
10. Treat area with corrosion preventive compound (D83).

GO TO NEXT PAGE

11-2-63. ACTUATOR SUPPORT ASSEMBLY (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)

11. Support clevis and press out bushings (2, 3, 4, 5, 6, and 7).

12. Thermal fit bushings (2, 3, 4, 5, 6, and 7) in support assembly (1). Stress relief not required.



Zinc Chromate Primer

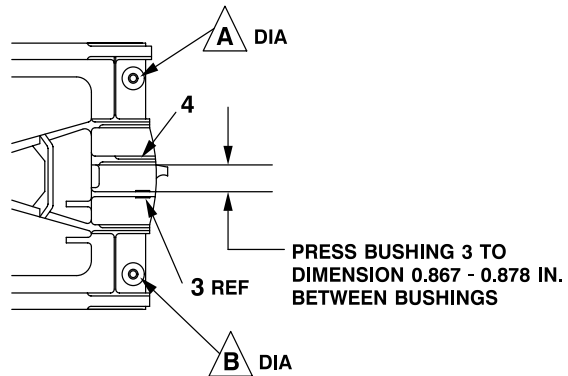
13. Coat bushings (2, 3, 4, 5, 6, and 7) with unreduced zinc chromate primer (D161) prior to installation.

14. Support clevis and press in flanged bushings (2, 4, 5, and 6) first.

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

The **0.874 inch and 0.878 inch** dimensions are characteristics critical to flight safety.



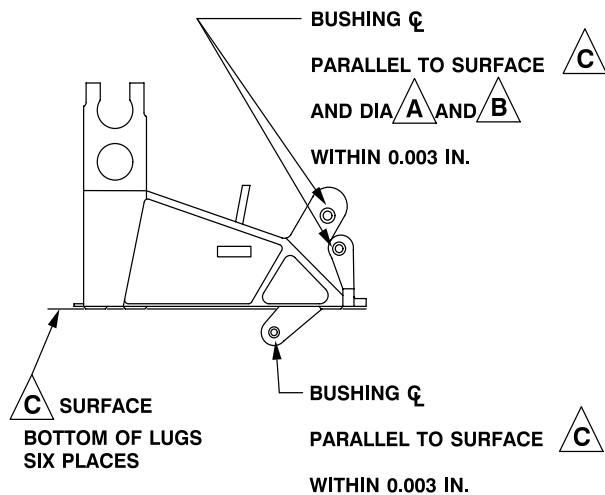
15. Press straight bushings (3 and 7) to dimensions shown to obtain clearance between bushing faces using hand arbor press (B107).

16. Line bushings to the following diameters:

Index No. Of Bushing	Diameter
(2) and (5)	0.312 — 0.313 Inch
(3, 4, 6, and 7)	0.249 — 0.250 Inch In-Line

INSPECT

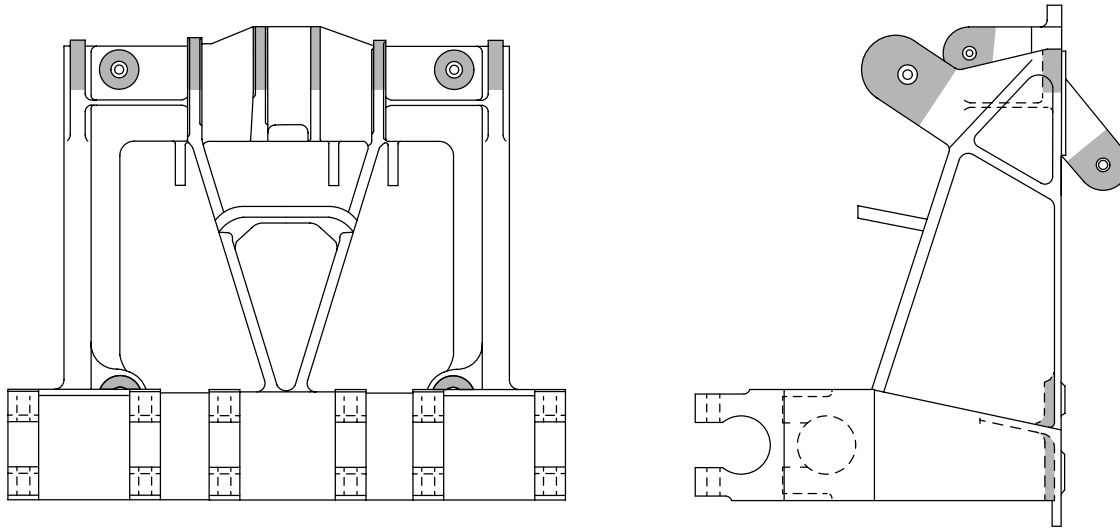
17. Fluorescent penetrant inspect area around bushings for cracks in accordance with MIL-STD-6866. If cracks in bushings are suspected perform eddy current inspection (TM 1-1520-266-23).



406961-219-1
J1803

GO TO NEXT PAGE

11-2-63. ACTUATOR SUPPORT ASSEMBLY (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



ACTUATOR SUPPORT ASSEMBLY
406-001-500-101

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	0.010 in. before and after repair	0.020 in. before and after repair
MECHANICAL	0.010 in. before and after repair	0.020 in. before and after repair
CORROSION	0.005 in. before and 0.010 in. after repair	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.010 sq. in.	Not critical
NUMBER OF REPAIRS	One per lug	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in.	0.060 in.
BORES		
Mount bolt bores:	0.001 in. for full circumference	
Pivot bores:	0.001 in. for 1/4 circumference	

- NOTES: 1. No cracks are permitted.
2. Bushing bores shall be in line and perpendicular to adjacent surface within 0.005 inch.

406001-17
J1845

Actuator Support Assembly — Damage Limits

END OF TASK

11-2-64. COLLECTIVE FRICTION KNOB AND SHAFT — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

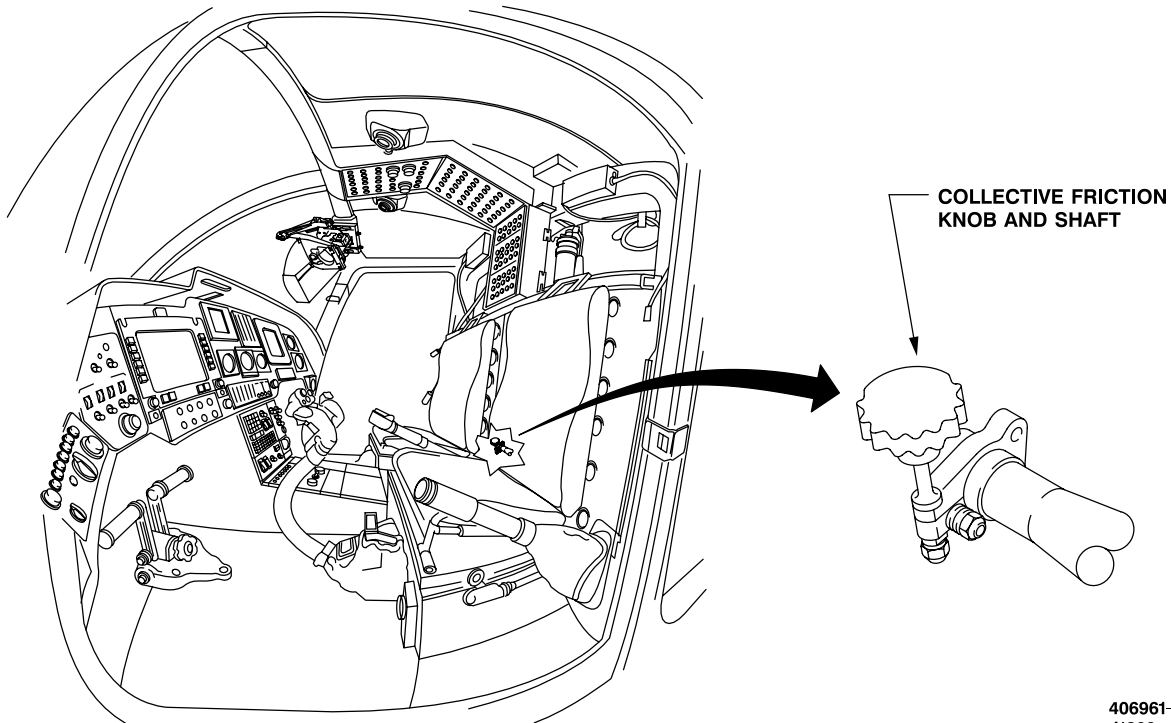
INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B236)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)



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J1803

GO TO NEXT PAGE

11-2-64. COLLECTIVE FRICTION KNOB AND SHAFT — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove knob and shaft (1) and friction nut (2) from bearing (3) by turning knob and shaft (1) counterclockwise after removing jamnut (4) and washer (5).

INSTALL

2. Install knob and shaft (1) in bearing (3) by threading knob and shaft (1) into friction nut (2) until a gap of **0.005 to 0.020 inch** is obtained between shoulder of knob and shaft (1) and bearing (3).

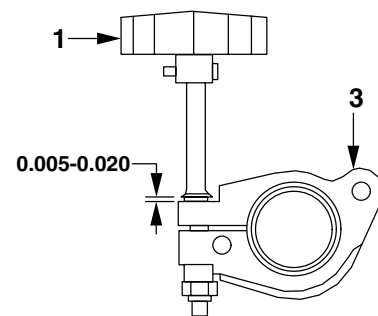
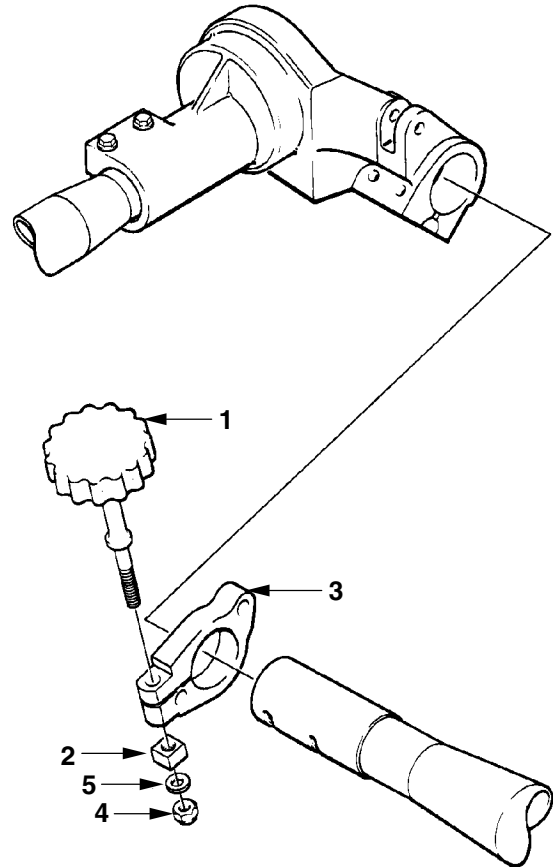
3. Install jamnut (4) and washer (5) on knob and shaft (1). Torque jamnut (4) **30 TO 40 INCH-POUNDS**.

4. Check friction adjustment (Task 11-2-24).

INSPECT

FOLLOW-ON MAINTENANCE

Install crew seat and armor seat panel (Task 2-2-33) or seat pan assembly (Task 2-2-34).



406001-222
J0517

END OF TASK

11-2-65. COLLECTIVE FRICTION KNOB AND SHAFT PIN — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

11-2-65. COLLECTIVE FRICTION KNOB AND SHAFT PIN — REMOVAL/INSTALLATION (CONT)

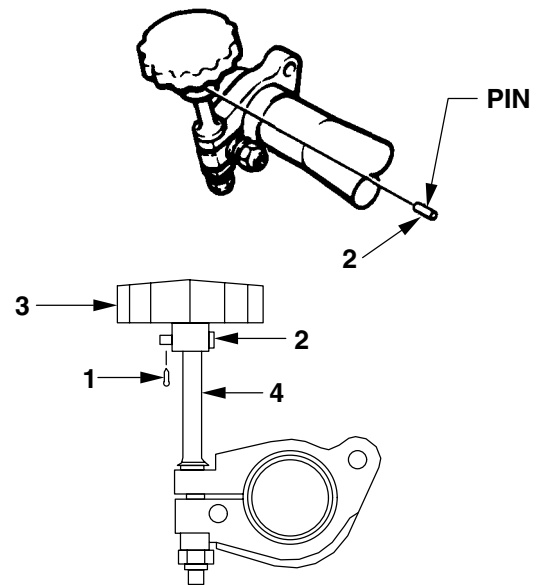
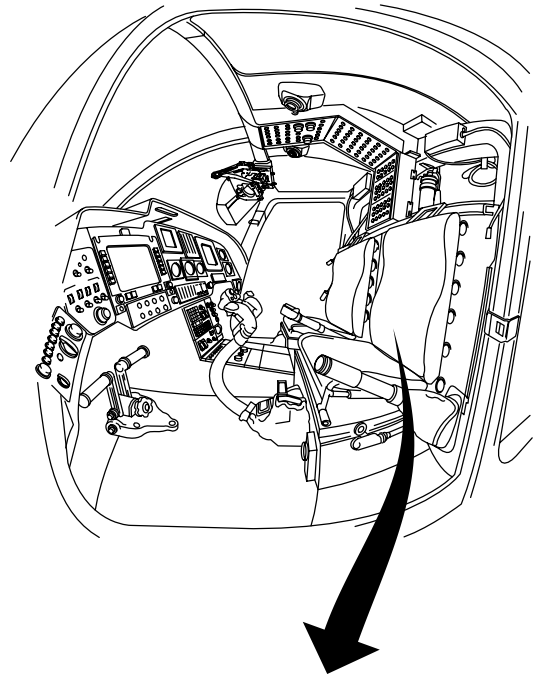
REMOVE

1. Remove cotter pin (1) from pin (2). Discard cotter pin (1).
2. Remove pin (2) from collective friction knob (3).
3. Remove collective friction knob (3) from shaft (4).

INSTALL

4. Position collective friction knob (3) on shaft (4).
5. Insert pin (2) in collective friction knob (3) and shaft (4).
6. Install cotter pin (1) in pin (2).

INSPECT



406961-756
J0517

END OF TASK

11-2-66. COLLECTIVE PLATE ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

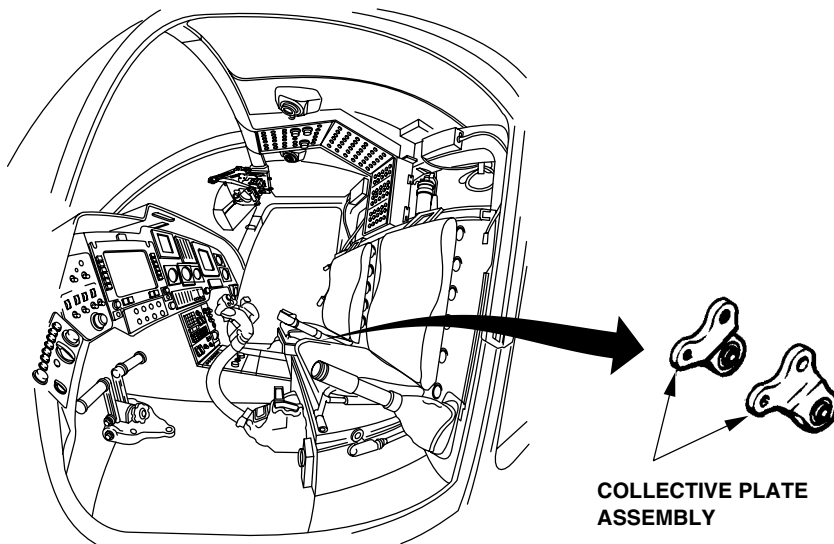
Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B236)

Material:
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Center Post Duct and Panels Removed
(Task 2-2-69)



406961-414
J0517

GO TO NEXT PAGE

11-2-66. COLLECTIVE PLATE ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Cut lockwire, remove two bolts (1) and two washers (2).
2. Remove two cotter pins (3), two nuts (4), and two washers (5). Discard cotter pins (3).
3. Remove two plate assemblies (6) and two washers (7) from trunnion bearing assembly (8). Remove shims (9) between plate assemblies (6) and mixing lever (10).

INSTALL

WARNING

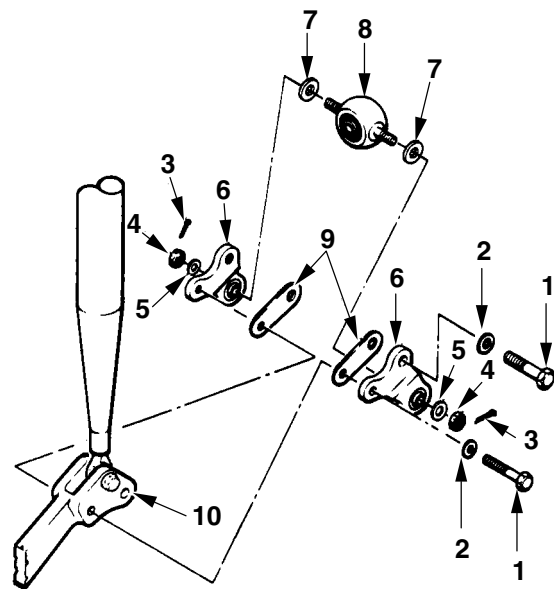
FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Correct installation of collective pitch link to elbow is a critical flight safety task. Ensure nut and cotter pin are secure.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

4. Position two plate assemblies (6) and two washers (7) onto trunnion bearing assembly (8).
5. Install two washers (5) and two nuts (4) fingertight to trunnion bearing assembly (8).
6. Position plate assemblies (6) onto mixing lever (10). Then push on plate assemblies (6), and measure gaps between plate assemblies (6) and mixing lever (10) using feeler gage. Peel shims (9) as required to establish this dimension at **0.002 inch** on each side.
7. Using feeler gage dimensions from step 6, position shims (9), half against one plate and half against the other to within **0.009 inch** of each other, and maintain dimension established in step 7.
8. Install shims (9) using two bolts (1) and two washers (2).
9. Loosen nuts (4) and check for **0.002 inch** maximum total gap between trunnion bearing assembly (8) and plate assemblies (6).

406961-415
J0517

10. Torque nuts (4) **20 TO 35 INCH-POUNDS**.
11. Install cotter pins (3) through nuts (4).
12. Secure bolts (1) with lockwire (D132).

INSPECT

FOLLOW-ON MAINTENANCE

- Install center post duct and panels (Task 2-2-69). ■
- Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).

END OF TASK

11-2-67. COLLECTIVE CONTROL INPUT VALVE BELLCRANK ASSEMBLY — REMOVAL/
INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

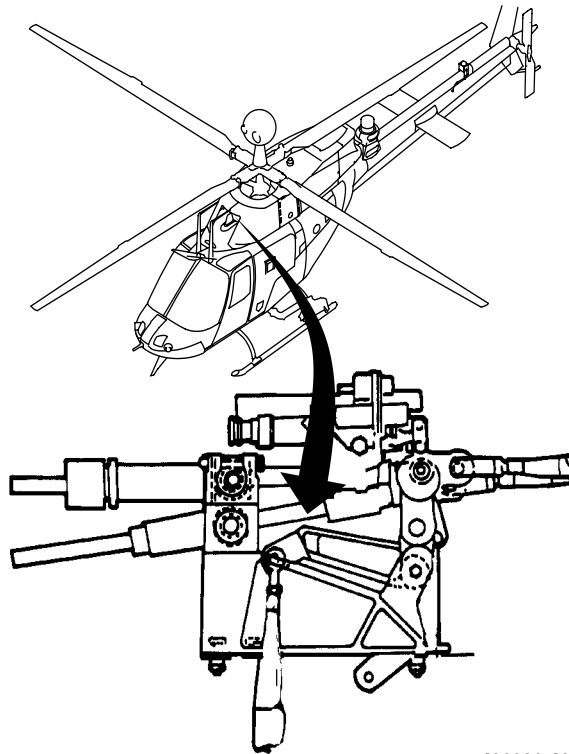
References:
TM 1-1500-204-23

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)
Collective Hydraulic Actuator
Removed (Task 7-1-9)

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B236)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer (2)



406961-416
J0520

GO TO NEXT PAGE

 11-2-67. COLLECTIVE CONTROL INPUT VALVE BELLCRANK ASSEMBLY — REMOVAL/
 INSTALLATION (CONT)

REMOVE

1. Position maintenance stand (B162) next to helicopter.

WARNING

- Ensure that no one operates controls from inside of helicopter during replacement of input valve bellcrank assembly. Physical injury can occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

2. Remove collective bellcrank (1) from support assembly (2) and tube assembly (3) by removing two cotter pins (4), two nuts (5), four washers (6), and two bolts (7). Discard cotter pins (4).

INSTALL

WARNING

**FLIGHT SAFETY CRITICAL AIRCRAFT
 PART (FSCAP)**

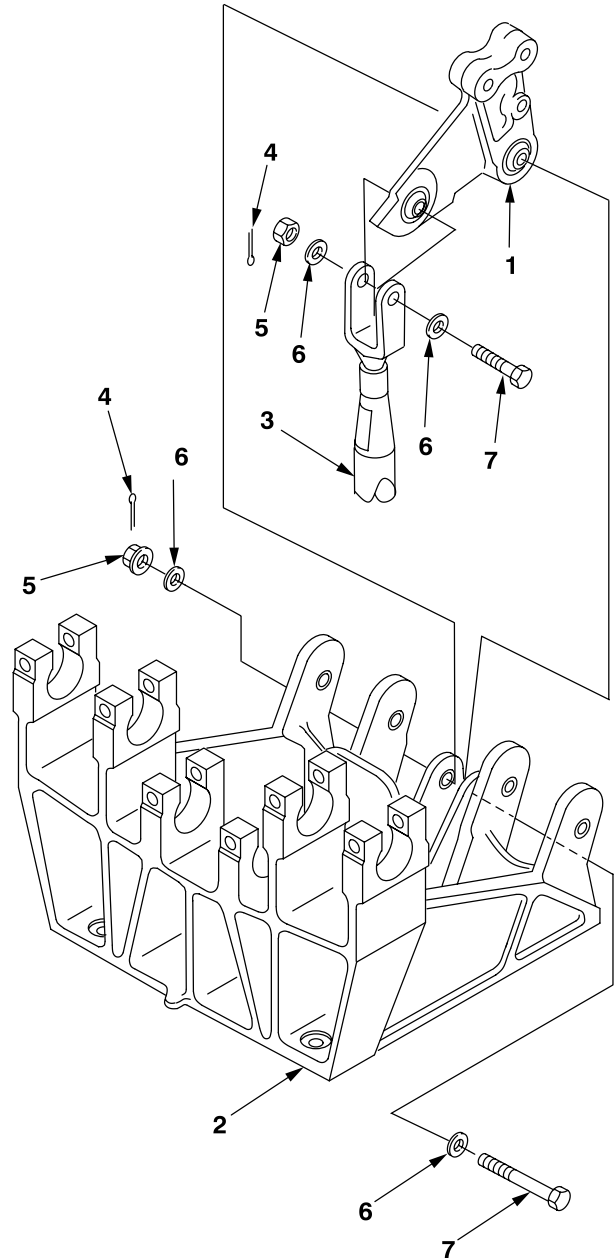
Correct installation of collective bellcrank on support assembly is a critical flight safety task. Ensure nut and cotter pin are secure.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

3. Install collective bellcrank (1) on support assembly (2) and tube assembly (3). Secure with two bolts (7), four washers (6), and two nuts (5). Torque nuts (5) **30 TO 40 INCH-POUNDS**.

4. Install cotter pins (4) through nuts (5).

INSPECT
 406961-417
 J0517

GO TO NEXT PAGE

11-2-67. COLLECTIVE CONTROL INPUT VALVE BELLCRANK ASSEMBLY — REMOVAL/
INSTALLATION (CONT)

FOLLOW-ON MAINTENANCE

Install collective hydraulic actuator (Task 7-1-9).

Bleed hydraulic system (Task 7-2-1).

- Install forward fairing assembly (Task 2-2-47).

END OF TASK

11-2-68. COLLECTIVE CONTROL INPUT VALVE BELLCRANK ASSEMBLY — CLEANING/
INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

- Powertrain Repairer Tool Kit (B180)
- Hand Arbor Press (B107)
- Bearing Staking Tool Set (B189)
- Spring Scale (B120)
- Special Bolt (H15)

Material:

- Wiping Rag (D164)
- Acetone (D2)
- Abrasive Mat (D1)

- Low-Lint Cleaning Cloth (D67)
- Retaining Compound (D169)
- Sandpaper (D175)
- Crocus Cloth (D90)
- Epoxy Primer Coating (D98)
- Rubber Gloves (D111)
- Drycleaning Solvent (D199)

Personnel Required:

- 67S Scout Helicopter Technical Inspector (TI)
- 68D Aircraft Powertrain Repairer

References:

- TM 55-1500-322-24
- TM 1-1520-266-23

CLEAN

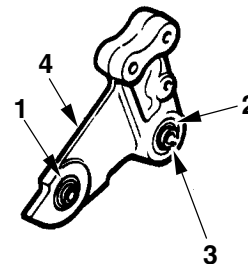


Drycleaning Solvent

1. Clean bellcrank with drycleaning solvent (D199).
2. Dry bellcrank with a wiping rag (D164).

INSPECT

3. Inspect bearings (1 and 2) for condition and tightness. Inspect sleeve (3) for corrosion.
4. Inspect bellcrank (4) to limits shown. See figure Collective Control Input Valve Bellcrank Assembly — Damage Limits. If cracks in bellcrank are suspected perform eddy current inspection (TM 1-1520-266-23).



406001-224
J0517

REPAIR



Sanding Operations

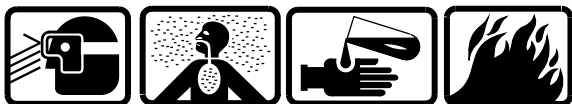
5. Remove scratches, nicks, and corrosion on bellcrank surface with 400 grit sandpaper (D175). Smooth surface with crocus cloth (D90).

GO TO NEXT PAGE

11-2-68. COLLECTIVE CONTROL INPUT VALVE BELLCRANK ASSEMBLY — CLEANING/
INSPECTION/REPAIR (CONT)



Sanding Operations



Acetone

6. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



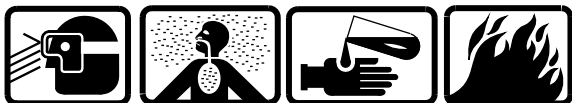
Epoxy Primer Coating

7. Touch up repaired areas of bellcrank with epoxy primer coating (D98).

8. Replace bellcrank if wear or damage limits are exceeded.

REPLACE BEARINGS

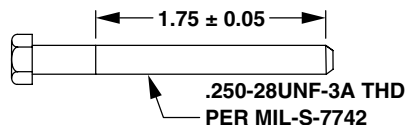
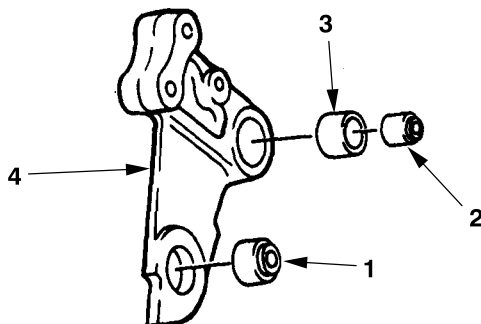
9. Press bearings (1 and 2) and sleeve (3) from bellcrank (4) using special bolt (H15) and hand arbor press (B107).



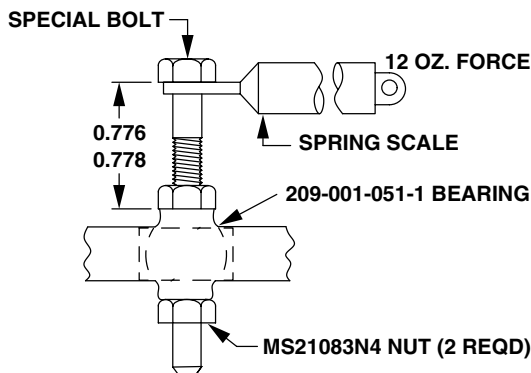
Acetone

10. Clean surfaces with acetone (D2) and abrasive mat (D1) to remove old retaining compound, primer, and other contaminants. Dry surfaces with a clean, dry, low-lint cleaning cloth (D67). Smooth bore with abrasive mat (D1).

11. Inspect bore for damage. Maximum allowable damage is **0.0001 inch** depth for 1/4 circumference.



MAKE FROM MS20073-04-20 BOLT
SPECIAL BOLT

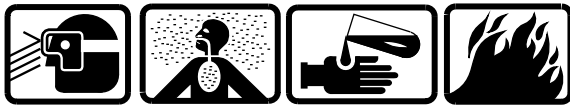


BREAKOUT FRICTION TORQUE
12 IN.-OZ. MAX

406001-282
J0517

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11-2-68. COLLECTIVE CONTROL INPUT VALVE BELLCRANK ASSEMBLY — CLEANING/ INSPECTION/REPAIR (CONT)



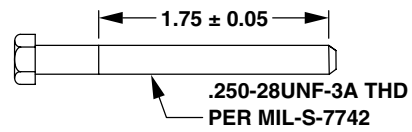
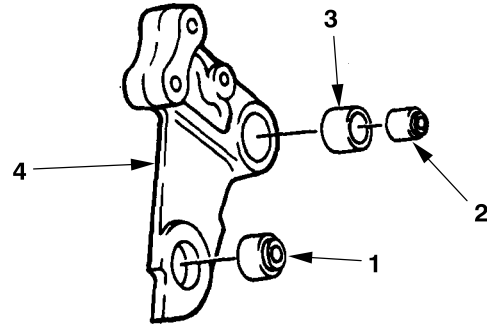
Retaining Compound

12. Apply retaining compound (D169) to all mating surfaces.

NOTE

As soon as possible after applying retaining compound, parts should be pressed into bellcrank.

13. Press bearings (2) into bellcrank (4) and roll stake (TM 55-1500-322-24).



MAKE FROM MS20073-04-20 BOLT
SPECIAL BOLT

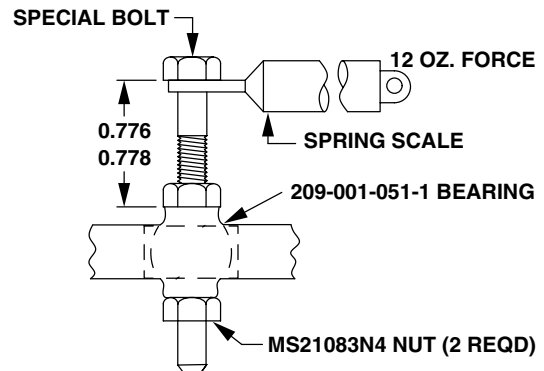


Acetone

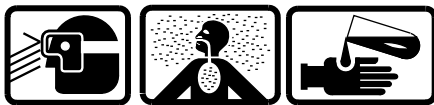
CAUTION

Do not allow acetone to enter bearing.

14. Clean excessive retaining compound from bellcrank with acetone (D2) and brush.



**BREAKOUT FRICTION TORQUE
12 IN.-OZ. MAX**



Epoxy Primer Coating

15. Apply epoxy primer coating (D98) to bore and sleeve (3) and outside surface of bearing (1). Press sleeve (3) and bearing (1) into bellcrank (4).

16. Using bearing staking tool set (B189), ring stake bearing (2) (TM 55-1500-322-24).

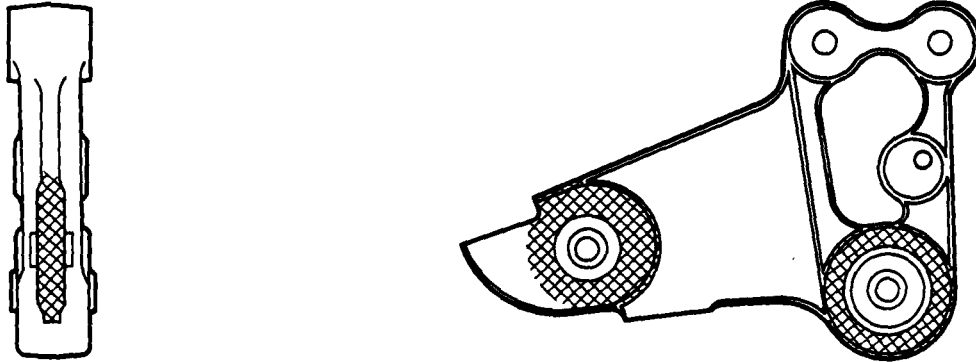
17. Check breakout or misalignment torque of bearing (1) to be **12 inch-ounce** maximum using special bolt (H-15) and spring scale (B120) as shown.

INSPECT

406001-282
J0517

GO TO NEXT PAGE

11-2-68. COLLECTIVE CONTROL INPUT VALVE BELLCRANK ASSEMBLY — CLEANING/
INSPECTION/REPAIR (CONT)



BELLCRANK ASSEMBLY

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	0.010 in. before and after repair	0.030 in. before and after repair
MECHANICAL	0.010 in. before and after repair	0.030 in. before and after repair
CORROSION	0.005 in. before and 0.010 in. after repair	0.015 in. before and 0.030 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	Not critical
NUMBER OF REPAIRS	One per lug	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in.	0.060 in.
BORES	0.001 in. for 1/4 circumference	

- NOTES:
1. No cracks are permitted.
 2. Axial bearing wear shall not exceed 0.030 inch; radial bearing wear shall not exceed 0.005 inch.

406001-74
J0517

Collective Control Input Valve Bellcrank Assembly — Damage Limits

END OF TASK

Section III. CYCLIC CONTROL SYSTEM

11-8. CYCLIC CONTROL SYSTEM

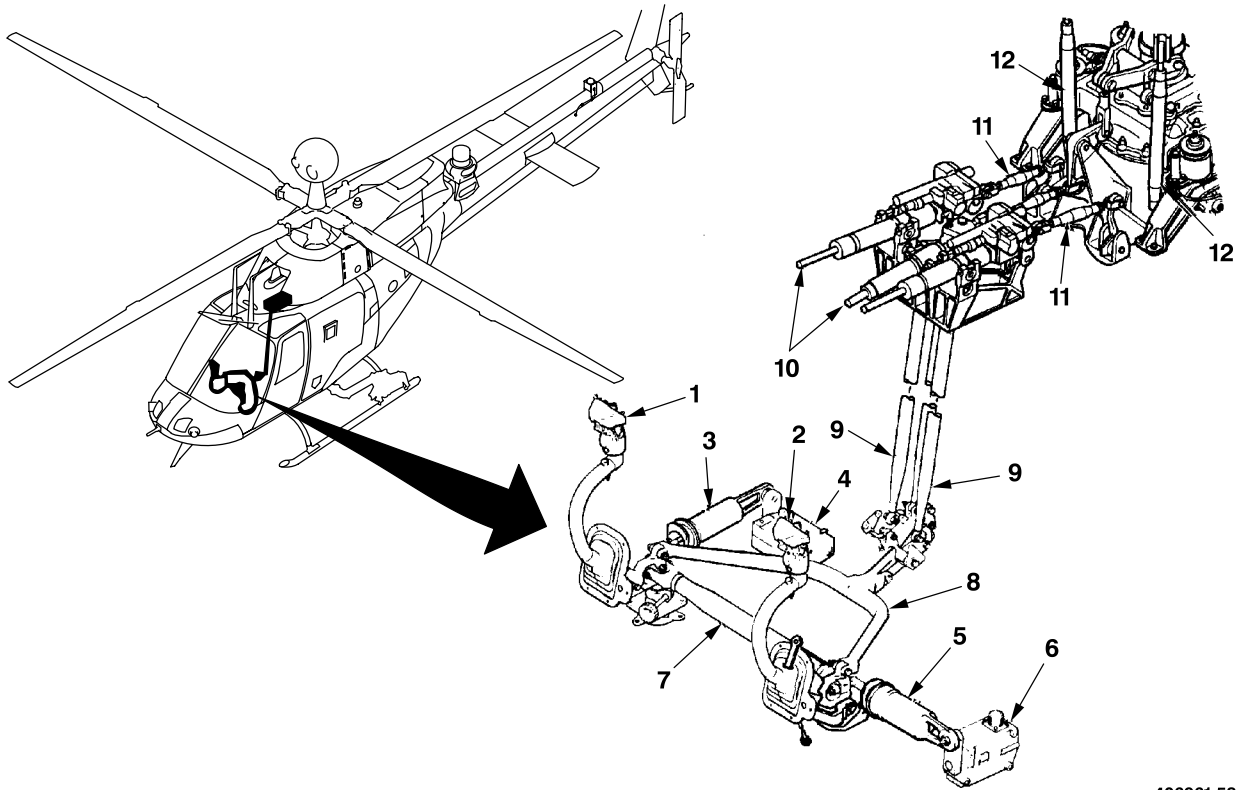
(8), control tubes (9), servoactuators (10), and control tubes (11 and 12) for the OH-58D and OH-58D(R) helicopters. Standard torques are provided in Appendix P and TM 1-1500-204-23.

11-9. INTRODUCTION

This section covers maintenance on the cyclic control system consisting of: pilot cyclic stick (1), CPG cyclic stick (2), fore-and-aft force gradient (3), and magnetic brake (4), lateral force gradient (5), and magnetic brake (6), torque tube (7), yoke

CAUTION

To prevent possible damage to controls or static stops, do not apply excessive force to the controls when entering or exiting the aircraft.



406961-584
J1754

11-10. TASK LIST

This task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Fore-and-Aft Force Gradient — Removal/Installation	11-3-1	11-213
Fore-and-Aft Force Gradient — Cleaning/Inspection/Repair	11-3-2	11-215
Bearing in Force Gradient Cylinder (AVIM) — Removal/Installation	11-3-3	11-220
Fore-and-Aft Magnetic Brake — Removal/Installation	11-3-4	11-222
Fore-and-Aft Magnetic Brake — Cleaning/Inspection/Repair	11-3-5	11-225
Lateral Force Gradient — Removal/Installation	11-3-6	11-226
Lateral Force Gradient — Cleaning/Inspection/Repair	11-3-7	11-228
Force Gradient Tube Assembly — Cleaning/Inspection/Repair	11-3-8	11-233
Lateral Magnetic Brake — Removal	11-3-9	11-235
Lateral Magnetic Brake — Cleaning/Inspection/Repair	11-3-10	11-236
Lateral Magnetic Brake — Installation	11-3-11	11-237
Cyclic Torque Tube — Removal	11-3-12	11-240
Cyclic Torque Tube — Cleaning/Inspection/Repair	11-3-13	11-243
Cyclic Torque Tube — Installation	11-3-14	11-245
Left Cyclic Yoke — Removal	11-3-15	11-248
Left Cyclic Yoke — Installation	11-3-16	11-250
Right Cyclic Yoke — Removal	11-3-17	11-252
Right Cyclic Yoke — Installation	11-3-18	11-254
Cyclic Yoke — Cleaning/Inspection/Repair	11-3-19	11-256
Lateral Cyclic Transducer — Removal	11-3-20	11-258
Lateral Cyclic Transducer — Installation	11-3-21	11-260
Fore-and-Aft Cyclic Transducer — Removal	11-3-22	11-262
Fore-and-Aft Cyclic Transducer — Installation	11-3-23	11-264
Cyclic Friction Knob and Shaft — Removal	11-3-24	11-266
Cyclic Friction Knob and Shaft — Cleaning/Inspection/Repair	11-3-25	11-267
Cyclic Friction Knob and Shaft — Installation	11-3-26	11-269
Copilot/Gunner Cyclic Stick Lockout Catch — Removal/Installation	11-3-27	11-271
Cyclic Mixer Bellcrank Assembly — Removal/Installation	11-3-28	11-273
Cyclic Mixer Bellcrank Assembly Clevis — Cleaning/Inspection/Repair	11-3-29	11-277
Cyclic Mixer Bellcrank Assembly Rod End Bearing — Cleaning/Inspection/Repair	11-3-30	11-279
Cyclic Mixer Bellcrank Assembly (AVIM) — Cleaning/Inspection/Repair	11-3-31	11-281
Cyclic Adjustable Tube Assembly (Typical) — Removal/Installation	11-3-32	11-283
Cyclic Adjustable Tube Assembly Rod End Bearing (Typical) — Removal/Installation	11-3-33	11-287
Input Cyclic Control Bellcrank Assembly Bearings — Removal/Installation	11-3-34	11-290
Input Cyclic Control Bellcrank Assembly Bearings — Cleaning/Inspection/Repair	11-3-35	11-292
Input Cyclic Control Bellcrank Assembly Bearings (AVIM) — Removal/Installation	11-3-36	11-294
Adjustable Tube Assembly Controls — Removal/Installation	11-3-37	11-296

LIST OF TASKS (CONT)

TASK	TASK NUMBER	PAGE NUMBER
Boosted Bellcrank Assembly — Removal/Installation	11-3-38	11-297
Boosted Bellcrank Assembly — Cleaning/Inspection/Repair	11-3-39	11-300
Boosted Bellcrank Assembly Bearings (AVIM) — Removal/Installation	11-3-40	11-302
Boosted Tube Assembly — Removal/Installation	11-3-41	11-305
Pilot Cyclic Stick Pivot Assembly — Removal/Installation	11-3-42	11-308
Pivot Support Bearing — Cleaning/Inspection/Repair	11-3-43	11-310
Cyclic Stick Pivot Bearing Retainer — Cleaning/Inspection/Repair	11-3-44	11-311
Pilot Cyclic Pivot Assembly — Cleaning/Inspection/Repair	11-3-45	11-313
Cyclic Stick Indicator Pin Retainer — Cleaning/Inspection/Repair	11-3-46	11-315
Cyclic Transducer Spacer — Cleaning/Inspection/Repair	11-3-47	11-317
Pilot Cyclic Stick Stop — Cleaning/Inspection/Repair	11-3-48	11-319
Pivot Assembly Bearing (AVIM) — Removal/Installation	11-3-49	11-321
Pilot Cyclic Stick Pivot Bearing — Removal/Installation	11-3-50	11-325
Pilot Cyclic Stick Pivot Bearing — Cleaning/Inspection	11-3-51	11-326
Pilot Cyclic Position Adjustment Rod End — Removal/Installation	11-3-52	11-327
Pilot Cyclic Position Adjustment Rod End — Cleaning/Inspection/Repair	11-3-53	11-330
Pilot Cyclic Position Adjustment Knob Assembly — Removal/Installation	11-3-54	11-332
Pilot Cyclic Position Adjustment Indicator Pin — Removal/Installation	11-3-55	11-335
Pilot Cyclic Position Adjustment Indicator Pin — Cleaning/Inspection/Repair	11-3-56	11-337
Pilot Cyclic Stick and Pivot Support Assembly — Removal/Installation	11-3-57	11-339
Pilot Cyclic Stick Fitting Assembly — Removal/Installation	11-3-58	11-343
Pilot Cyclic Tube Assembly — Cleaning/Inspection/Repair	11-3-59	11-348
Pilot Cyclic Stick Fitting Assembly — Cleaning/Inspection/Repair	11-3-60	11-350
Pilot Cyclic Fitting Assembly Bearings (AVIM) — Removal/Installation	11-3-61	11-352
Pilot Cyclic Pivot Support Assembly Inserts — Removal/Installation	11-3-62	11-354
CPG Cyclic Stick — Removal/Installation	11-3-63	11-355
Cyclic Stick Gimbal/Fitting/Plate/Support Assemblies — Removal/Installation	11-3-64	11-359
CPG Cyclic Stick Gimbal Assembly — Cleaning/Inspection/Repair	11-3-65	11-365
CPG Cyclic Stick Gimbal Assembly Bushing (AVIM) — Removal/Installation	11-3-66	11-367
CPG Cyclic Stick Fitting Assembly — Cleaning/Inspection/Repair	11-3-67	11-368
CPG Cyclic Stick Fitting Assembly Bearings (AVIM) — Removal/Installation	11-3-68	11-370
CPG Cyclic Stick Support Assembly — Cleaning/Inspection/Repair	11-3-69	11-372
CPG Cyclic Stick Support Assembly Bearing (AVIM) — Removal/Installation	11-3-70	11-374
CPG Cyclic Stick Plate Assembly — Cleaning/Inspection/Repair	11-3-71	11-375
CPG Cyclic Stick Plate Assembly Bearing (AVIM) — Removal/Installation	11-3-72	11-377
CPG Cyclic Stick Stud Assembly — Removal/Installation	11-3-73	11-379

LIST OF TASKS (CONT)

TASK	TASK NUMBER	PAGE NUMBER
CPG Cyclic Stick Stud — Cleaning/Inspection/Repair	11-3-74	11-381
CPG Cyclic Stick Quick-Disconnect Lever and Link Assembly — Removal/Installation	11-3-75	11-383
CPG Cyclic Stick Quick-Disconnect Lever Assembly — Cleaning/Inspection/Repair	11-3-76	11-385
CPG Cyclic Quick-Disconnect Lever Bushings (AVIM) — Removal/Installation	11-3-77	11-387
CPG Cyclic Stick Link Assembly — Cleaning/Inspection/Repair	11-3-78	11-388
Link Assembly Bushings (AVIM) — Removal/Installation	11-3-79	11-390
CPG Cyclic Stick Socket Housing/Housing Assembly — Removal/Installation	11-3-80	11-391
CPG Cyclic Stick Housing Assembly — Cleaning/Inspection/Repair	11-3-81	11-394
CPG Cyclic Stick Housing Assembly Bearings — Removal/Installation	11-3-82	11-396
CPG Cyclic Stick Socket Housing Assembly — Cleaning/Inspection/Repair	11-3-83	11-398
CPG Cyclic Stick Socket Housing Bushings (AVIM) — Removal/Installation	11-3-84	11-401
CPG Cyclic Stick Tube Assembly — Removal/Installation	11-3-85	11-402
CPG Cyclic Stick Tube Assembly — Cleaning/Inspection/Repair	11-3-86	11-404
CPG Cyclic Stick Latch Support and Anchor Ball Assembly — Removal/Installation	11-3-87	11-406
CPG Cyclic Stick Quick-Disconnect Latch Assembly — Cleaning/Inspection/Repair	11-3-88	11-411
CPG Cyclic Stick Quick-Disconnect Support Assembly — Cleaning/Inspection/Repair	11-3-89	11-413
CPG Cyclic Stick Quick-Disconnect Anchor Ball Assembly — Cleaning/Inspection/Repair	11-3-90	11-415

11-3-1. FORE-AND-AFT FORCE GRADIENT — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

References:
TM 1-1500-204-23

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B236)
Torque Wrench (B237)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

GO TO NEXT PAGE

11-3-1. FORE-AND-AFT FORCE GRADIENT — REMOVAL/INSTALLATION (CONT)

REMOVE

WARNING

Ensure that no one moves flight controls during removal and installation of fore-and-aft force gradient. Physical injury can occur. If injury occurs, seek medical aid. A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Remove cotter pin (1) and discard.
2. Remove nut (2), washer (3), bolt (4), and spacers (5 and 6) to separate force gradient (7) from cyclic stick pivot (8).
3. Remove cotter pin (9) and discard.
4. Remove nut (10) and spacers (11 and 12) to separate force gradient (7) from magnetic brake (13). Remove force gradient (7).
5. Loosen nut (14). Remove tube assembly (15) and washer (16) from force gradient (7).

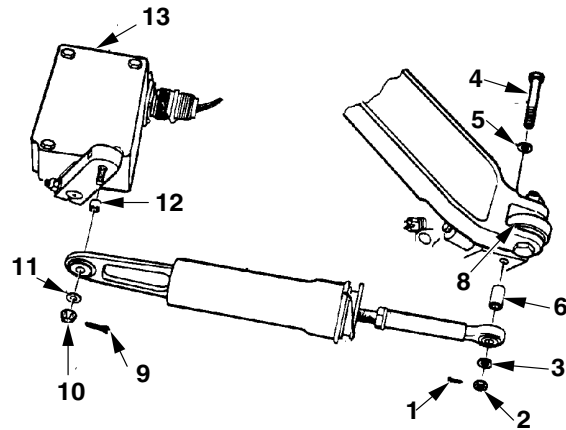
INSTALL

6. Install tube assembly (15) and washer (16) on force gradient (7). Tighten nut (14) fingertight. Do not torque nut (14) until rigging check after installation.
7. Install force gradient (7) between magnetic brake (13) and cyclic stick pivot (8).

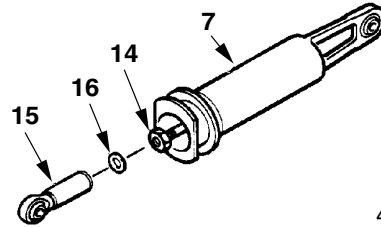
NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

8. Install spacers (11 and 12) and nut (10).
■ Torque nut (10) 30 TO 40 INCH-POUNDS.
9. Install cotter pin (9) through nut (10).
10. Install bolt (4), spacers (5 and 6), washer (3), and nut (2). Torque nut (2) **50 TO 70 INCH-POUNDS.**



VIEW LOOKING DOWN UNDER PILOT SEAT



406961-586
J0517

11. Install cotter pin (1) through nut (2).

INSPECT

FOLLOW-ON MAINTENANCE

Check cyclic controls rigging (Task 11-1-3).

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

END OF TASK

11-3-2. FORE-AND-AFT FORCE GRADIENT — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Spring Scale (B121)
■ Torque Wrench (B238)

Material:
Rubber Gloves (D111)
Lockwire (D132)
Sandpaper (D175)
Solid Film Lubricant (D136)
Zinc Chromate Primer (D161)
Drycleaning Solvent (D199)
Wiping Rag (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

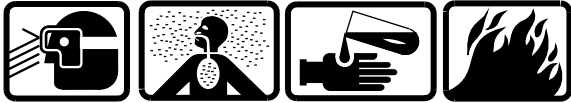
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11-3-2. FORE-AND-AFT FORCE GRADIENT — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN

CAUTION

When cleaning force gradient, do not contaminate bearing with drycleaning solvent.



Drycleaning Solvent

1. Clean force gradient surface with drycleaning solvent (D199).
2. Dry force gradient with a wiping rag (D164).

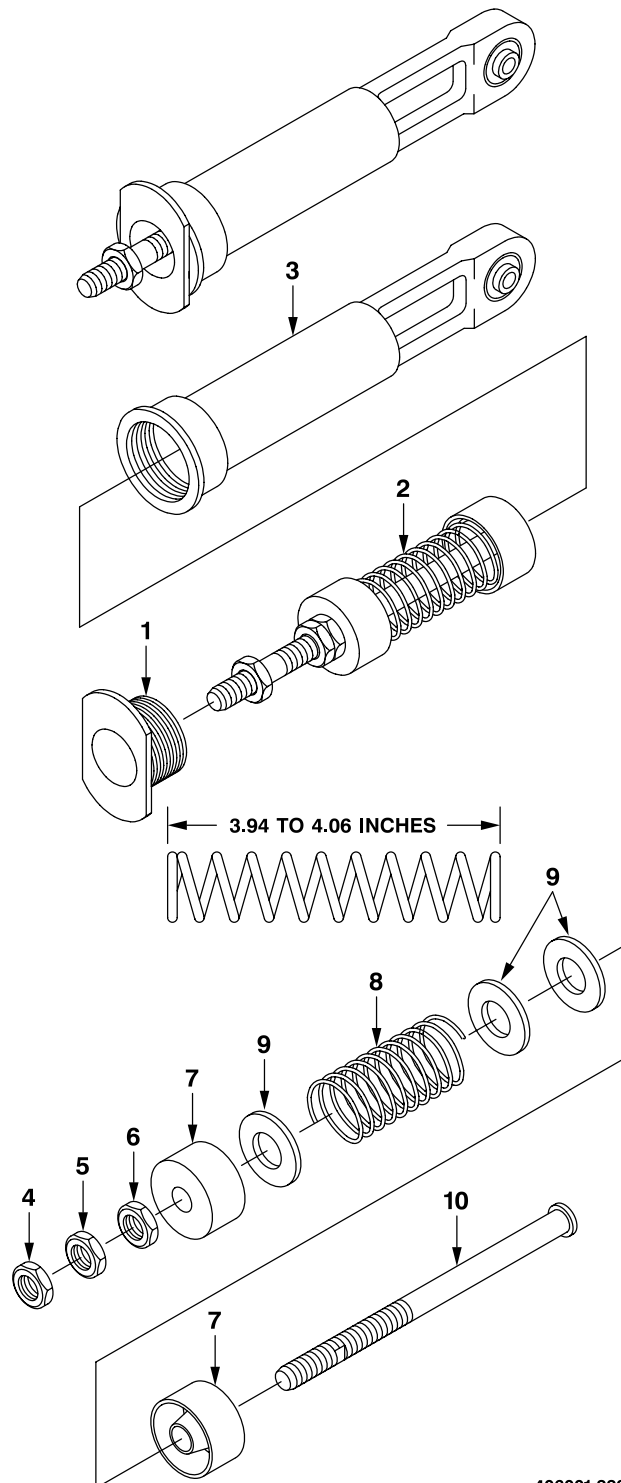
DISASSEMBLE

3. Remove lockwire from cap (1).
4. Remove cap (1) and spring assembly (2) from cylinder (3).
5. Remove nuts (4 and 5).

WARNING

Spring guides are under tension. Use caution when removing nut to avoid injury to personnel.

6. Remove nut (6), guides (7), spring (8), and three washers (9) from shaft (10).



406001-229
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11-3-2. FORE-AND-AFT FORCE GRADIENT — CLEANING/INSPECTION/REPAIR (CONT)

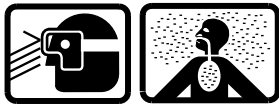
INSPECT

7. Inspect spring (8) for a free length of **3.94 to 4.06 inches**. Replace spring if length is not within limits.

8. Inspect other parts of force gradient for damage to limits shown. When limits are exceeded replace part. See figure Fore-and-Aft Force Gradient — Damage Limits.

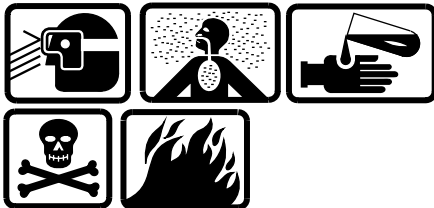
9. Inspect bearing in cylinder (3) for wear as shown. If limits are exceeded, bearing can be replaced by AVIM (Task 11-3-3).

REPAIR



Sanding Operations

10. Polish out reparable damage with 400 grit sandpaper (D175).



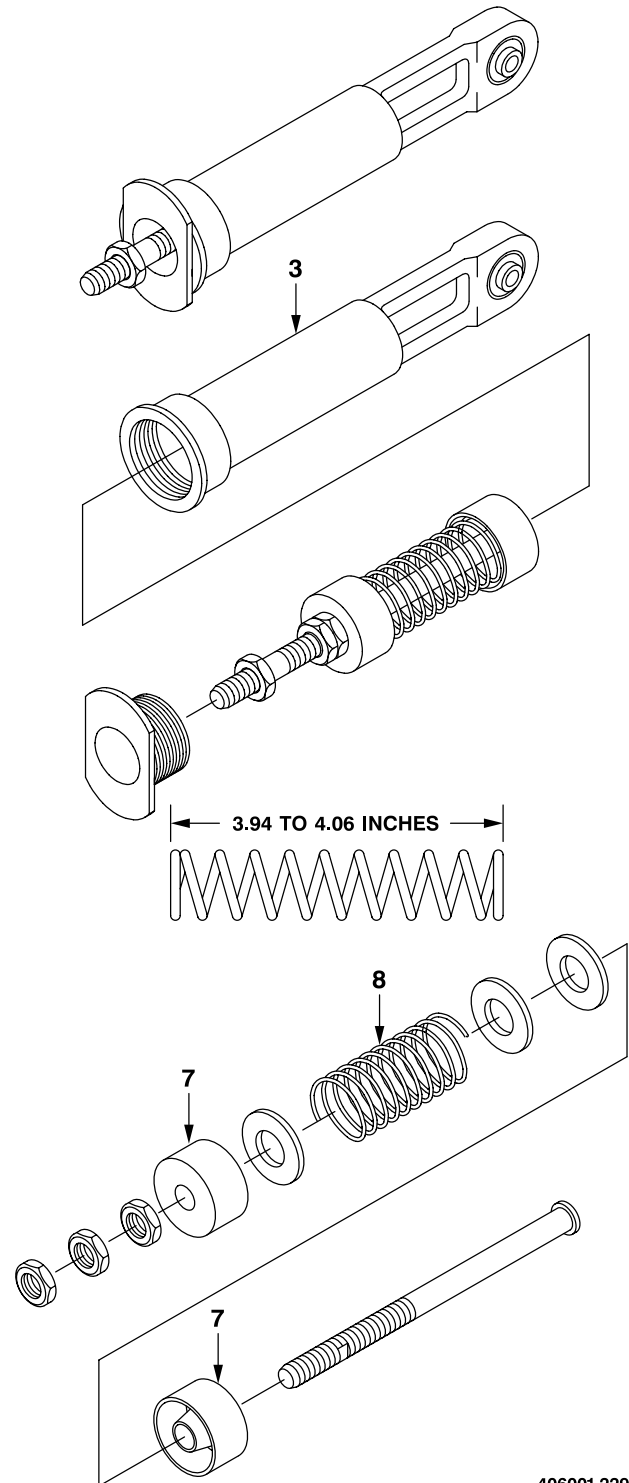
Lubricant

11. Apply solid film lubricant (D136) to bare metal on inside surface of cylinder (3) and outside surface of guides (7).



Zinc Chromate Primer

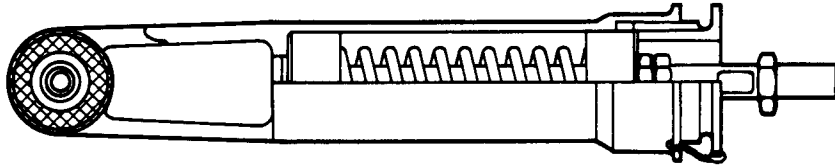
12. Apply one coat of zinc chromate primer (D161) to repaired areas on outside of cylinder (3).



406001-229
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GO TO NEXT PAGE

11-3-2. FORE-AND-AFT FORCE GRADIENT — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	0.005 in. before and 0.010 in. after repair	0.010 in. before and 0.020 in. after repair
MECHANICAL AND CORROSION		
MAXIMUM AREA PER FULL DEPTH REPAIR	0.062 sq. in.	0.50 sq. in.
NUMBER OF REPAIRS	Not critical	Not critical
BORES	0.002 for 1/4 circumference	
EDGE CHAMFER TO REMOVE DAMAGE	0.020 in. x 45°	0.020 in. x 45°
THREAD DAMAGE:		
Depth	1/3 of thread	
Length	1/4 of circumference	
Number	One per threaded segment	
BEARING WEAR		
Axial	0.012	
Radial	0.005	

406001-25
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Fore-and-Aft Force Gradient — Damage Limits

GO TO NEXT PAGE

11-3-2. FORE-AND-AFT FORCE GRADIENT — CLEANING/INSPECTION/REPAIR (CONT)

ASSEMBLE

13. Install guides (7), three washers (9), and spring (8) on shaft (10).

14. Install nuts (6, 5, and 4) on shaft (10). Do not tighten nuts. Temporarily install rod end bearing assembly (11) for attachment of spring scale (B121) (12).

15. Adjust spring preload as follows:

a. Insert hook of spring scale (B121) (12) through rod end bearing (11).

b. Hold spring assembly (2) securely in place and spring scale (B121) (12) parallel with shaft (10) and exert 12.0 to 14.0 pounds of force on spring. Measure and record length of spring (8) and guides (7).

c. Tighten nut (6) to hold guides (7) in position noted in step b.

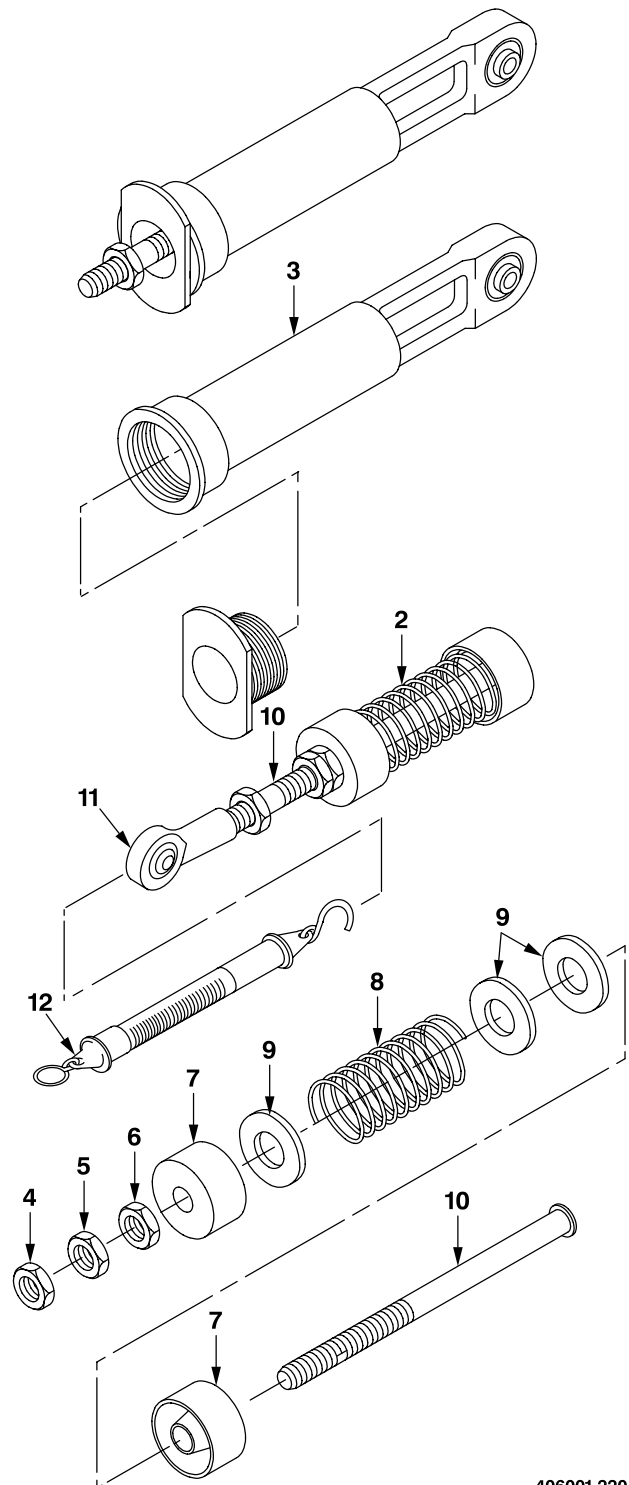
d. Torque nut (5) **95 TO 110 INCH-POUNDS** to lock nut (6) in place. Leave nut (4) loose.

e. Release force and remove spring scale (B121) (12) and rod end bearing assembly (11) from shaft (10).

16. Install spring assembly (2) and cap (1) in cylinder (3).

17. Tighten cap (1) until all end play of spring assembly (2) is eliminated.

18. Secure cap (1) with lockwire (D132) (2 places).

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J2211

END OF TASK

11-3-3. BEARING IN FORCE GRADIENT CYLINDER (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Repairer Tool Kit (B180)
Hand Arbor Press (B107)
Bearing Staking Tool Set (B189)
Spring Scale (B120)
Special Bolt (H-15)

Material:
Acetone (D2)
Abrasive Mats (D1)
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:
TM 55-1500-322-24

GO TO NEXT PAGE

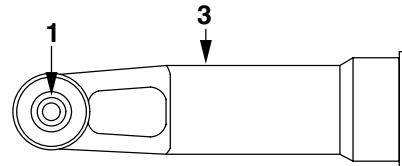
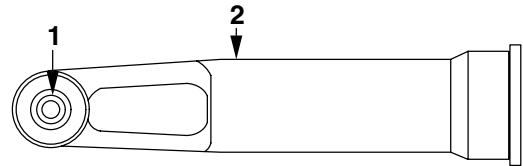
11-3-3. BEARING IN FORCE GRADIENT CYLINDER (AVIM) — REMOVAL/INSTALLATION (CONT)

REMOVE

NOTE

Procedures for replacing bearing in fore-and-aft cylinder and lateral cylinder are the same.

1. Using hand arbor press (B107), press bearing (1) from cylinder (2 or 3).



Acetone

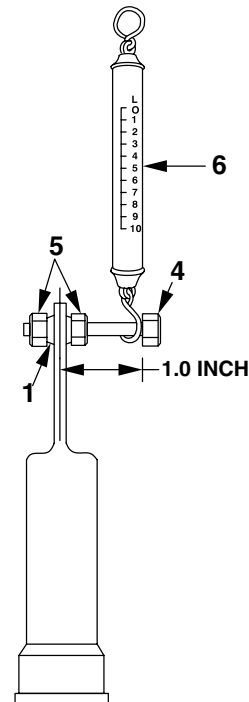
2. Remove epoxy primer coating from bearing bore with acetone (D2) and abrasive mats (D1).
3. Inspect bearing bore for damage, maximum allowable, **0.002 inch** for 1/4 of circumference (Task 11-3-2).

INSTALL



Epoxy Primer Coating

4. Coat bearing bore in cylinder (2 or 3) and mating surfaces of bearing (1) with epoxy primer coating (D98).
5. Install bearing (1) in bore of cylinder (2 or 3) while primer is still wet.
6. Using bearing staking tool set (B189), ring stake bearing (1) (both sides) (TM 55-1500-322-24).



CHECK BEARING BREAKOUT TORQUE

7. Install **1/4-inch** bolt (4) with two nuts (5) as shown.
8. Attach spring scale (B120) (6) to bolt (4).
9. Check force required to move bearing (1); maximum allowable is 12 ounces.

INSPECT

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END OF TASK

11-3-4. FORE-AND-AFT MAGNETIC BRAKE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B235)
Torque Wrench (B236)
Torque Wrench (B237)

Material:
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 55-1500-323-24

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

GO TO NEXT PAGE

11-3-4. FORE-AND-AFT MAGNETIC BRAKE — REMOVAL/INSTALLATION (CONT)

REMOVE

WARNING

- Ensure that no one moves flight controls during removal and installation of magnetic brake. Physical injury can occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

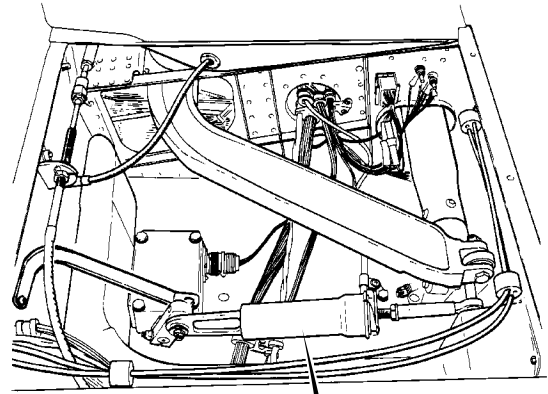
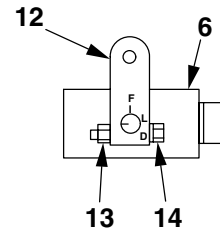
1. Remove lockwire from electrical connector (1).
2. Disconnect electrical connector (1).
3. Remove cotter pin (2) and discard.
4. Remove nut (3) and spacers (4 and 5) to separate magnetic brake (6) from force gradient (7).
5. Remove four bolts (8), four washers (9), eight washers (10), bonding strap (11), and magnetic brake (6).

PREPARE MAGNETIC BRAKE FOR INSTALLATION

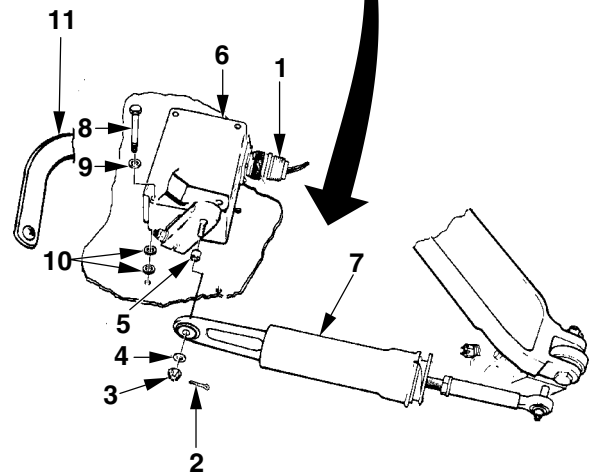
6. Check that arm (12) is positioned on shaft of magnetic brake (6) so that F on arm is located 90 degrees clockwise from mark on shaft as shown.

7. If arm (12) is incorrectly positioned, reposition as follows:

- a. Remove nut (13) and bolt (14).
- b. Remove arm (12) and position on shaft of magnetic brake (6) as shown.
- c. Install bolt (14) and nut (13). Torque nut (13) **12 TO 15 INCH-POUNDS**.



VIEW LOOKING DOWN UNDER PILOT SEAT

406961-592
J0517

GO TO NEXT PAGE

11-3-4. FORE-AND-AFT MAGNETIC BRAKE — REMOVAL/INSTALLATION (CONT)

INSTALL

8. Perform Class H electrical bond between magnetic brake (6) and aircraft structure per Appendix M (TM 55-1500-323-24).

9. Install magnetic brake (6).

10. Install four bolts (8), four washers (9), bonding strap (11), under bolt head, and eight washers (10) under magnetic brake (6). Torque bolts (8) **50 TO 70 INCH-POUNDS**.

11. Connect electrical connector (1)

12. Secure electrical connector (1) to drilled head bolt with lockwire (D132).

13. Install spacer (5), force gradient (7), spacer (4), and nut (3) on shaft of magnetic brake (6). Torque nut (3) **30 TO 40 INCH-POUNDS**.

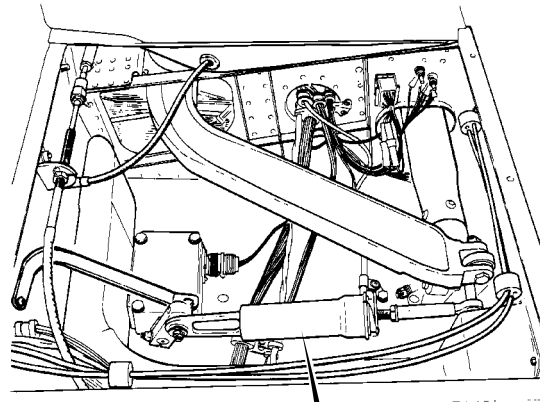
14. Install cotter pin (2).

INSPECT

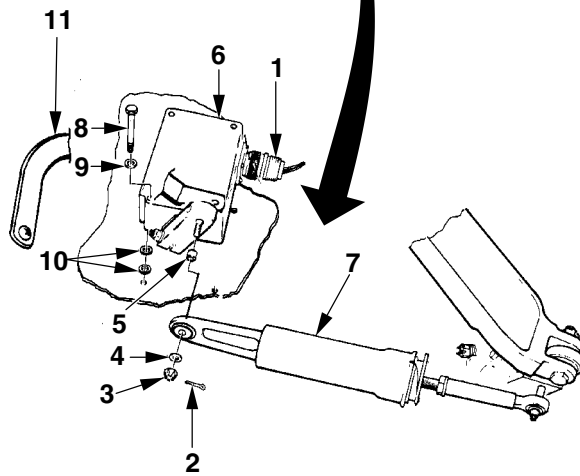
FOLLOW-ON MAINTENANCE

Check cyclic controls rigging (Task 11-1-3).

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).



VIEW LOOKING DOWN UNDER PILOT SEAT



406961-592
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END OF TASK

 11-3-5. FORE-AND-AFT MAGNETIC BRAKE — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Spring Scale (B120)
Spring Scale (B122)

Material:
Rubber Gloves (D111)
Drycleaning Solvent (D199)
Wiping Rag (D164)

Personnel Required:
67S Scout Helicopter Repairer

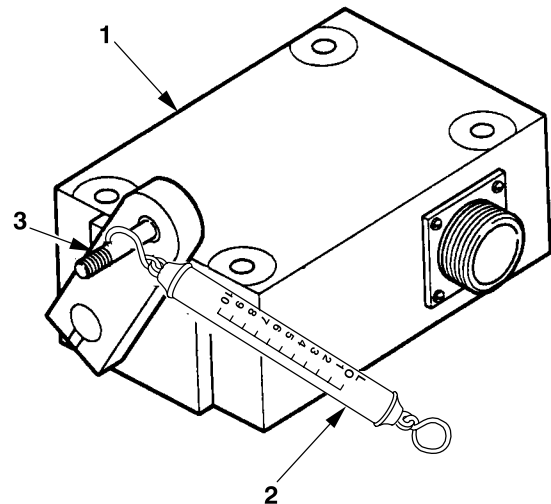
CLEAN

**Drycleaning Solvent**

1. Clean magnetic brake surface with drycleaning solvent (D199).
2. Dry magnetic brake with a wiping rag (D164).

INSPECT

3. Inspect fore-and-aft magnetic brake for:
 - a. Dents and cracks.
 - b. Damaged electrical connector and connector pins.
 - c. Bent or broken shaft.
4. Functional test fore-and-aft magnetic brake:
 - a. Secure brake (1) to work bench or suitable support.
 - b. With brake (1) off, attach spring scale (B120) (2) to arm (3). Arm should operate freely with 2.5 pounds of force or less pull on spring scale.
 - c. With brake (1) engaged, attach spring scale (B122) (2) to arm (3). With a minimum of 100 pounds of force pull on spring scale there should be no slippage of brake.



406961-1030
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REPAIR

5. Replace fore-and-aft magnetic brake if any inspection defects are found (Task 11-3-4).

END OF TASK

11-3-6. LATERAL FORCE GRADIENT — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

References:
TM 1-1500-204-23

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B236)
Torque Wrench (B237)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

GO TO NEXT PAGE

11-3-6. LATERAL FORCE GRADIENT — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove cotter pin (1), nut (2), and spacers (3 and 4) to separate force gradient (5) from magnetic brake (6). Discard cotter pin (1).

2. Remove cotter pin (7), nut (8), washer (9), bolt (10), and spacer (11) to separate force gradient (5) from CPG cyclic stick fitting (12). Discard cotter pin (7) and remove force gradient (5).

3. Remove tube assembly (13) from force gradient (5).

INSTALL

4. Install tube assembly (13) on force gradient (5).

5. Install force gradient (5) between magnetic brake (6) and CPG cyclic stick fitting (12) by adjusting tube assembly (13) to avoid preload on force gradient. Tighten nut (14) fingertight. Do not torque nut (14) until rigging following installation.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

a. Install spacers (4 and 3) and nut (2). Torque nut (2) **30 TO 40 INCH-POUNDS** and secure with cotter pin (1).

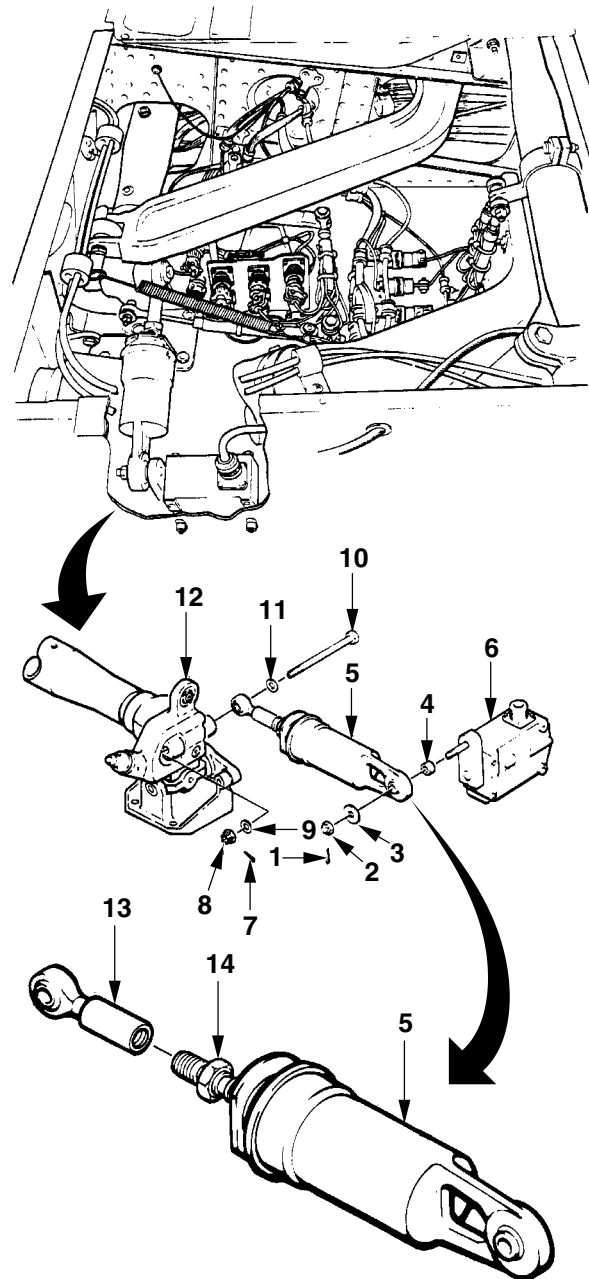
b. Install bolt (10), spacer (11), washer (9), and nut (8). Torque nut (8) **50 TO 70 INCH-POUNDS** and secure with cotter pin (7).

INSPECT

FOLLOW-ON MAINTENANCE

Check cyclic controls rigging (Task 11-1-3).

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).



406961-595
J0517

END OF TASK

11-3-7. LATERAL FORCE GRADIENT — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Spring Scale (B120)
■ Torque Wrench (B238)

Material:

Drycleaning Solvent (D199)
Wiping Rag (D164)
Lockwire (D132)
Sandpaper (D175)
Solid Film Lubricant (D136)
Zinc Chromate Primer (D161)
Rubber Gloves (D111)

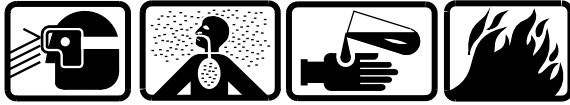
Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

GO TO NEXT PAGE

11-3-7. LATERAL FORCE GRADIENT — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN

**Drycleaning Solvent****CAUTION**

When cleaning force gradient, do not contaminate bearing with drycleaning solvent (D199).

1. Clean force gradient surface with drycleaning solvent (D199).
2. Dry force gradient with a wiping rag (D164).

DISASSEMBLE

3. Remove lockwire from cap (1).
4. Remove cap (1) and spring assembly (2) from cylinder (3).
5. Remove nuts (4 and 5).

CAUTION

Spring guides are under tension. Use caution when removing nut (6).

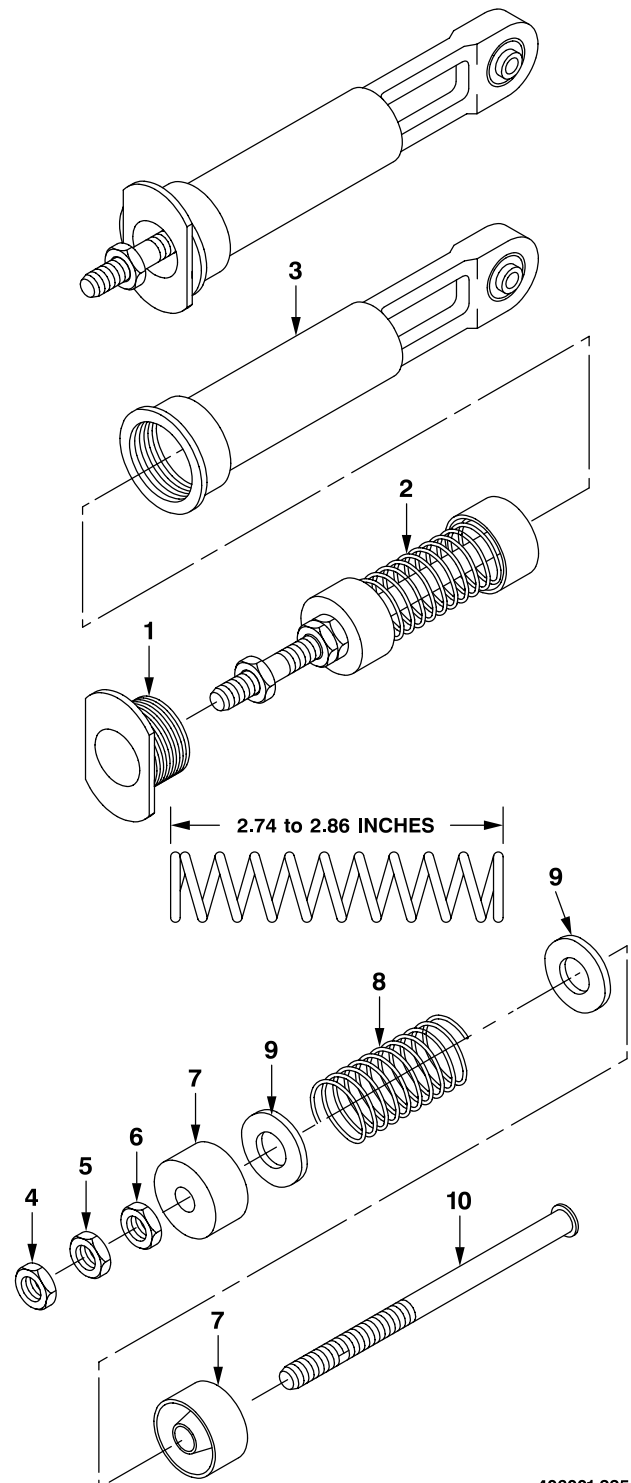
6. Remove nut (6), guides (7), spring (8), and two washers (9) from shaft (10).

INSPECT

7. Inspect spring (8) for a free length of **2.74 to 2.86 inches**. Replace spring if length is not within limits.

8. Inspect other parts of force gradient for damage to limits shown. If limits are exceeded, replace part. See figure Lateral Force Gradient — Damage Limits.

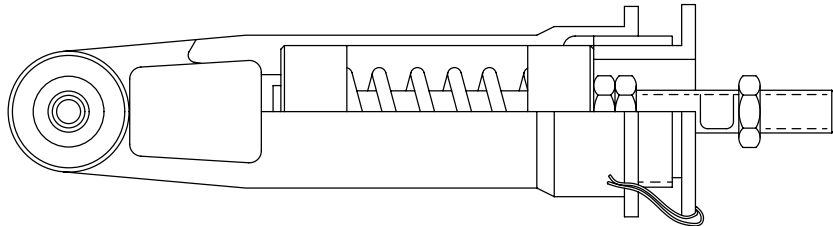
9. Inspect bearing in cylinder (3). If specified limits are exceeded, bearing can be replaced by AVIM (Task 11-3-3).



406001-225
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GO TO NEXT PAGE

11-3-7. LATERAL FORCE GRADIENT — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOL



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL AND CORROSION	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.25 sq. in.
NUMBER OF REPAIRS	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.020 in. x 45°
BORES	0.002 in. for 1/4 circumference
THREAD DAMAGE Depth Length Number	1/3 of thread 1/4 of circumference One per threaded segment
BEARING WEAR Axial Radial	0.012 in. 0.005 in.

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Lateral Force Gradient — Damage Limits

GO TO NEXT PAGE

11-3-7. LATERAL FORCE GRADIENT — CLEANING/INSPECTION/REPAIR (CONT)

REPAIR



Sanding Operations

10. Polish out reparable damage with 400 grit sandpaper (D175).

INSPECT



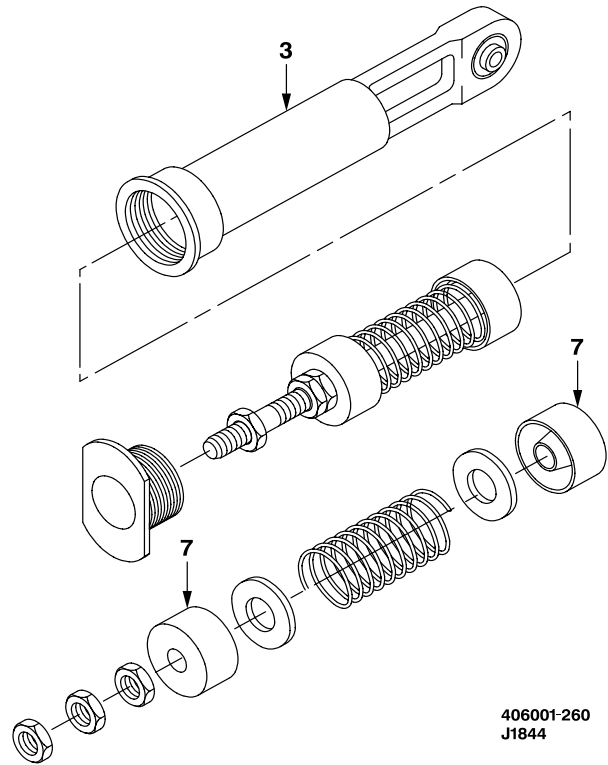
Lubricant

11. Apply solid film lubricant (D136) to bare metal on inside surface of cylinder (3) and outside surface of guides (7).



Zinc Chromate Primer

12. Apply one coat of zinc chromate primer (D161) to repaired area on outside of cylinder (3).



406001-260
J1844

GO TO NEXT PAGE

11-3-7. LATERAL FORCE GRADIENT — CLEANING/INSPECTION/REPAIR (CONT)

ASSEMBLE

13. Install guides (7), two washers (9), and spring (8) on shaft (10).

14. Install nuts (6, 5, and 4) on shaft (10). Do not tighten nuts. Temporarily install rod end bearing assembly (11) for attachment of spring scale (B120) (12).

15. Adjust spring preload as follows:

a. Insert hook of spring scale (B120) (12) through rod end bearing (11).

b. Hold spring assembly (2) securely in place and spring scale (B120) (12) parallel with shaft (10), and exert 7.0 to 14.0 pounds of force on spring. Measure and record length of spring (8) and guides (7).

c. Tighten nut (6) to hold guides (7) in position noted in step b.

d. Torque nut (5) **95 TO 110 INCH-POUNDS** to lock nut (6) in place. Leave nut (4) loose.

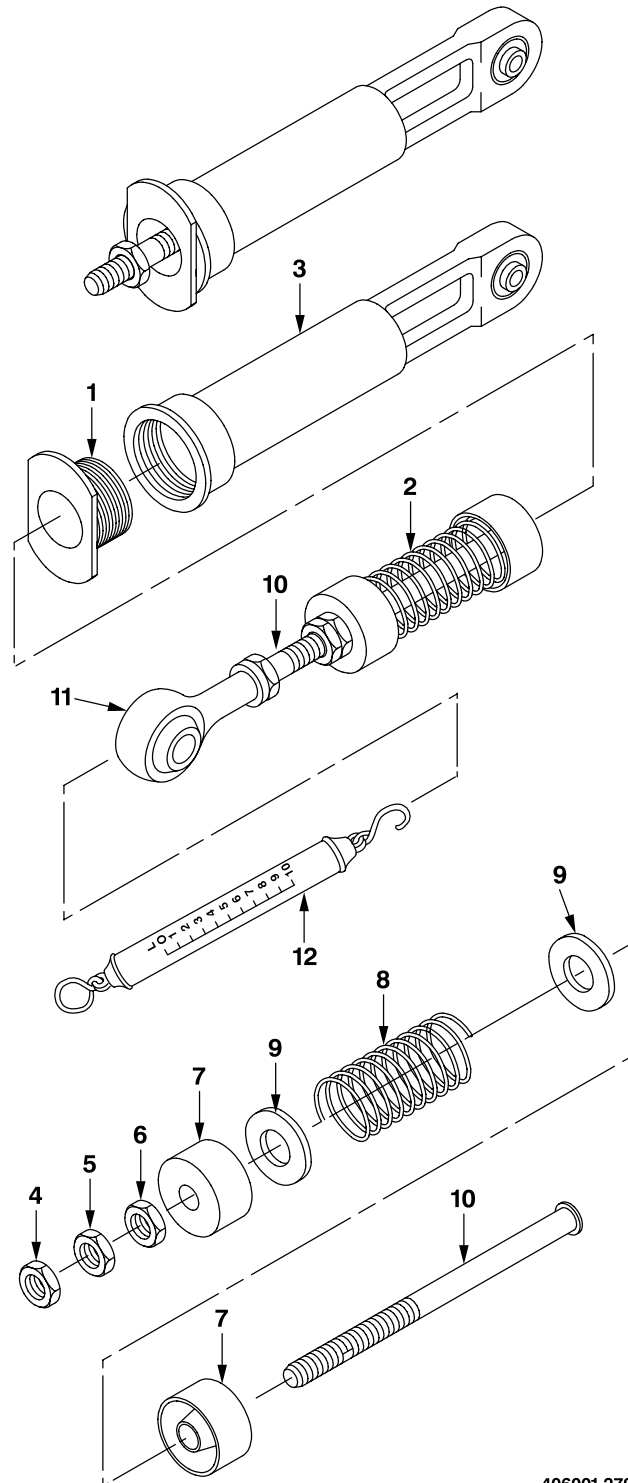
e. Release force and remove spring scale (B120) (12) and rod end bearing (11) from shaft (10).

16. Install spring assembly (2) and cap (1) in cylinder (3).

17. Tighten cap (1) until all end play of spring assembly (2) is eliminated.

18. Secure cap (1) with lockwire (D132) (2 places).

INSPECT



406001-279
J1844

END OF TASK

11-3-8. FORCE GRADIENT TUBE ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Rubber Gloves (D111)
Drycleaning Solvent (D199)

Wiping Rag (D164)
Sandpaper (D175)
Epoxy Primer Coating (D98)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

NOTE

The same tube assembly is used with both the fore-and-aft and lateral force gradient.

CLEAN



Drycleaning Solvent

1. Clean force gradient tube assembly surface with drycleaning solvent (D199).
2. Dry force gradient tube assembly with wiping rag (D164).

INSPECT

3. Inspect tube for damage to limits shown. If limits are exceeded replace tube assembly.
4. Inspect bearing for wear to limits shown. If limits are exceeded replace tube assembly. See figure Force Gradient Tube Assembly — Damage Limits.

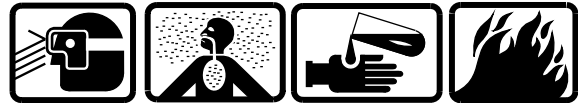
REPAIR



Sanding Operations

5. Polish out reparable damage with 400 grit sandpaper (D175).

INSPECT



Acetone

6. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

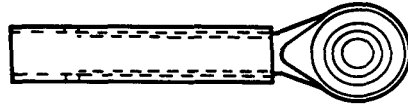


Epoxy Primer Coating

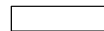
7. Touch up repaired areas with epoxy primer coating (D98).

GO TO NEXT PAGE

11-3-8. FORCE GRADIENT TUBE ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL AND CORROSION	0.005 in. before and 0.010 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.062 sq. in.
NUMBER OF REPAIRS	Not critical
BORES	0.002 in. for 1/4 circumference
THREAD DAMAGE:	
Depth	1/3 of thread
Length	1/4 of circumference
Number	One per thread
BEARING WEAR:	
Axial	0.012 in.
Radial	0.005 in.

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Force Gradient Tube Assembly — Damage Limits

END OF TASK

 11-3-9. LATERAL MAGNETIC BRAKE — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

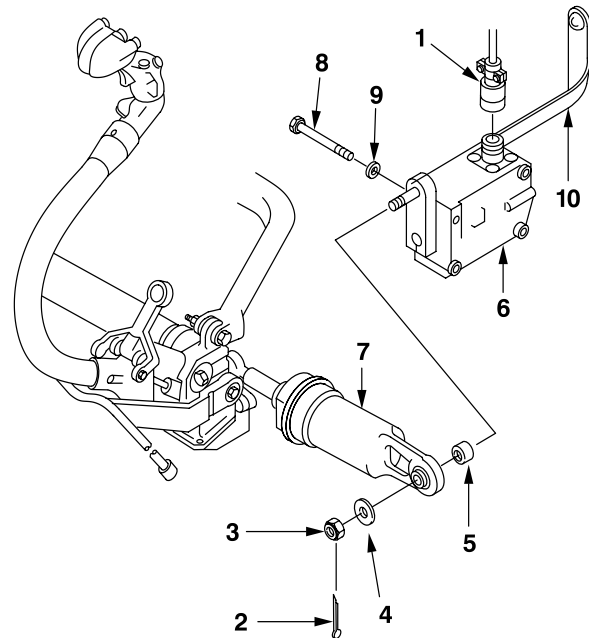
Tools:
General Mechanic Tool Kit (B178)

Personnel Required:
67S Scout Helicopter Repairer

WARNING

- Ensure that no one moves flight controls during removal and installation of lateral magnetic brake. Physical injury can occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Remove lockwire from electrical connector (1).
2. Disconnect electrical connector (1).
3. Remove cotter pin (2) and discard.
4. Remove nut (3) and spacers (4 and 5) to separate magnetic brake (6) from force gradient (7).
5. Remove four bolts (8), washers (9), bonding strap (10), and magnetic brake (6).



VIEW LOOKING DOWN UNDER CPG SEAT

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END OF TASK

11-3-10. LATERAL MAGNETIC BRAKE — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

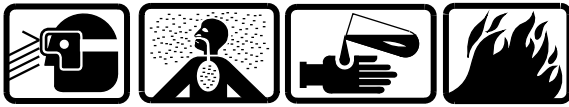
Applicable Configurations:
All

Tools:
Spring Scale (B120)
Spring Scale (B122)

Material:
Rubber Gloves (D111)
Drycleaning Solvent (D199)
Wiping Rag (D164)

Personnel Required:
67S Scout Helicopter Repairer

CLEAN

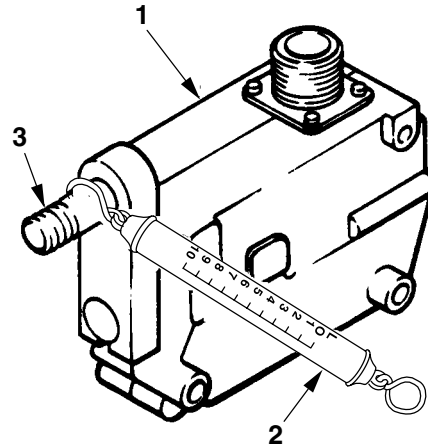


Drycleaning Solvent

1. Clean magnetic brake surface with drycleaning solvent (D199).
2. Dry magnetic brake with a wiping rag (D164).

INSPECT

3. Inspect lateral magnetic brake for:
 - a. Dents and cracks.
 - b. Damaged electrical connector or connector pins.
 - c. Bent or broken shaft.
4. Functional test lateral magnetic brake:
 - a. Secure brake (1) to work bench or suitable support.
 - b. With brake (1) off, attach spring scale (B120) (2) to arm (3). Arm should operate freely with 2.5 pounds of force or less pull on spring scale.
 - c. With brake (1) engaged, attach spring scale (B122) (2) to arm (3). With a minimum of 100 pounds of force pull on spring scale, there should be no slippage of brake.



406961-1031
J0517

REPAIR

5. Replace lateral magnetic brake if any inspection defects are found (Task 11-3-11).

END OF TASK

11-3-11. LATERAL MAGNETIC BRAKE — INSTALLATION

This task covers: Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Shear Bolt (B8)
Industrial Goggles (B55)
Torque Wrench (B235)
Torque Wrench (B236)
Torque Wrench (B237)

Material:

Lockwire (D132)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Pilot

References:

TM 1-1520-248-10
TM 1-1520-248-CL
TM 55-1500-323-24

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

GO TO NEXT PAGE

11-3-11. LATERAL MAGNETIC BRAKE — INSTALLATION (CONT)

PREPARE MAGNETIC BRAKE FOR INSTALLATION

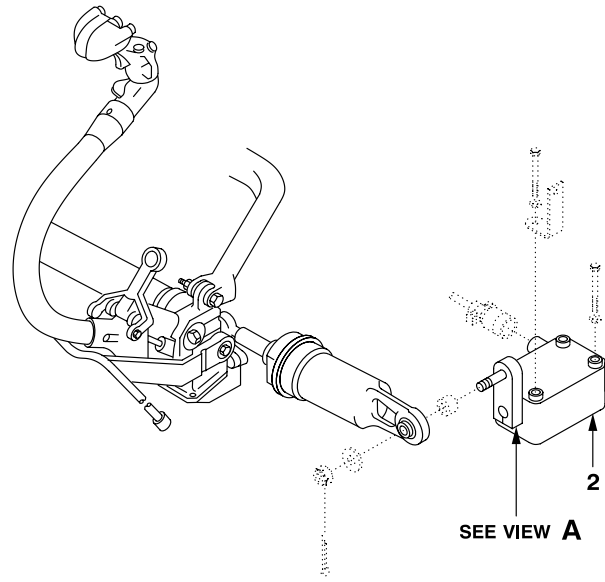
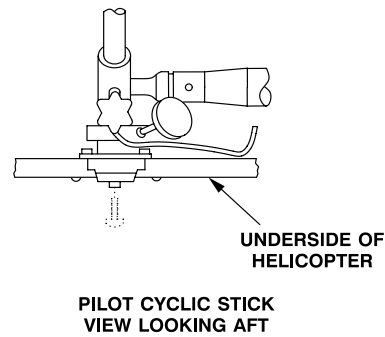
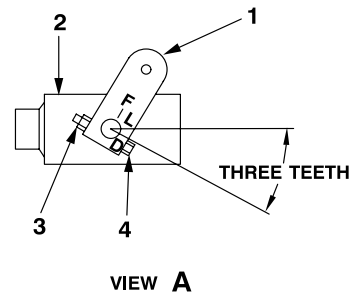
WARNING

- Ensure that no one moves flight controls during installation of lateral magnetic brake. Physical injury can occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Check that magnetic brake arm (1) is positioned on shaft of magnetic brake (2) so that L on arm is located three teeth clockwise from mark on shaft as shown.

2. If magnetic brake arm (1) is incorrectly positioned, reposition as follows:

- a. Remove nut (3) and bolt (4).
- b. Remove magnetic brake arm (1).
- c. Position L on arm three teeth clockwise from mark on shaft of magnetic brake (2) as shown.
- d. Install bolt (4) and nut (3). Torque nut (3) **12 TO 15 INCH-POUNDS.**



VIEW LOOKING DOWN UNDER CPG SEAT

406961-900-1
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GO TO NEXT PAGE

11-3-11. LATERAL MAGNETIC BRAKE — INSTALLATION (CONT)

INSTALL

3. Prepare magnetic brake (2) in area of bonding strap (5) for Class R-1 electrical bond per Appendix M (TM 55-1500-323-24).

4. Center pilot cyclic stick (6). Install shear bolt (B6) (7) through hole (8) in bottom of fuselage into base of cyclic stick (6) and secure.

5. Install magnetic brake (2) as follows:

a. Install drilled head bolt (9), washer (10), and bonding strap (5), under bolthead.

b. Install three bolts (11) with washer (12) under bolthead. Torque bolts (9 and 11) **50 TO 70 INCH-POUNDS**.

c. Connect electrical connector (13).

d. Secure electrical connector (13) to drilled head bolt (9) with lockwire (D132).

e. Install spacer (14), force gradient (15), spacer (16), and nut (17) on shaft of magnetic brake (2). Torque nut (2) **30 TO 40 INCH-POUNDS**.

f. Install cotter pin (18).

6. Remove shear bolt (B6) (7) from pilot cyclic stick (6).

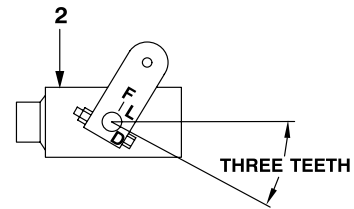
INSPECT

FOLLOW-ON MAINTENANCE

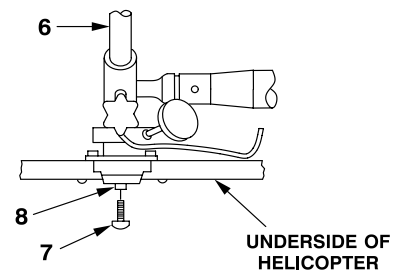
Check cyclic controls rigging (Task 11-1-3).

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

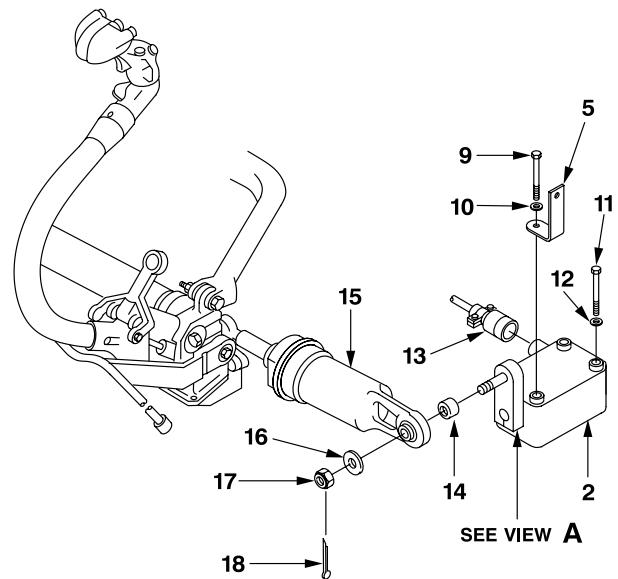
Pilot perform MOC (TM 1-1520-248-10/CL).



VIEW A



PILOT CYCLIC STICK
VIEW LOOKING AFT



VIEW LOOKING DOWN UNDER CPG SEAT

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J2015

END OF TASK

11-3-12. CYCLIC TORQUE TUBE — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

Tools:
General Mechanic Tool Kit (B178)

Personnel Required:
67S Scout Helicopter Repairer

GO TO NEXT PAGE

11-3-12. CYCLIC TORQUE TUBE — REMOVAL (CONT)

DISCONNECT TORQUE TUBE FROM CPG CYCLIC STICK

WARNING

- To prevent physical injury, ensure that no one moves flight controls during removal of torque tube. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

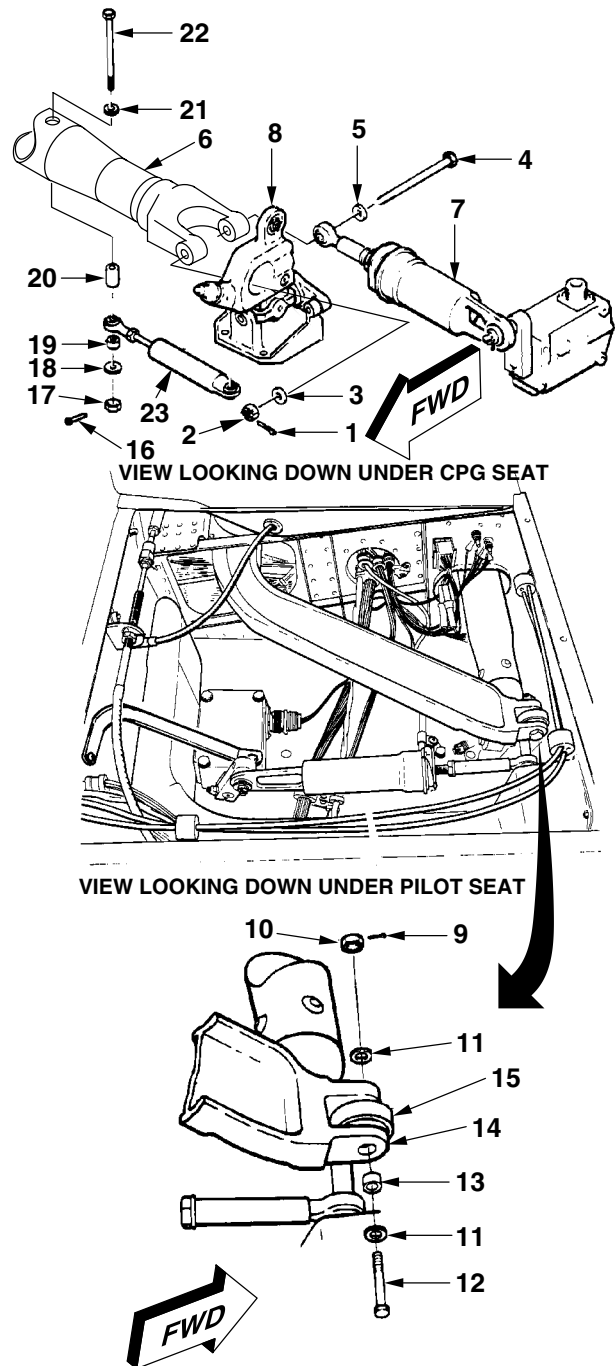
1. Remove cotter pin (1) and discard.
2. Remove nut (2), washer (3), bolt (4), and spacer (5) to separate torque tube (6) and force gradient (7) from fitting of CPG cyclic stick (8).

DISCONNECT YOKE FROM PILOT CYCLIC STICK

3. Remove cotter pin (9) and discard.
4. Remove nut (10), two washers (11), bolt (12), and spacer (13) to separate yoke (14) from pivot of pilot cyclic stick (15).

DISCONNECT TRANSDUCER FROM TORQUE TUBE

5. Remove cotter pin (16) and discard.
6. Remove nut (17), spacers (18, 19, and 20), washer (21), and bolt (22) to separate transducer (23) from torque tube (6).



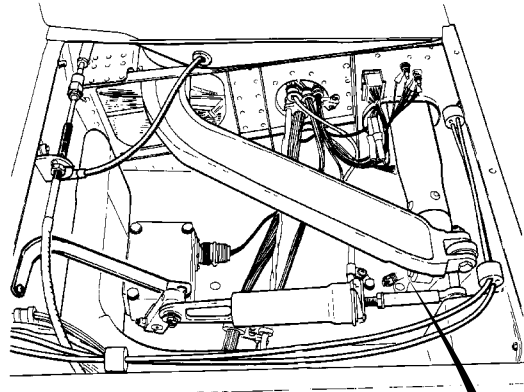
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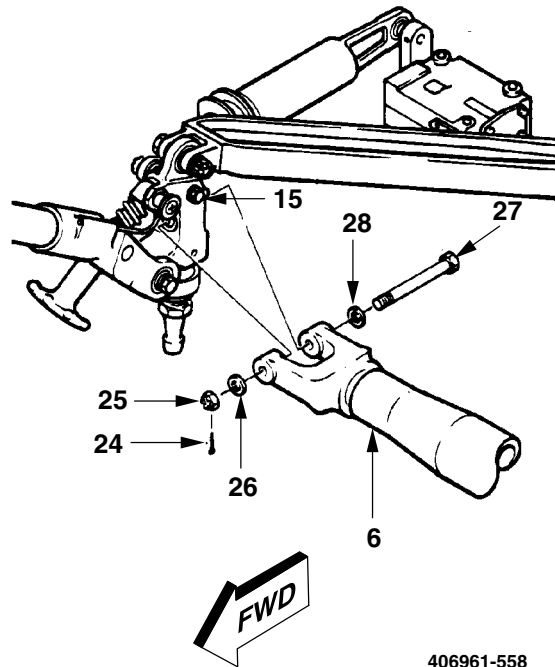
11-3-12. CYCLIC TORQUE TUBE — REMOVAL (CONT)

DISCONNECT TORQUE TUBE FROM PILOT CYCLIC STICK

7. Remove cotter pin (24) and discard.
8. Remove nut (25), washer (26), bolt (27), and washer (28), to separate torque tube (6) from pivot of pilot cyclic stick (15).
9. Move pilot cyclic stick (15) to the side.
10. Remove torque tube (6).



VIEW LOOKING DOWN UNDER PILOT SEAT



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END OF TASK

11-3-13. CYCLIC TORQUE TUBE — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Sandpaper (D175)
Crocus Cloth (D90)
Zinc Chromate Primer (D161)
Rubber Gloves (D111)
Acetone (D2)

Tools:
General Mechanic Tool Kit (B178)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Material:
Drycleaning Solvent (D199)
Wiping Rag (D164)

CLEAN



Drycleaning Solvent

1. Clean torque tube surfaces with drycleaning solvent (D199).
2. Dry torque tube surfaces with wiping rag (D164).

INSPECT

3. Inspect for loose or missing rivets and for damage to limits specified. See figure Cyclic Torque Tube — Damage Limits.

REPAIR



Sanding Operations

4. Polish out allowable damage with 400 grit sandpaper (D175). Smooth surface with crocus cloth (D90).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



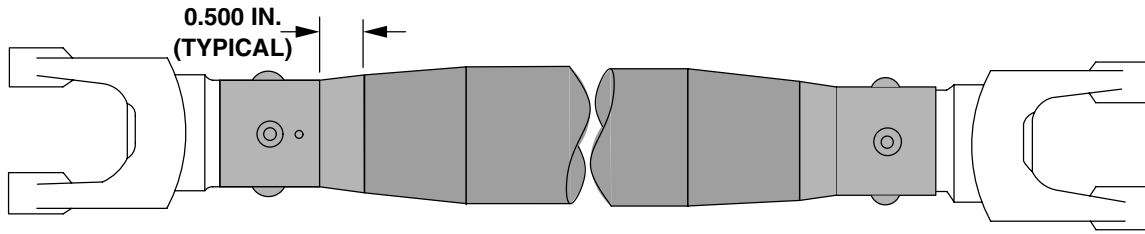
Zinc Chromate Primer

6. Apply one coat of primer (D161) to repaired areas.

7. If damage limits are exceeded, replace torque tube. Replace torque tube having loose or missing rivets.

GO TO NEXT PAGE

11-3-13. CYCLIC TORQUE TUBE — CLEANING/INSPECTION/REPAIR (CONT)



P/N 206-001-306-011/-113

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL AND CORROSION

None allowed 0.005 in. 0.040 in.

MAXIMUM DEPTH OF CORROSION PITS BEFORE REPAIR

None allowed 0.003 in. 0.020 in.

EDGE CHAMFER TO REMOVE DAMAGE

None allowed 0.030 in. x 45°

BORE DAMAGE

0.002 in. for 1/4 of circumference. One damaged area per hole.

- NOTES:
1. No cracks are permitted.
 2. Total material removed by repeated repairs not to exceed limits shown.
 3. No circumferential damage permitted.

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Cyclic Torque Tube — Damage Limits

END OF TASK

11-3-14. CYCLIC TORQUE TUBE — INSTALLATION

This task covers: Installation (On Helicopter)

INITIAL SETUP

References:
TM 1-1500-204-23

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

Tools:

General Mechanic Tool Kit (B178)
Torque Wrench (B235)
Torque Wrench (B237)
Torque Wrench (B239)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

GO TO NEXT PAGE

11-3-14. CYCLIC TORQUE TUBE — INSTALLATION (CONT)

INSTALL

WARNING

- To prevent physical injury, ensure that no one moves flight controls during installation of torque tube. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

NOTE

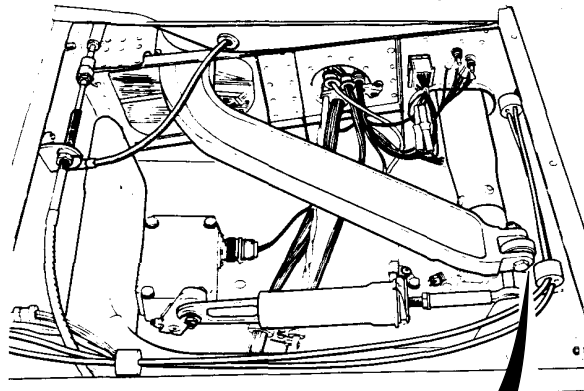
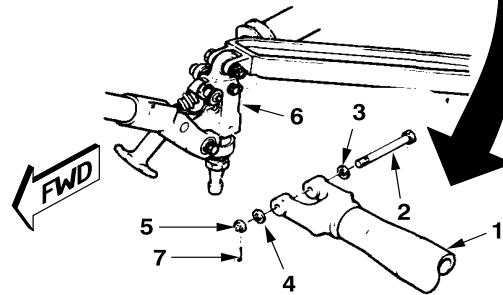
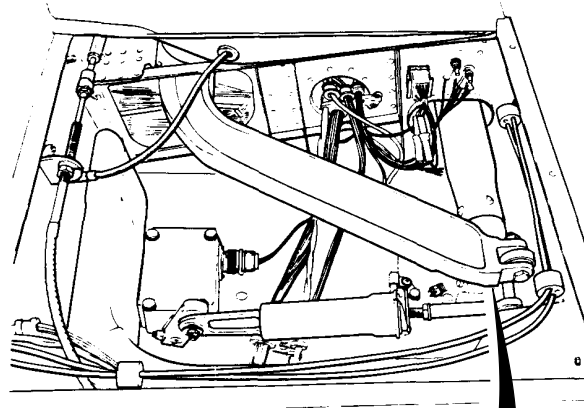
Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

1. Install torque tube (1) with bolt (2), spacer (3), washer (4), and nut (5) to connect torque tube (1) to pivot of pilot cyclic stick (6). Torque nut (5) **50 TO 70 INCH-POUNDS**.

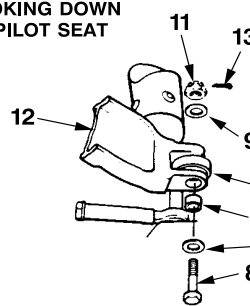
2. Install cotter pin (7) through nut (5).

3. Install bolt (8), two washers (9), spacer (10), and nut (11) to connect yoke (12) to pivot of cyclic stick (6). Torque nut (11) **100 TO 140 INCH-POUNDS**.

4. Install cotter pin (13) through nut (11).



VIEW LOOKING DOWN UNDER PILOT SEAT



406961-560
J0517

GO TO NEXT PAGE

11-3-14. CYCLIC TORQUE TUBE — INSTALLATION (CONT)

5. Install bolt (14), spacer (15), washer (16), and nut (17) to connect torque tube (1) to fitting of CPG cyclic stick (18). Torque nut (17) **50 TO 70 INCH-POUNDS**.

6. Install cotter pin (19).

7. Install bolt (20), washer (21), spacers (22, 23, and 24), and nut (25) to connect transducer (26) to torque tube (1). Torque nut (25) **20 TO 25 INCH-POUNDS**.

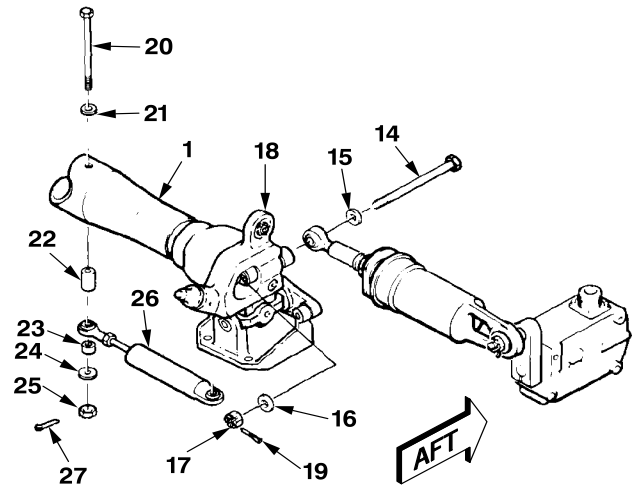
8. Install cotter pin (27).

INSPECT

FOLLOW-ON MAINTENANCE

Check cyclic controls rigging (Task 11-1-3).

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).



VIEW LOOKING DOWN UNDER CPG SEAT

406961-561
J2015

END OF TASK

11-3-15. LEFT CYCLIC YOKE — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

Personnel Required:
67S Scout Helicopter Repairer

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)
Center Post Duct and Panel Removed
(Task 2-2-69)

Tools:
General Mechanic Tool Kit (B178)

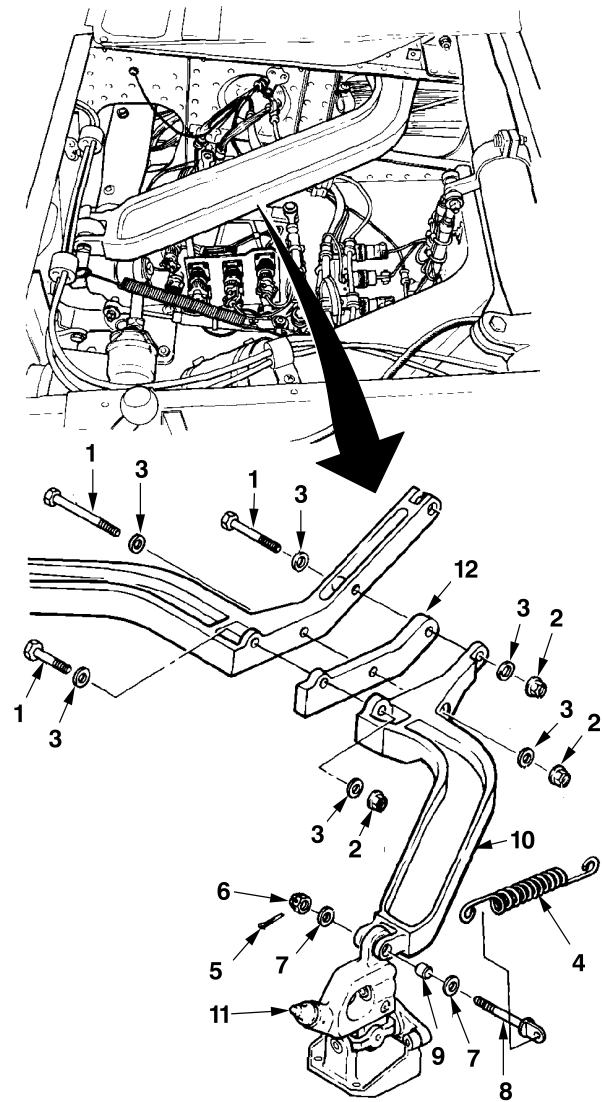
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11-3-15. LEFT CYCLIC YOKE — REMOVAL (CONT)

WARNING

- Ensure that no one moves flight controls during removal of left cyclic yoke. Physical injury can occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Remove three bolts (1), three nuts (2), and six washers (3).
2. Disconnect spring (4).
3. Remove cotter pin (5) and discard.
4. Remove nut (6), two washers (7), eyebolt (8), and bushing (9) to separate yoke (10) from fitting on CPG stick (11).
5. Remove yoke (10) and shim (12).

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J0517

END OF TASK

11-3-16. LEFT CYCLIC YOKE — INSTALLATION

This task covers: Installation (On Helicopter)

INITIAL SETUP

References:

TM 1-1500-204-23

Applicable Configurations:

All

Equipment Condition:

Helicopter Safed (Task 1-6-7)

Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly

Removed (Task 2-2-34)

Center Post Duct and Panels Removed
(Task 2-2-69)

Tools:

General Mechanic Tool Kit (B178)

Torque Wrench (B238)

Torque Wrench (B239)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)

67S Scout Helicopter Repairer

GO TO NEXT PAGE

11-3-16. LEFT CYCLIC YOKE — INSTALLATION (CONT)

WARNING

- Ensure that no one moves flight controls during installation of left cyclic yoke. Physical injury can occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Connect yoke (1) to yoke (2) and add shim (3) between yokes.

NOTE

Three bolts installed in following step are different in length, but installed in same manner.

2. Install three bolts (4) six washers (5) and three nuts (6). Torque nuts (6) **75 TO 95 INCH-POUNDS**.

3. Connect yoke (1) over fitting of CPG cyclic stick (7).

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

4. Install eyebolt (8), two washers (9), bushing (10), and nut (11). Torque nut (11) **100 TO 140 INCH-POUNDS**.

5. Install cotter pin (12) through nut (11).

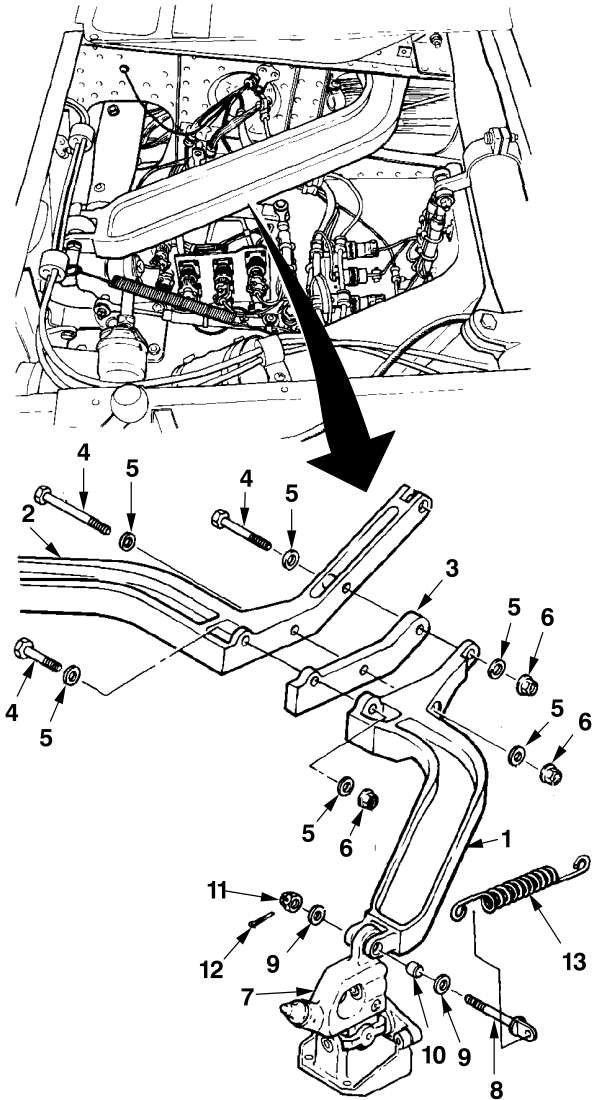
6. Connect spring (13) to eyebolt (8).

INSPECT**FOLLOW-ON MAINTENANCE**

Check cyclic controls rigging (Task 11-1-3).

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Install center post duct and panels (Task 2-2-69).



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J0517

END OF TASK

11-3-17. RIGHT CYCLIC YOKE — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

Personnel Required:
67S Scout Helicopter Repairer

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)
Center Post Duct and Panels Removed
(Task 2-2-69)

Tools:
General Mechanic Tool Kit (B178)

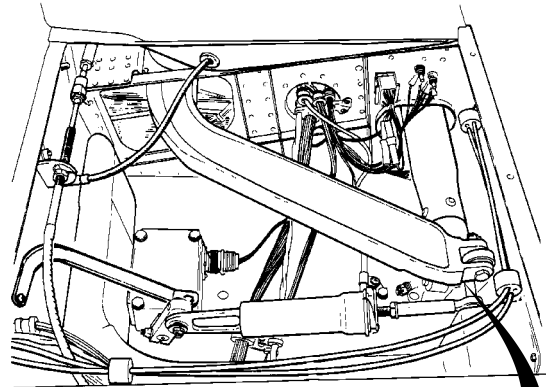
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11-3-17. RIGHT CYCLIC YOKE — REMOVAL (CONT)

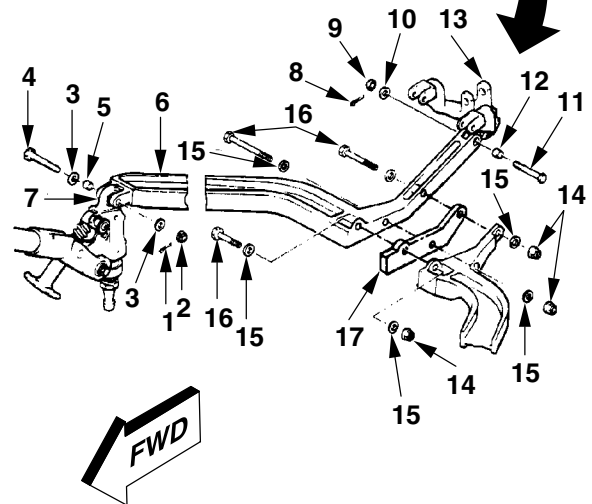
WARNING

- Ensure that no one moves flight controls during removal of right cyclic yoke. Physical injury can occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Remove cotter pin (1) and discard.
2. Remove nut (2), two washers (3), bolt (4), and bushing (5) to separate yoke (6) from pivot of pilot cyclic stick (7).
3. Remove cotter pin (8) and discard.
4. Remove nut (9), washer (10), bolt (11), and bushing (12) to separate bellcrank (13) from yoke (6).
5. Remove three nuts (14), six washers (15), and three bolts (16).
6. Separate yoke (6) and remove shim (17).
7. Remove yoke (6).



VIEW LOOKING DOWN UNDER PILOT SEAT

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END OF TASK

11-3-18. RIGHT CYCLIC YOKE — INSTALLATION

This task covers: Installation (On Helicopter)

INITIAL SETUP

References:

TM 1-1500-204-23

Applicable Configurations:

All

Equipment Condition:

Helicopter Safed (Task 1-6-7)

Crew Seat and Armor Seat Panel Removed

(Task 2-2-33) or Seat Pan Assembly

Removed (Task 2-2-34)

Center Post Duct and Panels Removed

(Task 2-2-69)

Tools:

General Mechanic Tool Kit (B178)

Torque Wrench (B237)

Torque Wrench (B238)

Torque Wrench (B239)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)

67S Scout Helicopter Repairer

GO TO NEXT PAGE

11-3-18. RIGHT CYCLIC YOKE — INSTALLATION (CONT)

WARNING

- Ensure that no one moves flight controls during installation of right cyclic yoke. Physical injury can occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Align yoke (1) together and add shim (2) between yokes.

NOTE

Three bolts installed in following step are different length, but installed in same manner.

2. Install three bolts (3), six washers (4), and three nuts (5). Torque nuts (5) **75 TO 95 INCH-POUNDS**.
3. Connect yoke (1) over pivot of pilot cyclic stick (6).

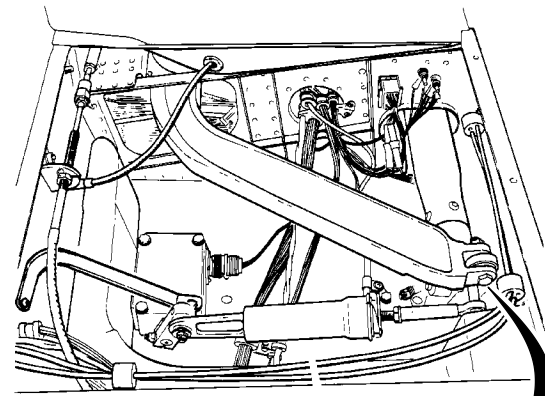
NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

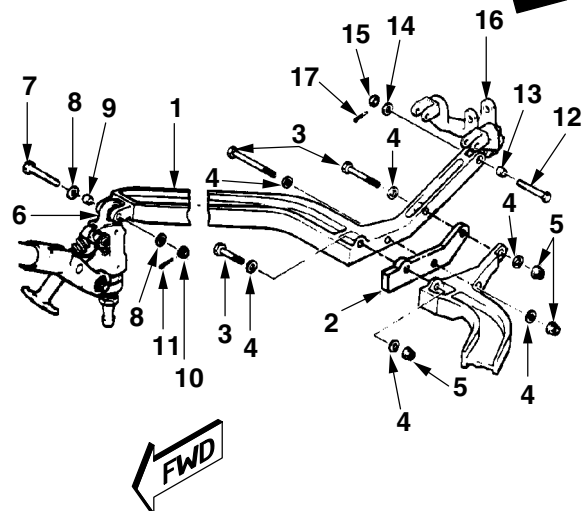
4. Connect bolt (7), two washers (8), bushing (9), and nut (10). Torque nut (10) **100 TO 140 INCH-POUNDS**.
5. Install cotter pin (11) through nut (10).
6. Install bolt (12), bushing (13), washer (14), and nut (15), to connect yoke (1) to bellcrank (16). Torque nut (15) **50 TO 70 INCH-POUNDS**.
7. Install cotter pin (17) through nut (15).

INSPECT**FOLLOW-ON MAINTENANCE**

- Check cyclic controls rigging (Task 11-1-3).
- Install center post duct and panels (Task 2-2-69).
- Install crew seat and armor seat panel (Task 2-2-33) or seat pan assembly (Task 2-2-34).



VIEW LOOKING DOWN UNDER PILOT SEAT

406961-841
J1961

END OF TASK

11-3-19. CYCLIC YOKE — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Drycleaning Solvent (D199)
Wiping Rag (D164)
Sandpaper (D175)
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

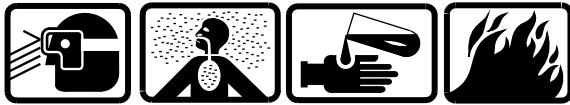
NOTE

The following procedures are for inspecting and repairing both the left cyclic yoke and the right cyclic yoke.

4. Polish out damage with 400 grit sandpaper (D175).

5. Remove sanding residue with wiping rag (D164) from repaired areas.

CLEAN



Drycleaning Solvent

1. Clean yoke surfaces with drycleaning solvent (D199).

2. Dry yoke surfaces with wiping rag (D164).

INSPECT

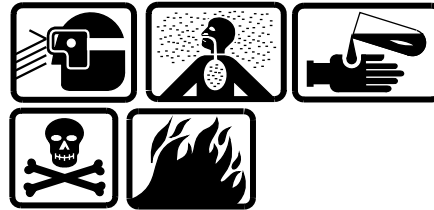
3. Inspect for damage to limits shown. If limits are exceeded, replace yoke. See figure Cyclic Yoke — Damage Limits.

REPAIR



Sanding Operations

INSPECT



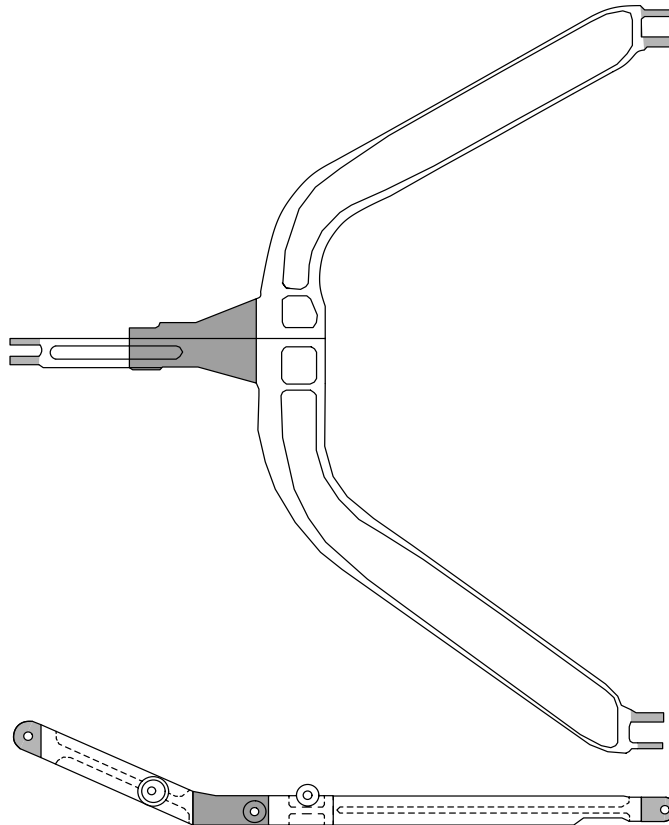
Epoxy Primer Coating

6. Apply one coat of epoxy primer coating (D98) to repaired areas.

7. Replace yoke if damage or wear limits are exceeded.

GO TO NEXT PAGE

11-3-19. CYCLIC YOKE — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH		
	0.005 in. before and 0.010 in. after repair	0.010 in. before and 0.020 in. after repair	0.020 in. before and 0.040 in. after repair
MECHANICAL AND CORROSION	0.005 in. before and 0.010 in. after repair	0.010 in. before and 0.020 in. after repair	0.020 in. before and 0.040 in. after repair
MAXIMUM AREA OF FULL DEPTH REPAIR	0.10 sq. in.	0.10 sq. in.	0.25 sq. in.
NUMBER OF REPAIRS	One per lug	Two per part	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.015 in. x 45°	0.020 in. x 45°	0.060 in. x 45°
BORES	0.002 in. for 1/4 of the circumference. One damage area per hole.	0.002 in. for 1/4 of the circumference. One damage area per hole.	

406001-37
J1831

Cyclic Yoke — Damage Limits

END OF TASK

11-3-20. LATERAL CYCLIC TRANSDUCER — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

Tools:
General Mechanic Tool Kit (B178)

Personnel Required:
67S Scout Helicopter Repairer

GO TO NEXT PAGE

11-3-20. LATERAL CYCLIC TRANSDUCER — REMOVAL (CONT)

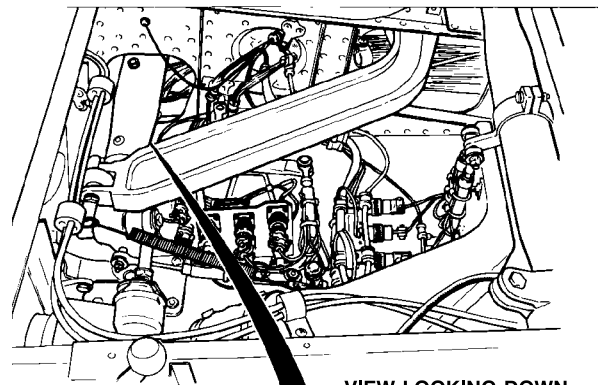
WARNING

- Ensure that no one moves flight controls during removal of lateral cyclic transducer. Physical injury can occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

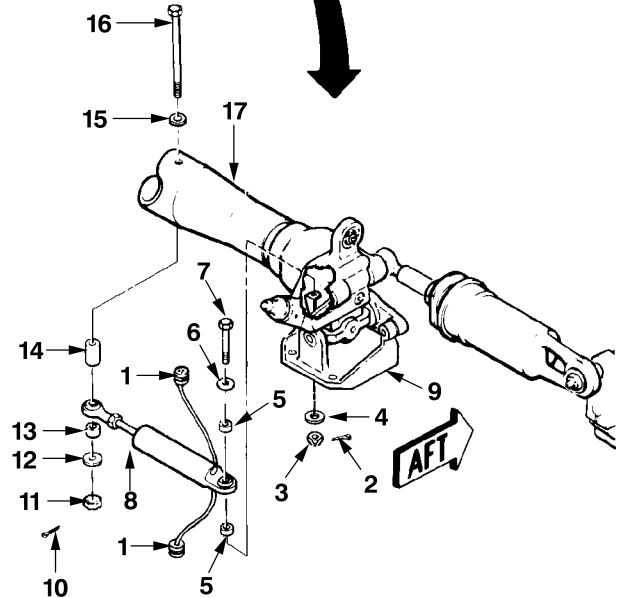
1. Disconnect two electrical connectors (1).
2. Remove cotter pin (2) and discard.
3. Remove nut (3), washer (4), two spacers (5), spacer (6), and bolt (7) to separate transducer (8) from CPG cyclic stick support (9).
4. Remove cotter pin (10) and discard.
5. Remove nut (11), spacers (12, 13, and 14), washer (15), and bolt (16) to separate transducer (8) from torque tube (17).

NOTE

Refer to Task 11-5-5 for inspection and repair of transducer.



VIEW LOOKING DOWN UNDER CPG SEAT



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J0517

END OF TASK

11-3-21. LATERAL CYCLIC TRANSDUCER — INSTALLATION

This task covers: Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B235)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-T
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

GO TO NEXT PAGE

11-3-21. LATERAL CYCLIC TRANSDUCER — INSTALLATION (CONT)

WARNING

- To prevent physical injury, ensure that no one moves flight controls during installation of lateral cyclic transducer. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Adjust transducer (1) to obtain **6.18 inches** between centers of grounded bearing and adjustable rod end bearing with transducer movable rod at midstroke position

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

2. Install transducer (1) on CPG cyclic stick support (2) using bolt (3), spacer (4), two spacers (5), washer (6), and nut (7). Torque nut (7) **12 TO 15 INCH-POUNDS**.

3. Install cotter pin (8) through nut (7).

4. Install transducer (1) on torque tube (9) using bolt (10), washer (11), spacers (12, 13, and 14), and nut (15). Torque nut (15) **12 TO 15 INCH-POUNDS**.

5. Install cotter pin (16) through nut (15).

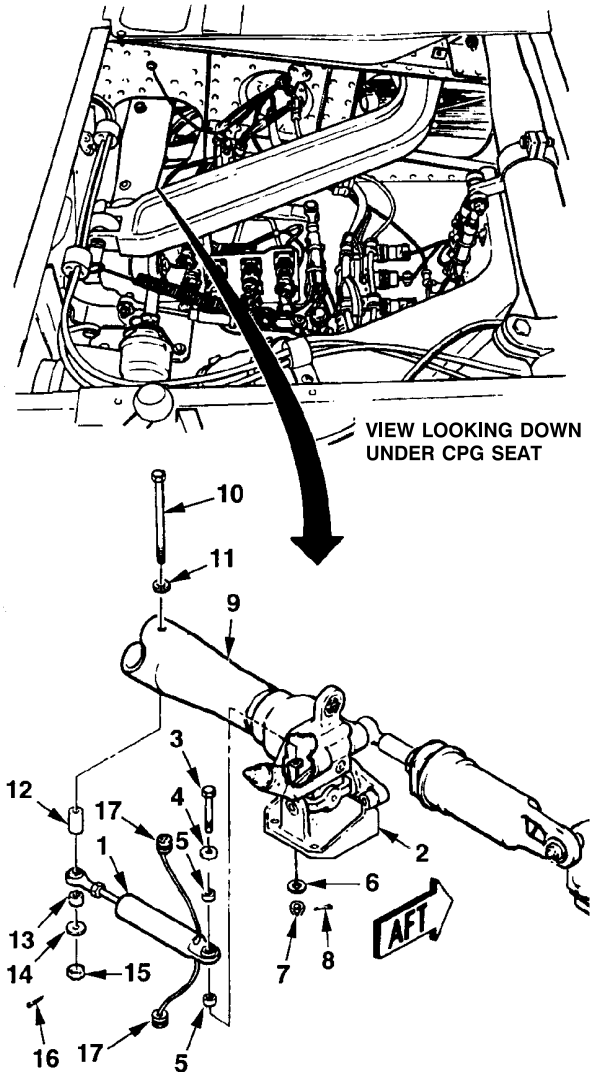
6. Connect two electrical connectors (17).

INSPECT**FOLLOW-ON MAINTENANCE**

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Perform operational check of SCAS and hydraulic electrical system (TM 1-1520-248-T).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



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J1963

END OF TASK

11-3-22. FORE-AND-AFT CYCLIC TRANSDUCER — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

Tools:
General Mechanic Tool Kit (B178)

Personnel Required:
67S Scout Helicopter Repairer

GO TO NEXT PAGE

11-3-22. FORE-AND-AFT CYCLIC TRANSDUCER — REMOVAL (CONT)

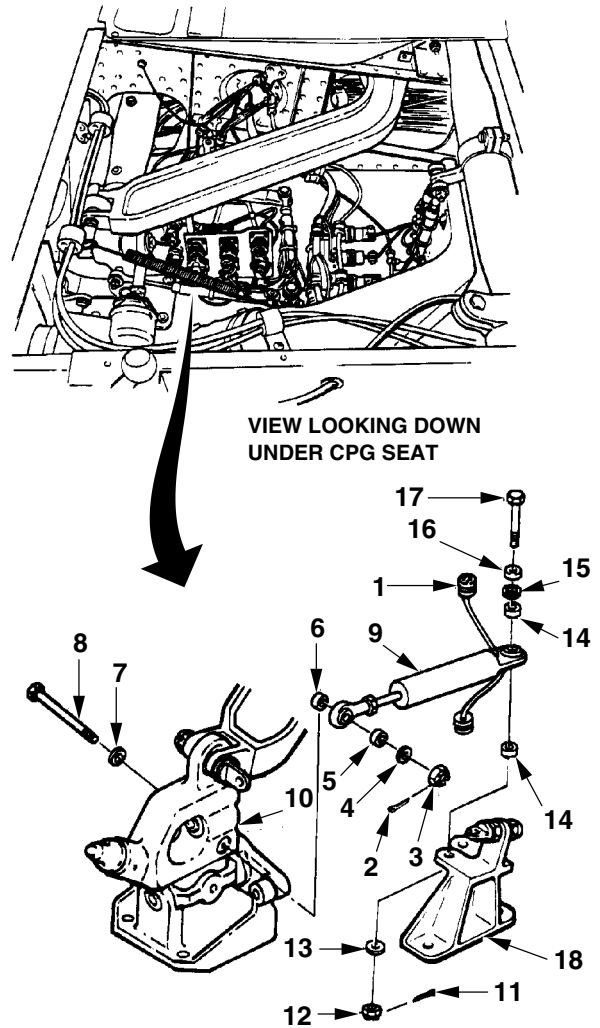
WARNING

- Ensure that no one moves flight controls during removal of fore-and-aft cyclic transducer. Physical injury can occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Disconnect two electrical connectors (1).
2. Remove cotter pin (2) and discard.
3. Remove nut (3), spacers (4, 5, and 6), washer (7), and bolt (8) to separate transducer (9) from CPG cyclic stick fitting (10).
4. Remove cotter pin (11) and discard.
5. Remove nut (12), washer (13), two spacers (14), washer (15), spacer (16), and bolt (17) to separate transducer (9) from support (18).

FOLLOW-ON MAINTENANCE

Clean, inspect, and/or repair transducer (Task 11-5-5).



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J0517

END OF TASK

11-3-23. FORE-AND-AFT CYCLIC TRANSDUCER — INSTALLATION

This task covers: Installation (On Helicopter).

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B235)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-T
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

GO TO NEXT PAGE

11-3-23. FORE-AND-AFT CYCLIC TRANSDUCER — INSTALLATION (CONT)

WARNING

- To prevent physical injury, ensure that no one moves flight controls during installation of fore-and-aft cyclic transducer. Physical injury can occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Adjust transducer (1) to obtain **6.18 inches** between centers of the grounded bearing and adjustable rod end bearing with transducer moveable rod at midstroke position.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

2. Install transducer (1) on CPG cyclic stick fitting (2) using bolt (3), washer (4), spacers (5, 6, and 7), and nut (8). Torque nut (8) **12 TO 15 INCH-POUNDS**.

3. Install cotter pin (9) through nut (8).

4. Install transducer (1) on support (10) using bolt (11), spacer (12), washer (13), two spacers (14), washer (15), and nut (16). Torque nut (16) **12 TO 15 INCH-POUNDS**.

5. Install cotter pin (17) through nut (16).

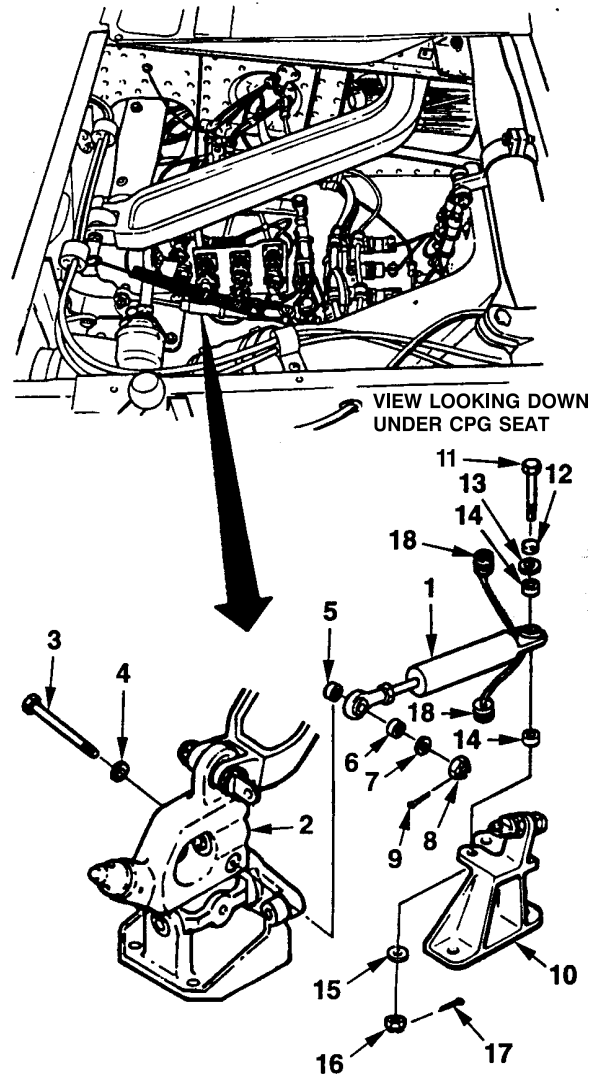
6. Connect two electrical connectors (18).

INSPECT**FOLLOW-ON MAINTENANCE**

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Perform operational check of SCAS and hydraulic electrical system (TM 1-1520-248-T).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



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J1962

END OF TASK

11-3-24. CYCLIC FRICTION KNOB AND SHAFT — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

Tools:
General Mechanic Tool Kit (B178)

Personnel Required:
67S Scout Helicopter Repairer

WARNING

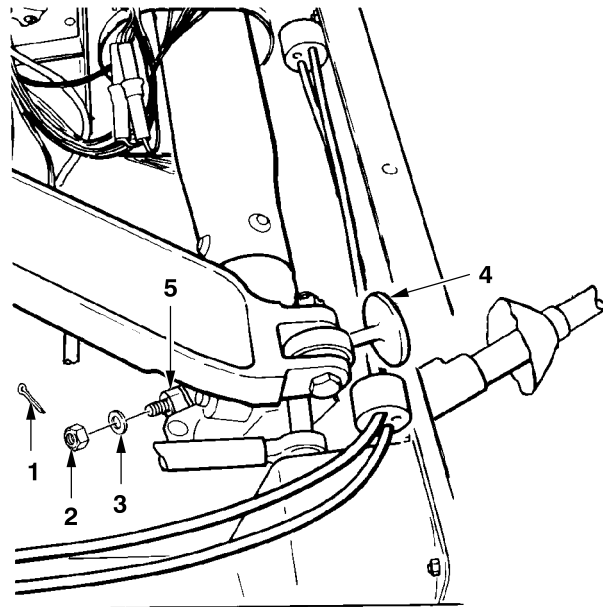
- Ensure that no one moves flight controls during removal of cyclic friction knob and shaft. Physical injury can occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Remove cotter pin (1) and discard.

NOTE

More than one washer may be installed under nut.

2. Remove nut (2) and washer (3).
3. Remove knob and shaft (4) and friction nut (5).



VIEW LOOKING DOWN UNDER PILOT SEAT

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J0517

END OF TASK

11-3-25. CYCLIC FRICTION KNOB AND SHAFT — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Tap and Die Set (B136)
Swiss Pattern File Set (B127)

Material:
Drycleaning Solvent (D199)
Wiping Rag (D164)
Sandpaper (D175)
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

CLEAN



Drycleaning Solvent

1. Clean knob and shaft surfaces with drycleaning solvent (D199).
2. Dry knob and shaft surfaces with wiping rag (D164).

INSPECT

3. Inspect for damage to limits shown. If limits are exceeded discard knob and shaft. See figure Cyclic Friction Knob and Shaft — Damage Limits.

REPAIR



Sanding Operations

4. Polish out damage within allowable limits with 400 grit sandpaper (D175).

5. Repair thread damage within allowable limits with 1/4-20 thread die (Part of tap and die set (B136)) or Swiss pattern file (Part of Swiss pattern file set (B127)).

INSPECT

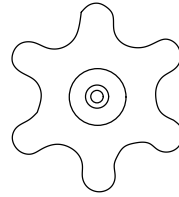
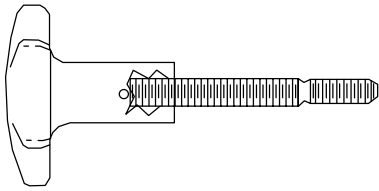


Epoxy Primer Coating

6. Apply one coat of epoxy primer coating (D98).

GO TO NEXT PAGE

11-3-25. CYCLIC FRICTION KNOB AND SHAFT — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOL



TYPE OF DAMAGE

**MECHANICAL AND
CORROSION**

**MAXIMUM AREA PER
FULL DEPTH REPAIR**

NUMBER OF REPAIRS

THREAD DAMAGE:

Depth

Length

Number

MAXIMUM DAMAGE AND REPAIR DEPTH

**0.040 in. before and
after repair**

0.10 sq. in.

Not critical

1/3 of thread

0.180 in.

Two per shaft

NOTE: Damage to knob is not critical as long as it does not interfere with operation.

406001-60
J0517

Cyclic Friction Knob and Shaft — Damage Limits

END OF TASK

11-3-26. CYCLIC FRICTION KNOB AND SHAFT — INSTALLATION

This task covers: Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Spring Scale (B120)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

GO TO NEXT PAGE

11-3-26. CYCLIC FRICTION KNOB AND SHAFT — INSTALLATION (CONT)

WARNING

- Ensure that no one moves flight controls during installation of cyclic friction knob and shaft. Physical injury can occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

NOTE

When installing knob and shaft into support, the slot in the support may be spread slightly, if necessary, to permit engagement of the fine threads on knob and shaft. If spreading of slot does not permit thread engagement, slot may be compressed a maximum of **0.020 inch** to permit thread engagement.

1. Install knob and shaft (1) into support and friction nut (2) until fine threads are engaged.

2. Connect hydraulic test stand to helicopter and operate (Task 7-2-1).

3. Attach spring scale (B120) to center of cyclic stick (3) grip.

4. Adjust friction on knob and shaft (1) until a force of 0.5 to 1.5 pounds is required to move cyclic stick (3).

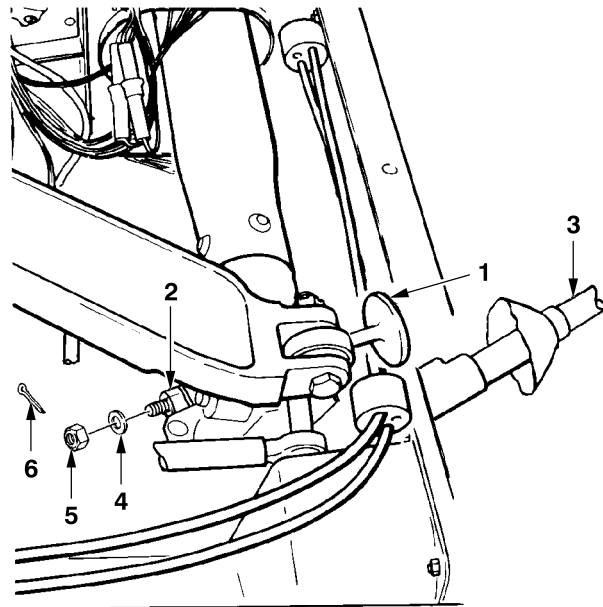
NOTE

A maximum of six washers may be used under nut to obtain cotter pin engagement.

5. Install washer (4) and nut (5) finger tight.

6. Install cotter pin (6).

7. Disconnect hydraulic test stand (Task 7-2-1).

INSPECT

VIEW LOOKING DOWN UNDER PILOT SEAT

406961-581
J0517**FOLLOW-ON MAINTENANCE**

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Install forward fairing assembly (Task 2-2-47).

END OF TASK

11-3-27. COPILOT/GUNNER CYCLIC STICK LOCKOUT CATCH — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
■ General Mechanic Tool Kit (B178)
■ Torque Wrench (B237)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

11-3-27. COPILOT/GUNNER CYCLIC STICK LOCKOUT CATCH — REMOVAL/INSTALLATION
(CONT)

REMOVE

1. Remove cotter pin (1), nut (2), three washers (3), spring (4), and bolt (5) to release latch (6) from support (7).

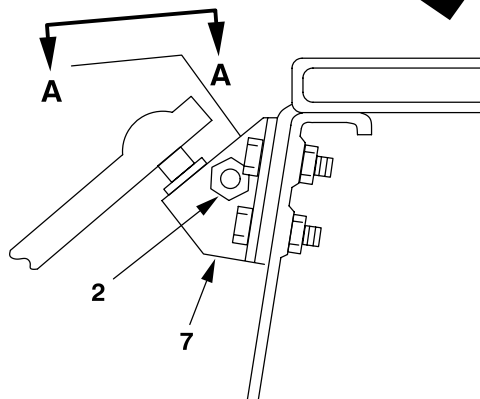
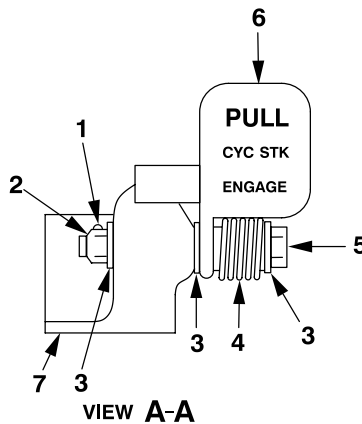
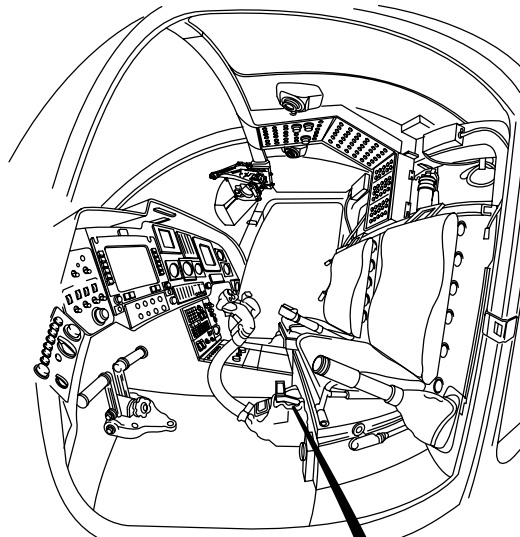
INSTALL

2. Install spring (4) on shoulder of release latch (6).

3. Install bolt (5), washer (3) through spring (4), and release latch (6). Insert bolt (5), with washer (3) against shoulder of support (7), through support (7).

4. Install washer (3) and nut (2). Torque nut (2) **50 TO 70 INCH-POUNDS** and secure with cotter pin (1).

INSPECT



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J1838

END OF TASK

11-3-28. CYCLIC MIXER BELLCRANK ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

- General Mechanic Tool Kit (B178)
- Spring Scale (B120)
- Special Bolt (H-14)
- Torque Wrench (B237)
- Torque Wrench (B239)

Material:

- Corrosion Preventive Compound (D82)

Personnel Required:

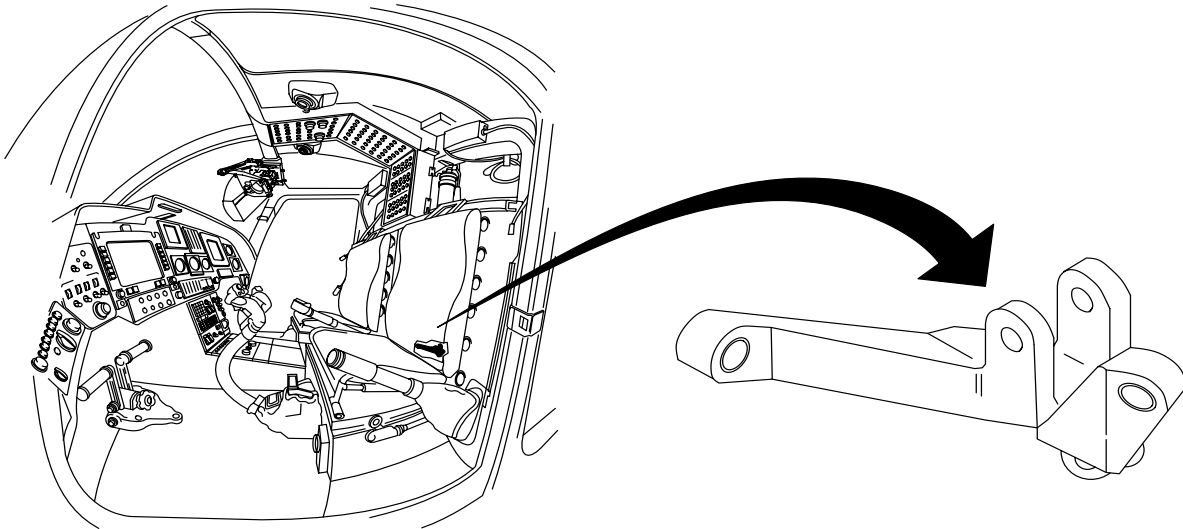
- 67S Scout Helicopter Technical Inspector (TI)
- 67S Scout Helicopter Repairer

References:

- TM 1-1500-204-23

Equipment Condition:

- Helicopter Safed (Task 1-6-7)
- Crew Seat and Armor Seat Panel Removed (Task 2-2-33) or Seat Pan Assembly Removed (Task 2-2-34)
- Center Post Duct and Panels Removed (Task 2-2-69)



406001-246
J1866

GO TO NEXT PAGE

11-3-28. CYCLIC MIXER BELLCRANK ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Disconnect two tube assemblies (1) from clevises (2) by removing two cotter pins (3), two nuts (4), two washers (5), and two bolts (6). Discard cotter pins (3).

2. Disconnect yoke assembly (7) from bearing (8) by removing cotter pin (9), nut (10), washer (11), bushing (12), and bolt (13). Discard cotter pin (9).

3. Remove bellcrank assembly (14) from trunnion bearing (15) by removing cotter pin (16), nut (17), two washers (18), and bolt (19). Discard cotter pin (16).

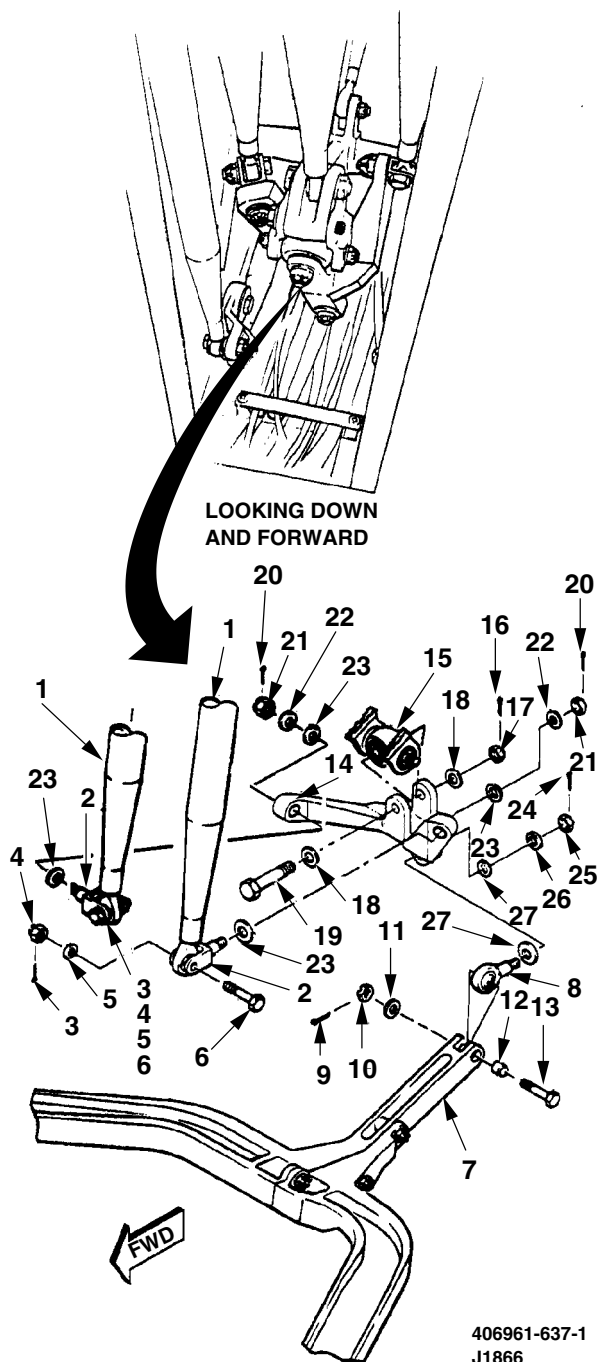
4. Remove two clevises (2) from bellcrank assembly (14) by removing two cotter pins (20), two nuts (21), shims (22), and four washers (23). Discard cotter pins (20).

5. Remove bearing (8) from bellcrank assembly (14) by removing cotter pin (24), nut (25), shim (26), and two washers (27). Discard cotter pin (24).

6. Inspect clevis (2) for wear and damage limits (Task 11-3-29).

7. Inspect rod end bearing (8) for wear and damage limits (Task 11-3-30).

8. Inspect bellcrank assembly (14) for wear and damage limits (Task 11-3-31).



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J1866

GO TO NEXT PAGE

11-3-28. CYCLIC MIXER BELLCRANK ASSEMBLY — REMOVAL/INSTALLATION (CONT)

INSTALL

9. Assemble two clevises (2) and bearing (8) to bellcrank assembly (14) as shown in Detail A.

NOTE

- A common spring scale (B120) may be used to ensure that shanks of bearing assembly and clevises do not bind in holes of bellcrank. The check procedure is illustrated in Detail B.
- Ensure treated surface of washers (23 and 27) is installed against bellcrank assembly (14) as shown in Detail A.
- Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

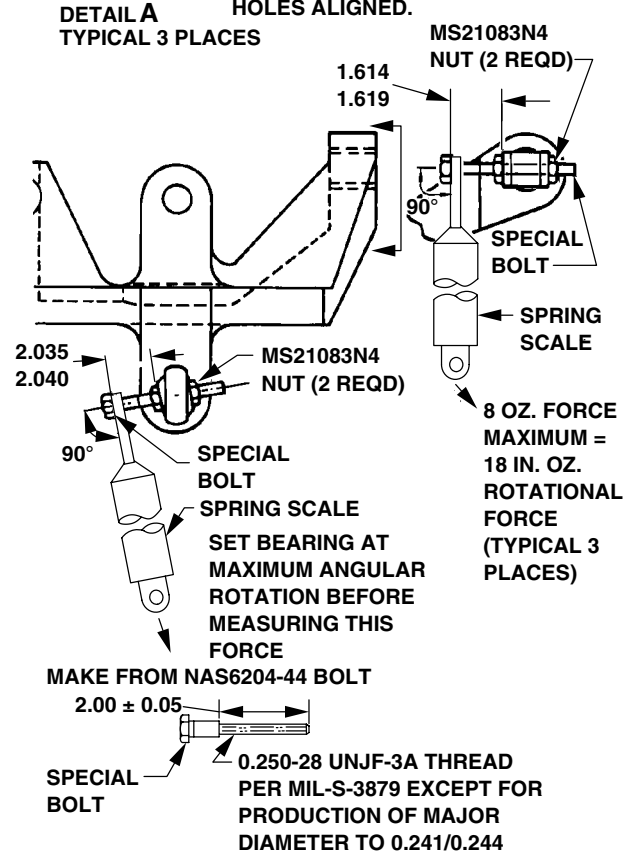
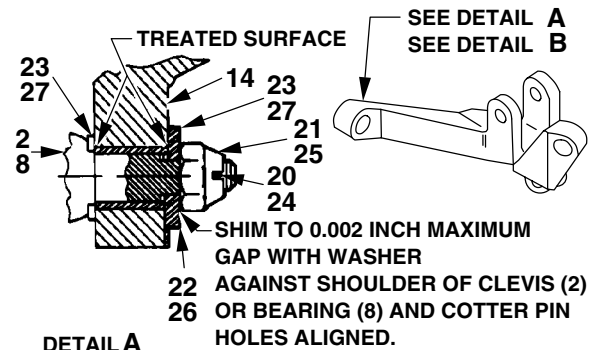
a. Place washer (23) on clevis (2) and insert clevis (2) through hole in bellcrank assembly (14). Install washer (23), shim (22), and nut (21).

b. Place washer (27) on bearing (8) and insert bearing (8) through hole in bellcrank assembly (14). Install washer (27), shim (26), and nut (25). Refer to Detail A.

c. Tighten nuts (21 and 25) snug and check alignment of cotter pin holes.

d. Increase or decrease laminations of shims (22 and 26) as necessary for alignment of cotter pin hole. A gap of **0.002 inch** maximum may be left between shim (22 and 26) and nut (21 and 25). Refer to Detail A.

e. Install cotter pins (20 and 24) through nuts (21 and 25). Using spring scale (B120) and special bolt (H-14), verify rotational force to turn clevis (2) or bearing (8) does not exceed **18 inch-ounces**. Refer to Detail B.



NOTE: ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DETAIL B

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J1964

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11-3-28. CYCLIC MIXER BELLCRANK ASSEMBLY — REMOVAL/INSTALLATION (CONT)

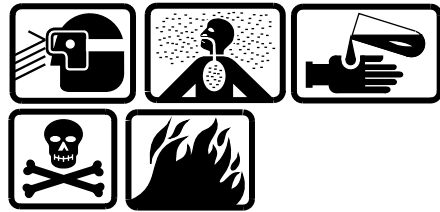
10. Connect bellcrank assembly (14) to trunnion bearing (15) with bolt (19), two washers (18), and nut (17). Torque nuts (17) **100 TO 140 INCH-POUNDS** and secure with and cotter pin (16).

11. Verify bolt (19) rotates freely in bellcrank assembly (14).

12. Connect yoke assembly (7) to bearing (8) with bolt (13), bushing (12), washer (11), nut (10). Torque nut (10) **50 TO 70 INCH-POUNDS** and install cotter pin (9).

13. Connect two tube assemblies (1) to clevises (2) with two bolts (6), two washers (5), and two nuts (4). Torque nuts (4) **50 TO 70 INCH-POUNDS**.

14. Install cotter pins (3) through nuts (4).



Corrosion Preventive Compound

CAUTION

To prevent failure of repair, do not allow corrosion preventive compound (D82) to enter metallic or elastomeric bearings.

15. After assembly, apply a light coat of corrosion preventive compound (D82) to external areas and exposed threads, excluding any metallic or elastomeric bearings or seals.

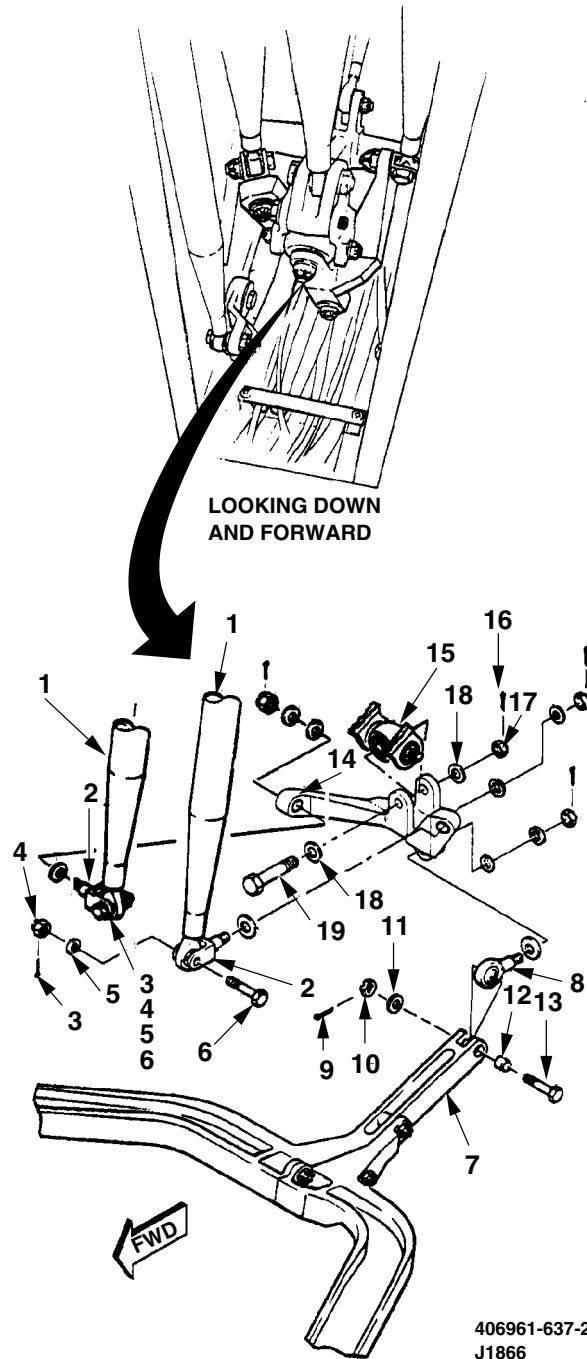
INSPECT

FOLLOW-ON MAINTENANCE

Verify cyclic controls rigging (Task 11-1-3).

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Install center post duct and panels (Task 2-2-69).



406961-637-2
J1866

END OF TASK

11-3-29. CYCLIC MIXER BELLCRANK ASSEMBLY CLEVIS — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

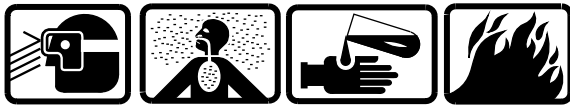
Tools:
General Mechanic Tool Kit (B178)

Material:
Rubber Gloves (D111)
Wiping Rag (D164)

Drycleaning Solvent (D199)
Sandpaper (D175)
Crocus Cloth (D90)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

CLEAN



Drycleaning Solvent

1. Clean clevis surface with drycleaning solvent (D199).
2. Dry clevis with a dry wiping rag (D164).

INSPECT

3. Inspect clevis to limits shown. See figure Cyclic Mixer Bellcrank Assembly Clevis — Damage Limits.

REPAIR



Sanding Operations

4. Repair damage within specified limits using 400 grit sandpaper (D175). Smooth surface with crocus cloth (D90).

INSPECT

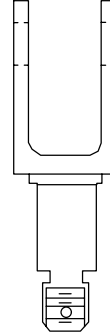
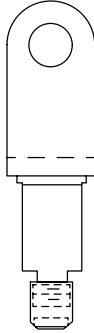


Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).
6. Replace clevis if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-29. CYCLIC MIXER BELLCRANK ASSEMBLY CLEVIS — CLEANING/INSPECTION/REPAIR
(CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

**MECHANICAL AND
CORROSION**

**MAXIMUM AREA PER
FULL DEPTH REPAIR**

NUMBER OF REPAIRS

**EDGE CHAMFER TO
REMOVE DAMAGE**

BORES

THREAD DAMAGE:

**Depth
Length
Number**

MAXIMUM DAMAGE AND REPAIR DEPTH

**0.010 in. before and
0.020 in. after repair**

0.25 sq. in.

Not critical

0.020 in. x 45°

**0.002 inch for 1/4
circumference**

**1/3 of thread
1/5 of circumference
One per threaded segment**

406001-14
J0517

Cyclic Mixer Bellcrank Assembly Clevis — Damage Limits

END OF TASK

11-3-30. CYCLIC MIXER BELLCRANK ASSEMBLY ROD END BEARING — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

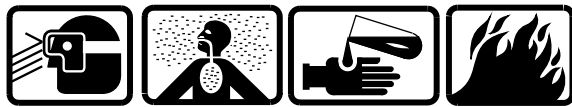
Drycleaning Solvent (D199)
Sandpaper (D175)
Crocus Cloth (D90)
Epoxy Primer Coating (D98)
Acetone (D2)

Tools:
General Mechanic Tool Kit (B178)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Material:
Rubber Gloves (D111)
Wiping Rag (D164)

CLEAN



Drycleaning Solvent

1. Clean rod end bearing surfaces with drycleaning solvent (D199).
2. Dry rod end bearing with a dry wiping rag (D164).

INSPECT

3. Inspect rod end bearing to limits shown. See figure Cyclic Mixer Bellcrank Assembly Rod End Bearing — Damage Limits.

REPAIR



Sanding Operations

4. Repair damage within specified limits using 400 grit sandpaper (D175). Smooth surface with crocus cloth (D90).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

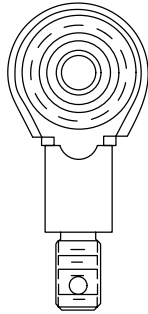


Epoxy Primer Coating

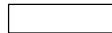
6. Touch up repaired areas with epoxy primer coating (D98).
7. Replace rod end bearing if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-30. CYCLIC MIXER BELLCRANK ASSEMBLY ROD END BEARING — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL AND
CORROSION

0.010 in. before and
0.020 in. after repair

MAXIMUM AREA PER
FULL DEPTH REPAIR

0.25 sq. in.

NUMBER OF REPAIRS

Not critical

EDGE CHAMFER TO
REMOVE DAMAGE

0.020 in. x 45°

THREAD

Depth
Length
Number

1/3 of thread
1/5 of circumference
One per thread

BEARING WEAR:

Axial
Radial

0.012 in.
0.005 in.

406001-13
J1831

Cyclic Mixer Bellcrank Assembly Rod End Bearing — Damage Limits

END OF TASK

11-3-31. CYCLIC MIXER BELLCRANK ASSEMBLY (AVIM) — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Hand Arbor Press (B107)
Bearing Staking Tool Set (B189)
Reamer Set (B114)

Material:
Rubber Gloves (D111)
Acetone (D2)
Abrasive Mats (D1)
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:
TM 1-1520-266-23 ■

CLEAN



Acetone

1. Clean bores using acetone (D2) and abrasive mats (D1). Wipe dry with wiping rag (D164).

INSPECT

2. Inspect bellcrank for damage after cleanup and smoothout. See figure Cyclic Mixer Bellcrank Assembly — Damage Limits. If cracks in cyclic mixer bellcrank assembly are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR

3. Press old bushings (1) out of cyclic mixer bellcrank assembly (2) using plug and hand arbor press (B107).

4. Clean the bores using acetone (D2) and abrasive mats (D1). Wipe dry with wiping rag (D164).

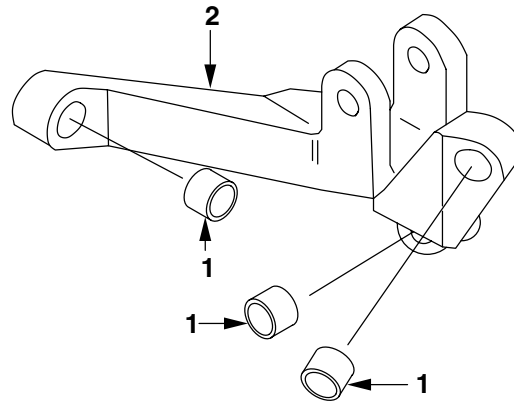
5. Press new bushings (1) into cyclic mixer bellcrank assembly (2) using pressing plug and hand arbor press (B107).

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Installation of bushings (1) flush to slightly recessed is the critical characteristic of the cyclic mixer bellcrank assembly.

GO TO NEXT PAGE



406001-247
J0517

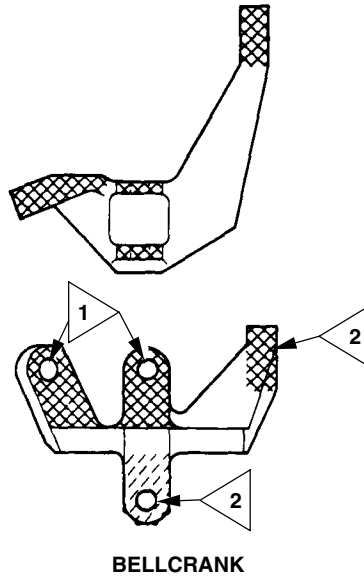
6. Ensure that new bushings (1) are installed flush to slightly recessed. New bushings (1) shall not protrude at either end.

7. Ream new bushings (1) **0.3753 to 0.3758 inch.**

8. Replace cyclic mixer bellcrank assembly (2) if unrepairable.

INSPECT

11-3-31. CYCLIC MIXER BELLCRANK ASSEMBLY (AVIM) — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL AND CORROSION

0.010 in. before and 0.020 in. after repair

0.010 in. before and 0.020 in. after repair

0.020 in. before and 0.040 in. after repair

MAXIMUM AREA PER FULL DEPTH REPAIR

0.10 sq. in.

0.10 sq. in.

0.25 sq. in.

NUMBER OF REPAIRS

Two per lug

Two per lug

Not critical

EDGE CHAMFER TO REMOVE DAMAGE

0.030 in. x 45°

0.030 in. by 45°

0.060 in. x 45°

- NOTES:
- 1 Bore damage not to exceed 0.001 inch for one-fourth circumference. Limit one repair per bore.
 - 2 Bore damage not to exceed 0.002 inch for one-fourth circumference. Limit one repair per bore.

406001-65
J0537

Cyclic Mixer Bellcrank Assembly — Damage Limits

END OF TASK

11-3-32. CYCLIC ADJUSTABLE TUBE ASSEMBLY (TYPICAL) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

References:
TM 1-1500-204-23

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)
Center Post Duct and Panels Removed (Task
2-2-69)

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B236)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer (2)

GO TO NEXT PAGE

11-3-32. CYCLIC ADJUSTABLE TUBE ASSEMBLY (TYPICAL) — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Position maintenance stand (B162) next to helicopter.

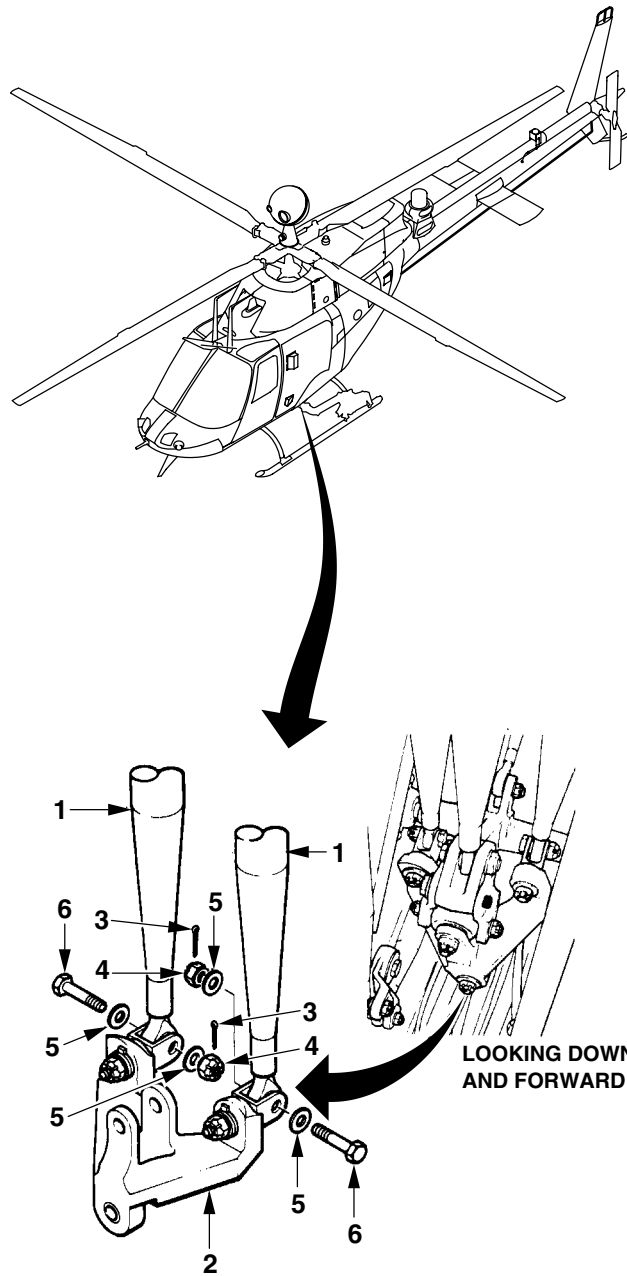
WARNING

- To prevent physical injury, ensure that no one moves flight controls during installation of lateral cyclic transducer. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

NOTE

Replacement procedures apply to left and right bellcrank assemblies.

2. Disconnect tube assembly (1) from bellcrank assembly (2) by removing cotter pin (3), nut (4), two washers (5), and bolt (6). Discard cotter pin (3).



406961-802
J0520

GO TO NEXT PAGE

11-3-32. CYCLIC ADJUSTABLE TUBE ASSEMBLY (TYPICAL) — REMOVAL/INSTALLATION (CONT)

3. Disconnect tube assembly (1) from bellcrank assembly (7) by removing cotter pin (8), nut (9), washer (10), and bolt (11). Discard cotter pin (8).

4. Remove tube assembly (1) through cabin roof.

5. Inspect tube assembly (1) for wear and damage limits (Task 11-5-1).

INSTALL

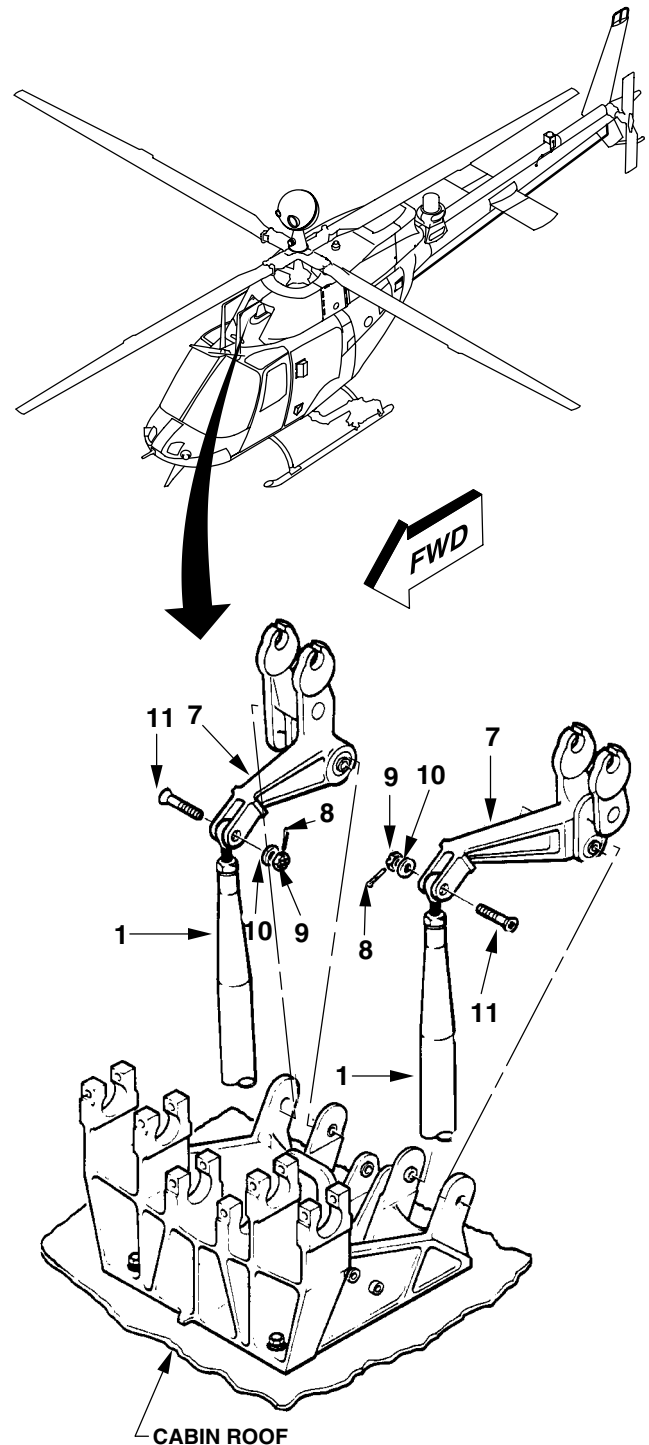
6. Place tube assembly (1) into proper position through cabin roof.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

7. Secure tube assembly (1) to bellcrank assembly (7) with bolt (11), washer (10), nut (9). Torque nut (9) **30 TO 40 INCH-POUNDS**.

8. Install cotter pin (8) through nut (9).



406961-803
J0520

GO TO NEXT PAGE

11-3-32. CYCLIC ADJUSTABLE TUBE ASSEMBLY (TYPICAL) — REMOVAL/INSTALLATION (CONT)

9. Secure tube assembly (1) to bellcrank assembly (2) with bolt (6), two washers (5), and nut (4). Torque nut (4) **30 TO 40 INCH-POUNDS**.

10. Install cotter pin (3) through nut (4).

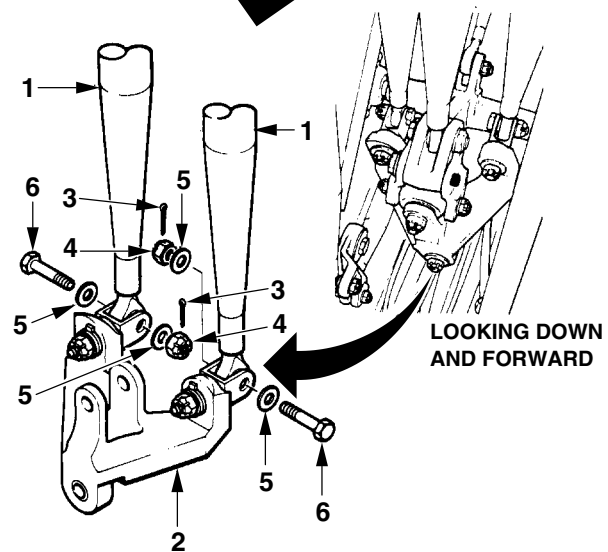
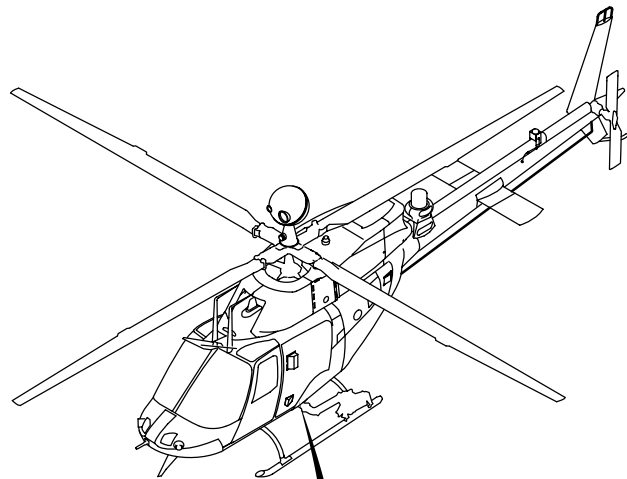
INSPECT

FOLLOW-ON MAINTENANCE

Check cyclic controls rigging (Task 11-1-3).

Install center post duct and panels (Task 2-2-69).

Install forward fairing assembly (Task 2-2-47).



406961-802
J0520

END OF TASK

**11-3-33. CYCLIC ADJUSTABLE TUBE ASSEMBLY ROD END BEARING (TYPICAL) — REMOVAL/
INSTALLATION**

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

Torque Wrench (B236)
Torque Wrench (B237)
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:

TM 1-1500-204-23

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly
Removed (Task 2-2-47)

GO TO NEXT PAGE

11-3-33. CYCLIC ADJUSTABLE TUBE ASSEMBLY ROD END BEARING (TYPICAL) — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Position maintenance stand (B162) next to helicopter.

WARNING

- Ensure that no one operates controls from inside of helicopter during replacement of rod end bearing. Physical injury can occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this check.

NOTE

Replacement procedures apply to left and right adjustable tube assemblies.

2. Count and record number of exposed threads on rod end bearing (1) and loosen jamnut (2).

3. Disconnect rod end bearing (1) from bellcrank (3) by removing cotter pin (4), nut (5), washer (6), and bolt (7). Discard cotter pin (4).

4. Remove rod end bearing (1) from tube assembly (8).

5. Remove jamnut (2) and washer (9) from rod end bearing (1).

INSTALL

6. Install washer (9) and jamnut (2) on rod end bearing (1).

7. Screw rod end bearing (1) into tube assembly (8) and establish correct number of exposed threads as previously recorded.

NOTE

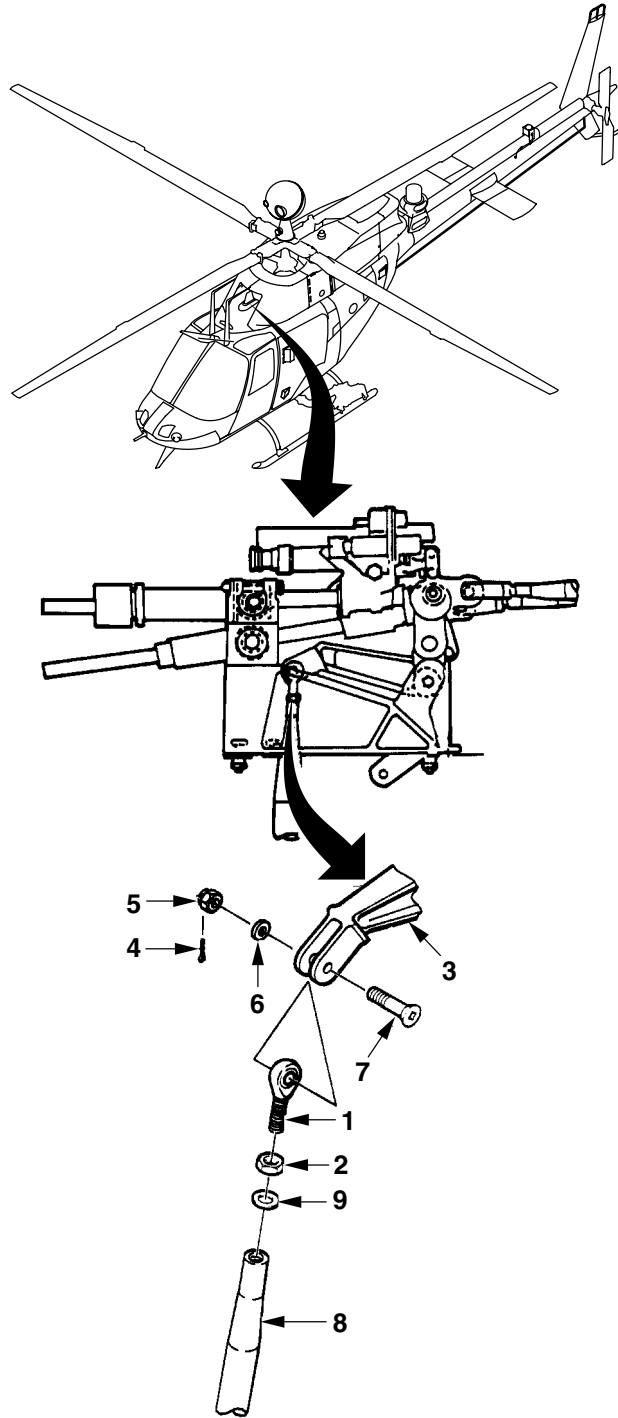
Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

8. Secure rod end bearing (1) to bellcrank (3) with bolt (7), washer (6), and nut (5). Torque nut (5) **30 TO 40 INCH-POUNDS**.

9. Torque jamnut (2) **80 TO 100 INCH-POUNDS**.

10. Install cotter pin (4) through nut (5).

INSPECT



406961-620
J0520

GO TO NEXT PAGE

11-3-33. CYCLIC ADJUSTABLE TUBE ASSEMBLY ROD END BEARING (TYPICAL) — REMOVAL/
INSTALLATION (CONT)

FOLLOW-ON MAINTENANCE

Check cyclic controls rigging (Task 11-1-3).

- Install forward fairing assembly (Task 2-2-47).

END OF TASK

11-3-34. INPUT CYCLIC CONTROL BELLCRANK ASSEMBLY BEARINGS — REMOVAL/
INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B237)
Torque Wrench (B239)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer (2)

References:
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed (Task 2-2-47)
Cyclic Hydraulic Actuators Removed (Task 7-1-10)

REMOVE

1. Position maintenance stand (B162) next to helicopter.

NOTE

Replacement procedures apply to left and right bellcrank assemblies.

2. Disconnect bellcrank assembly (1) from support assembly (2) by removing cotter pin (3), bolt (4), two washers (5), bushing (6), and nut (7). Discard cotter pin (3).

3. Remove bellcrank assembly (1) from control tube (8) by removing cotter pin (9), bolt (10), washer (11), and nut (12). Discard cotter pin (9).

4. Inspect bellcrank assembly (1) (Task 11-3-35).

INSTALL

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

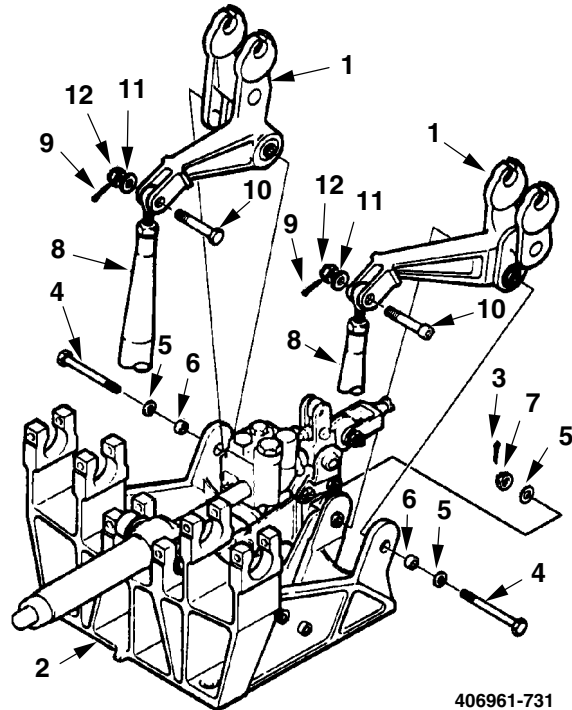
5. Install bellcrank assembly (1) to control tube (8) with bolt (10), washer (11), and nut (12).

■ Torque nut (12) **50 TO 70 INCH-POUNDS**.

6. Install cotter pin (9) through nut (12).

7. Install bellcrank assembly (1) on support assembly (2) and secure with bolt (4), two washers (5), bushing (6), and nut (7). Torque nut (7) **100 TO 140 INCH-POUNDS**.

8. Install cotter pin (3) through nut (7).



406961-731
J0518

GO TO NEXT PAGE

11-3-34. INPUT CYCLIC CONTROL BELLCRANK ASSEMBLY BEARINGS — REMOVAL/
INSTALLATION (CONT)

INSPECT

FOLLOW-ON MAINTENANCE

Install cyclic hydraulic actuator (Task 7-1-10).

- Install forward fairing assembly (Task 2-2-47).

END OF TASK

11-3-35. INPUT CYCLIC CONTROL BELLCRANK ASSEMBLY BEARINGS — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

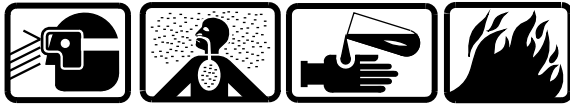
Material:
Rubber Gloves (D111)
Wiping Rag (D164)
Drycleaning Solvent (D199)

Acetone (D2)
Crocus Cloth (D90)
Sandpaper (D175)
Epoxy Primer Coating (D98)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



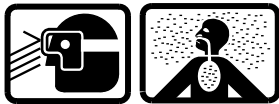
Drycleaning Solvent

1. Clean bellcrank assembly surface with drycleaning solvent (D199).
2. Dry bellcrank assembly with a dry wiping rag (D164).

INSPECT

3. Inspect bellcrank assembly to limits shown. See figure Input Cyclic Control Bellcrank Assembly — Damage Limits. If cracks in bellcrank assembly are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove scratches, nicks and corrosion on bellcrank assembly surface with 400 grit

sandpaper (D175). Smooth surface with crocus cloth (D90).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



Epoxy Primer Coating

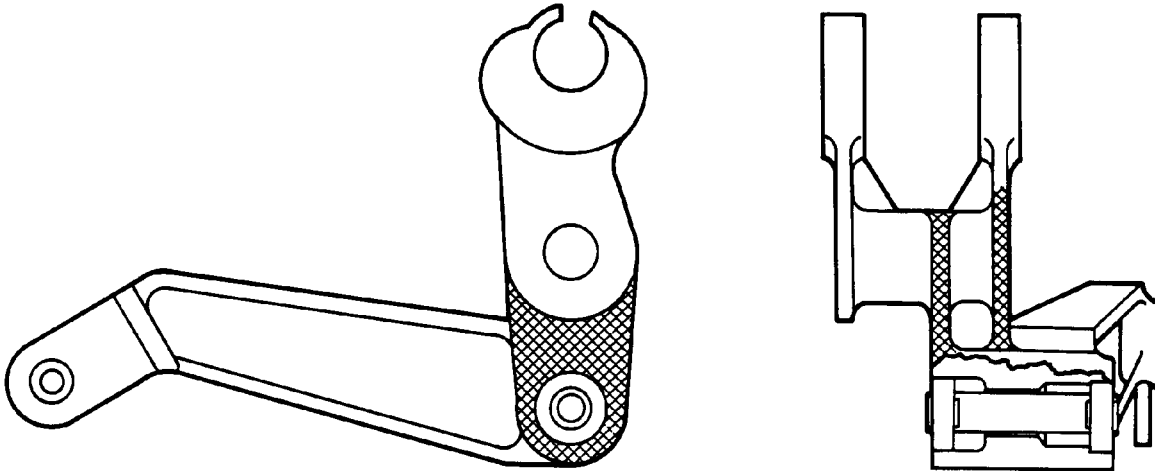
6. Touch up repaired areas with epoxy primer coating (D98) of previously painted parts.

7. Replace bellcrank assembly if wear or damage limits are exceeded.

8. Replace bearings (Task 11-3-36) if bearing wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-35. INPUT CYCLIC CONTROL BELLCRANK ASSEMBLY BEARINGS — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	0.010 in. before and after repair	0.020 in. before and after repair
MECHANICAL	0.010 in. before and after repair	0.020 in. before and after repair
CORROSION	0.005 in. before and 0.010 in. after repair	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.025 sq. in.	0.50 sq. in.
NUMBER OF REPAIRS	One per segment	One per segment
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in.	0.060 in.
BORES	0.002 in. for 1/4 circumference	

NOTE: No cracks are permitted.

406001-75
J0537

Input Cyclic Control Bellcrank Assembly — Damage Limits

END OF TASK

11-3-36. INPUT CYCLIC CONTROL BELLCRANK ASSEMBLY BEARINGS (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal/Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Hand Arbor Press (B107)
Drift Pin (B38)
Powertrain Repairer Tool Kit (B180)
Torque Wrench (B236)

Material:
Drycleaning Solvent (D199)
Abrasive Mat (D1)
Wiping Rag (D164)
Rubber Gloves (D111)
Retaining Compound (D169)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

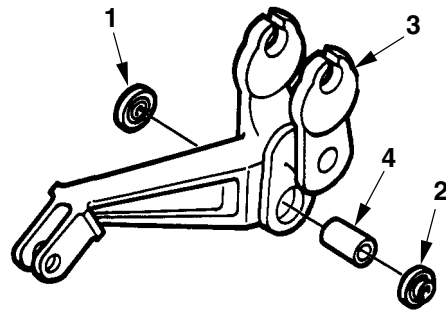
REMOVE

NOTE

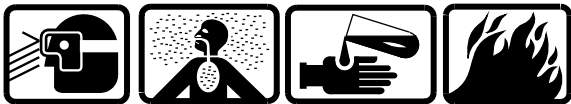
Repair procedures apply to both left and right input cyclic control bellcrank assemblies.

1. Using hand arbor press (B107), press bearing (1) in to push old bearing (2) out of bellcrank (3).

2. Press on spacer (4) with drift pin (B38) to remove bearing (1) and spacer (4) from bellcrank (3).



CLEAN



Drycleaning Solvent

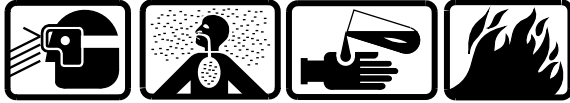
3. Clean surfaces of bellcrank (3) with drycleaning solvent (D199) to remove grease, oil, dirt, and other contaminants. Dry with wiping rag (D164). Smooth bore with abrasive mat (D1).

406961-804
J0518

GO TO NEXT PAGE

 11-3-36. INPUT CYCLIC CONTROL BELLCRANK ASSEMBLY BEARINGS (AVIM) — REMOVAL/INSTALLATION (CONT)

INSTALL

**Retaining Compound**

4. Apply retaining compound (D169) to mating surfaces of bearings (1 and 2) and bellcrank (3).

NOTE

- As soon as possible after applying retaining compound (D169), parts should be pressed into bellcrank.
- Bearings (1 and 2) must be centered in bellcrank (3).

5. Using hand arbor press (B107), press bearing (2) into bellcrank (3). Install spacer (4), then press bearing (1) into bellcrank (3).

NOTE

Do not stake bearings.

6. Within 5 minutes, install 5/16-24 alignment bolt (5), two washers (6), and nut (7) to align bearings (1 and 2) and spacer (4).

7. Torque nut (7) **25 TO 35 INCH-POUNDS**.

8. Allow assembly to cure at room temperature (70 to 77 °F) for 26 to 28 hours.

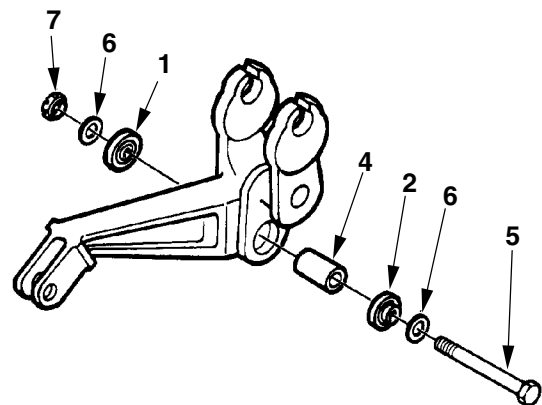
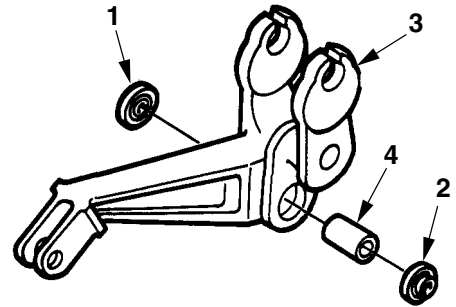
9. Remove nut (7), bolt (5), and two washers (6) when retaining compound (D169) is dry.

INSPECT

10. Inspect bellcrank assembly for damage (Task 11-3-35).

11. Inspect installation of bearings (1 and 2) and spacer (4). Verify that excessive retaining compound (D169) has not been removed from surfaces.

12. Ensure there is no movement or looseness of bearing outer race.

INSPECT

406001-248
J0518

END OF TASK

11-3-37. ADJUSTABLE TUBE ASSEMBLY CONTROLS — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B238)

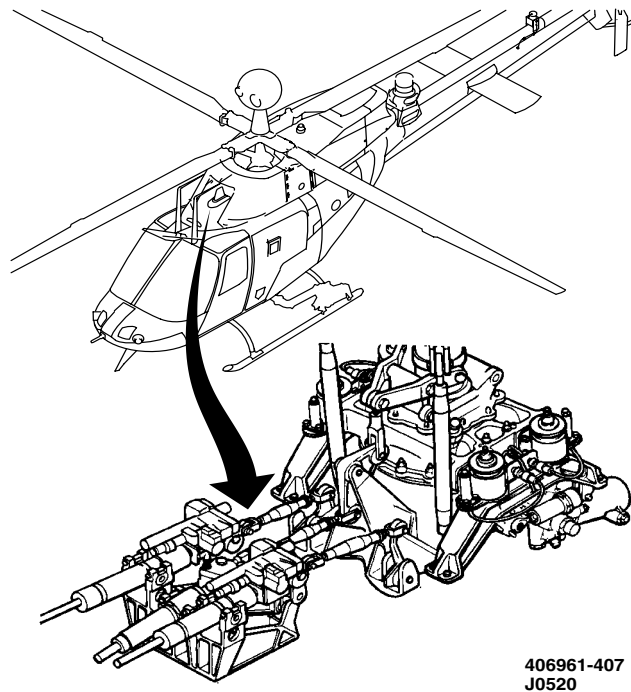
Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)

NOTE

Refer to Task 11-2-60 for removal and installation procedures.



END OF TASK

11-3-38. BOOSTED BELLCRANK ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

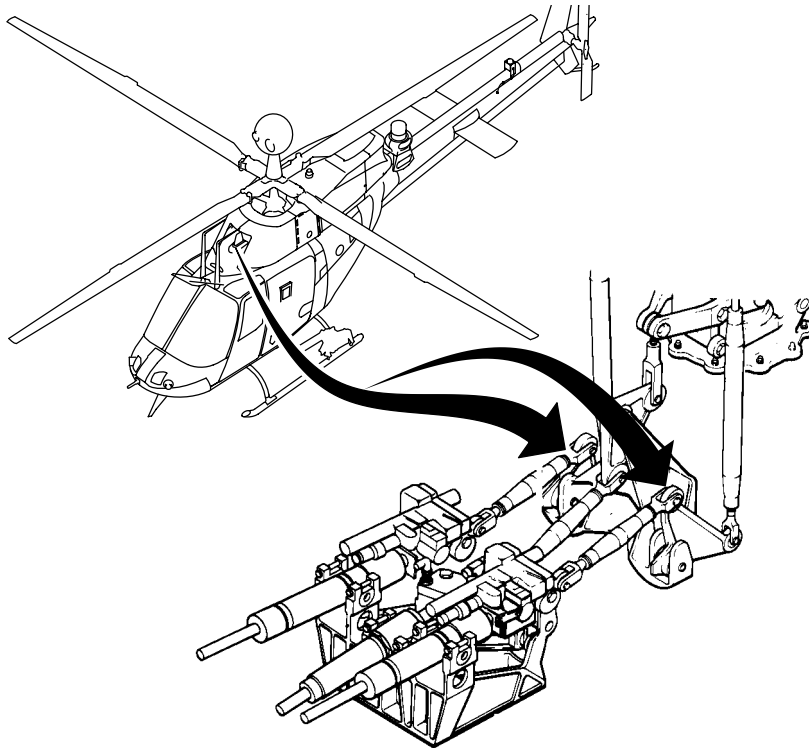
Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B238)
■ Torque Wrench (B237)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)



406961-625
J0520

GO TO NEXT PAGE

11-3-38. BOOSTED BELLCRANK ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Position maintenance stand (B162) next to helicopter.

2. Disconnect tube assembly (1) from bellcrank assembly (2) by removing cotter pin (3), bolt (4), two washers (5), and nut (6). Discard cotter pin (3).

3. Disconnect tube assembly (7) from bellcrank assembly (2) by removing cotter pin (8), bolt (9), two washers (10), and nut (11). Discard cotter pin (8).

4. Remove bellcrank assembly (2) from support assembly (12) by removing cotter pin (13), bolt (14), two washers (15), and nut (16). Discard cotter pin (13).

INSPECT

5. Inspect bellcrank assembly (2) (Task 11-3-39).

INSTALL

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

6. Position bellcrank assembly (2) in support assembly (12) and attach with bolt (14), two washers (15), nut (16). Torque nut (16) **95 TO 110 INCH-POUNDS**.

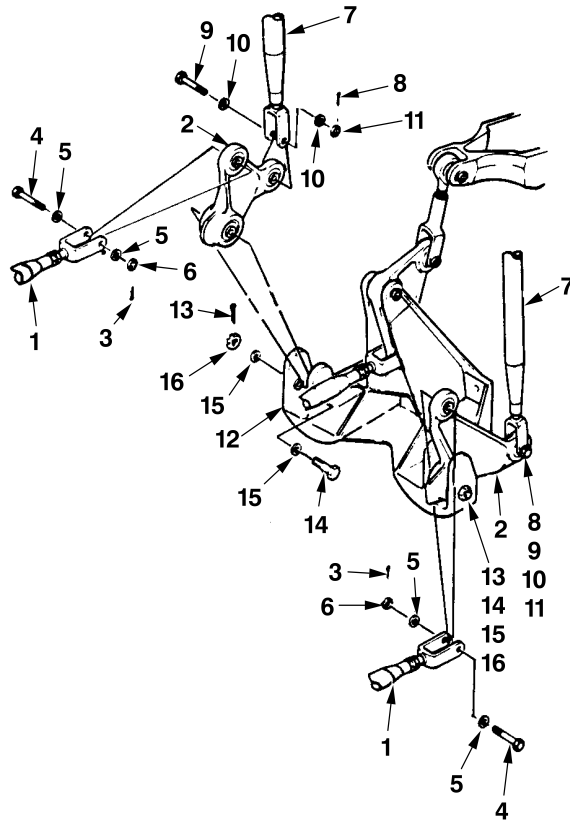
7. Install cotter pin (13) through nut (16).

8. Connect tube assembly (7) to bellcrank assembly (2) by installing bolt (9), two washers (10), and nut (11). Torque nut (11) **65 TO 85 INCH-POUNDS**.

9. Install cotter pin (8) through nut (11).

10. Connect tube assembly (1) to bellcrank assembly (2) by installing bolt (4), two washers (5), nut (6). Torque nut (6) **65 TO 85 INCH-POUNDS**.

11. Install cotter pin (3) through nut (6).



406961-1384-1
J1866

GO TO NEXT PAGE

11-3-38. BOOSTED BELLCRANK ASSEMBLY — REMOVAL/INSTALLATION (CONT)

INSPECT

CAUTION

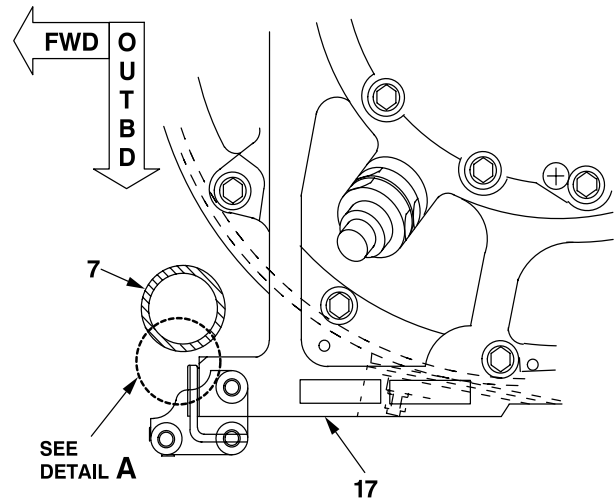
To prevent failure of repair, after replacing components of the swashplate, boosted bellcrank, or transmission assemblies, check for interference between the cyclic control tubes and transmission top case. If less than **0.06 inch** clearance exists, rework is required.

12. Check for interference between cyclic control tube assemblies (7) and transmission top case (17). If less than **0.06 inch** clearance exists, rework transmission top case (17) as shown in detail A (Task 6-3-1).

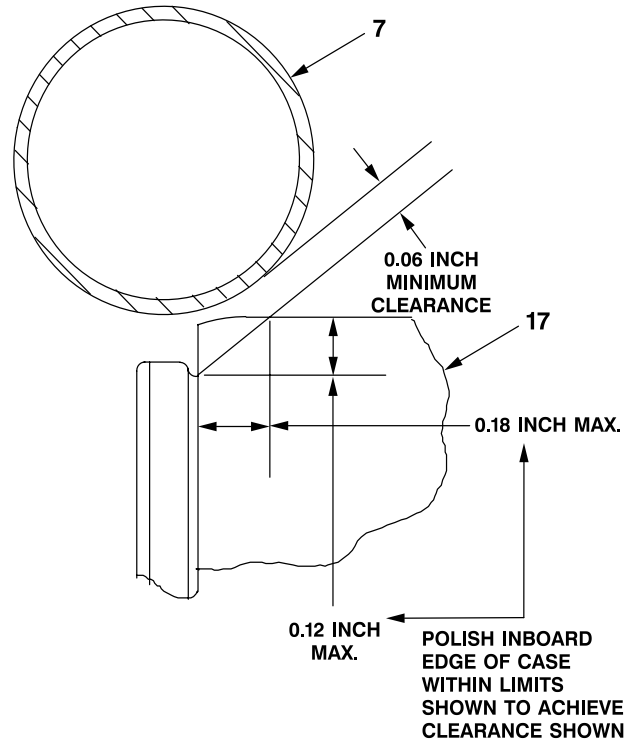
FOLLOW-ON MAINTENANCE

Install forward fairing assembly (Task 2-2-47).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



VIEW LOOKING DOWN ON TRANSMISSION



DETAIL A

406961-1384-3
J1866

END OF TASK

11-3-39. BOOSTED BELLCRANK ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Epoxy Primer Coating (D98)
Rubber Gloves (D111)
Wiping Rag (D164)

Drycleaning Solvent (D199)
Crocus Cloth (D90)
Sandpaper (D175)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean bellcrank assembly surface with drycleaning solvent (D199).

2. Dry bellcrank assembly with a dry wiping rag (D164).

INSPECT

3. Inspect bellcrank assembly to limits shown. See figure Boosted Bellcrank Assembly — Damage Limits. If cracks in boosted bellcrank assembly are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR

4. Replacement procedures for the bellcrank bearing are provided in Task 11-3-40.



Sanding Operations

5. Remove scratches, nicks and corrosion on boosted bellcrank assembly surface with 400 grit sandpaper (D175). Smooth surface with crocus cloth (D90).



Acetone

6. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



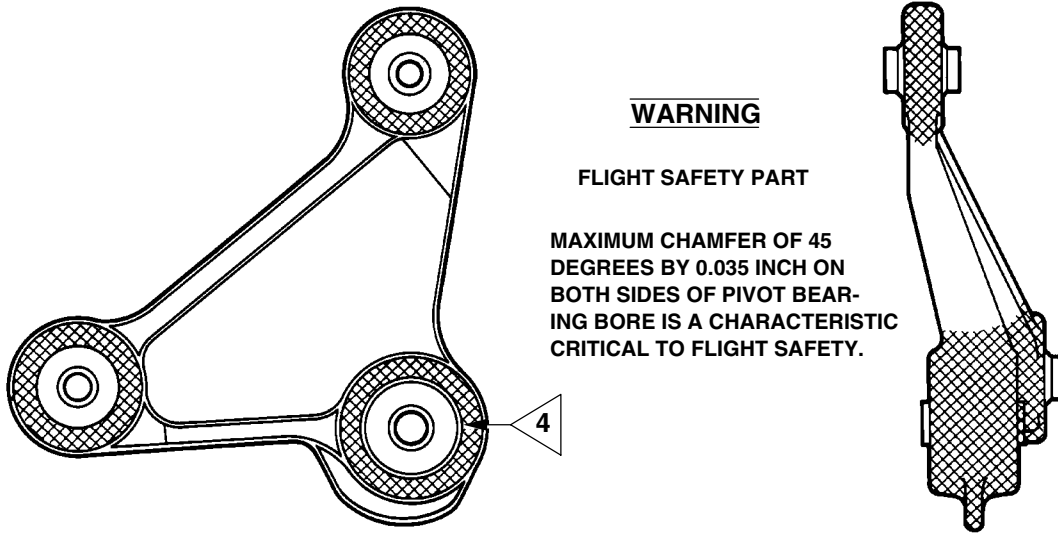
Epoxy Primer Coating

7. Apply epoxy primer coating (D98) to repaired areas of bellcrank.

8. Replace bellcrank assembly if damage or wear limits are exceeded.

GO TO NEXT PAGE

11-3-39. BOOSTED BELLCRANK ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



BELLCRANK ASSEMBLY
406-001-505-105, -106

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	0.010 in. before and after repair	0.020 in. before and after repair
MECHANICAL	0.010 in. before and after repair	0.020 in. before and after repair
CORROSION	0.005 in. before and 0.010 in. after repair	0.020 in. before and 0.040 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.100 sq. in.	Not critical
NUMBER OF REPAIRS	One per lug	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in.	0.060 in.
BORES	0.002 in. for 1/4 circumference	

- NOTES:
1. No cracks are permitted.
 2. Axial bearing wear shall not exceed 0.030 inch; radial bearing wear shall not exceed 0.005 inch.
 3. Bore damage not to exceed 0.001 inch for full circumference. Bearing bore damage not to exceed 0.002 inch for 1/4 circumference.

- 4 Maximum chamfer of 45 degrees by 0.035 inch on both sides of pivot bearing bore.

406001-77
J0538

Boosted Bellcrank Assembly — Damage Limits

END OF TASK

11-3-40. BOOSTED BELLCRANK ASSEMBLY BEARINGS (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal/Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Repairer Tool Kit (B180)
Hand Arbor Press (B107)
Bearing Staking Tool Set (B189)
Telescoping Gage Set (B47)
Outside Micrometer Caliper Set (B12)
Spring Scale (B120)
Special Bolt (H-14)

Material:

Drycleaning Solvent (D199)
Wiping Rag (D164)
Retaining Compound (D169)
Rubber Gloves (D111)
Zinc Chromate Primer (D161)
Magnabond Adhesive (D23)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:

TM 1-1500-204-23

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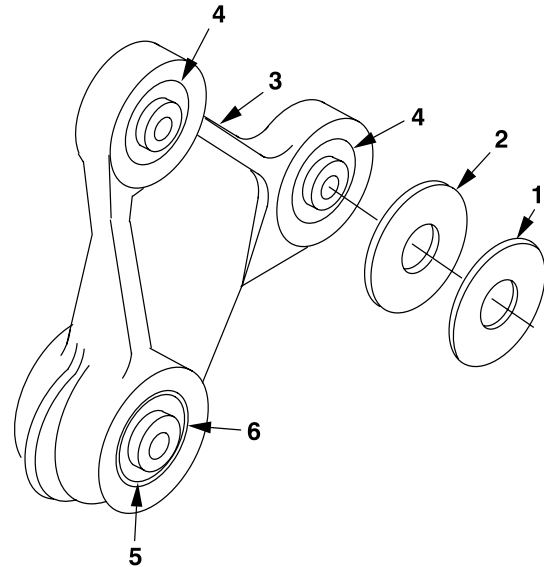
11-3-40. BOOSTED BELLCRANK ASSEMBLY BEARINGS (AVIM) — REMOVAL/INSTALLATION
(CONT)

REMOVE BEARINGS

NOTE

Repair procedures apply to both left and right boosted bellcrank assemblies.

1. Remove flat washer (1) from rubber washer (2).
2. Remove rubber washer (2) from bellcrank (3).
3. Press two bearings (4) from bellcrank (3).
4. Press bearing (5) and sleeve (6) from bellcrank (3).



CLEAN



Drycleaning Solvent

5. Clean surfaces with drycleaning solvent (D199) to remove grease, oil, dirt, and other contaminants. Dry surfaces with clean wiping rag.

INSPECT

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT
PART (FSCAP)

Maximum chamfer of 45 degrees by **0.035 inch** on both sides of pivot bearing bore is a characteristic critical to flight safety.

6. Inspect bores for damage. Maximum allowable damage is **0.002 inch** deep for one-fourth of circumferences.

INSTALL BEARINGS



Retaining Compound

GO TO NEXT PAGE

406001-249
J1803

NOTE

As soon as possible after applying retaining compound, parts should be pressed into bellcrank.

7. Apply retaining compound (D169) to mating surfaces of bellcrank (3) and bearings (4).

WARNING

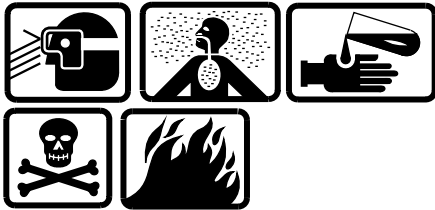
FLIGHT SAFETY CRITICAL AIRCRAFT
PART (FSCAP)

Accomplishment of roll staking to both sides of bearings and ring staking to both sides of pivot bearing are characteristics critical to flight safety.

8. Using hand arbor press (B107), press two bearings (4) into bellcrank (3).

11-3-40. BOOSTED BELLCRANK ASSEMBLY BEARINGS (AVIM) — REMOVAL/INSTALLATION (CONT)

9. Using spring scale (B120) and special bolt (H-14), check breakout torque of two bearings (4) to measure **1 TO 6 INCH-POUNDS** of torque.



Zinc Chromate Primer

10. Apply zinc chromate primer (D161) to mating surface of sleeve (6) and bellcrank (3).

11. Using hand arbor press (B107), press sleeve (6) into bellcrank (3) while primer is still wet.

12. Ream sleeve (6) **1.0613 to 1.0618 inches**.

13. Coat mating surfaces of bearing (5) and sleeve (6) with zinc chromate primer (D161).

14. Press bearing (5) into sleeve (6) while primer is still wet.

15. Using bearing staking tool set (B189), ring stake bearing (5) (TM 1-1500-204-23).



Adhesive

CAUTION

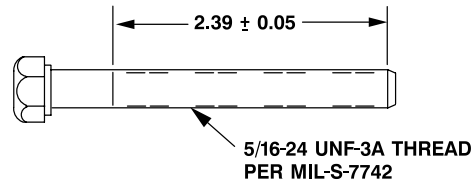
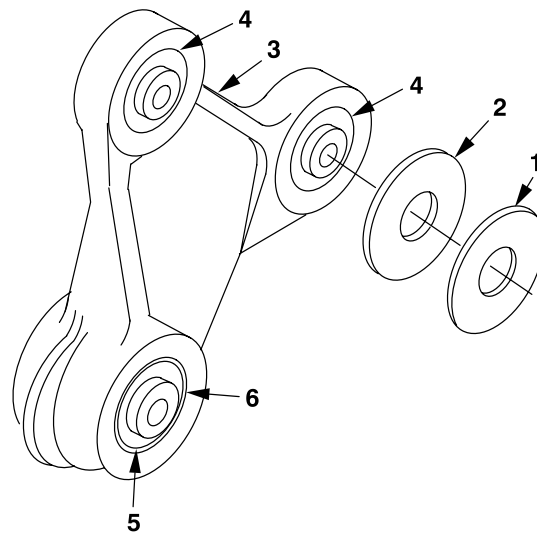
Do not allow adhesive to touch bearing or premature failure of the bearing could occur.

16. Install rubber washer (2) by attaching to bellcrank (3) with magnabond adhesive (D23).

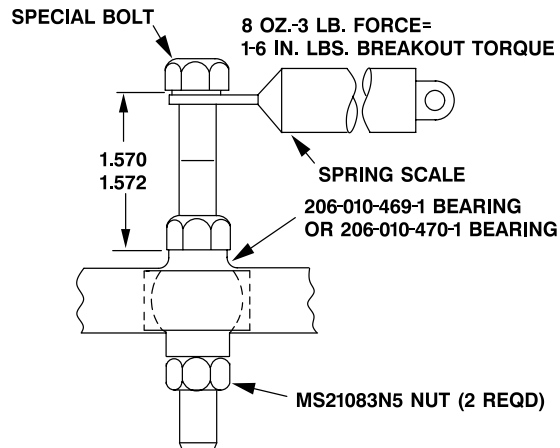
17. Install flat washer (1) by attaching to rubber washer (2) with magnabond adhesive (D23).

18. Inspect bellcrank assembly for damage (Task 11-3-39).

INSPECT



**MAKE FROM MS20073-05-32 BOLT
SPECIAL BOLT**



**BREAKOUT FRICTION TORQUE
1-6 IN. -LB.**

NOTE

All dimensions are in inches unless otherwise specified.

406961-865
J1803

END OF TASK

11-3-41. BOOSTED TUBE ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Torque Wrench (B239)
Maintenance Stand (B162)

Material:

Corrosion Preventive Compound (D82)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:

TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed (Task 2-2-47)

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11-3-41. BOOSTED TUBE ASSEMBLY — REMOVAL/INSTALLATION (CONT)

NOTE

Removal procedures are the same for both boosted tube assemblies.

REMOVE

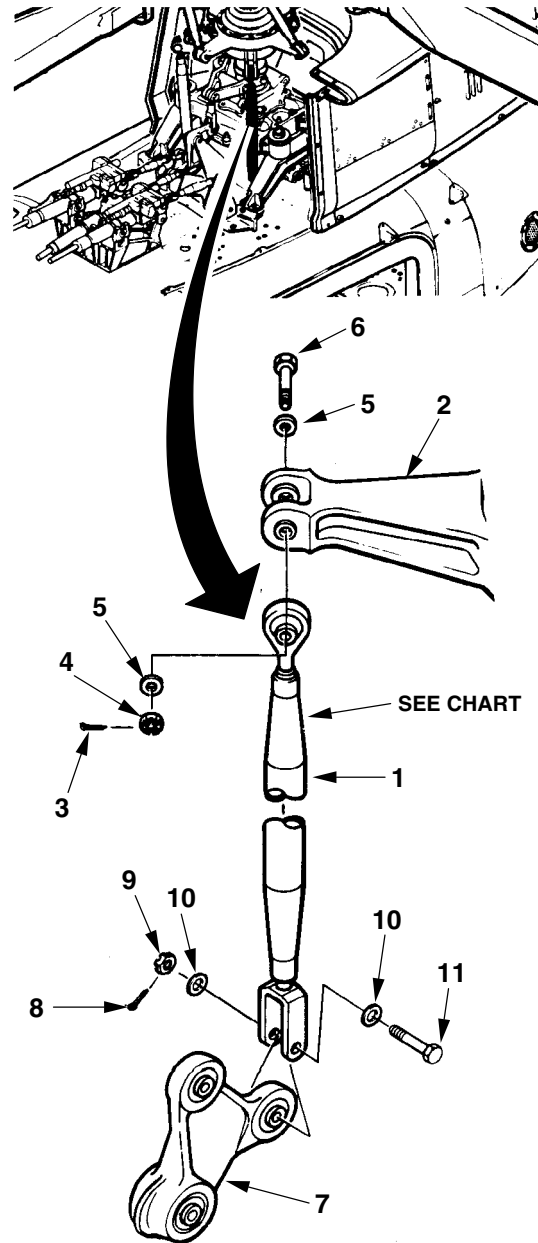
1. Position maintenance stand (B162) next to helicopter.
2. Disconnect boosted tube assembly (1) at swashplate (2) by removing cotter pin (3), nut (4), two washers (5), and bolt (6). Discard cotter pin (3).
3. Disconnect boosted tube assembly (1) from bellcrank assembly (7) by removing cotter pin (8), nut (9), two washers (10), and bolt (11). Discard cotter pin (8).
4. Remove boosted tube assembly (1).

INSTALL

NOTE

- Left and right tubes are not interchangeable, and care should be exercised to ensure the correct tube is installed. See chart.
- Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

5. Connect boosted tube assembly (1) to swashplate (2) with bolt (6), two washers (5), and nut (4). Torque nut (4) **100 TO 140 INCH-POUNDS**.
6. Install cotter pin (3) through nut (4).
7. Connect boosted tube assembly (1) to bellcrank assembly (7) with bolt (11), two washers (10), and nut (9). Torque nut (9) **100 TO 140 INCH-POUNDS**.
8. Install cotter pin (8) through nut (9).

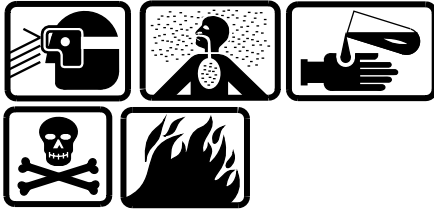


TUBE	BEARING DEGREE DIMENSION	LENGTH DIMENSION
LEFT	45°	18.26
RIGHT	135°	18.46

406961-627
J0519

GO TO NEXT PAGE

11-3-41. BOOSTED TUBE ASSEMBLY — REMOVAL/INSTALLATION (CONT)

**Corrosion Preventive Compound****CAUTION**

Do not allow corrosion preventive compound to enter metallic or elastomeric bearings. Premature failure of bearings will occur.

9. After assembly, apply a light coat of corrosion preventive compound (D82) to external areas and exposed threads, excluding any metallic or elastomeric bearings or seals.

INSPECT**FOLLOW-ON MAINTENANCE**

- Install forward fairing assembly (Task 2-2-47).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).

END OF TASK

11-3-42. PILOT CYCLIC STICK PIVOT ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Airframe Repairer Tool Kit (B176)
Torque Wrench (B243)
Torque Wrench (B235)
Torque Wrench (B236)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68G Aircraft Structural Repairer

References:
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Pilot Cyclic Stick Removed (Task 11-3-57)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

GO TO NEXT PAGE

11-3-42. PILOT CYCLIC STICK PIVOT ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

NOTE

If pivot assembly is replaced, the stop must be replaced.

1. Remove cotter pin (1), nut (2), two washers (3), and bolt (4). Discard cotter pin.
2. Remove cotter pin (5), nut (6), washer (7), bushing (8), retainer (9), and bolt (10). Leave indicator pin (11) in fitting (12). Discard cotter pin.
3. Remove rivet (13).
4. Remove stop (14) and bearing (15) from pivot assembly (16).
5. Inspect pivot assembly (16) (Task 11-3-45).
6. Inspect stop (14) (Task 11-3-48).
7. Inspect pivot support bearing (15) (Task 11-3-43).

INSTALL

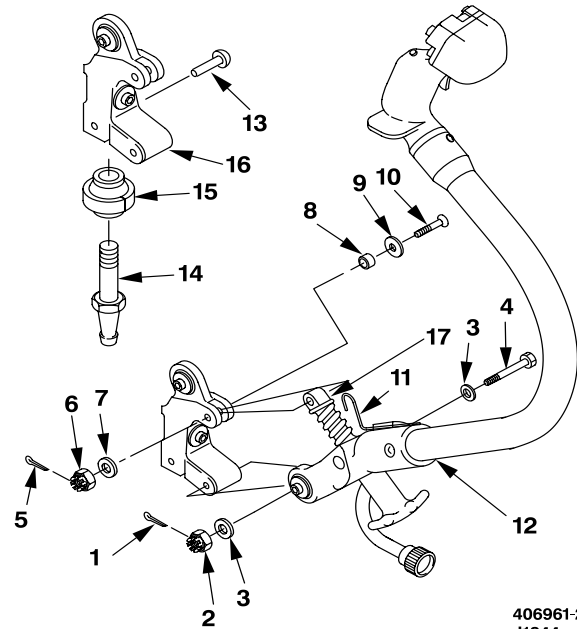
8. Install stop (14) and bearing (15) in pivot assembly (16). Torque stop **1100 TO 1300 INCH-POUNDS**.

**Drilling Operations**

9. Using rivet hole in pivot assembly (16) as a guide, drill hole in stop (14).
10. Install rivet (13) in pivot assembly (16) to secure stop (14).

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

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J1844

11. Secure pivot assembly (16) to fitting (12) with bolt (4), two washers (3), and nut (2). Torque nut (2) **30 TO 40 INCH-POUNDS**.

12. Install cotter pin (1) through nut (2).

13. Secure indicator pin (11) and rod end (17) to pivot assembly (16) with bolt (10), retainer (9), bushing (8), washer (7), and nut (6).

14. Torque nut (6) **6 TO 10 INCH-POUNDS**.

15. Install cotter pin (5) through nut (6).

INSPECT**FOLLOW-ON MAINTENANCE**

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Install pilot cyclic stick (Task 11-3-57).

END OF TASK

11-3-43. PIVOT SUPPORT BEARING — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

CLEAN

1. Do not clean pivot support bearing. This bearing is a sealed unit.

INSPECT

2. Inspect pivot bearing for freedom of rotation.

3. Replace pivot support bearing if it does not rotate freely.

REPAIR

4. No repair allowed on pivot support bearing.

5. Remove pivot support bearing (Task 11-3-50).

6. Install new replacement pivot support bearing (Task 11-3-49).

INSPECT

END OF TASK

11-3-44. CYCLIC STICK PIVOT BEARING RETAINER — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

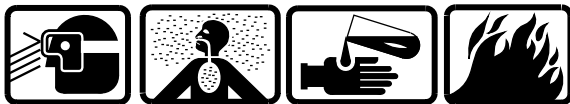
Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Rubber Gloves (D111)
Wiping Rag (D164)
Drycleaning Solvent (D199)
Sandpaper (D175)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

CLEAN



Drycleaning Solvent

1. Clean bearing retainer surface with drycleaning solvent (D199).
2. Dry bearing retainer with a dry wiping rag (D164).

INSPECT

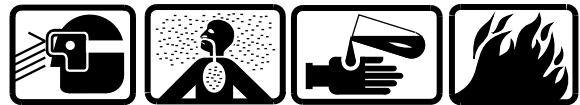
3. Inspect bearing retainer to limits shown. See figure Cyclic Stick Pivot Bearing Retainer — Damage Limits.

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on retainer surface with 400 grit sandpaper (D175).



Acetone

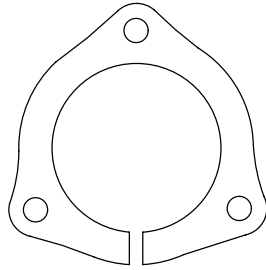
5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

6. Replace bearing retainer if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-44. CYCLIC STICK PIVOT BEARING RETAINER — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL AND CORROSION	0.005 in. before and 0.010 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.25 sq. in.
NUMBER OF REPAIRS	Not critical

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J0518

Cyclic Stick Pivot Bearing Retainer — Damage Limits

END OF TASK

11-3-45. PILOT CYCLIC PIVOT ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Rubber Gloves (D111)
Wiping Rag (D164)

Drycleaning Solvent (D199)
Sandpaper (D175)
Epoxy Primer Coating (D98)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean cyclic pivot assembly surface with drycleaning solvent (D199).
2. Dry cyclic pivot assembly with a dry wiping rag (D164).

INSPECT

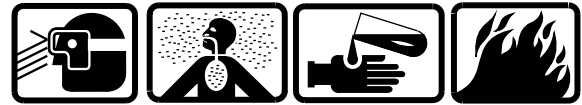
3. Inspect cyclic pivot assembly to limits shown. See figure Pilot Cyclic Pivot Assembly — Damage Limits. If cracks in pilot cyclic pivot assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on cyclic pivot assembly surface with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

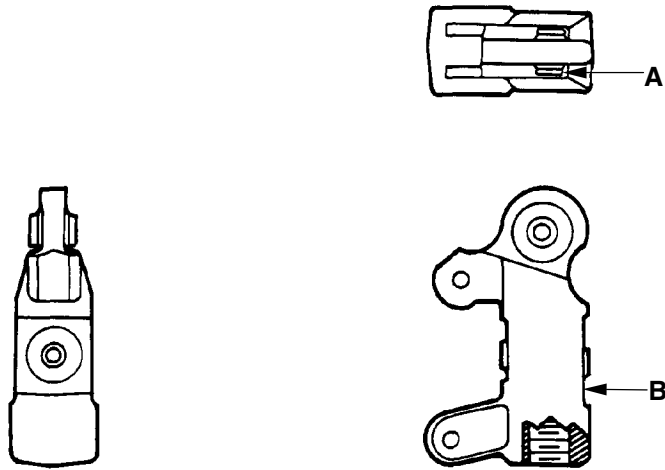


Epoxy Primer Coating

6. Touch up repaired areas with epoxy primer coating (D98).
7. Replace cyclic pivot assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-45. PILOT CYCLIC PIVOT ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL AND CORROSION	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.250 sq. in.
NUMBER OF REPAIRS	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.015 in. x 45°
BORES	0.002 in. for 1/4 circumference
THREAD:	
Depth:	1/3 of thread
Length:	1/2 of circumference
Number:	One per thread
BEARING WEAR:	
A. BEARING, SPHERICAL:	
Axial:	0.012
Radial:	0.005
B. BEARING, BALL:	
Axial:	0.030
Radial:	0.006

406001-54
J0518

Pilot Cyclic Pivot Assembly — Damage Limits

END OF TASK

11-3-46. CYCLIC STICK INDICATOR PIN RETAINER — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Rubber Gloves (D111)
Wiping Rag (D164)
Drycleaning Solvent (D199)
Sandpaper (D175)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

CLEAN



Drycleaning Solvent

1. Clean indicator pin retainer surface with drycleaning solvent (D199).
2. Dry indicator pin retainer with a dry wiping rag (D164).

INSPECT

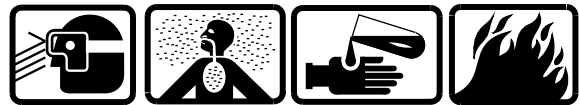
3. Inspect indicator pin retainer to limits shown. See figure Cyclic Stick Indicator Pin Retainer — Damage Limits.

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on retainer surface with 400 grit sandpaper (D175).



Acetone

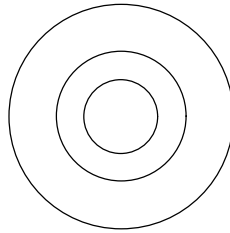
5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

6. Replace indicator pin retainer if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-46. CYCLIC STICK INDICATOR PIN RETAINER — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL AND CORROSION	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	Not critical
NUMBER OF REPAIRS	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in. X 45°

406001-66
J0518

Cyclic Stick Indicator Pin Retainer — Damage Limits

END OF TASK

11-3-47. CYCLIC TRANSDUCER SPACER — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

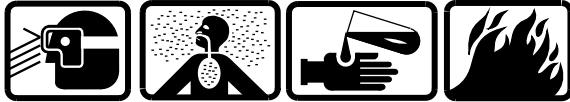
Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Rubber Gloves (D111)
Wiping Rag (D164)
Drycleaning Solvent (D199)
Sandpaper (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

CLEAN



Drycleaning Solvent

1. Clean spacer surface with dry cleaning solvent (D199).
2. Dry spacer with a dry wiping rag (D164)

INSPECT

3. Inspect spacer to limits shown. See figure Cyclic Transducer Spacer — Damage Limits.

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on spacer surface with 400 grit sandpaper (D175).



Drycleaning Solvent

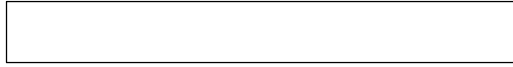
5. Remove sanding residue with wiping rag (D164) moistened with drycleaning solvent (D199).

INSPECT

6. Replace spacer if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-47. CYCLIC TRANSDUCER SPACER — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL AND CORROSION	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.50 sq. in.
NUMBER OF REPAIRS	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in. x 45°
BORES	0.002 for 1/4 circumference

406001-70
J0518

Cyclic Transducer Spacer — Damage Limits

END OF TASK

11-3-48. PILOT CYCLIC STICK STOP — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

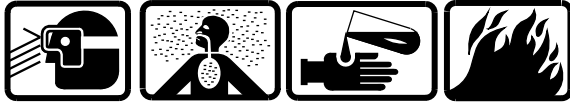
Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Rubber Gloves (D111)
Wiping Rag (D164)
Sandpaper (D175)
Drycleaning Solvent (D199)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

CLEAN



Drycleaning Solvent

1. Clean stick stop surface with drycleaning solvent (D199).
2. Dry stick stop with a dry wiping rag (D164).

INSPECT

3. Inspect stick stop to limits shown. See figure Pilot Cyclic Stick Stop — Damage Limits.

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on cyclic stick stop with 400 grit sandpaper (D175).



Drycleaning Solvent

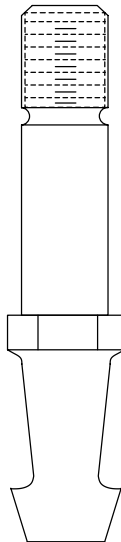
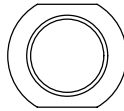
5. Remove sanding residue with wiping rag (D164) moistened with drycleaning solvent (D199).

INSPECT

6. Replace stick stop if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-48. PILOT CYCLIC STICK STOP — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL AND CORROSION	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.250 sq. in.
NUMBER OF REPAIRS	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.020 in. x 45°
THREAD:	
Depth:	1/3 of thread
Length:	1/2 of circumference
Number:	One per thread

406001-53
J0518

Pilot Cyclic Stick Stop — Damage Limits

END OF TASK

11-3-49. PIVOT ASSEMBLY BEARING (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

Powertrain Repairer Tool Kit (B180)
Hand Arbor Press (B107)
Bearing Staking Tool Set (B189)
Upright Drill Press (B108)
Spring Scale (B120)
Special Bolt (H-14)
Torque Wrench (B236)

Material:

Retaining Compound (D169)
Acetone (D2)
Rubber Gloves (D111)
Abrasive Mats (D1)
Wiping Rag (D164)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:

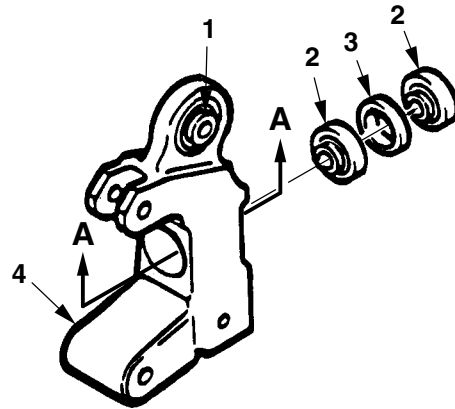
TM 55-1500-322-24

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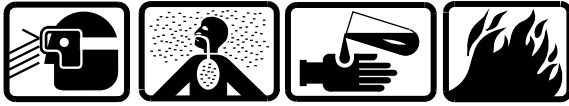
11-3-49. PIVOT ASSEMBLY BEARING (AVIM) — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove bearing (1) from pivot assembly (4).
2. Remove bearing (2) and spacer (3) from pivot assembly (4). Use smaller sleeve or drift punch to remove near side bearing and spacer.
3. Remove bearing (2) using drift punch to loosen bearing (2) from far side of pivot assembly (4).



CLEAN

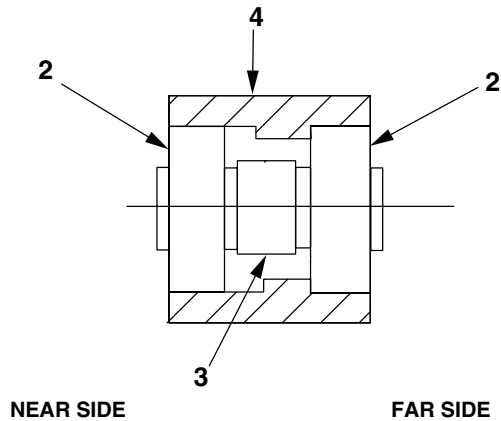


Acetone

4. Clean bearing bore in pivot assembly (4) with acetone (D2) and abrasive mat (D1). Dry with wiping rags (D164).
5. Clean bearing bore in pivot assembly (4) with acetone (D2) and abrasive mat (D1) in area where bearings (2) and spacer (3) were located.

INSPECT

6. Inspect bore of pivot assembly (4) for damage; maximum allowed is **0.002 inch** for one-fourth circumference.



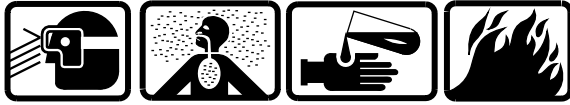
SECTION A-A

406001-287
J0518

GO TO NEXT PAGE

11-3-49. PIVOT ASSEMBLY BEARING (AVIM) — REMOVAL/INSTALLATION (CONT)

INSTALL

**Retaining Compound****CAUTION**

When extreme interference fit occurs at the beginning of press fit operation, stop and determine the cause. Do not stake bearing unless the cause of interference can be eliminated or satisfactorily remedied.

7. Apply retaining compound (D169) to bore of pivot assembly (4) and outside surface of bearing (1).

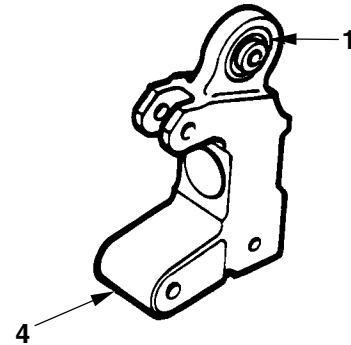
8. Using hand arbor press (B107), press bearing (1) into pivot assembly (4) while retaining compound is still wet.

9. Using bearing staking tool set (B189), mounted in upright drill press (B108), rollstake pregrooved outer race of bearing on both sides (TM 55-1500-322-24).

CAUTION

Use care when removing excess retaining compound from bearing. If retaining compound gets into bearing, bearing will lock up.

10. Carefully remove excess retaining compound from outside of bearing (1).



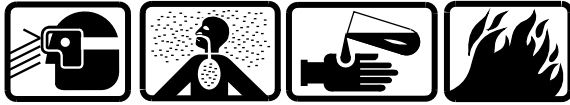
406001-250
J0518

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11-3-49. PIVOT ASSEMBLY BEARING (AVIM) — REMOVAL/INSTALLATION (CONT)

11. Using spring scale (B120), check breakout torque of inner race of bearing (1) of **4 TO 24 INCH-OUNCES** as shown.

12. Remove special bolt (H-14) and nut.



Retaining Compound

13. Apply retaining compound (D169) to bore of pivot assembly (4) and outside of bearing (2).

14. Install near side bearing (2) in bore of pivot assembly (4) while retaining compound is still wet.

15. Install spacer (3) next to bearing (2).

16. Install far side bearing (2) in bore of pivot assembly (4) while retaining compound is still wet.

17. Using bearing staking tool set (B189), mounted in upright drill press (B108), segment stake bearings six places on both sides (TM 55-1500-322-24).

CAUTION

Use care when removing excess retaining compound from bearing. If retaining compound gets into bearing, bearing will lock up.

18. Carefully remove excess retaining compound from outside of bearing.

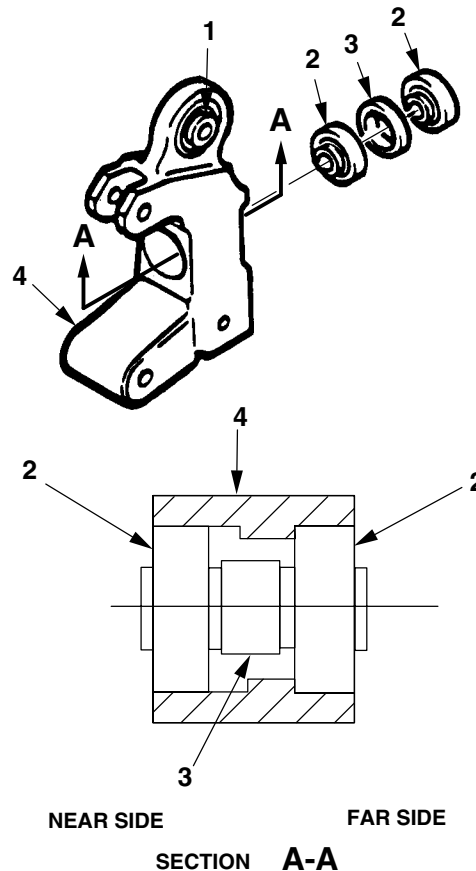
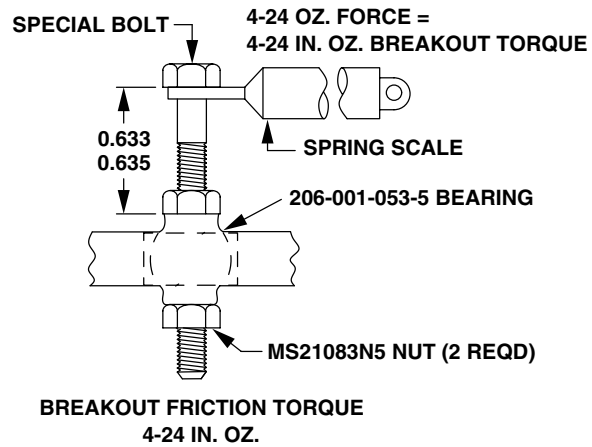
19. Use special bolt (H-14), nut, and washers to align the bearings (2) and spacer (3) during cure cycle.

20. Torque nut **25 TO 35 INCH-POUNDS** prior to curing.

21. Allow assembly to cure at room temperature 70 to 77 °F for 26 to 28 hours.

22. Remove nut, washers, and bolt from pivot assembly (4).

INSPECT



406001-288
J0518

 11-3-50. PILOT CYCLIC STICK PIVOT BEARING — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Airframe Repairer Tool Kit (B176)
Torque Wrench (B243)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68G Aircraft Structural Repairer

References:

TM 1-1500-204-23

Equipment Condition:

Pilot Cyclic Stick Removed (Task 11-3-57)

REMOVE

1. Remove rivet (1) (TM 1-1500-204-23).
2. Remove stop (2) and bearing (3) from pivot assembly (4).

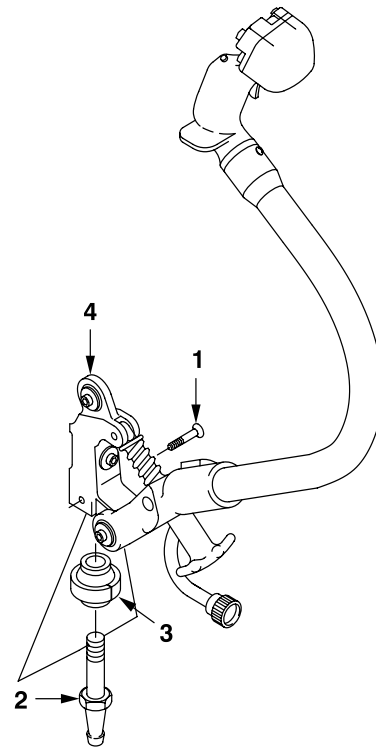
INSTALL

3. Place bearing (3) on stop (2). Install stop (2) in pivot assembly (3).
4. Torque stop (2) **1100 TO 1300 INCH-POUNDS**.
5. Install rivet (1) to secure stop (2) to pivot assembly (4).

INSPECT

FOLLOW-ON MAINTENANCE

Install pilot cyclic stick (Task 11-3-57).



406001-262
J1803

END OF TASK

11-3-51. PILOT CYCLIC STICK PIVOT BEARING — CLEANING/INSPECTION

This task covers: Cleaning and Inspection (Off Helicopter)

INITIAL SETUP

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

CLEAN

1. Do not clean pivot bearing. This unit incorporates a nonlubricated antifriction liner.

INSPECT

2. Inspect pivot bearing for freedom of rotation.

3. Replace pivot bearing if it binds or does not rotate freely.

4. No repairs allowed on pivot bearing.

INSPECT

END OF TASK

11-3-52. PILOT CYCLIC POSITION ADJUSTMENT ROD END — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B235)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

GO TO NEXT PAGE

11-3-52. PILOT CYCLIC POSITION ADJUSTMENT ROD END — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove six screws (1) securing pilot cyclic stick boot (2) and pull pilot cyclic stick boot (2) back to gain access to work area.

2. Disconnect electrical connector (3).

3. Remove cotter pin (4), nut (5), washer (6), spacer (7), retainer (8), and bolt (9) securing rod end (10) and indicator pin (11) to pivot assembly (12). Discard cotter pin (4).

4. Unscrew rod end (10) from knob assembly (13) and remove rod end (10), washer (14), and spring (15) from fitting assembly (16).

5. Inspect rod end (10) for wear and damage limits (Task 11-3-53).

INSTALL

6. Turn knob assembly (13) in until shoulder on knob contacts surface of fitting assembly (16). Hold knob assembly (13) in this position.

7. Assemble rod end (10), washer (14), and spring (15) onto knob assembly (13).

8. Screw rod end (10) in until rod end contacts surface of fitting assembly (16). Turn rod end out two turns.

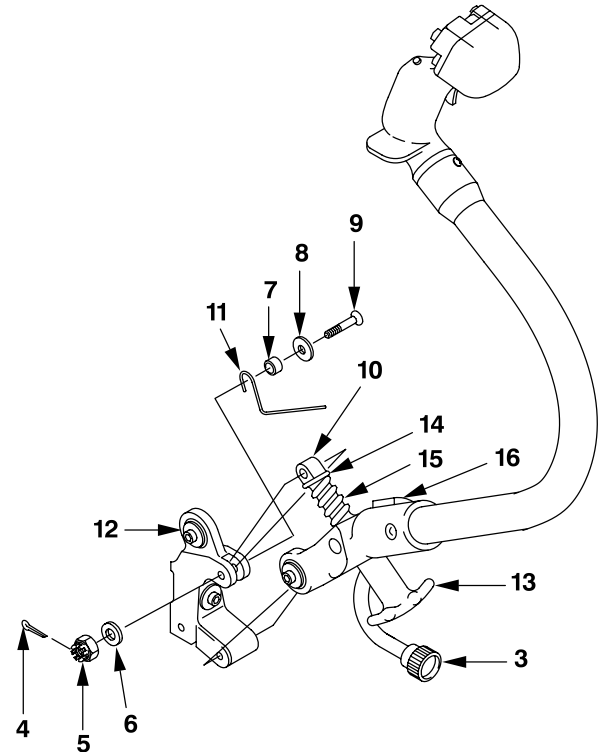
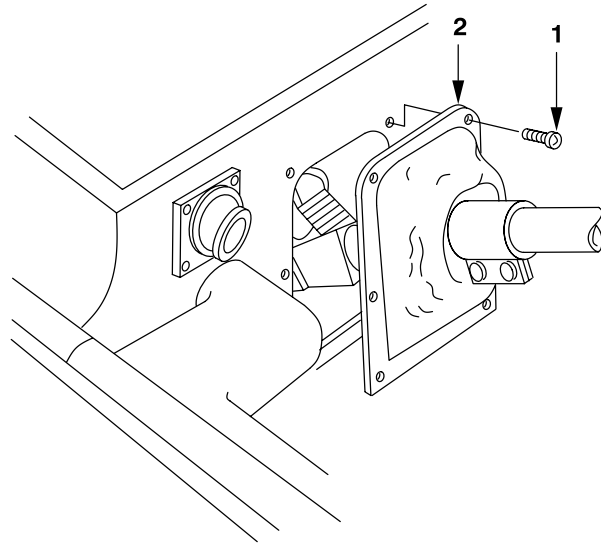
NOTE

- Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.
- If rod end (10) will not assemble to pivot assembly (12) due to alignment of rod end (10) at two turns, the rod end may be turned out an additional one-half turn. The knob assembly (13) should have 2 to 2-1/2 turns from all the way out to all the way in.

9. Secure rod end (10) and indicator pin (11) to pivot assembly (12) with bolt (9), retainer (8), spacer (7), washer (6), and nut (5).

10. Torque nut (5) **6 TO 10 INCH-POUNDS**.

11. Install cotter pin (4) through nut (5).



406001-323-1
J1852

GO TO NEXT PAGE

11-3-52. PILOT CYCLIC POSITION ADJUSTMENT ROD END — REMOVAL/INSTALLATION (CONT)

ADJUST

12. Turn knob assembly (13) to position stick full forward.

13. Connect hydraulic test stand to helicopter and operate (Task 7-2-1).

14. Position stick against forward stick stop and verify stick grip clears the instrument panel.

15. If stick grip contacts the instrument panel, readjust knob assembly (13) (steps 6 thru 10), by turning rod end (10) in one-half turn increments, clockwise from installed position.

16. Repeat step 14.

17. Check position of indicator pin (11). End of indicator pin should align with end of small boss on fitting assembly (16) which guides indicator pin.

18. If position of indicator pin (11) is incorrect, adjust by bending indicator pin at bend area below spacer (7).

19. Connect electrical connector (3).

20. Install pilot cyclic stick boot (2) and secure with six screws (1).

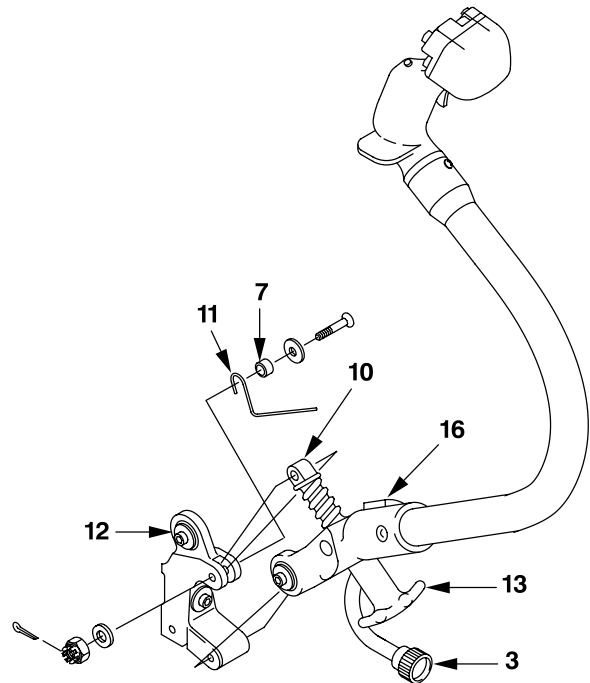
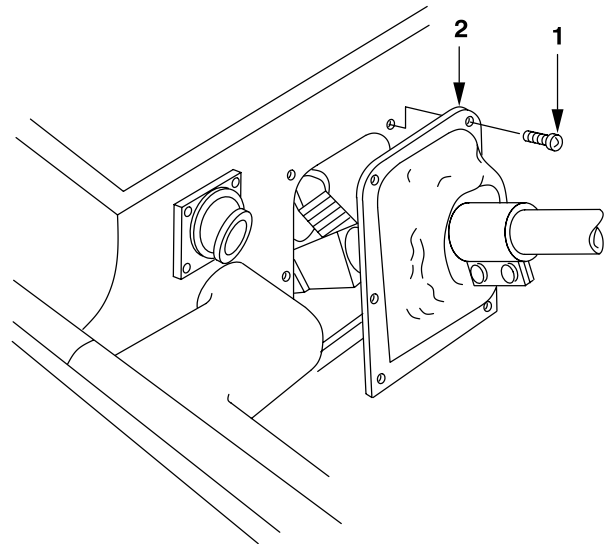
21. Disconnect hydraulic test stand (Task 7-2-1).

INSPECT

FOLLOW-ON MAINTENANCE

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



406001-323-2
J1852

END OF TASK

11-3-53. PILOT CYCLIC POSITION ADJUSTMENT ROD END — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Drycleaning Solvent (D199)
Sandpaper (D175)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

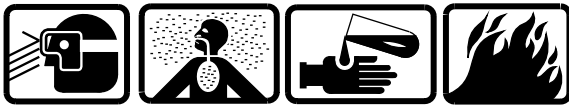
Tools:
General Mechanic Tool Kit (B178)

References:
TM 1-1520-266-23

Material:
Rubber Gloves (D111)
Wiping Rag (D164)

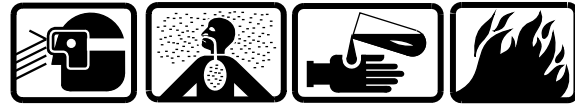
CLEAN

4. Remove scratches, nicks, and corrosion on rod end surface with 400 grit sandpaper (D175).



Drycleaning Solvent

1. Clean rod end surface with drycleaning solvent (D199).
2. Dry rod end with a dry wiping rag (D164).



Drycleaning Solvent

5. Remove sanding residue with wiping rag (D164) moistened with drycleaning solvent (D199).

INSPECT

INSPECT

3. Inspect rod end to limits shown. See figure Pilot Cyclic Position Adjustment Rod End — Damage Limits. If cracks in pilot cyclic position adjustment rod end are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

6. Replace rod end if wear or damage limits are exceeded.

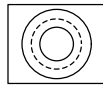
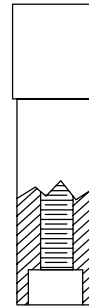
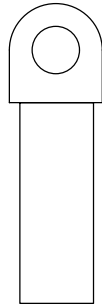
REPAIR



Sanding Operations

GO TO NEXT PAGE

11-3-53. PILOT CYCLIC POSITION ADJUSTMENT ROD END — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL AND CORROSION	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.125 sq. in.
NUMBER OF REPAIRS	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.020 in. x 45°
THREAD:	
Depth:	1/3 of thread
Length:	0.187 in.
Number:	One per thread

406001-56
J0518

Pilot Cyclic Position Adjustment Rod End — Damage Limits

END OF TASK

11-3-54. PILOT CYCLIC POSITION ADJUSTMENT KNOB ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-MTF

TM 1-1500-204-23

Applicable Configurations:

All

Equipment Condition:

Helicopter Safed (Task 1-6-7)

Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly

Removed (Task 2-2-34)

Tools:

General Mechanic Tool Kit (B178)

Torque Wrench (B235)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)

67S Scout Helicopter Repairer

Maintenance Test Pilot

GO TO NEXT PAGE

 11-3-54. PILOT CYCLIC POSITION ADJUSTMENT KNOB ASSEMBLY — REMOVAL/INSTALLATION
 (CONT)

REMOVE

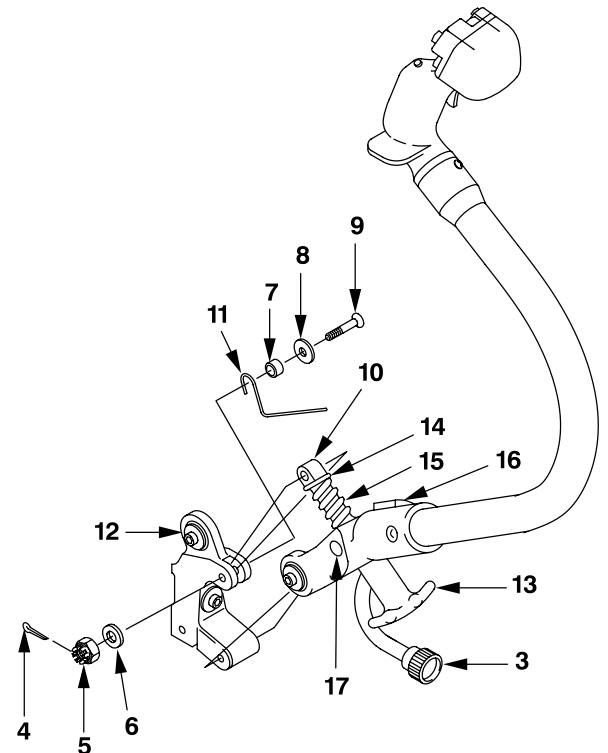
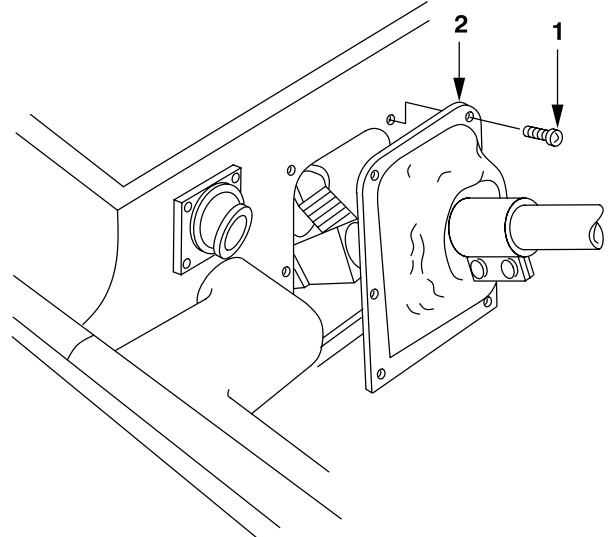
1. Remove six screws (1) securing pilot cyclic stick boot (2) and pull cyclic stick boot (2) back to gain access to work area.

2. Disconnect electrical connector (3).

3. Remove cotter pin (4), nut (5), washer (6), spacer (7), retainer (8), and bolt (9) securing rod end (10) and indicator pin (11) to pivot assembly (12). Discard cotter pin (4).

4. Unscrew rod end (10) from knob assembly (13) and remove rod end (10), washer (14), and spring (15) from fitting assembly (16).

5. Unscrew knob assembly (13) from trunnion (17) inside fitting assembly (16).



406001-323-3
J1852

GO TO NEXT PAGE

11-3-54. PILOT CYCLIC POSITION ADJUSTMENT KNOB ASSEMBLY — REMOVAL/INSTALLATION
(CONT)

INSTALL

6. Screw knob assembly (13) into trunnion (17) inside fitting assembly (16) until shoulder of knob assembly (13) contacts surface of fitting assembly (16).

7. Turn knob assembly (13) out two revolutions and hold in this position.

8. Install rod end (10), washer (14), and spring (15) onto knob assembly (13) and tighten rod end (10) until it touches surface of fitting assembly (16).

9. Turn rod end (10) out 2 turns and assemble to pivot assembly (12). Due to alignment the rod end (10) may be turned out an additional 1/2 turn.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

10. Secure rod end (10) and indicator pin (11) to pivot assembly (12) with bolt (9), retainer (8), spacer (7), washer (6), and nut (5).

11. Torque nut (5) **6 TO 10 INCH-POUNDS**.

12. Install cotter pin (4) through nut (5).

13. The knob assembly (13) should now have approximately 2 to 2 1/2 turns of travel from all the way in to all the way out to verify rigging.

INSPECT

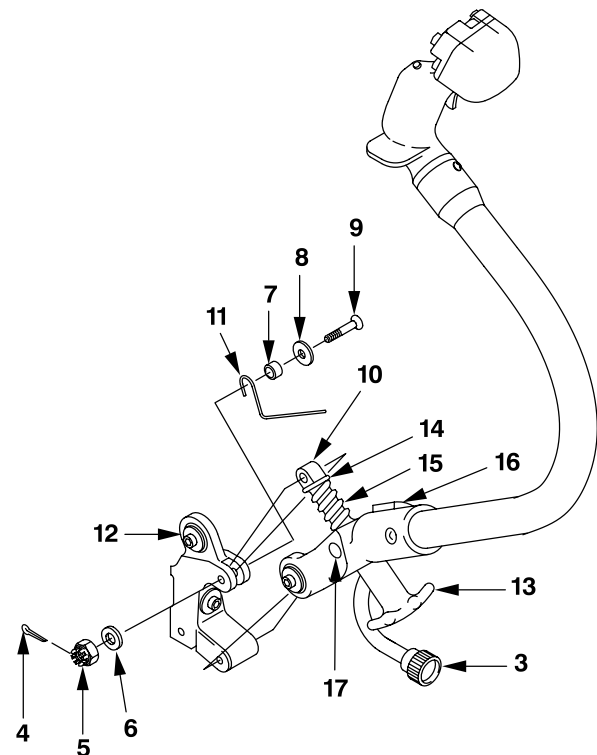
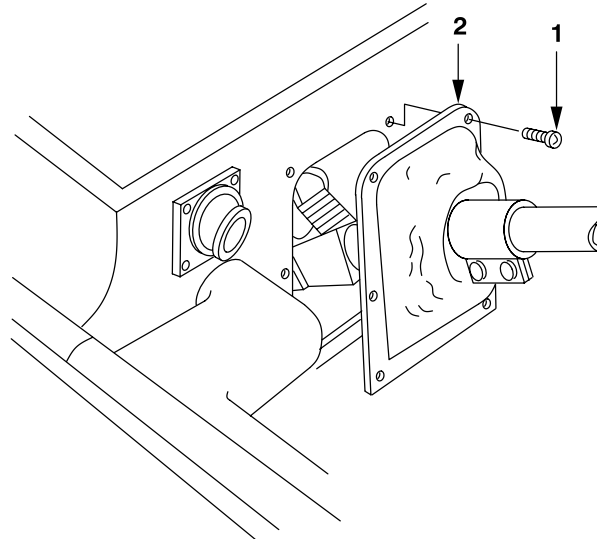
14. Connect electrical connector (3).

15. Install pilot cyclic stick boot (2) and secure with six screws (1).

FOLLOW-ON MAINTENANCE

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



406001-323-3
J1852

END OF TASK

11-3-55. PILOT CYCLIC POSITION ADJUSTMENT INDICATOR PIN — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B235)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

GO TO NEXT PAGE

11-3-55. PILOT CYCLIC POSITION ADJUSTMENT INDICATOR PIN — REMOVAL/INSTALLATION
(CONT)

REMOVE

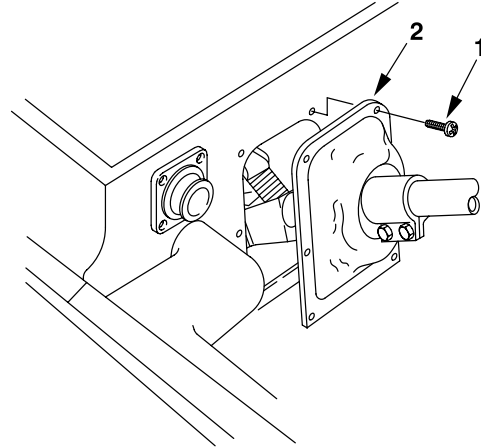
1. Remove six screws (1) securing pilot cyclic stick boot (2) and pull pilot cyclic stick boot (2) back to gain access to work area.

2. Disconnect electrical connector (3).

3. Remove cotter pin (4), nut (5), washer (6), spacer (7), retainer (8), and bolt (9) securing rod end (10) and indicator pin (11) to pivot assembly (12). Discard cotter pin (4).

4. Tilt pilot cyclic stick (13) forward and slide indicator pin (11) down and out of guide (14).

5. Inspect indicator pin (11) for wear and damage limits (Task 11-3-56).



INSTALL

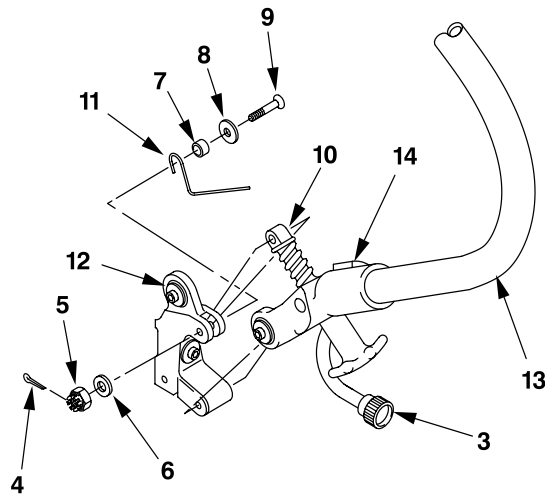
6. Slide indicator pin (11) into guide (14).

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

7. Tilt pilot cyclic stick (13) back and secure rod end (10) and indicator pin (11) to pivot assembly (12) with bolt (9), retainer (8), spacer (7), washer (6), and nut (5). Torque nut (5) **6 TO 10 INCH-POUNDS**.

8. Install cotter pin (4) through nut (5).



INSPECT

9. Connect electrical connector (3).

10. Install pilot cyclic stick boot (2) and secure with six screws (1).

FOLLOW-ON MAINTENANCE

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).

406001-253
J1803

END OF TASK

11-3-56. PILOT CYCLIC POSITION ADJUSTMENT INDICATOR PIN — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

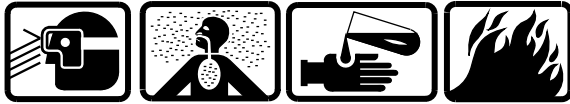
INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Rubber Gloves (D111)
Wiping Rag (D164)
Drycleaning Solvent (D199)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repair

CLEAN**Drycleaning Solvent**

1. Clean indicator pin surface with drycleaning solvent (D199).
2. Dry indicator pin with a dry wiping rag (D164).

INSPECT

3. Inspect indicator pin to limits shown. See figure Pilot Cyclic Position Adjustment Indicator Pin — Damage Limits.

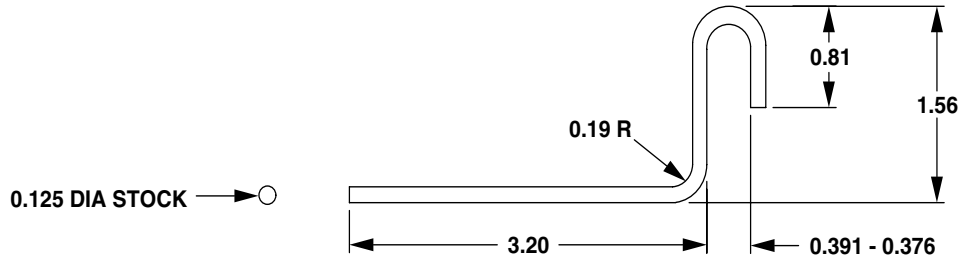
REPAIR

4. Replace indicator pin if wear or damage limits are exceeded.

INSPECT

GO TO NEXT PAGE

11-3-56. PILOT CYCLIC POSITION ADJUSTMENT INDICATOR PIN — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL AND CORROSION	0.005 in.
MAXIMUM AREA	0.062 sq. in.

406001-69
J0518

Pilot Cyclic Position Adjustment Indicator Pin — Damage Limits

END OF TASK

11-3-57. PILOT CYCLIC STICK AND PIVOT SUPPORT ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Torque Wrench (B237)
Torque Wrench (B239)

References:

TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

Personnel Required:

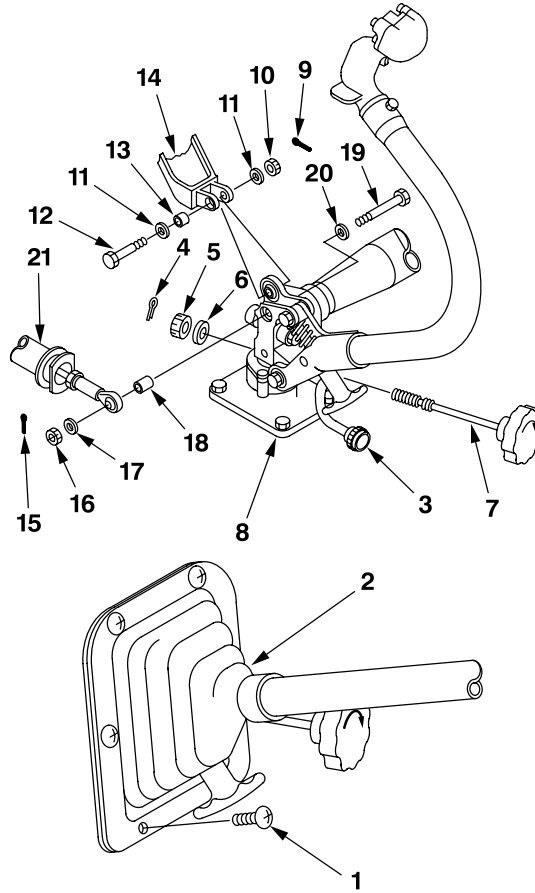
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

GO TO NEXT PAGE

11-3-57. PILOT CYCLIC STICK AND PIVOT SUPPORT ASSEMBLY — REMOVAL/INSTALLATION
(CONT)

REMOVE

1. Remove six screws (1) securing pilot cyclic stick boot (2) and remove pilot cyclic stick boot (2).
2. Disconnect electrical connector (3).
3. Remove cotter pin (4), nut (5), and washer (6). Discard cotter pin (4).
4. Turn friction adjustment knob and shaft (7) counterclockwise to remove from support assembly (8).
5. Remove cotter pin (9), nut (10), two washers (11), bolt (12), and bushing (13) to disconnect yoke (14). Discard cotter pin (9).
6. Remove cotter pin (15), nut (16), washer (17), spacer (18), bolt (19), and washer (20) to disconnect force gradient (21). Discard cotter pin (15).



406961-847
J0518

GO TO NEXT PAGE

 11-3-57. PILOT CYCLIC STICK AND PIVOT SUPPORT ASSEMBLY — REMOVAL/INSTALLATION
 (CONT)

7. Remove cotter pin (22), nut (23), two washers (24), and bolt (25) to disconnect torque tube (26). Discard cotter pin (22).

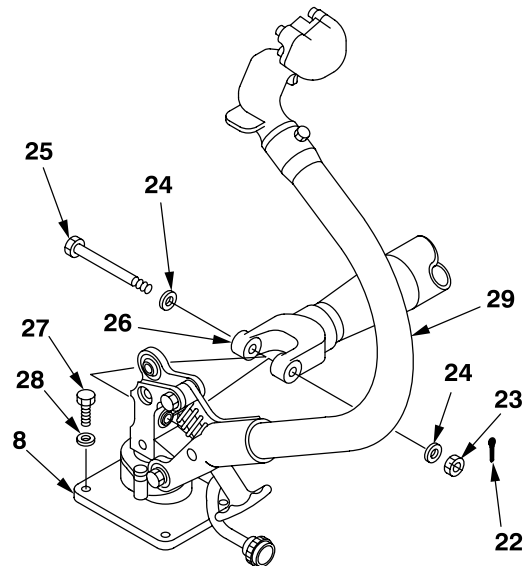
8. Remove four bolts (27) and four washers (28) securing support assembly (8).

9. Remove cyclic stick (29) and support assembly (8) from helicopter.

10. Remove three screws (30) and three washers (31).

11. Lift cyclic stick (29) from support assembly (8).

12. Remove retainer (32) from bearing (33) of cyclic stick (29).



INSTALL

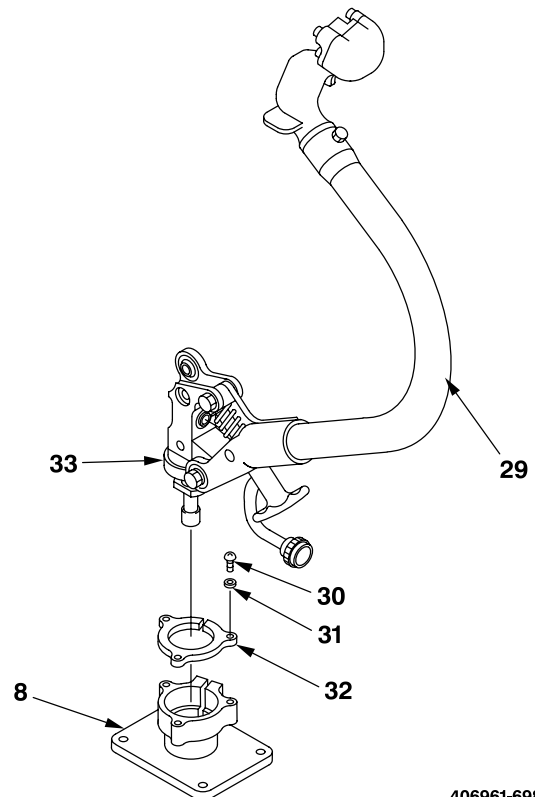
13. Install retainer (32) on cyclic stick (29) above bearing (33).

14. Position cyclic stick (29) in support assembly (8) with slots in retainer (32), and bearing (33) aligned with slot in support assembly (8).

15. Install three screws (30) with three washers (31).

16. Place cyclic stick (29) and support assembly (8) in helicopter. Install four bolts (27) with washers (28).

17. Torque bolts (27) **40 TO 50 INCH-POUNDS**.



NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

18. Connect torque tube (26) with bolt (25), two washers (24), and nut (23). Torque nut (23) **50 TO 70 INCH-POUNDS**.

19. Install cotter pin (22) through nut (23).

406961-698
J0518

GO TO NEXT PAGE

11-3-57. PILOT CYCLIC STICK AND PIVOT SUPPORT ASSEMBLY — REMOVAL/INSTALLATION
(CONT)

20. Connect force gradient (21) to cyclic stick (29) with bolt (19), washer (20), spacer (18), washer (17), and nut (16). Torque nut (16) **50 TO 70 INCH-POUNDS** and secure with cotter pin (15).

21. Connect yoke (14) to cyclic stick (29) with bolt (12), two washers (11), bushing (13), and nut (10). Torque nut (10) **100 TO 140 INCH-POUNDS** and secure with cotter pin (9).

22. Install friction adjustment knob and shaft (7) and adjust minimum friction setting (Task 11-3-26).

23. Connect electrical connector (3).

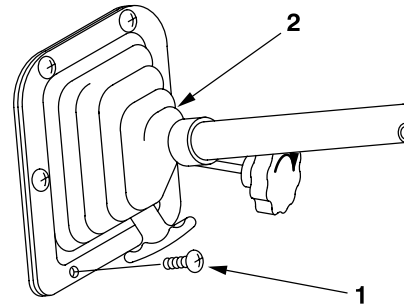
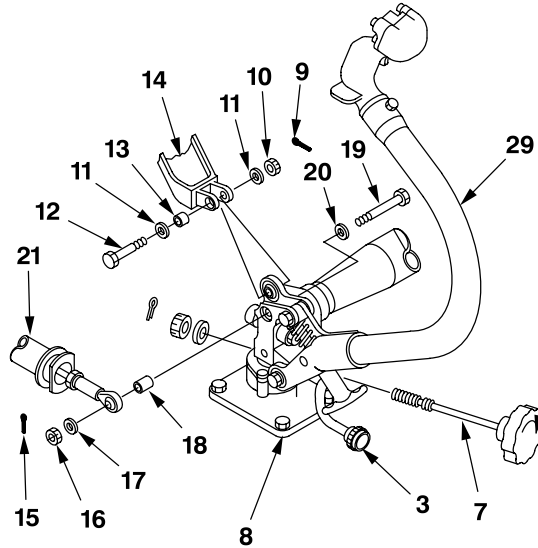
24. Install pilot cyclic stick boot (2) with six screws (1).

INSPECT

FOLLOW-ON MAINTENANCE

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



406961-898
J0518

END OF TASK

11-3-58. PILOT CYCLIC STICK FITTING ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Airframe Repairer Tool Kit (B176)
Heat Gun (B59)
Digital Multimeter (B98)
Electrical Connector Kit (B80)
Torque Wrench (B235)
■ Torque Wrench (B236)

Material:

Acetone (D2)
Wiping Rag (D164)
Abrasive Mats (D1)
Adhesive (D19)
Rubber Gloves (D111)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68F Aircraft Electrician
68G Aircraft Structural Repairer
Maintenance Test Pilot

References:

TM 1-1520-248-MTF
TM 1-1500-204-23

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

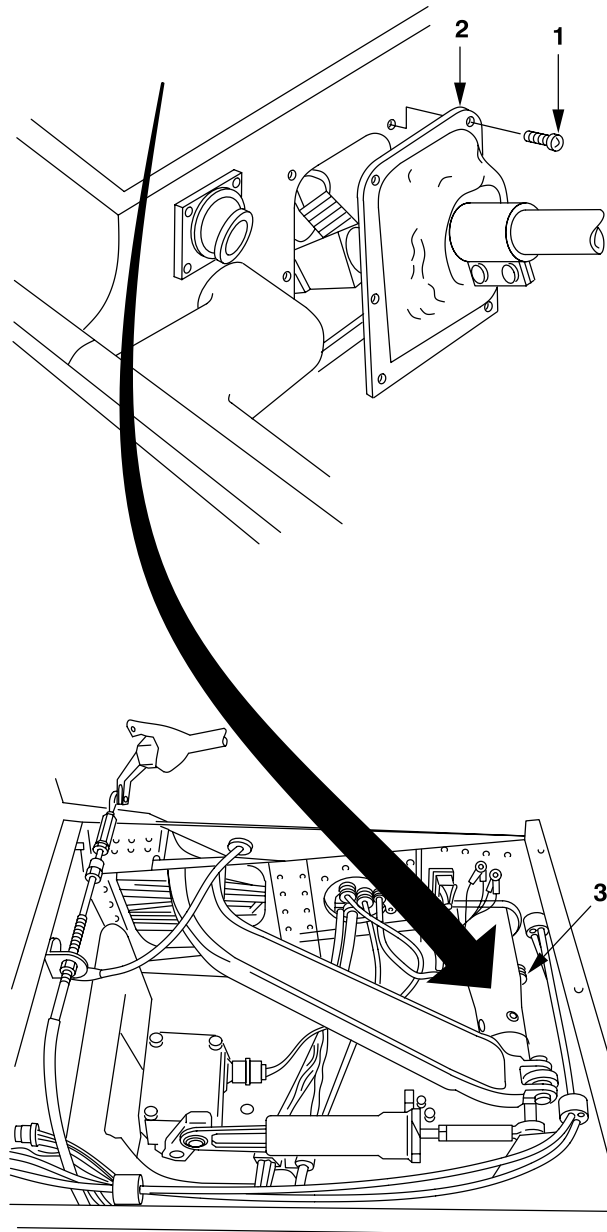
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11-3-58. PILOT CYCLIC STICK FITTING ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove six screws (1) securing pilot cyclic stick boot (2) and pull pilot cyclic stick boot (2) back to gain access to work area.

2. Disconnect electrical connector (3).



406001-323-9
J1852

GO TO NEXT PAGE

11-3-58. PILOT CYCLIC STICK FITTING ASSEMBLY — REMOVAL/INSTALLATION (CONT)

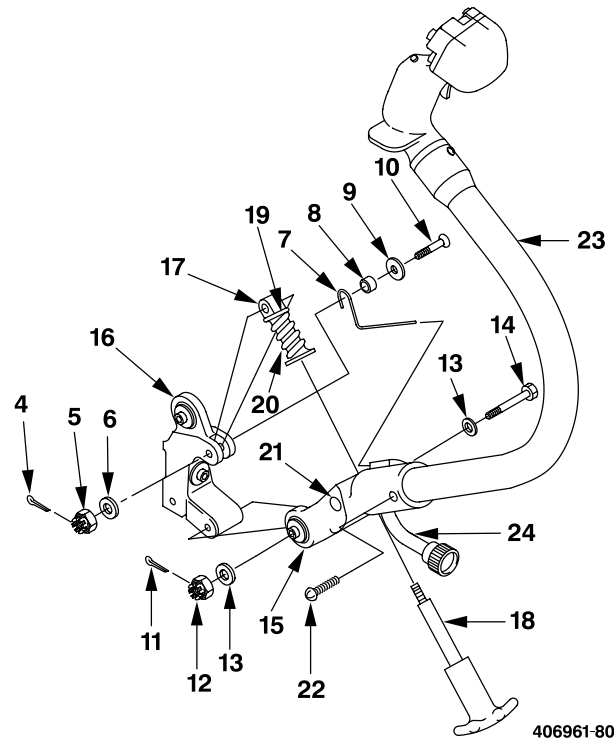
3. Remove cotter pin (4), nut (5), washer (6), indicator pin (7), spacer (8), retainer (9), and bolt (10). Discard cotter pin (4).

4. Remove cotter pin (11), nut (12), two washers (13), and bolt (14) securing fitting assembly (15) to pivot assembly (16). Discard cotter pin (11).

5. Unscrew rod end (17) from knob assembly (18) and remove washer (19) and spring (20).

6. Unscrew knob assembly (18) from trunnion (21).

7. Remove trunnion (21) from fitting assembly (15).



406961-808
J1852



Drilling Operations

CAUTION

To prevent damage to wire bundle inside pilot cyclic, care must be used.

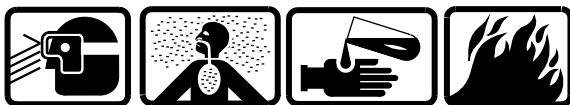
8. Drill four rivets (22) securing pilot cyclic tube (23) to fitting assembly (15) (TM 1-1500-204-23).



Heat

9. Apply heat, not exceeding 200 °F, to fitting assembly (15) until pilot cyclic tube (23) can be separated from fitting assembly (15).

10. Remove pilot cyclic tube (23) and wire bundle (24) from fitting assembly (15).



Acetone

11. Clean adhesive from pilot cyclic tube (23) using acetone (D2) and abrasive mat (D1). Wipe dry with wiping rag (D164).

INSTALL



Adhesive

12. Apply a coating of adhesive (D19) to outside diameter of pilot cyclic tube (23), where pilot cyclic tube (23) joins fitting assembly (15), and to inside diameter of fitting assembly (15).

13. Thread wire bundle (24) through hole in fitting assembly (15).

14. Insert pilot cyclic tube (23) into fitting assembly (15) insuring correct alignment of rivet (22) holes.

15. Wipe off excess adhesive (D19) with wiping rag (D164) dampened with acetone (D2).

GO TO NEXT PAGE

11-3-58. PILOT CYCLIC STICK FITTING ASSEMBLY — REMOVAL/INSTALLATION (CONT)



Heat

16. Apply heat 145 to 180 °F for 30 minutes to fitting assembly (15) to cure adhesive (D19) (full cure is 24 hours).

17. Secure pilot cyclic tube (23) to fitting assembly (15) with four rivets (22).

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

18. Secure fitting assembly (15) to pivot assembly (16) with bolt (14), two washers (13), and nut (12). Torque nut (12) **30 TO 40 INCH-POUNDS**.

19. Install cotter pin (11) through nut (12).

20. Insert trunnion (21) into fitting assembly (15).

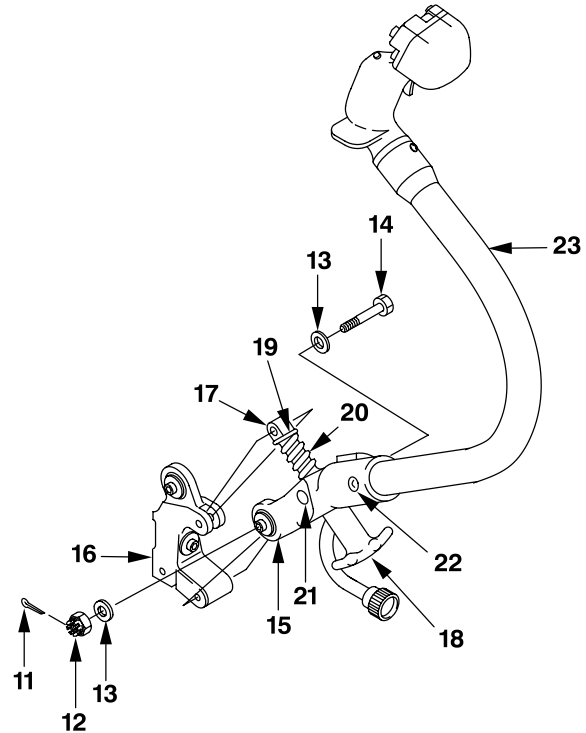
21. Assemble knob assembly (18) in trunnion (21) until knob shoulder contacts surface of fitting assembly (15).

22. Hold knob assembly (18) against fitting assembly (15).

23. Assemble rod end (17) in knob assembly (18), with spring (20) and washer (19) installed, until rod end (17) contacts surface of fitting assembly (15).

24. Turn rod end (17) out 2 turns and assemble to pivot assembly (16), due to alignment the rod end (17) may be turned out an additional 1/2 turn.

25. The knob assembly (18) should now have approximately 2 to 2 1/2 turns of travel from all the way in to all the way out to verify rigging.



406961-807
J1852

GO TO NEXT PAGE

 11-3-58. PILOT CYCLIC STICK FITTING ASSEMBLY — REMOVAL/INSTALLATION (CONT)

26. After stick assembly is rigged adjust the stick assembly to the far forward position.

27. Adjust the bend of indicator pin at the bend area flagged to position the end face of pin flush with end of the small boss guiding it.

28. Secure rod end (17) and indicator pin (7) to pivot assembly (16) with bolt (10), retainer (9), spacer (8), washer (6), and nut (5). Torque nut (5) **6 TO 10 INCH-POUNDS**.

29. Install cotter pin (4) through nut (5).

INSPECT

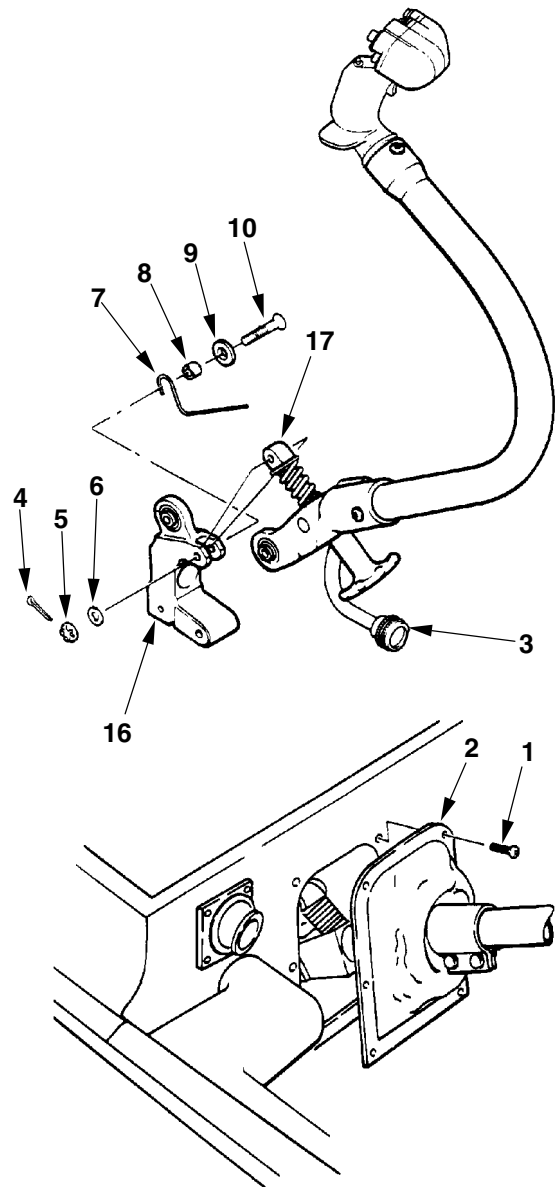
30. Connect electrical connector (3).

31. Install pilot cyclic stick boot (2) and secure with six screws (1).

FOLLOW-ON MAINTENANCE

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



406961-991
J0518

END OF TASK

11-3-59. PILOT CYCLIC TUBE ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Epoxy Primer Coating (D98)
Rubber Gloves (D111)
Crocus Cloth (D90)

Wiping Rag (D164)
Drycleaning Solvent (D199)
Acetone (D2)
Sandpaper (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean tube assembly surface with drycleaning solvent (D199).
2. Dry tube assembly with a dry wiping rag (D164).

INSPECT

3. Inspect tube assembly to limits shown. See figure Pilot Cyclic Tube Assembly — Damage Limits. If cracks in pilot cyclic tube assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

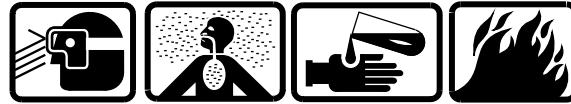
REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on cyclic tube assembly surface with 400 grit

sandpaper (D175). Smooth surface with crocus cloth (D90).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

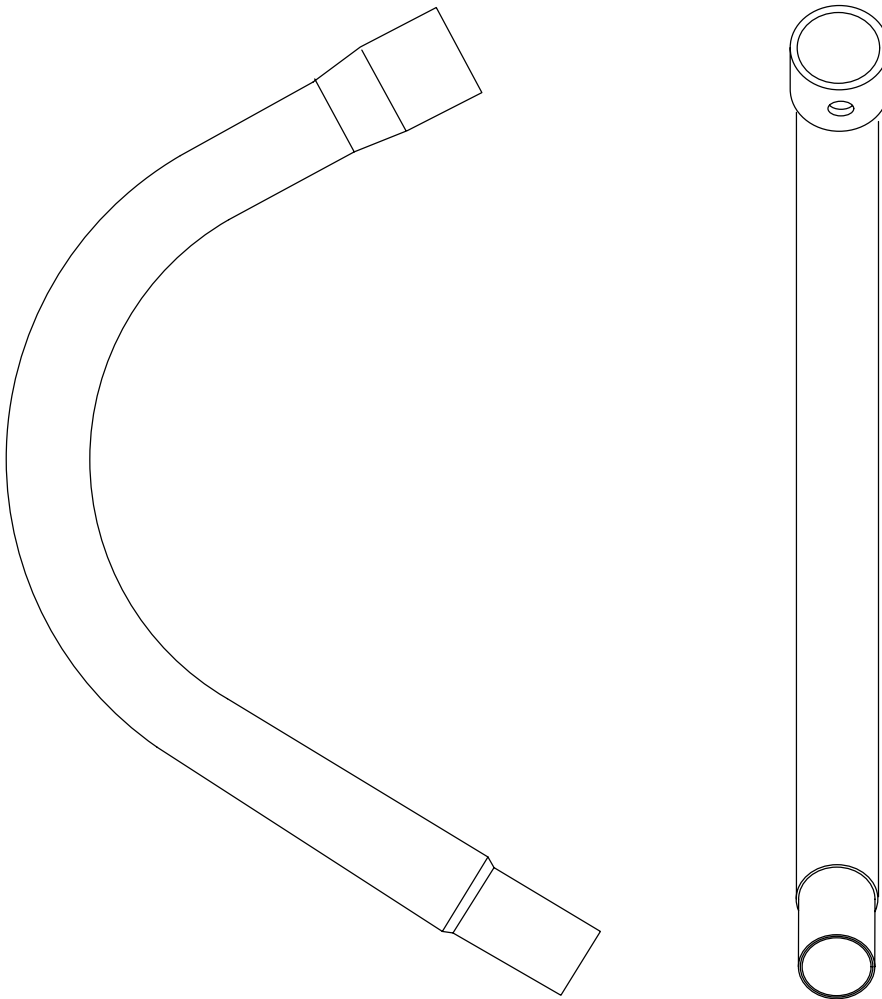


Epoxy Primer Coating

6. Touch up repair areas with epoxy primer coating (D98).
7. Replace tube assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-59. PILOT CYCLIC TUBE ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL AND CORROSION	0.005 in. before and 0.010 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.50 sq. in.
NUMBER OF REPAIRS	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.015 in. x 45°

406001-55
J1831

Pilot Cyclic Tube Assembly — Damage Limits

END OF TASK

11-3-60. PILOT CYCLIC STICK FITTING ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Wiping Rag (D164)
Drycleaning Solvent (D199)
Acetone (D2)
Sandpaper (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean fitting assembly surface with drycleaning solvent (D199).
2. Dry fitting assembly with a dry wiping rag (D164).

INSPECT

3. Inspect fitting assembly to limits shown. See figure Pilot Cyclic Stick Fitting Assembly — Damage Limits. If cracks in pilot cyclic stick fitting assembly arm are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove nicks, scratches, and corrosion on fitting assembly with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

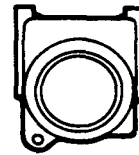
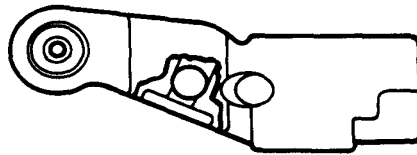
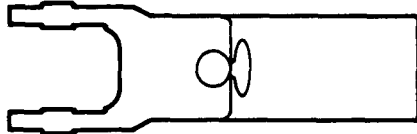


Epoxy Primer Coating

6. Touch up repaired areas with epoxy primer coating (D98).
7. Replace fitting assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-60. PILOT CYCLIC STICK FITTING ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL AND CORROSION	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.50 sq. in.
NUMBER OF REPAIRS	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in. x 45°
BORES	0.002 in. for 1/4 circumference
BEARING WEAR:	
Axial	0.012 in.
Radial	0.006 in.

NOTE

No cracks are permitted.

406001-52
J0534

Pilot Cyclic Stick Fitting Assembly — Damage Limits

END OF TASK

11-3-61. PILOT CYCLIC FITTING ASSEMBLY BEARINGS (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Repairer Tool Kit (B180)
Reamer Set (B114)
Hand Arbor Press (B107)
Bearing Staking Tool Set (B189)

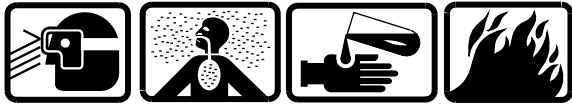
Material:
Acetone (D2)
Abrasive Mats (D1)
Wiping Rag (D164)
Rubber Gloves (D111)
Zinc Chromate Primer (D161)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:
TM 55-1500-322-24

REMOVE

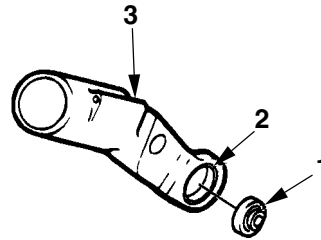
1. Press two bearings (1) and sleeve (2) from fitting assembly (3).



Acetone

2. Clean bores of fitting assembly (3) using acetone (D2) and abrasive mat (D1).

3. Inspect bores of fitting assembly (3) for damage. Maximum allowable damage is **0.002 inch** for one-fourth of circumference.



406001-255
J0534

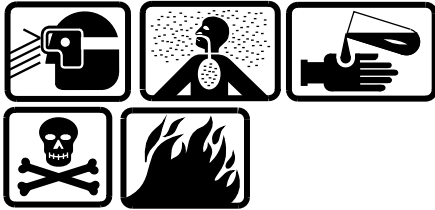
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 11-3-61. PILOT CYCLIC FITTING ASSEMBLY BEARINGS (AVIM) — REMOVAL/INSTALLATION
 (CONT)

INSTALL

CAUTION

Where extreme interference fit occurs at the beginning of press fit operation, stop and determine the cause. Do not stake bearing unless the cause can be eliminated or satisfactorily remedied.

**Zinc Chromate Primer**

4. Coat mating surfaces of sleeve (2) and bore of fitting assembly (3) with zinc chromate primer (D161).

5. Press sleeve into bore of left tang of fitting assembly (3) (as installed in helicopter) until centered equally on both sides.

6. Ream sleeve (2) in line with bore in opposite tang of fitting to **0.748 to 0.749 inch**.

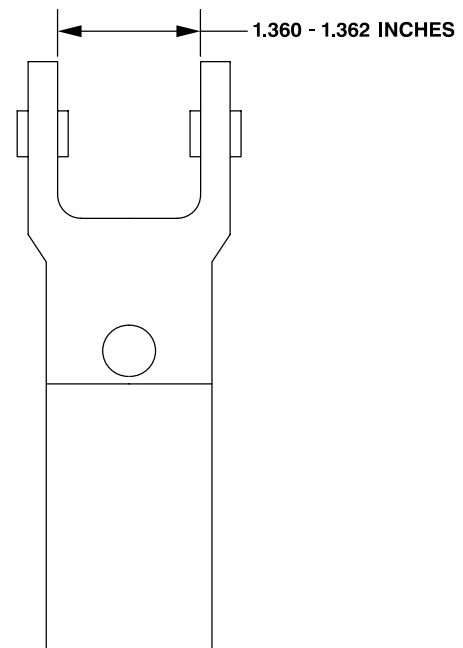
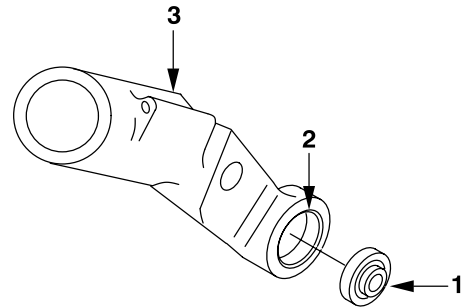
7. Coat mating surfaces of sleeve (2) and bearing (1) with zinc chromate primer (D161).

8. Press bearing (1) into sleeve (2) until centered equally on each side.

9. Using bearing staking tool set (B189), ring stake both sides of sleeve (2) (TM 55-1500-322-24).

10. Coat mating surfaces of bearing (1) and bore of fitting assembly (3) with zinc chromate primer (D161).

11. Using hand arbor press (B107), press bearing (1) into bore of right tang of fitting assembly (3) while primer is still wet. Using workaid, obtain a dimension of **1.360 to 1.362 inches** between bearings (1).



406001-289
J1838

INSPECT

END OF TASK

11-3-62. PILOT CYCLIC PIVOT SUPPORT ASSEMBLY INSERTS — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Personnel Required:

- 67S Scout Helicopter Technical Inspector (TI) ■
- 68G Aircraft Structural Repairer

Applicable Configurations:
All

References:

TM 1-1500-204-23

Tools:

- Airframe Repairer Tool Kit (B176)
 - Screw Thread Insert Tool Kit (B181)
 - Screw Thread Insert Tool Kit (B182)
-

REMOVE

1. Remove two inserts (1 and 2) from support assembly (3) (TM 1-1500-204-23).

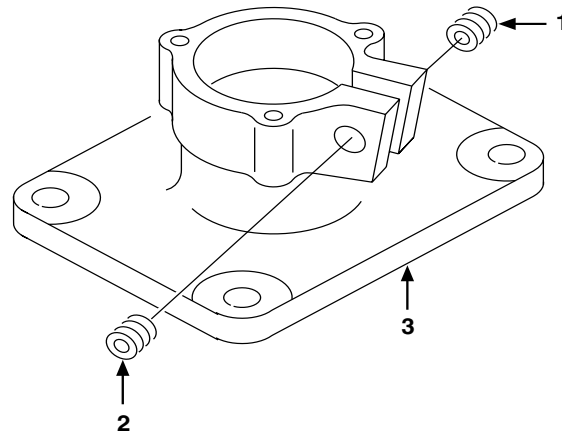
INSTALL

NOTE

Inserts are different in size. Use correct tool when installing.

2. Install two inserts (1 and 2) into support assembly (3) (TM 1-1500-204-23).

INSPECT



406001-256
H4055

END OF TASK

11-3-63. CPG CYCLIC STICK — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

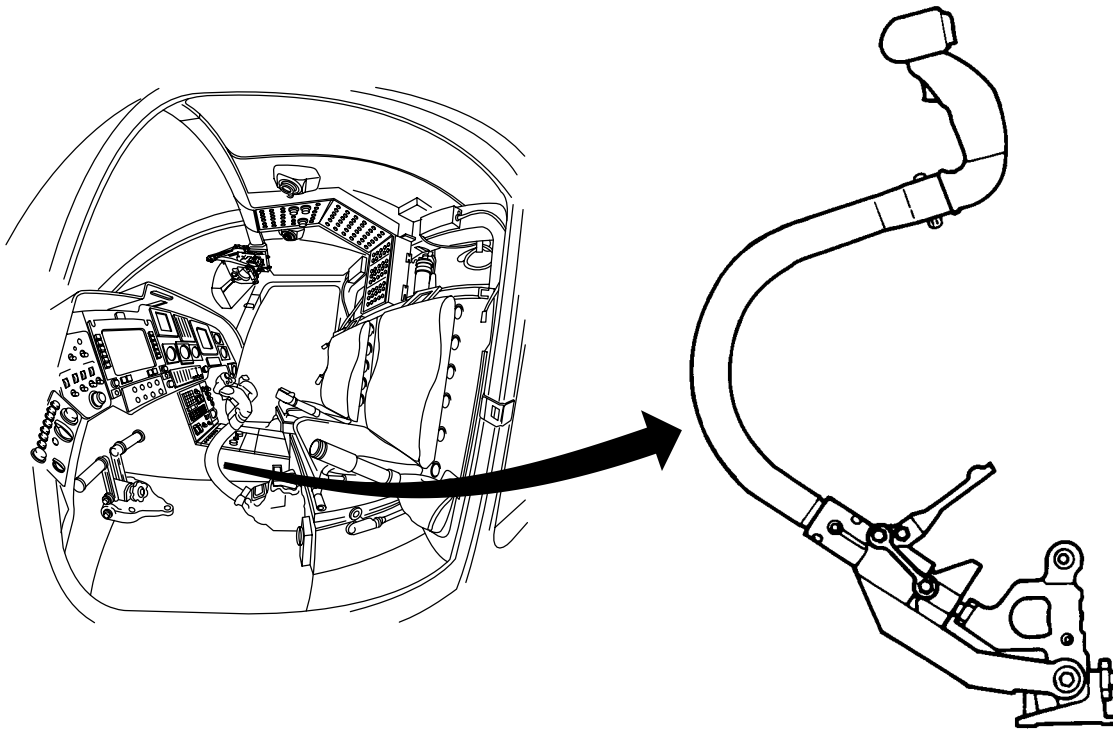
References:
TM 1-1520-248-MTF

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)

Tools:
General Mechanic Tool Kit (B178)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot



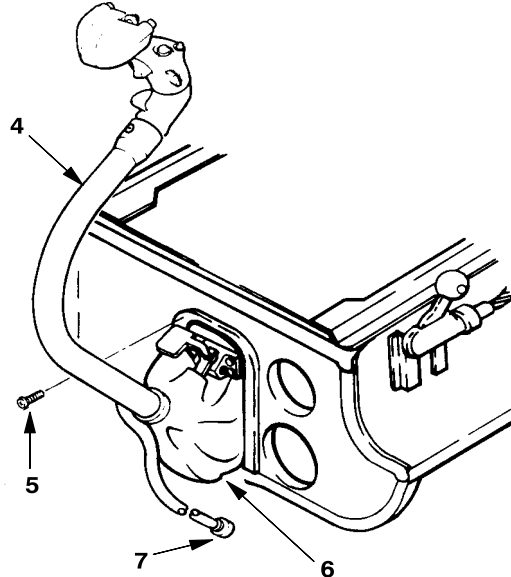
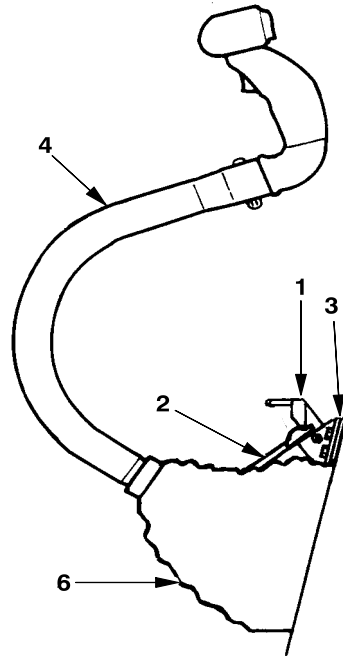
406961-845
J1845

GO TO NEXT PAGE

11-3-63. CPG CYCLIC STICK — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Pull latch assembly (1) to release lever assembly (2) from support latch (3) on CPG cyclic stick (4).
2. Remove eight screws (5).
3. Open fastener on boot (6) and remove boot.
4. Disconnect electrical connector (7).



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J1845

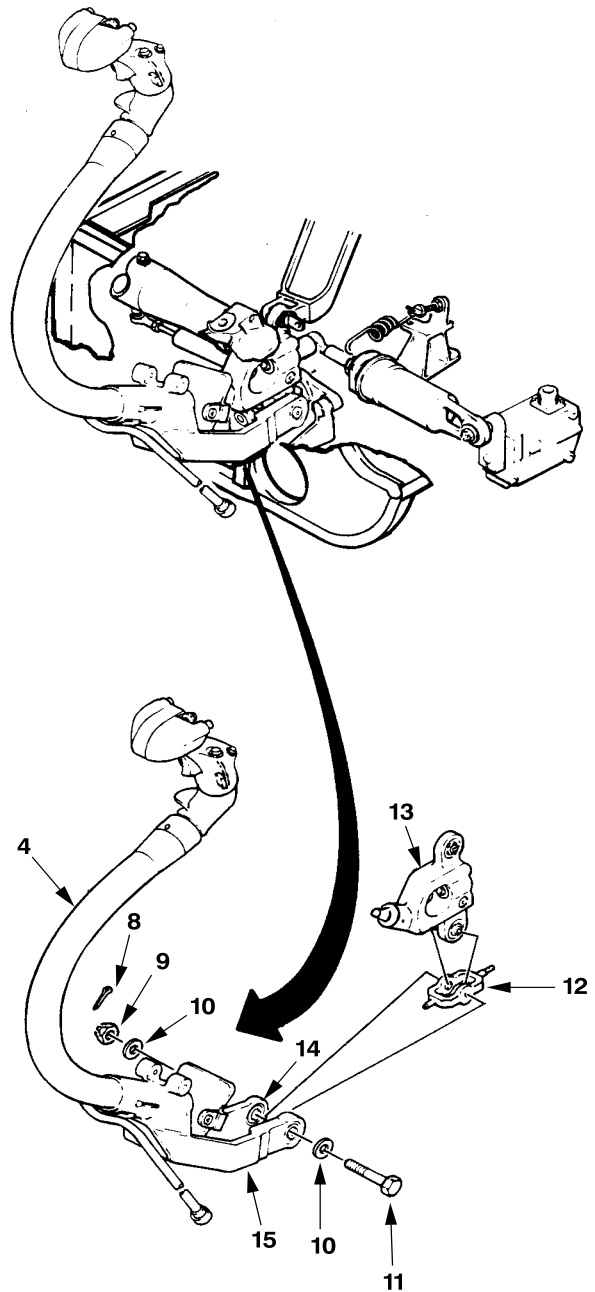
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11-3-63. CPG CYCLIC STICK — REMOVAL/INSTALLATION (CONT)

5. Remove and discard cotter pin (8).
6. Remove nut (9), two washers (10), and bolt (11) from CPG cyclic stick (4), gimbal assembly (12), and fitting assembly (13).
7. Remove bearing (14) from housing assembly (15).
8. Remove CPG cyclic stick (4) from helicopter.

INSTALL

9. Install bearing (14) into housing assembly (15).
10. Position CPG cyclic stick (4) on gimbal assembly (12) and fitting assembly (13).
11. Install bolt (11), two washers (10), and nut (9). Install cotter pin (8) through nut (9).
12. Measure free play at the trigger height on the cyclic stick. If free play exceeds **0.5 inch**, inspect cyclic stick and associated control linkages for worn or defective parts. Replace parts as necessary.

406961-864
J2062

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11-3-63. CPG CYCLIC STICK — REMOVAL/INSTALLATION (CONT)

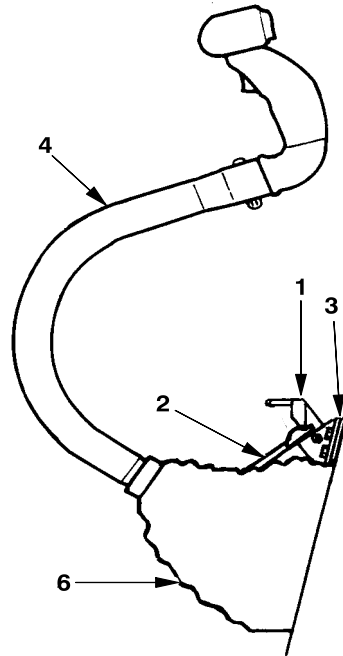
13. Connect electrical connector (7).

14. Install boot (6) over CPG cyclic stick (4) base. Close fastener on boot (6).

15. Install eight screws (5).

16. Pull up latch assembly (1) and position lever assembly (2) between latch assembly (1) and support latch (3).

17. Secure lever assembly (2) to support latch (3) by moving latch assembly (1) down to closed position.

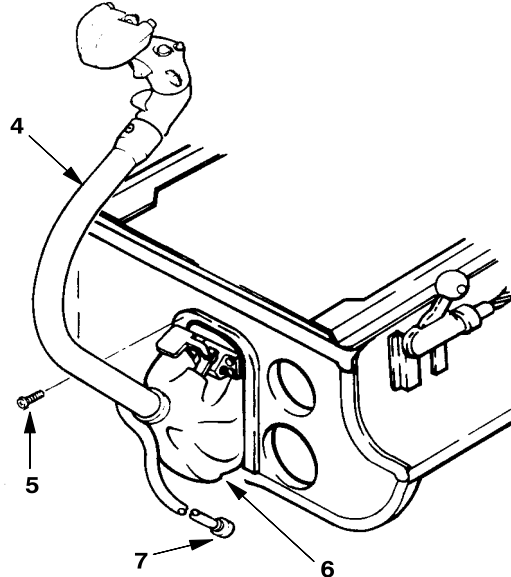


INSPECT

FOLLOW-ON MAINTENANCE

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



406961-840
J1845

END OF TASK

**11-3-64. CYCLIC STICK GIMBAL/FITTING/PLATE/SUPPORT ASSEMBLIES — REMOVAL/
INSTALLATION**

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Torque Wrench (B235)
Torque Wrench (B237)
Torque Wrench (B239)

References:

TM 1-1520-248-MTF

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)
CPG Cyclic Stick Removed (Task 11-3-63)

Personnel Required:

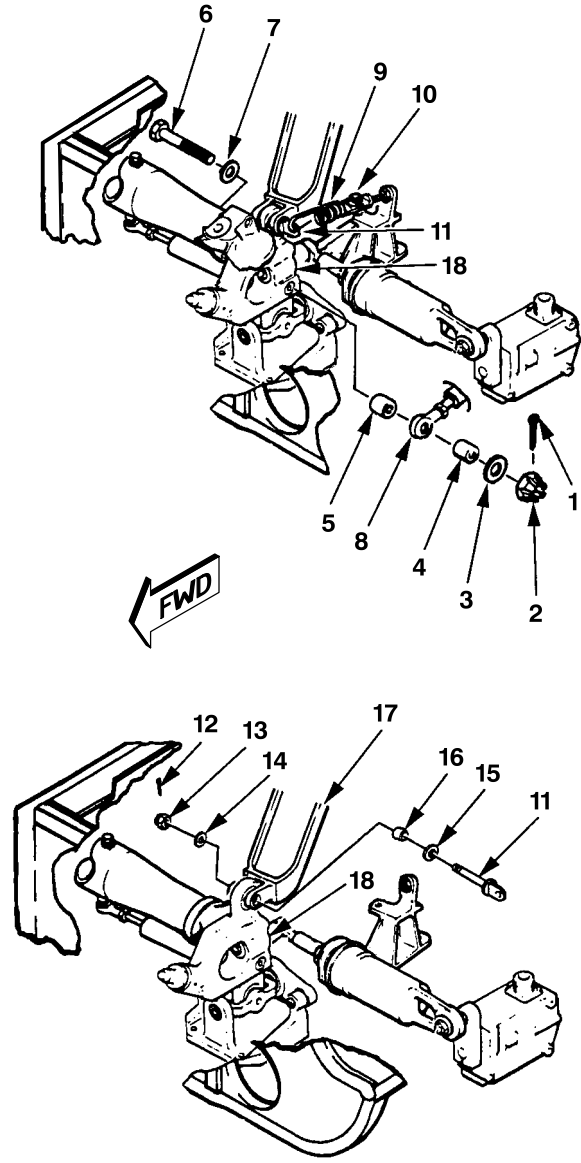
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

GO TO NEXT PAGE

11-3-64. CYCLIC STICK GIMBAL/FITTING/PLATE/SUPPORT ASSEMBLIES — REMOVAL/
INSTALLATION (CONT)

REMOVE

1. Remove cotter pin (1) and discard.
2. Remove nut (2), spacers (3, 4, and 5), bolt (6), and washer (7) to disconnect transducer (8).
3. Remove spring (9) from eyebolts (10) and (11).
4. Remove cotter pin (12) and discard.
5. Remove nut (13), washer (14), eyebolt (11), washer (15), and bushing (16) from yoke (17) and fitting assembly (18).

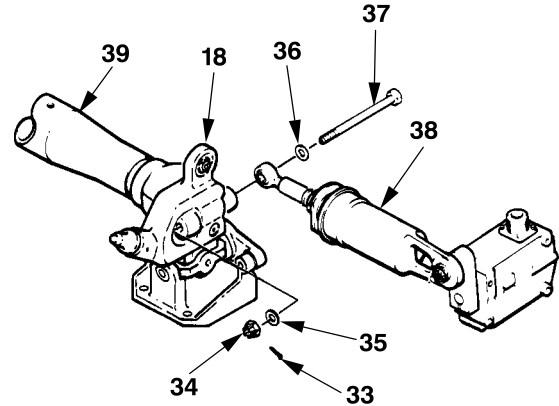
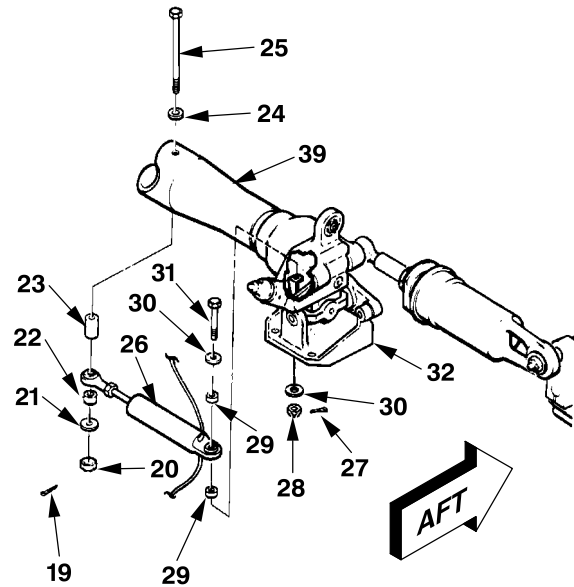


406961-838
J1966

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 11-3-64. CYCLIC STICK GIMBAL/FITTING/PLATE/SUPPORT ASSEMBLIES — REMOVAL/
 INSTALLATION (CONT)

6. Remove and discard cotter pin (19).
7. Remove nut (20), spacers (21, 22, and 23), washer (24), and bolt (25) from transducer (26).
8. Remove cotter pin (27) and discard.
9. Remove nut (28), two spacers (29), two washers (30), and bolt (31) from transducer (26) and support assembly (32).
10. Remove cotter pin (33) and discard.
11. Remove nut (34), washer (35), spacer (36), and bolt (37).
12. Swing force gradient transducer (38) away from fitting assembly (18).
13. Separate the torque tube assembly (39) from fitting assembly (18) and remove fitting assembly (18).



406961-839
J0534

GO TO NEXT PAGE

11-3-64. CYCLIC STICK GIMBAL/FITTING/PLATE/SUPPORT ASSEMBLIES — REMOVAL/
INSTALLATION (CONT)

14. Remove support assembly (32) by removing four bolts (40) and four washers (41).

15. Remove plate assembly (42) from support assembly (32) by removing three cotter pins (43), three nuts (44), two bolts (45), and five washers (46). Discard cotter pins (43).

16. Remove gimbal assembly (47) from support assembly (32).

INSPECT

17. Inspect gimbal assembly (47) for wear and damage (Task 11-3-65).

18. Inspect plate assembly (42) for wear and damage (Task 11-3-71).

19. Inspect fitting assembly (18) for wear and damage (Task 11-3-67).

20. Inspect support assembly (32) for wear and damage (Task 11-3-69).

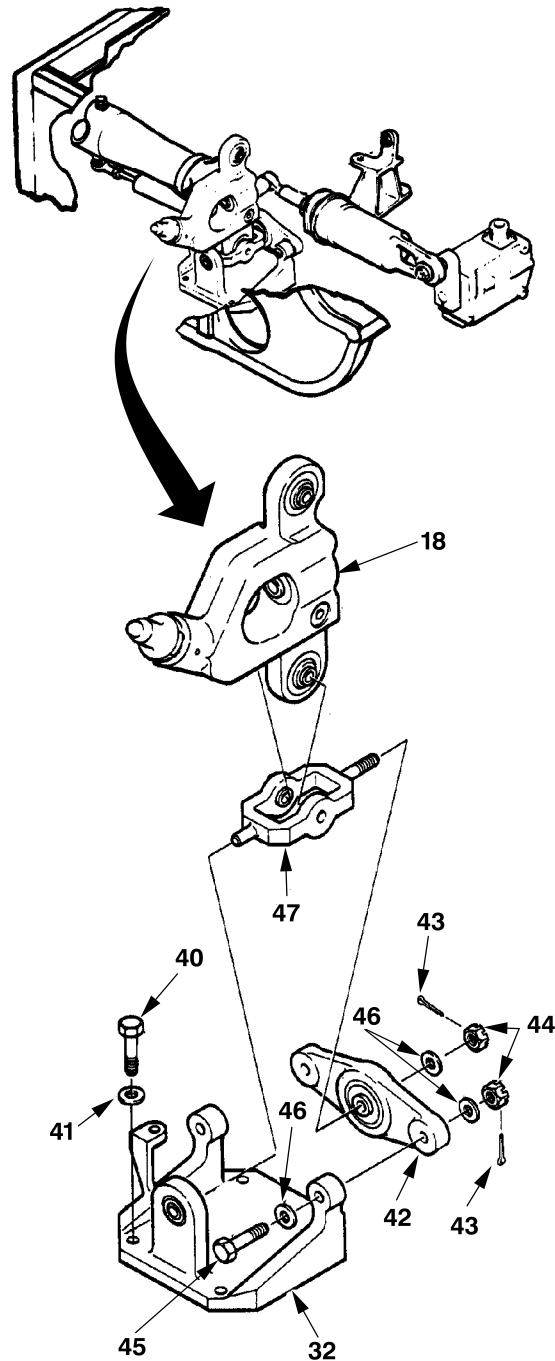
INSTALL

21. Position gimbal assembly (47) into support assembly (32).

22. Install plate assembly (42) using two bolts (45), five washers (46), and three nuts (44). Torque nuts (44) **50 TO 70 INCH-POUNDS** and install three cotter pins (43) through three nuts (44).

23. Position support assembly (32) into helicopter and align with mounting holes. Install four bolts (40) and washers (41). Torque bolts (40) **50 TO 70 INCH-POUNDS**.

24. Position fitting assembly (18) into gimbal assembly (47).



406961-870
J0534

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 11-3-64. CYCLIC STICK GIMBAL/FITTING/PLATE/SUPPORT ASSEMBLIES — REMOVAL/
 INSTALLATION (CONT)

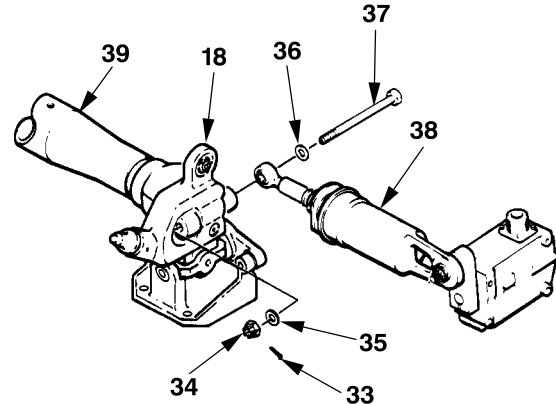
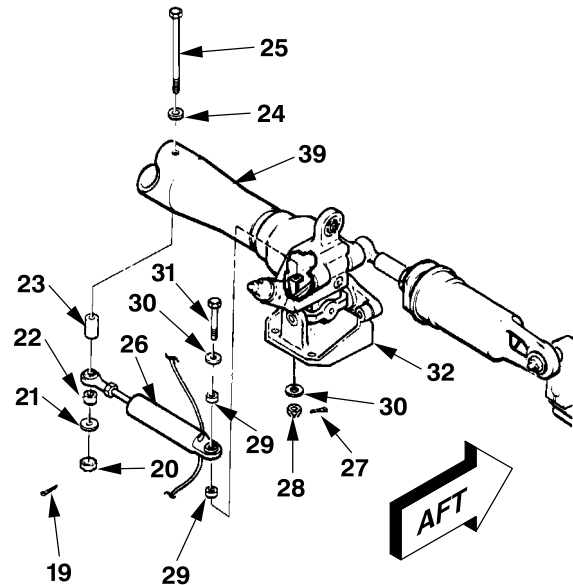
25. Position torque tube assembly (39) on fitting assembly (18).

26. Position force gradient transducer (38) beside fitting assembly (18).

27. Install force gradient transducer (38) and torque tube assembly (39) with bolt (37), spacer (36), washer (35), and nut (34). Torque nut (34) **50 TO 70 INCH-POUNDS** and install cotter pin (33) through nut (34).

28. Position transducer (26) on support assembly (32) and install with bolt (31), two washers (30), two spacers (29), and nut (28). Torque nut (28) **20 TO 25 INCH-POUNDS** and install cotter pin (27) through nut (28).

29. Connect transducer (26) to torque tube assembly (39) with bolt (25), washer (24), spacers (21, 22, and 23), and nut (20). Torque nut (20) **20 TO 25 INCH-POUNDS** and install cotter pin (19) through nut (20).



406961-839
J0534

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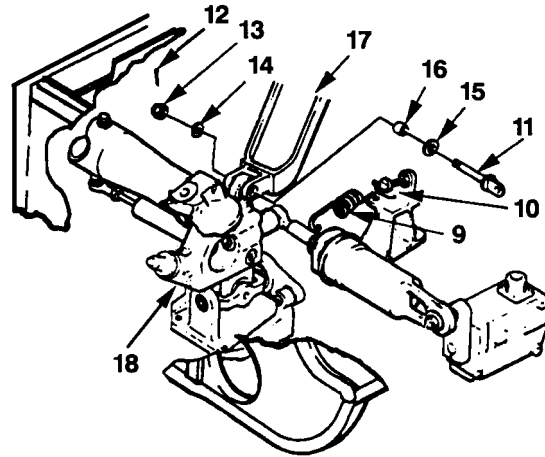
11-3-64. CYCLIC STICK GIMBAL/FITTING/PLATE/SUPPORT ASSEMBLIES — REMOVAL/
INSTALLATION (CONT)

30. Position yoke (17) on fitting assembly (18).

31. Install eyebolt (11), washer (15), bushing (16), washer (14), and nut (13). Torque nut (13) **100 TO 140 INCH-POUNDS** and install cotter pin (12) through nut (13).

32. Attach spring (9) to eyebolts (11 and 10).

33. Connect transducer (8) to fitting assembly (18) by installing bolt (6), washer (7), spacers (3, 4, and 5), and nut (2). Torque nut (2) **20 TO 25 INCH-POUNDS** and install cotter pin (1) through nut (2).



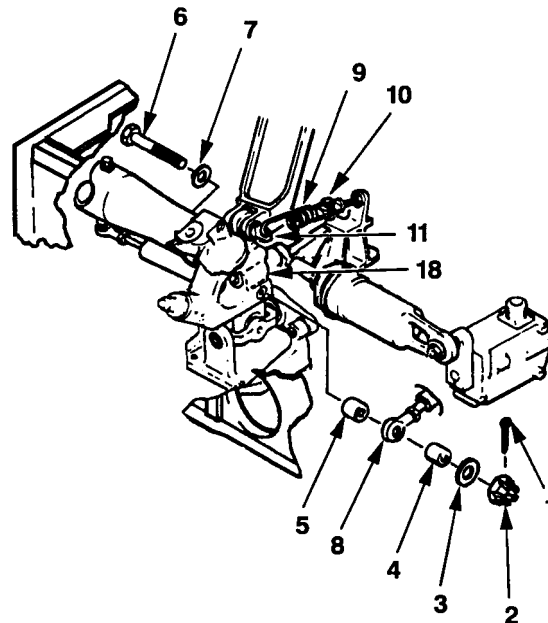
INSPECT

FOLLOW-ON MAINTENANCE

Install cyclic stick (Task 11-3-63)

Install crew seat and armor seat panel (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



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J0534

END OF TASK

11-3-65. CPG CYCLIC STICK GIMBAL ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Wiping Rag (D164)
Drycleaning Solvent (D199)
Acetone (D2)
Sandpaper (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean gimbal assembly surface with drycleaning solvent (D199).
2. Dry gimbal assembly with a dry wiping rag (D164).

INSPECT

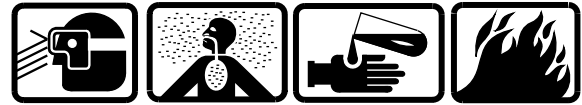
3. Inspect gimbal assembly to limits shown. See figure CPG Cyclic Stick Gimbal Assembly — Damage Limits. If cracks in CPG cyclic stick gimbal assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove nicks, scratches, and corrosion on fitting assembly with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

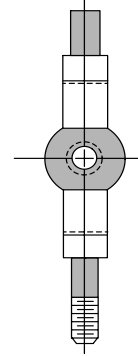
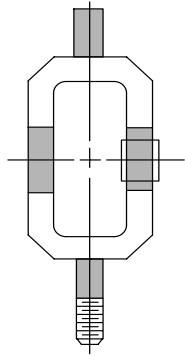


Epoxy Primer Coating

6. Touch up repaired areas with epoxy primer coating (D98).
7. Replace gimbal assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-65. CPG CYCLIC STICK GIMBAL ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MECHANICAL AND CORROSION

MAXIMUM AREA PER FULL DEPTH REPAIR

NUMBER OF REPAIRS

EDGE CHAMFER TO REMOVE DAMAGE

BORES

THREAD DAMAGE:

Depth
Length
Number

BUSHING WEAR:

Radial

MAXIMUM DAMAGE AND REPAIR DEPTH

0.005 in. before and after repair

0.1 sq. in.

One

0.030 in. x 45°

0.002 in. for 1/4 circumference

1/3 of thread
1/4 circumference
One

0.12 in.

0.020 in. before and 0.040 in. after repair

0.6 sq. in.

Not critical

0.030 in. x 45°

NOTES

1. No cracks are permitted.
2. Bore damage not to exceed 0.001 for full circumference bearing.

406961-895
J0534

CPG Cyclic Stick Gimbal Assembly — Damage Limits

END OF TASK

 11-3-66. CPG CYCLIC STICK GIMBAL ASSEMBLY BUSHING (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

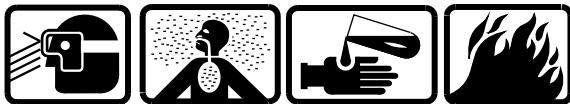
Tools:
Hand Arbor Press (B107)

Material:
Acetone (D2)
Abrasive Mats (D1)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

REMOVE

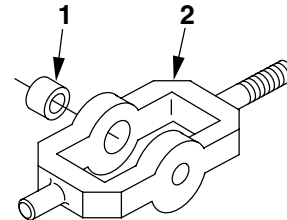
1. Press bushing (1) from gimbal assembly (2).



Acetone

2. Clean bores of gimbal assembly (2) using acetone (D2) and abrasive mat (D1).

3. Inspect bores of gimbal assembly (2) for damage. Maximum allowable damage (Task 11-3-65).



406961-873
J0534

INSTALL

CAUTION

Where extreme interference fit occurs at the beginning of press fit operation, stop and determine the cause. Do not press bushing unless the cause can be eliminated or satisfactorily remedied.

4. Using hand arbor press (B107), press bushing (1) into gimbal assembly (2) until centered equally on each side.

INSPECT

END OF TASK

11-3-67. CPG CYCLIC STICK FITTING ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

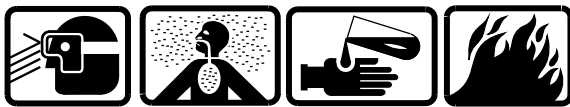
Material:
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Wiping Rag (D164)
Drycleaning Solvent (D199)
Acetone (D2)
Sandpaper (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



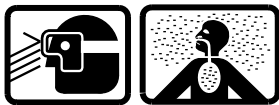
Drycleaning Solvent

1. Clean fitting assembly surface with drycleaning solvent (D199).
2. Dry fitting assembly with a dry wiping rag (D164).

INSPECT

3. Inspect fitting assembly to limits shown. See figure CPG Cyclic Stick Fitting Assembly — Damage Limits. If cracks in CPG cyclic stick fitting assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove nicks, scratches, and corrosion on fitting assembly with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

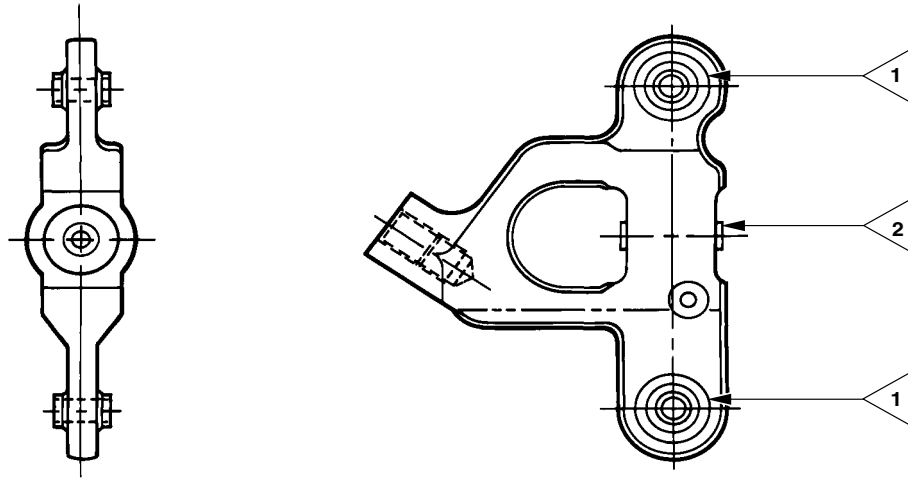


Epoxy Primer Coating

6. Touch up repair areas with epoxy primer coating (D98).
7. Replace fitting assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-67. CPG CYCLIC STICK FITTING ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MECHANICAL AND CORROSION

MAXIMUM AREA PER FULL DEPTH REPAIR

NUMBER OF REPAIRS

EDGE CHAMFER TO REMOVE DAMAGE

BORES

BEARING WEAR:

Axial
Radial

Axial
Radial

MAXIMUM DAMAGE AND REPAIR DEPTH

0.010 in. before and
0.020 in. after repair

0.25 sq. in.

Not critical

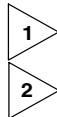
0.030 in. x 45°

0.002 in. for 1/4
circumference

0.012 in.
0.006 in.

0.012 in.
0.006 in.

1



NOTES

- 1 Total combined bearing wear for two (2) MS27640-4 bearings.
- 2. No cracks are permitted.

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J0534

CPG Cyclic Stick Fitting Assembly — Damage Limits

END OF TASK

11-3-68. CPG CYCLIC STICK FITTING ASSEMBLY BEARINGS (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Repairer Tool Kit (B180)
Hand Arbor Press (B107)
Bearing Staking Tool Set (B189)
Torque Wrench (B236)
Special Bolt (H-14)

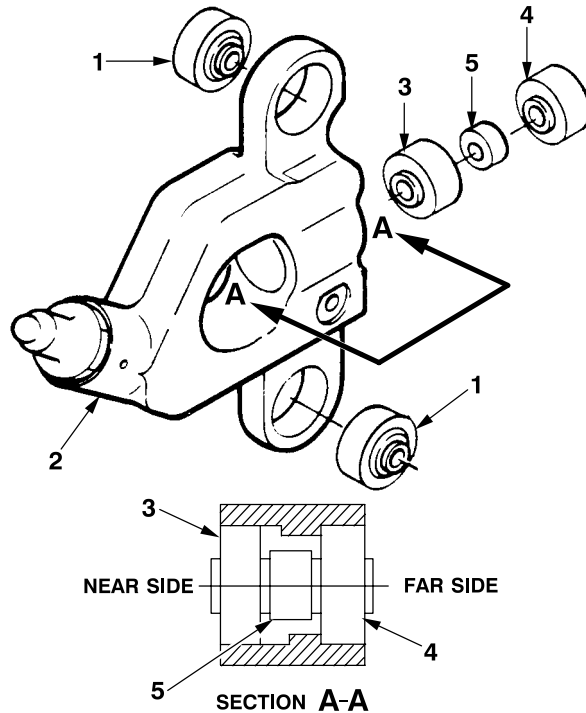
Material:
Acetone (D2)
Abrasive Mats (D1)
Wiping Rag (D164)
Rubber Gloves (D111)
Retaining Compound (D169)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:
TM 55-1500-322-24

REMOVE

1. Press bearings (1) from fitting assembly (2).
2. Remove bearings (3 and 4) and spacer (5) from fitting assembly (2):
 - a. Use smaller sleeve or drift punch to remove near side bearing (3) and spacer.
 - b. Remove bearing (4) using drift punch to loosen bearing (4) from far side of fitting assembly (2).



Acetone

3. Clean bearing bores in fitting assembly (2) with acetone (D2) and abrasive mat (D1). Dry with wiping rags (D164).

INSPECT

4. Inspect bores of fitting assembly (2) for damage; maximum allowed is **0.002 inch** for one-fourth circumference.

406961-875
J0534

GO TO NEXT PAGE

11-3-68. CPG CYCLIC STICK FITTING ASSEMBLY BEARINGS (AVIM) — REMOVAL/INSTALLATION (CONT)

INSTALL



Retaining Compound

5. Apply retaining compound (D169) to bore of fitting assembly (2) and outside surface of bearings (1).

CAUTION

Where extreme interference fit occurs at the beginning of press fit operation, stop and determine the cause. Do not stake bearing unless the cause can be eliminated or satisfactorily remedied.

6. Using hand arbor press (B107), press bearings (1) into fitting assembly (2) until centered equally on each side.

7. Using bearing staking tool set (B189), ring stake bearing (1) (TM 55-1500-322-24).

CAUTION

Use care when removing excess retaining compound from bearing. If retaining compound gets into bearing it will lock up.

8. Carefully remove excess retaining compound from outside of bearings (1).

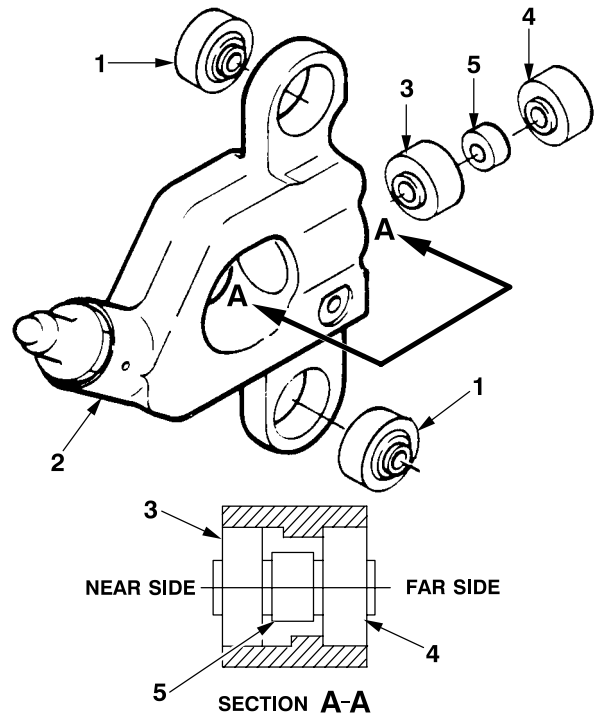
9. Ensure there is no movement or looseness of bearings (1) outer race.

NOTE

As soon as possible after applying retaining compound (D169), parts should be pressed into bellcrank.

10. Apply retaining compound (D169) to bore of fitting assembly (2) and outside of bearings (3) and (4).

11. Install near side bearing (3) in bore of fitting assembly (2) while retaining compound is still wet.



406961-875
J0534

12. Install spacer (5) next to bearing (3).

13. Install far side bearing (4) in bore of fitting assembly (2) while retaining compound is still wet.

14. Using bearing staking tool set (B189), ring stake bearings (1) (both sides) (TM 55-1500-322-24).

15. Use special bolt (H-14), nut, and washers to align bearings (3 and 4) and spacer (5) during cure cycle.

16. Torque nut **25 TO 35 INCH-POUNDS**, prior to curing.

17. Allow assembly to cure at room temperature 70 to 77 °F for 26 to 28 hours.

18. Remove nut, washers, and bolt from fitting assembly (2).

INSPECT

END OF TASK

11-3-69. CPG CYCLIC STICK SUPPORT ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

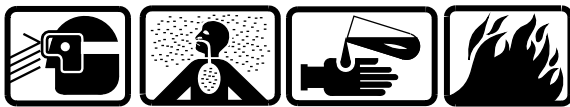
Material:
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Wiping Rag (D164)
Drycleaning Solvent (D199)
Acetone (D2)
Sandpaper (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean support assembly surface with drycleaning solvent (D199).
2. Dry support assembly with a dry wiping rag (D164).

INSPECT

3. Inspect support assembly to limits shown. See figure CPG Cyclic Stick Support Assembly — Damage Limits. If cracks in CPG cyclic stick support assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove, nicks, scratches, and corrosion on fitting assembly with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

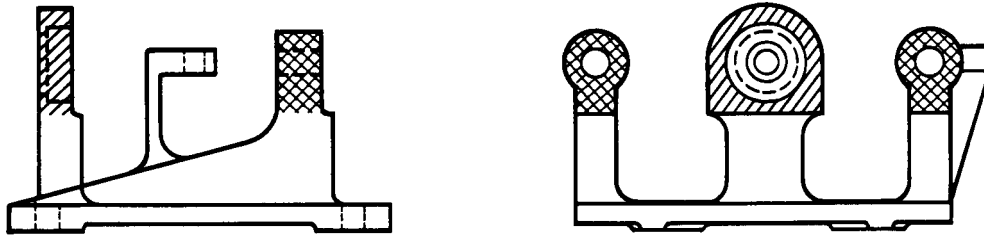


Epoxy Primer Coating

6. Touch up repaired areas with epoxy primer coating (D98).
7. Replace support assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-69. CPG CYCLIC STICK SUPPORT ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH		
	0.005 in. before and 0.010 in. after repair	0.010 in. before and 0.020 in. after repair	0.020 in. before and 0.040 in. after repair
MECHANICAL AND CORROSION			
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	0.10 sq. in.	0.25 sq. in.
NUMBER OF REPAIRS	One per lug	Two per lug, not same location	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in. x 45°	0.030 in. x 45°	0.060 in. x 45°
BORES		0.002 in. x 1/4 circumference	
BEARING WEAR:			
Axial		0.030 in.	
Radial		0.012 in.	

NOTE

No cracks are permitted.

406961-878
J0534

CPG Cyclic Stick Support Assembly — Damage Limits

END OF TASK

11-3-70. CPG CYCLIC STICK SUPPORT ASSEMBLY BEARING (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

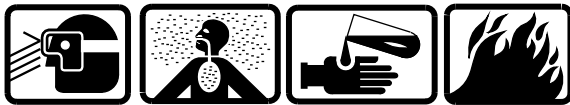
Tools:
Hand Arbor Press (B107)

Material:
Acetone (D2)
Abrasive Mats (D1)
Rubber Gloves (D111)
Retaining Compound (D169)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

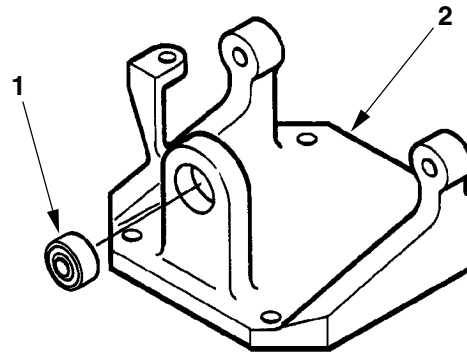
REMOVE

1. Press bearing (1) from support assembly (2).



Acetone

2. Clean bores of support assembly (2) using acetone (D2) and abrasive mat (D1).
3. Inspect bores of support assembly (2) for damage. Maximum allowable damage is **0.002 inch** for one-fourth of circumference.



INSTALL



Retaining Compound

406961-879
J0534

NOTE

As soon as possible after applying retaining compound (D169), parts should be pressed into support assembly (2).

4. Apply retaining compound (D169) to mating surfaces of bearing (1).

CAUTION

Where extreme interference fit occurs at the beginning of press fit operation, stop and determine the cause. Do not press bushing unless the cause can be eliminated or satisfactorily remedied.

5. Using hand arbor press (B107), press bearing (1) into support assembly (2).

6. Ensure there is no movement or looseness of bearing outer race.

INSPECT

END OF TASK

11-3-71. CPG CYCLIC STICK PLATE ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Wiping Rag (D164)
Drycleaning Solvent (D199)
Acetone (D2)
Sandpaper (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean plate assembly surface with drycleaning solvent (D199).
2. Dry plate assembly with a dry wiping rag (D164).

INSPECT

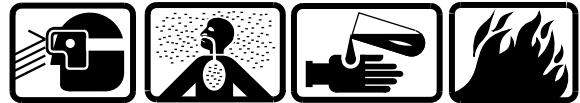
3. Inspect plate assembly to limits shown. See figure CPG Cyclic Stick Plate Assembly — Damage Limits. If cracks in CPG cyclic stick plate assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove nicks, scratches, and corrosion on fitting assembly with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



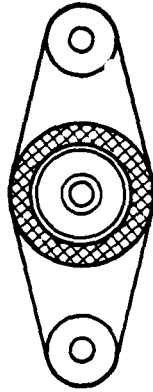
Epoxy Primer Coating

6. Touch up repaired areas with epoxy primer coating (D98).

7. Replace plate assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-71. CPG CYCLIC STICK PLATE ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
MECHANICAL AND CORROSION	0.005 in. before and 0.010 in. after repair	0.020 in. before and 0.025 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	Not critical
NUMBER OF REPAIRS	One	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in. x 45°	0.060 in. x 45°
BORES	0.002 in. for 1/4 circumference	
BEARING WEAR:		
Axial	0.030 in.	
Radial	0.012 in.	

NOTE

No cracks are permitted.

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J0534

CPG Cyclic Stick Plate Assembly — Damage Limits

END OF TASK

11-3-72. CPG CYCLIC STICK PLATE ASSEMBLY BEARING (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

Powertrain Repairer Tool Kit (B180)
Hand Arbor Press (B107)
Bearing Staking Tool Set (B189)

Material:

Acetone (D2)
Abrasive Mats (D1)
Rubber Gloves (D111)
Retaining Compound (D169)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:

TM 55-1500-322-24

GO TO NEXT PAGE

11-3-72. CPG CYCLIC STICK PLATE ASSEMBLY BEARING (AVIM) — REMOVAL/INSTALLATION (CONT)

REMOVE

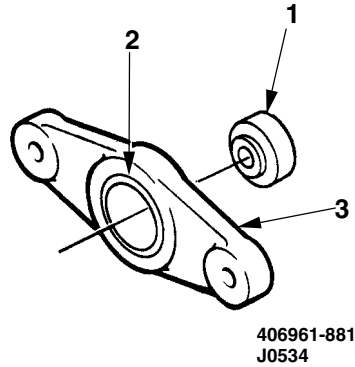
1. Press bearing (1) and sleeve (2) from plate assembly (3).



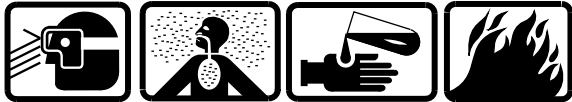
Acetone

2. Clean bores of plate assembly (3) using acetone (D2) and abrasive mat (D1).

3. Inspect bores of plate assembly (3) for damage. Maximum allowable damage is **0.002 inch** for one-fourth of circumference.



INSTALL



Retaining Compound

NOTE

As soon as possible after applying retaining compound (D169), parts should be pressed into plate assembly.

4. Coat mating surfaces of sleeve (2) and bore of plate assembly (3) with retaining compound (D169).

CAUTION

Where extreme interference fit occurs at the beginning of press fit operation, stop and determine the cause. Do not stake sleeve unless the cause can be eliminated or satisfactorily remedied.

5. Using hand arbor press (B107), press sleeve into bore of plate assembly (3) until centered equally on both sides.

6. Coat mating surfaces of sleeve (2) and bearing (1) with retaining compound (D169).

7. Using hand arbor press (B107), press bearing (1) into sleeve (2) until centered equally on each side of plate assembly (3).

8. Using bearing staking tool set (B189), ring stake sleeve (2) (both sides) (TM 55-1500-322-24).

CAUTION

Use care when removing excess retaining compound from bearing. If retaining compound gets into bearing it will lock up.

9. Carefully remove excess retaining compound from outside of bearing (1).

INSPECT

END OF TASK

11-3-73. CPG CYCLIC STICK STUD ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Airframe Repairer Tool Kit (B176)
Upright Drill Press (B108)
Torque Wrench (B237)

Material:

Lockwire (D132)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68G Aircraft Structural Repairer

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)
CPG Cyclic Stick Removed (Task 11-3-63)

GO TO NEXT PAGE

11-3-73. CPG CYCLIC STICK STUD ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove lockwire and lockpin (1) from fitting assembly (2) and remove stud (3).

2. Inspect stud (3) for wear and damage (Task 11-3-74).

INSTALL

3. Install stud (3) in fitting assembly (2). Torque stud (3) **50 INCH-POUNDS**.

3.1. Using lockpin (1) hole as a guide and a number 41 drill bit, drill a **0.094 to 0.097 inch** hole in new stud (3).

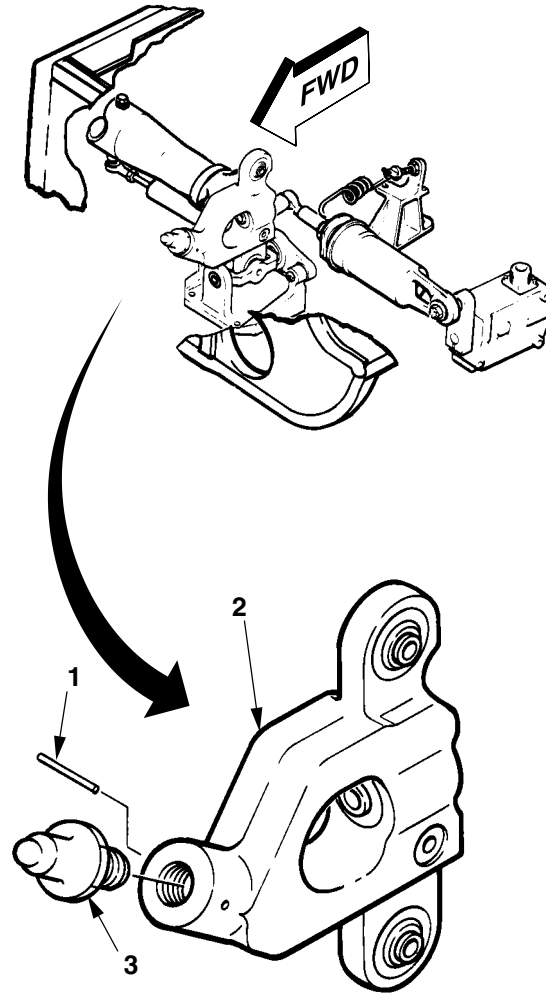
4. Insert lockpin (1) into fitting assembly (2) and secure with lockwire (D132).

INSPECT

FOLLOW-ON MAINTENANCE

Install CPG cyclic stick (Task 11-3-63)

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).



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END OF TASK

11-3-74. CPG CYCLIC STICK STUD — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

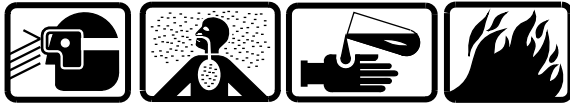
Tools:
General Mechanic Tool Kit (B178)

Material:
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Wiping Rag (D164)
Drycleaning Solvent (D199)
Acetone (D2)
Sandpaper (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

CLEAN



Drycleaning Solvent

1. Clean stud assembly surface with drycleaning solvent (D199).
2. Dry stud assembly with a dry wiping rag (D164).

INSPECT

3. Inspect stud assembly to limits shown. See figure CPG Cyclic Stick Stud — Damage Limits.

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

The integrity of the bond between the tip and stud is the critical characteristic of the stud assembly.

4. Inspect stud assembly for integrity of bond between tip and stud. Replace stud assembly if tip has become unbonded.

REPAIR



Sanding Operations

5. Remove nicks, scratches, and corrosion on assembly with 400 grit sandpaper (D175).



Acetone

6. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



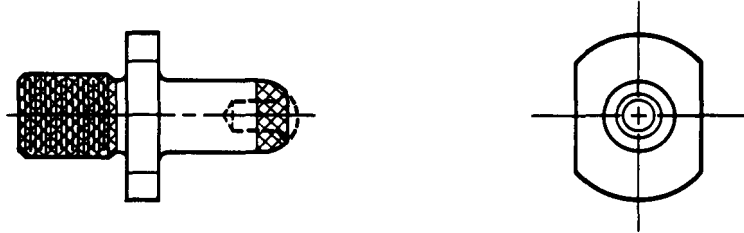
Epoxy Primer Coating

7. Touch up repaired areas with epoxy primer coating (D98).

8. Replace stud assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-74. CPG CYCLIC STICK STUD — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
MECHANICAL AND CORROSION	0.005 in. before and after repair	0.020 in. before and 0.040 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.01 sq. in.	Not critical
NUMBER OF REPAIRS	One	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in. x 45°	0.060 in. x 45°
BORES	0.002 in. for 1/4 circumference	
THREAD DAMAGE:		
Depth	1/3 of thread	
Length	1/4 circumference	
Number	One	

NOTE

No cracks are permitted.

406961-884
J0534

CPG Cyclic Stick Stud — Damage Limits

END OF TASK

11-3-75. CPG CYCLIC STICK QUICK-DISCONNECT LEVER AND LINK ASSEMBLY — REMOVAL/
INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
 ■ General Mechanic Tool Kit (B178)
 ■ Torque Wrench (B237)

Personnel Required:
 67S Scout Helicopter Technical Inspector (TI)
 67S Scout Helicopter Repairer

Equipment Condition:
 Helicopter Safed (Task 1-6-7)
 Crew Seat and Armor Seat Panel Removed
 (Task 2-2-33) or Seat Pan Assembly
 Removed (Task 2-2-34)
 CPG Cyclic Stick Removed (Task 11-3-63)

GO TO NEXT PAGE

11-3-75. CPG CYCLIC STICK QUICK-DISCONNECT LEVER AND LINK ASSEMBLY — REMOVAL/
INSTALLATION (CONT)

REMOVE

1. Remove two link assemblies (1) from housing assembly (2) by removing 4 cotter pins (3), 4 nuts (4), 4 bolts (5), and 10 washers (6). Discard cotter pins (3).

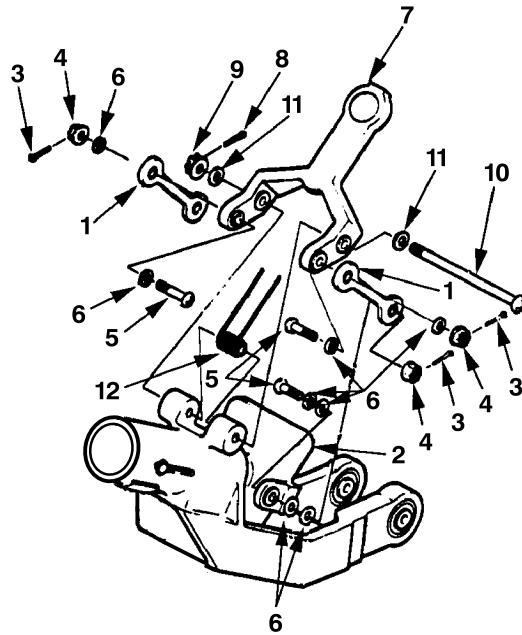
CAUTION

CPG quick-disconnect lever (7) is spring-loaded. Relieve spring tension before removing quick-disconnect lever (7).

2. Remove quick-disconnect lever (7) from housing assembly (2) by removing cotter pin (8), nut (9), bolt (10), two washers (11) and spring (12). Discard cotter pin (8).

3. Inspect link assemblies (1) for wear or damage (Task 11-3-78).

4. Inspect quick-disconnect lever assembly (8) for wear or damage (Task 11-3-76).



406961-886
J0534

INSTALL

5. Position quick-disconnect lever (8) on housing assembly (3) and install with spring (13), two washers (12), bolt (11), and nut (10). Torque nut (10) **50 TO 70 INCH-POUNDS** and install cotter pin (9) through nut (10).

6. Position two link assemblies (2) on housing assembly (3) and install with 4 bolts (6), 10 washers (7), and 4 nuts (5). Torque nuts (5) **50 TO 70 INCH-POUNDS** and install cotter pins (4) through nuts (5).

INSPECT

FOLLOW-ON MAINTENANCE

Install CPG cyclic stick (Task 11-3-63).

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

END OF TASK

11-3-76. CPG CYCLIC STICK QUICK-DISCONNECT LEVER ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

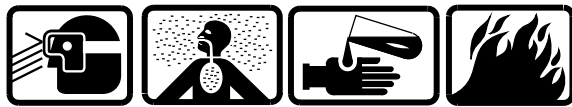
Material:
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Wiping Rag (D164)
Drycleaning Solvent (D199)
Acetone (D2)
Sandpaper (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean lever assembly surface with drycleaning solvent (D199).
2. Dry lever assembly with a dry wiping rag (D164).

INSPECT

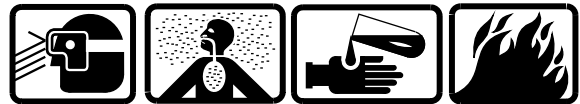
3. Inspect lever assembly to limits shown. See figure CPG Cyclic Stick Quick-Disconnect Lever Assembly — Damage Limits. If cracks in CPG cyclic stick quick-disconnect lever assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove nicks, scratches, and corrosion on fitting assembly with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

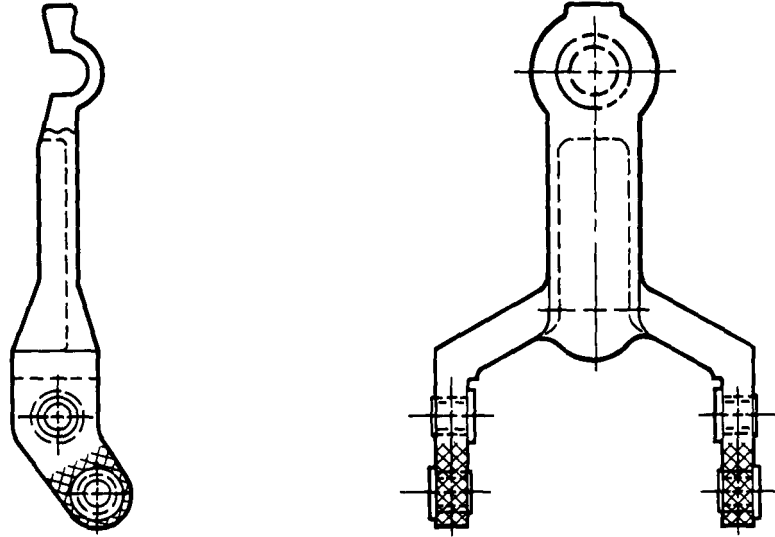


Epoxy Primer Coating

6. Touch up repaired areas with epoxy primer coating (D98).
7. Replace lever assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-76. CPG CYCLIC STICK QUICK-DISCONNECT LEVER ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
MECHANICAL AND CORROSION	0.010 in. before and 0.020 in. after repair	0.020 in. before and 0.030 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	Not critical
NUMBER OF REPAIRS	Two per lug	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in. x 45°	0.060 in. x 45°
BORES	0.004 in. for 1/4 circumference	
BEARING WEAR:		
Radial	0.024 in.	

NOTE

No cracks are permitted.

406961-887
J0534

CPG Cyclic Stick Quick-Disconnect Lever Assembly — Damage Limits

END OF TASK

11-3-77. CPG CYCLIC QUICK-DISCONNECT LEVER BUSHINGS (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

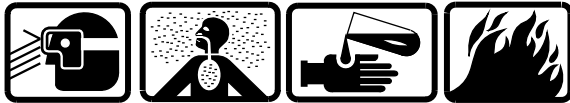
Tools:
Hand Arbor Press (B107)

Material:
Acetone (D2)
Abrasive Mats (D1)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

REMOVE

1. Press four bushings (1) from lever assembly (2).

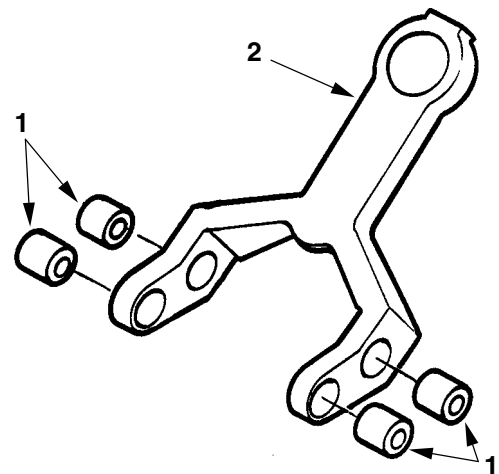
**Acetone**

2. Clean bores of lever assembly (2) using acetone (D2) and abrasive mat (D1).
3. Inspect bores of lever assembly (2) for damage. Maximum allowable damage is **0.002 inch** for one-fourth of circumference.

INSTALL**CAUTION**

Where extreme interference fit occurs at the beginning of press fit operation, stop and determine the cause. Do not press bushing unless the cause can be eliminated or satisfactorily remedied.

4. Using hand arbor press (B107), press two bushings (1) into bore of left tang of lever assembly (2).
5. Press two bushings (1) into bore of right tang of lever assembly (2).

INSPECT

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J0534

END OF TASK

11-3-78. CPG CYCLIC STICK LINK ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

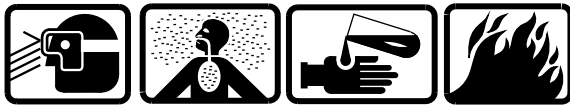
Material:
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Wiping Rag (D164)
Drycleaning Solvent (D199)
Acetone (D2)
Sandpaper (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean link assembly surface with drycleaning solvent (D199).
2. Dry link assembly with a dry wiping rag (D164).

INSPECT

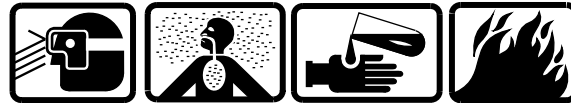
3. Inspect link assembly to limits shown. See figure CPG Cyclic Stick Link Assembly — Damage Limits. If cracks in CPG cyclic stick link assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove nicks, scratches, and corrosion on fitting assembly with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

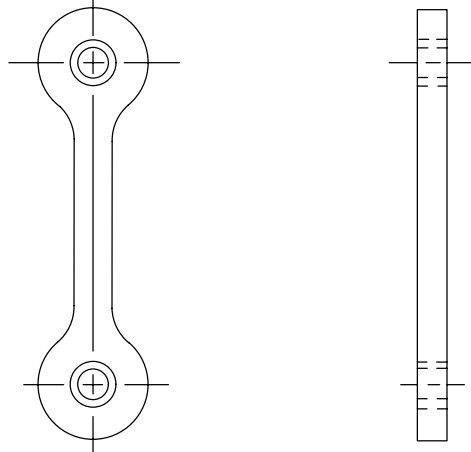


Epoxy Primer Coating

6. Touch up repaired areas with epoxy primer coating (D98).
7. Replace link assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-78. CPG CYCLIC STICK LINK ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

**MECHANICAL AND
CORROSION**

**MAXIMUM AREA PER
FULL DEPTH REPAIR**

NUMBER OF REPAIRS

**EDGE CHAMFER TO
REMOVE DAMAGE**

BORES

BUSHING WEAR

MAXIMUM DAMAGE AND REPAIR DEPTH

**0.030 in. before and
0.040 in. after repair**

Not critical

Not critical

0.080 in. x 45°

**0.004 in. for 1/4
circumference**

0.060 in.

NOTE

No cracks are permitted.

406961-888
J0534

CPG Cyclic Stick Link Assembly — Damage Limits

END OF TASK

11-3-79. LINK ASSEMBLY BUSHINGS (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

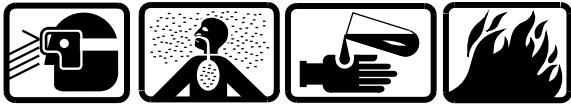
Tools:
Hand Arbor Press (B107)

Material:
Acetone (D2)
Abrasive Mats (D1)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

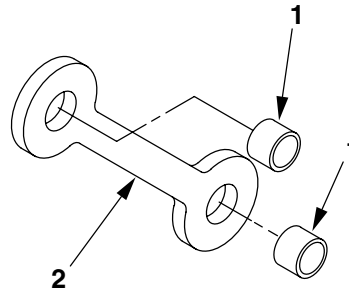
REMOVE

1. Press bushings (1) from link assembly (2).



Acetone

2. Clean bores of link assembly (2) using acetone (D2) and abrasive mat (D1).
3. Inspect bores of link assembly (2) for damage. Maximum allowable damage is **0.002 inch** for one-fourth of circumference.



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INSTALL

CAUTION

Where extreme interference fit occurs at the beginning of press fit operation, stop and determine the cause. Do not press bushing unless the cause can be eliminated or satisfactorily remedied.

4. Using hand arbor press (B107), press bushings (1) into link assembly (2) until centered equally on each side.

INSPECT

END OF TASK

**11-3-80. CPG CYCLIC STICK SOCKET HOUSING/HOUSING ASSEMBLY — REMOVAL/
INSTALLATION**

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Fluoro-Glide (D108)
Acetone (D2)
Low-Lint Cleaning Cloth (D67)

Applicable Configurations:
All

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68G Aircraft Structural Repairer

Tools:

Drill (B40)
General Mechanic Tool Kit (B178)
Airframe Repairer Tool Kit (B176)
Heat Gun (B59)

Equipment Condition:

CPG Cyclic Stick Quick-Disconnect Lever
and Link Assembly Removed (Task 11-3-75) ■

Material:

Adhesive (D19)
Rubber Gloves (D111)

GO TO NEXT PAGE

11-3-80. CPG CYCLIC STICK SOCKET HOUSING/HOUSING ASSEMBLY — REMOVAL/
INSTALLATION (CONT)

REMOVE

1. Remove housing assembly (1) from tube assembly (2) by removing cotter pin (3), pin (4), and two washers (5).



Drilling Operations

2. Drill four rivets (6) securing tube assembly (2) to housing assembly (1).



Heat

3. Apply heat, not to exceed 200 °F to housing assembly (1) until tube assembly (2) can be separated from housing assembly (1).

4. Remove socket housing assembly (7) by applying heat to housing assembly (1) and pulling socket housing assembly (7) from housing assembly (1).

5. Inspect socket housing assembly (7) for wear and damage (Task 11-3-83).

6. Inspect housing assembly (1) for wear or damage (Task 11-3-81).

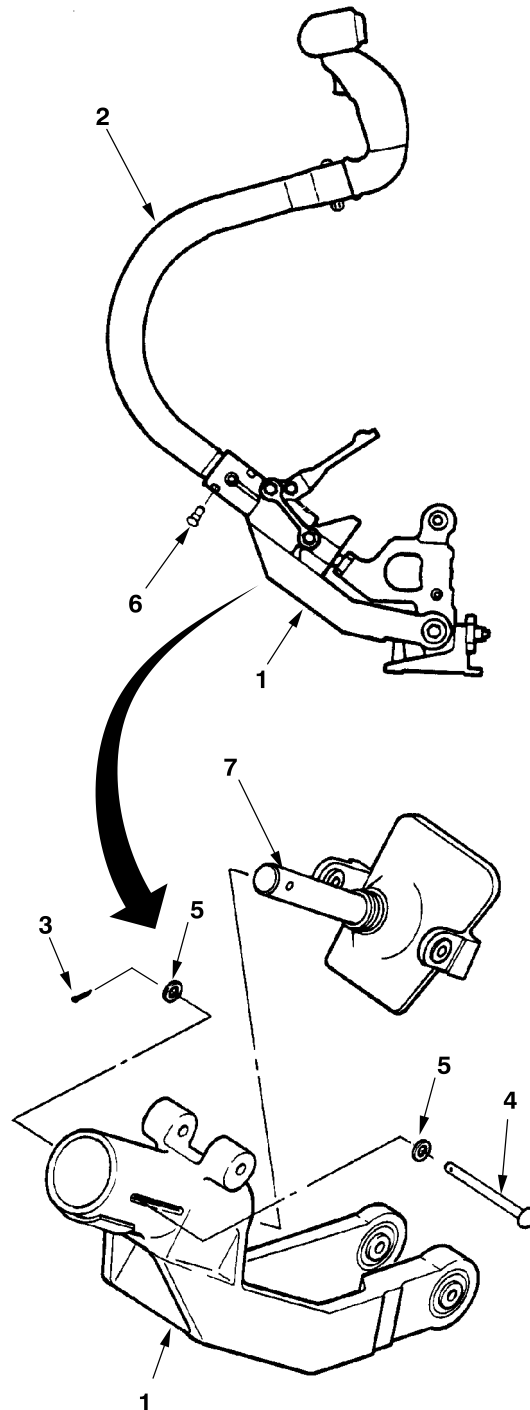
INSTALL



Adhesive

7. Apply a coating of adhesive (D19) to outside diameter of the tube assembly (2) and the inside diameter of housing assembly (1) where the two join together.

8. Insert tube assembly (2) into housing assembly (1) and align rivet holes.



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J0534

GO TO NEXT PAGE

11-3-80. CPG CYCLIC STICK SOCKET HOUSING/HOUSING ASSEMBLY — REMOVAL/INSTALLATION (CONT)

9. Secure tube assembly (2) to housing assembly (1) with four rivets (6).



Heat

10. Apply heat 145 to 180 °F for 30 minutes to housing assembly (1) to cure adhesive (D19) full cure is 24 hours.

INSTALL



Acetone

11. Use acetone (D2) to remove oil, paint, and primer from outer surfaces of socket housing assembly (7). Let air dry.



Film Lubricant

12. Spray fluoro-glide (D108) onto surfaces from a distance of **8 inches**. Protect surrounding areas from overspray.

13. Allow fluoro-glide (D108) to dry thoroughly. Lightly buff surface with soft low-lint cleaning cloth (D67) to improve lubricity.

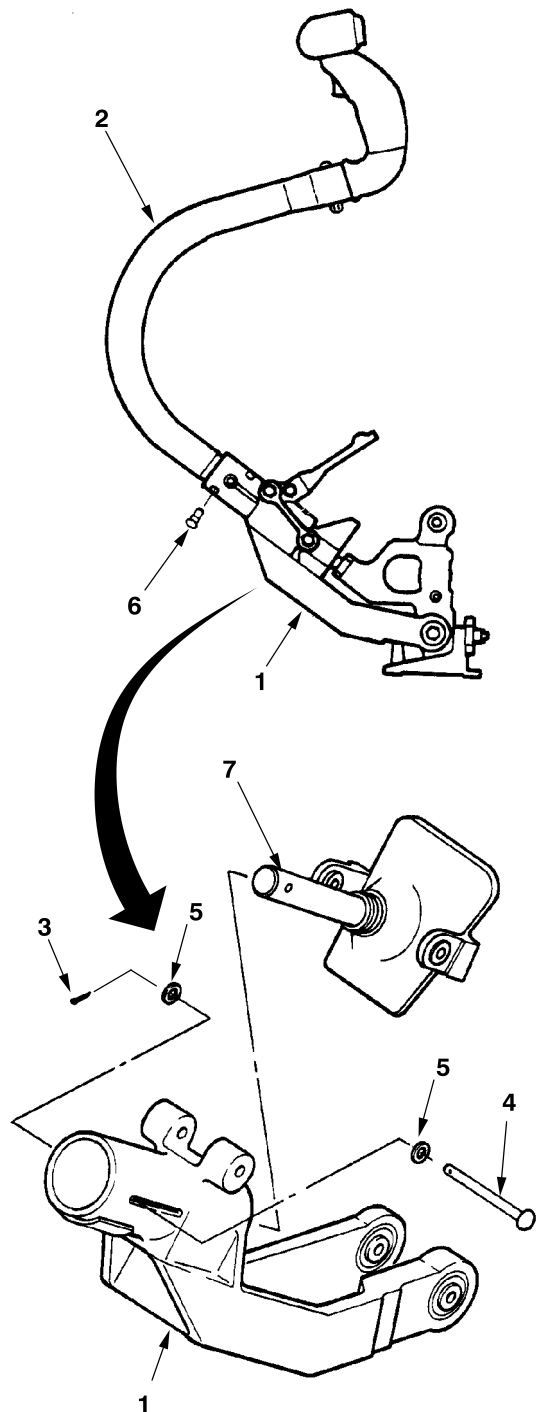
14. Slide socket housing assembly (7) into housing assembly (1).

15. Install pin (4) and two washers (5). Install cotter pin (3) through pin (4).

INSPECT

FOLLOW-ON MAINTENANCE

Install CPG cyclic stick quick-disconnect lever and link assembly (Task 11-3-75).



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J0534

END OF TASK

11-3-81. CPG CYCLIC STICK HOUSING ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Wiping Rag (D164)
Drycleaning Solvent (D199)
Acetone (D2)
Sandpaper (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean housing assembly surface with drycleaning solvent (D199).
2. Dry housing assembly with a dry wiping rag (D164).

INSPECT

3. Inspect housing assembly to limits shown. See figure CPG Cyclic Stick Housing Assembly — Damage Limits. If cracks in CPG cyclic stick housing assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove nicks, scratches, and corrosion on fitting assembly with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

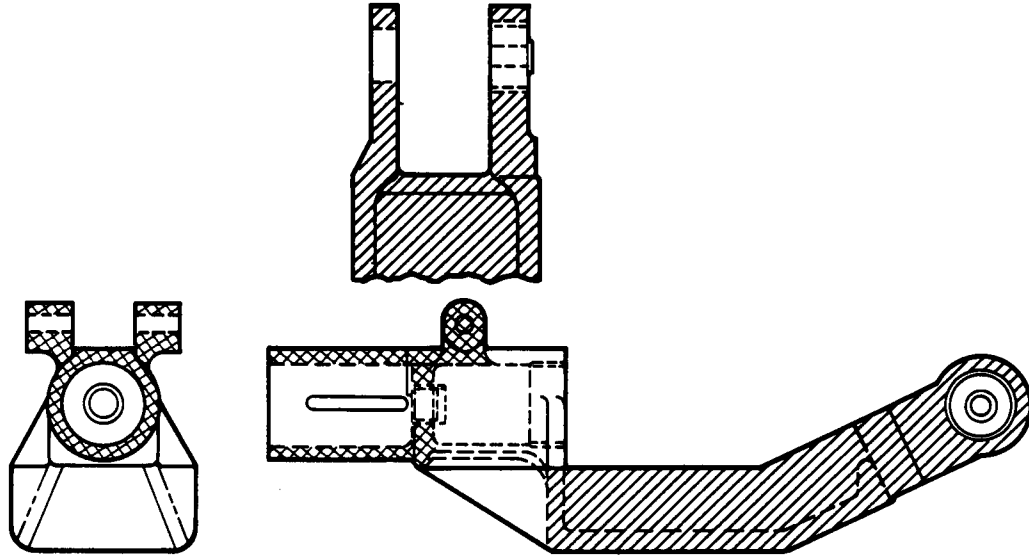


Epoxy Primer Coating

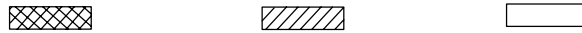
6. Touch up repaired areas with epoxy primer coating (D98).
7. Replace housing assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-81. CPG CYCLIC STICK HOUSING ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH		
	0.005 in. before and after repair	0.010 in. before and 0.015 in. after repair	0.020 in. before and 0.040 in. after repair
MECHANICAL AND CORROSION	0.005 in. before and after repair	0.010 in. before and 0.015 in. after repair	0.020 in. before and 0.040 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.01 sq. in.	0.10 sq. in.	
NUMBER OF REPAIRS	One	One	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in. x 45°	0.040 in. x 45°	0.060 in. x 45°
BORES	0.002 in. x 1/4 circumference	0.002 in. x 1/4 circumference	
BEARING WEAR:			
Axial		0.030 in.	
Radial		0.012 in.	

NOTE

No cracks are permitted.

406961-892
J0534

CPG Cyclic Stick Housing Assembly — Damage Limits

END OF TASK

11-3-82. CPG CYCLIC STICK HOUSING ASSEMBLY BEARINGS — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Repairer Tool Kit (B180)
Hand Arbor Press (B107)
Bearing Staking Tool Set (B189)

Material:
Acetone (D2)
Abrasive Mats (D1)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
68D Aircraft Powertrain Repairer

References:
TM 55-1500-322-24

GO TO NEXT PAGE

 11-3-82. CPG CYCLIC STICK HOUSING ASSEMBLY BEARINGS — REMOVAL/INSTALLATION
 (CONT)

REMOVE

1. Using hand arbor press (B107), press bearing (1) and sleeve (2) from housing assembly (3).
2. Using hand arbor press (B107), press inner sleeve (4) and bushing (5) from housing assembly (3).
3. Using hand arbor press (B107), press bearing (6) from housing assembly (3).

**Acetone**

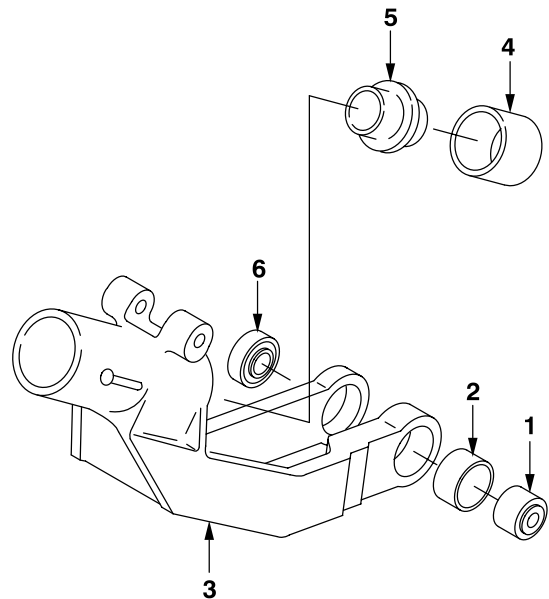
4. Clean bores of housing assembly (3) using acetone (D2) and abrasive mat (D1).
5. Inspect bores of housing assembly (3) for damage. Maximum allowable damage is **0.002 inch** for one-fourth of circumference.

INSTALL

CAUTION

Where extreme interference fit occurs at the beginning of press fit operation, stop and determine the cause. Do not stake sleeve unless the cause can be eliminated or satisfactorily remedied.

6. Using hand arbor press (B107), press sleeve (2) into housing assembly (3) until centered equally on both sides.
7. Using hand arbor press (B107), press bearing (1) into sleeve (2) until centered equally on each side.
8. Using bearing staking tool set (B189), ring stake sleeve (2) (TM 55-1500-322-24).
9. Using hand arbor press (B107), press bushing (5) into housing assembly (3).

406961-891
J1840

10. Using hand arbor press (B107), press inner sleeve (4) into housing assembly (3).
11. Using hand arbor press (B107), press bearing (6) into housing assembly (3).

INSPECT

END OF TASK

11-3-83. CPG CYCLIC STICK SOCKET HOUSING ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Polyamide Epoxy Primer (D98)
Rubber Gloves (D111)

Wiping Rag (D164)
Drycleaning Solvent (D199)
Acetone (D2)
Sandpaper (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean socket housing assembly surface with drycleaning solvent (D199).
2. Dry socket housing assembly with a dry wiping rag (D164).

INSPECT

3. Inspect socket housing assembly to limits shown. See figure CPG Cyclic Stick Socket Housing Assembly — Damage Limits. If cracks in CPG cyclic stick socket housing assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove nicks, scratches, and corrosion on fitting assembly with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

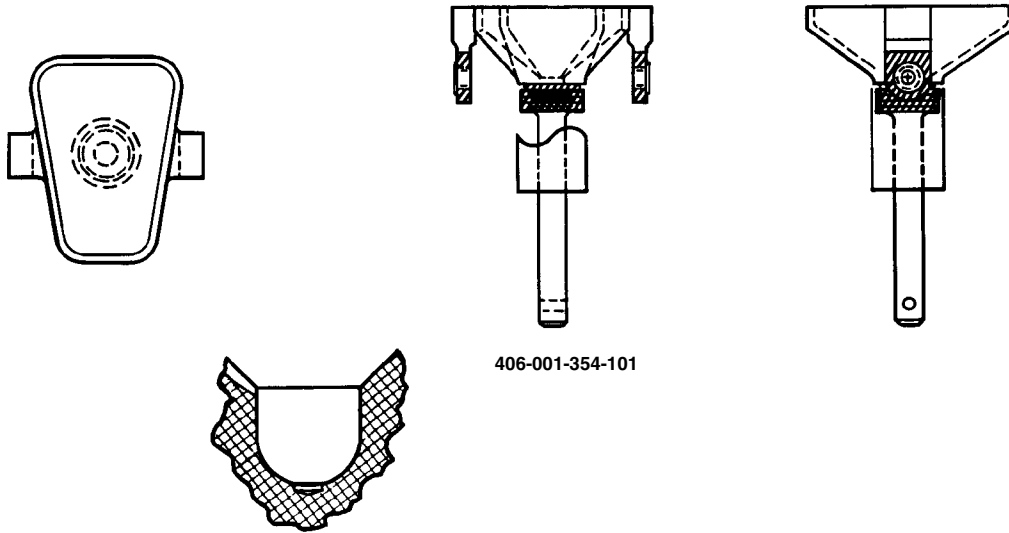


Epoxy Primer Coating

6. Touch up repaired areas with polyamide epoxy primer (D98).
7. Replace socket housing assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-83. CPG CYCLIC STICK SOCKET HOUSING ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



406-001-354-101

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL AND CORROSION	0.005 in. before and after repair	0.010 in. before and 0.015 in. after repair	0.020 in. before and 0.040 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.01 sq. in.	0.01 sq. in.	0.25 sq. in.
NUMBER OF REPAIRS	One	One	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in. X 45°	0.040 in. X 45°	0.040 in. X 45°
BORES		0.002 in. X 1/4 circumference	
THREAD DAMAGE: Depth Length Number		1/3 of thread 1/4 circumference One	

NOTES

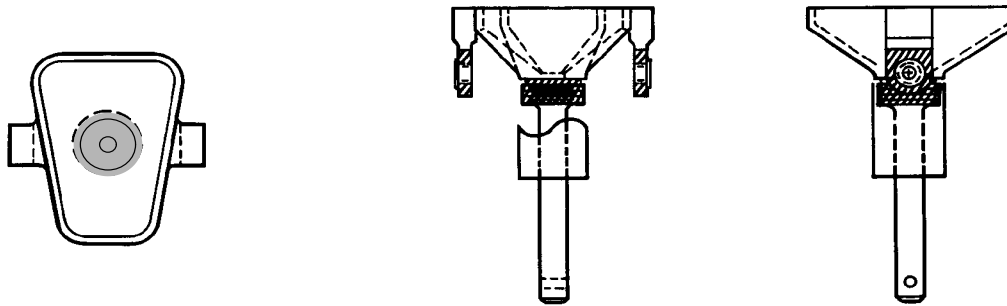
1. No cracks are permitted.
2. Damage in housing caused by stud impact are permitted if only slight oscillation of cyclic stick is required to free stud from dent and engage socket.
3. After any repair, demonstrate freedom of operation of engagement, slight oscillation of stick permitted. If engagement cannot be achieved, replace housing.

406961-866
J0482

CPG Cyclic Stick Socket Housing Assembly — Damage Limits (Sheet 1 of 2)

GO TO NEXT PAGE

11-3-83. CPG CYCLIC STICK SOCKET HOUSING ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



406-001-354-103

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL AND CORROSION	0.005 in. before and after repair	0.015 in. before and 0.030 in. after repair	0.020 in. before and 0.040 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.01 sq. in.	0.04 sq. in.	0.25 sq. in.
NUMBER OF REPAIRS	One	One per region	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in. X 45°	0.040 in. X 45°	0.040 in. X 45°
BORES		0.004 in. X 1/4 circumference	
THREAD DAMAGE: Depth Length Number		1/3 of thread 1/4 circumference One	

NOTES

1. No cracks are permitted.
2. Damage in housing caused by stud impact are permitted if only slight oscillation of cyclic stick is required to free stud from dent and engage socket.
3. After any repair, demonstrate freedom of operation of engagement, slight oscillation of stick permitted. If engagement cannot be achieved, replace housing.
4. No more than one repair is permitted on the socket housing under the housing sleeve with circumferential damage no longer than 0.375 inch.

406961-1390
J0254

CPG Cyclic Stick Socket Housing Assembly — Damage Limits (Sheet 2 of 2)

END OF TASK

 11-3-84. CPG CYCLIC STICK SOCKET HOUSING BUSHINGS (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

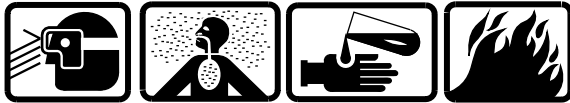
Tools:
Hand Arbor Press (B107)

Material:
Acetone (D2)
Abrasive Mats (D1)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

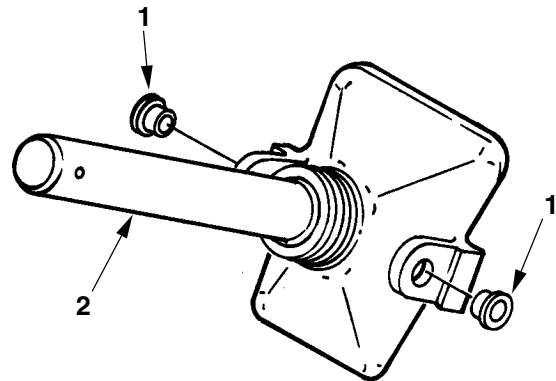
REMOVE

1. Press two bushings (1) from socket housing (2).



Acetone

2. Clean bores of socket housing (2) using acetone (D2) and abrasive mat (D1).
3. Inspect bores of socket housing (2) for damage. Maximum allowable damage is **0.002 inch** for one-fourth of circumference.



406961-869
J0534

INSTALL

CAUTION

Where extreme interference fit occurs at the beginning of press fit operation, stop and determine the cause. Do not press bushing unless the cause can be eliminated or satisfactorily remedied.

4. Using hand arbor press (B107), press bushing (1) into bore of left tang of socket housing (2).
5. Using hand arbor press (B107), press bushing (1) into bore of right tang of socket housing (2).

INSPECT

END OF TASK

11-3-85. CPG CYCLIC STICK TUBE ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

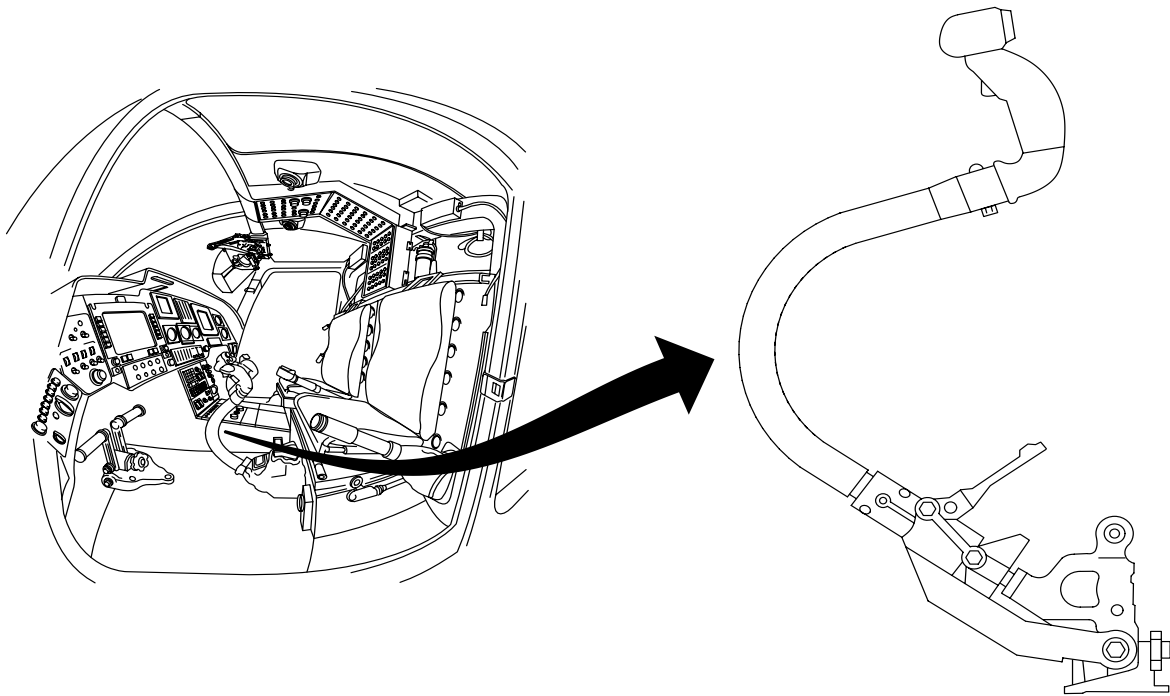
INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B236)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68F Aircraft Electrician

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)
CPG Cyclic Stick Removed (Task 11-3-63)
CPG Cyclic Stick Housing Assembly Removed
(Task 11-3-80)
CPG Cyclic Stick Quick Disconnect Lever and
Link Assembly Removed (Task 11-3-75)



406961-845
J1838

GO TO NEXT PAGE

 11-3-85. CPG CYCLIC STICK TUBE ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove CPG cyclic grip (1) by removing nut (2), three washers (3), and bolt (4).
2. Remove and tag wires from connector (5).
3. Pull wires through cyclic stick tube (6).
4. Inspect tube assembly for wear and damage (Task 11-3-86).

INSTALL

5. Pull wires through cyclic stick tube (6).
6. Install wires into connector (5) and remove tags.
7. Install cyclic grip (1) using bolt (2), three washers (3), and nut (4). Torque nut (4) **30 TO 40 INCH-POUNDS**.

INSPECT

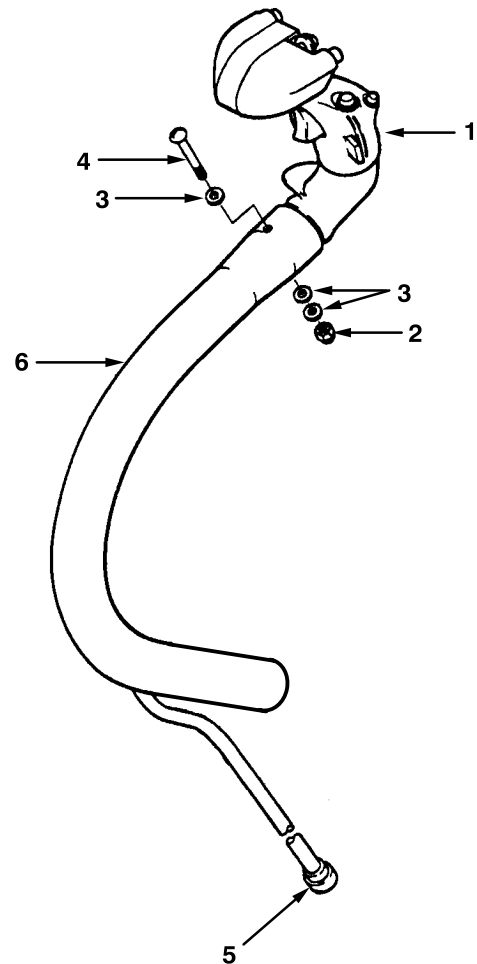
FOLLOW-ON MAINTENANCE

Install CPG cyclic stick quick-disconnect lever and link assembly (Task 11-3-75).

Install CPG cyclic stick housing assembly (Task 11-3-80).

Install CPG cyclic stick (1) (Task 11-3-63).

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).



406961-867
J1840

END OF TASK

11-3-86. CPG CYCLIC STICK TUBE ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

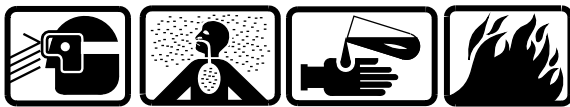
Material:
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Wiping Rag (D164)
Drycleaning Solvent (D199)
Acetone (D2)
Sandpaper (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



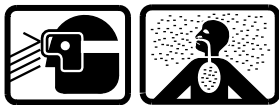
Drycleaning Solvent

1. Clean tube assembly surface with drycleaning solvent (D199).
2. Dry tube assembly with a dry wiping rag (D164).

INSPECT

3. Inspect tube assembly to limits shown. See figure CPG Cyclic Stick Tube Assembly — Damage Limits. If cracks in CPG cyclic stick tube assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove nicks, scratches, and corrosion on fitting assembly with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

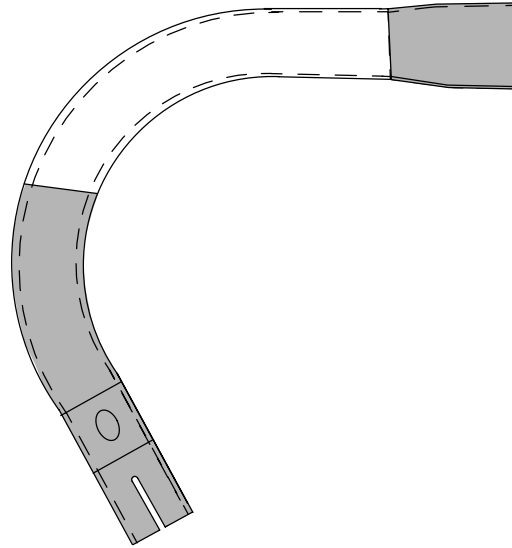


Epoxy Primer Coating

6. Touch up repaired areas with epoxy primer coating (D98).
7. Replace tube assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-86. CPG CYCLIC STICK TUBE ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	0.005 in. before and 0.010 in. after repair	0.010 in. before and 0.015 in. after repair
MECHANICAL AND CORROSION		
MAXIMUM AREA OF FULL DEPTH REPAIR	0.25 sq. in.	0.50 sq. in.
NUMBER OF REPAIRS	One	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in. x 45°	0.030 in x 45°

NOTE: No cracks are permitted.

406961-868
J0536

CPG Cyclic Stick Tube Assembly — Damage Limits

END OF TASK

11-3-87. CPG CYCLIC STICK LATCH SUPPORT AND ANCHOR BALL ASSEMBLY — REMOVAL/
INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

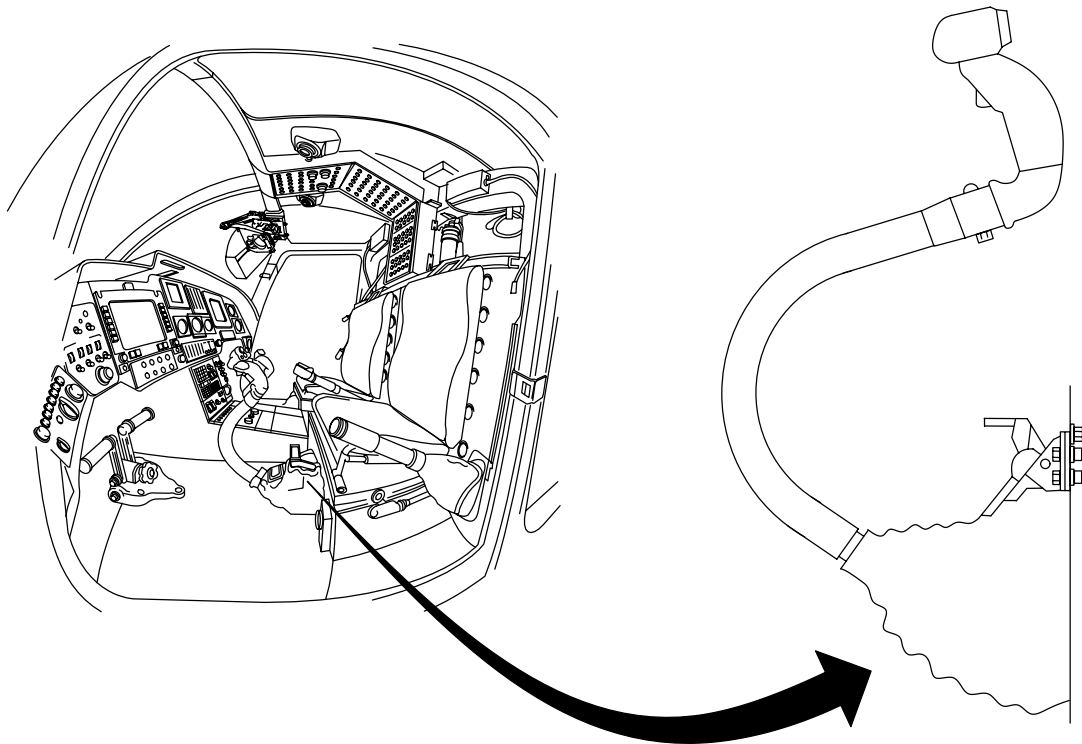
Tools:
General Mechanic Tool Kit (B178)
Hydraulic Test Stand
Torque Wrench (B235)
Torque Wrench (B237)

Material:
Drycleaning Solvent (D199)
Lockwire (D132)
Adhesive (D24)
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)



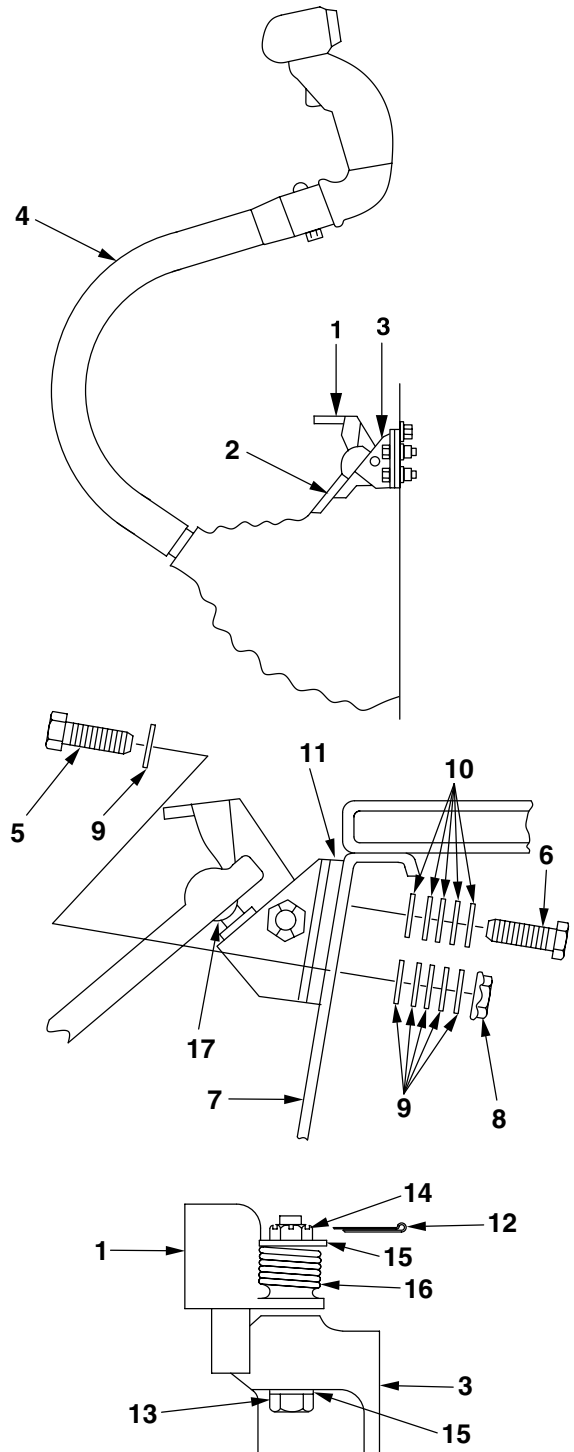
406961-1033
J1841

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11-3-87. CPG CYCLIC STICK LATCH SUPPORT AND ANCHOR BALL ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Pull latch assembly (1) to release lever assembly (2) from support latch (3) on CPG cyclic stick (4).
2. Remove lockwire (D132) from two bolts (5) on forward side of support latch (3) and bolt (6) from inside of seat bulkhead (7).
3. Remove two nuts (8), washers (9), and two bolts (5).
4. Remove bolt (6) and washers (10).
5. Remove support latch (3) and shim (11) from helicopter.
6. On support latch (3), remove cotter pin (12) from bolt (13).
7. Remove nut (14), two washers (15), spring (16), and bolt (13).
8. Remove latch assembly (1) from support latch (3).
9. Remove anchor ball (17) from support latch (3).



406961-1032
J1840

GO TO NEXT PAGE

11-3-87. CPG CYCLIC STICK LATCH SUPPORT AND ANCHOR BALL ASSEMBLY — REMOVAL/
INSTALLATION (CONT)

INSTALL



Drycleaning Solvent

10. Clean threads on anchor ball (17) and in support latch (3) with drycleaning solvent (D199).

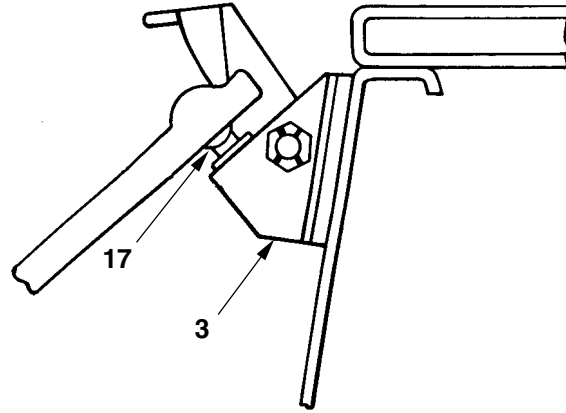


Adhesive

11. Apply adhesive (D24) to threads of anchor ball (17).

12. Install anchor ball (17) into support latch (3).

13. Tighten anchor ball (17) until fully seated against support latch (3).



406961-1300
H2036

GO TO NEXT PAGE

11-3-87. CPG CYCLIC STICK LATCH SUPPORT AND ANCHOR BALL ASSEMBLY — REMOVAL/INSTALLATION (CONT)

14. Wipe excessive adhesive from base of anchor ball (17) with wiping rag (D164) and drycleaning solvent (D199).

15. Install latch assembly (1) to support latch (3) with bolt (13), spring (16), two washers (15), and nut (14). Torque nut (14) **50 TO 70 INCH-POUNDS**.

16. Install cotter pin (12) through nut (14).

17. Align mounting holes with peel shims (11) and support latch (3).

NOTE

A maximum of five washers may be installed under nut to compensate for thickness of shims. One washer is required under head of bolt.

18. Install 2 bolts (5), 12 washers (9), and secure with 2 nuts (8). Torque nuts (8) **20 TO 25 INCH-POUNDS**.

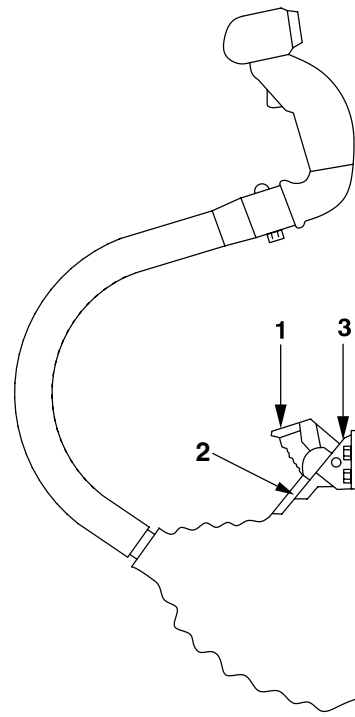
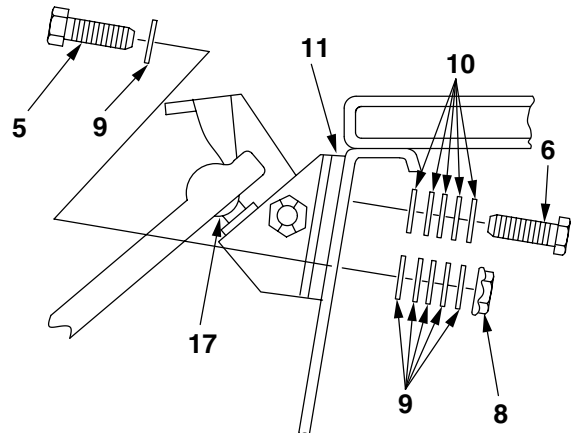
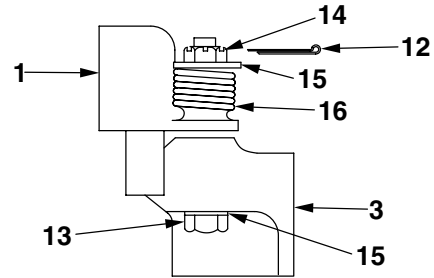
NOTE

A maximum of five washers may be installed under head of bolt to prevent bolt from bottoming out.

19. Install bolt (6) and five washers (10) into support latch (3). Torque bolt (6) **20 TO 25 INCH-POUNDS**.

20. Pull up latch assembly (1) and position lever assembly (2) between latch assembly (1) and support latch (3).

21. Secure lever assembly (2) to support latch (3) by moving latch assembly (1) down to closed position.



40696-1034
J1880

GO TO NEXT PAGE

11-3-87. CPG CYCLIC STICK LATCH SUPPORT AND ANCHOR BALL ASSEMBLY — REMOVAL/INSTALLATION (CONT)

22. From bottom of helicopter, remove rigging fixture cover (18) by removing three screws (19) and three washers (20).

23. Connect hydraulic test stand to helicopter and operate (Task 7-2-1).

24. Position pilot cyclic stick against forward stick stop (21).

25. Ensure a minimum clearance of **0.005 inch** between stop (21) and housing (22) on pilot cyclic stick.

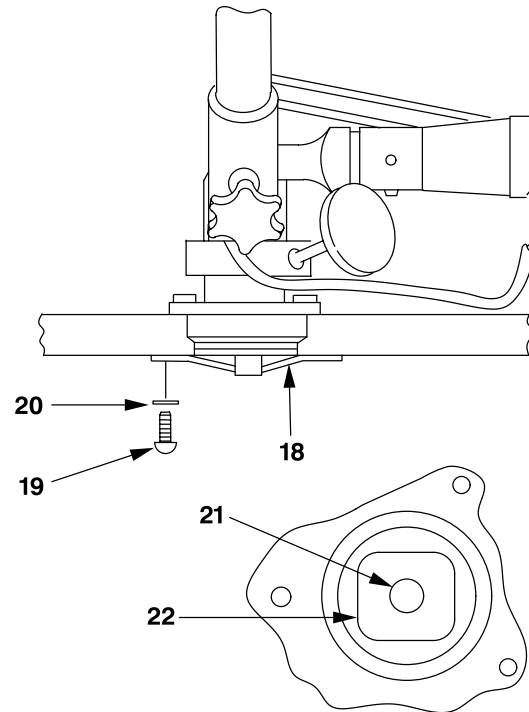
26. If minimum clearance cannot be attained, remove shims (11) under support latch (3), and recheck clearance.

27. Install lockwire (D132) between two bolt heads (5) on forward side of support assembly.

28. Install lockwire (D132) between bolt (6) and nut (8) on inside seat bulkhead.

29. Install rigging fixture cover (18) and secure with three washers (20) and three screws (19).

30. Disconnect hydraulic test stand (Task 7-2-1).

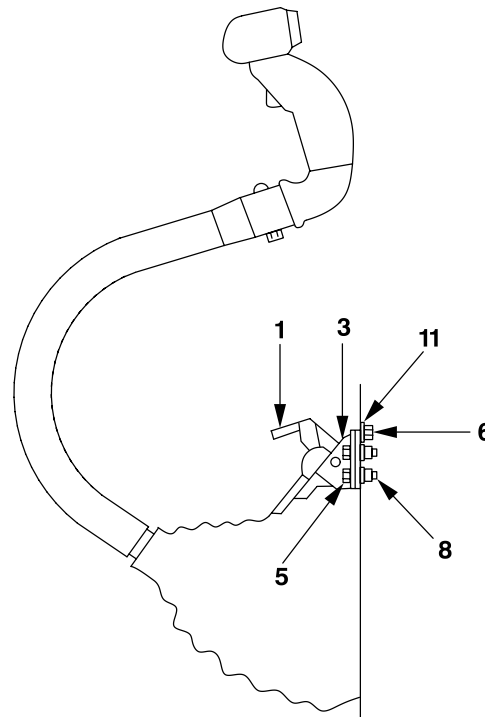


INSPECT

FOLLOW-ON MAINTENANCE

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



406961-1035
J1838

END OF TASK

11-3-88. CPG CYCLIC STICK QUICK-DISCONNECT LATCH ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

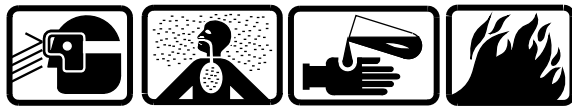
Material:
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Wiping Rag (D164)
Drycleaning Solvent (D199)
Acetone (D2)
Sandpaper (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean latch assembly surface with drycleaning solvent (D199).
2. Dry latch assembly with a dry wiping rag (D164).

INSPECT

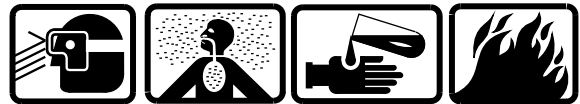
3. Inspect latch assembly to limits shown. See figure CPG Cyclic Stick Quick-Disconnect Latch Assembly — Damage Limits. If cracks in CPG cyclic stick quick-disconnect latch assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove nicks, scratches, and corrosion on latch assembly with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

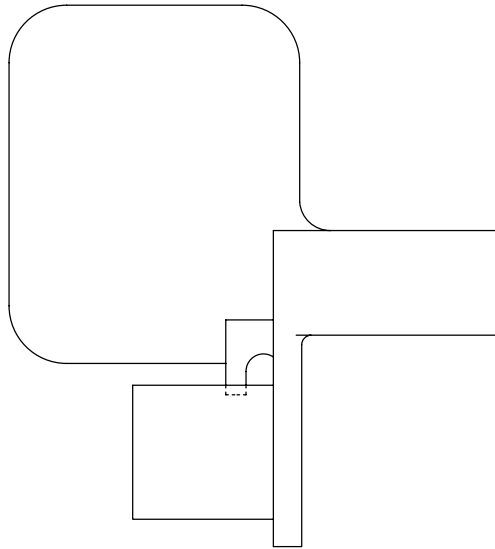


Epoxy Primer Coating

6. Touch up repaired areas with epoxy primer coating (D98).
7. Replace latch assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-88. CPG CYCLIC STICK QUICK-DISCONNECT LATCH ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



LATCH ASSEMBLY

DAMAGE LOCATION SYMBOL



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL MAXIMUM REPAIR DEPTH	0.010 in.
MAXIMUM DEPTH OF CORROSION BEFORE REPAIR	0.005 in.
AFTER REPAIR	0.010 in.
MAXIMUM EDGE CHAMFER	0.040 in. x 45°
BORES	0.002 in. for 1/4 circumference

- NOTES: 1. No cracks permitted.
2. Total depth of repeated repairs not to exceed limits shown.

406001-292
J1845

CPG Cyclic Stick Quick-Disconnect Latch Assembly — damage Limits

END OF TASK

11-3-89. CPG CYCLIC STICK QUICK-DISCONNECT SUPPORT ASSEMBLY — CLEANING/
INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Wiping Rag (D164)
Drycleaning Solvent (D199)
Acetone (D2)
Sandpaper (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean support assembly surface with drycleaning solvent (D199).
2. Dry support assembly with a dry wiping rag (D164).

INSPECT

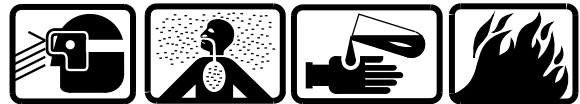
3. Inspect support assembly to limits shown. See figure CPG Cyclic Stick Quick-Disconnect Support Assembly — Damage Limits. If cracks in CPG cyclic stick quick-disconnect support assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove nicks, scratches, and corrosion on support assembly with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT

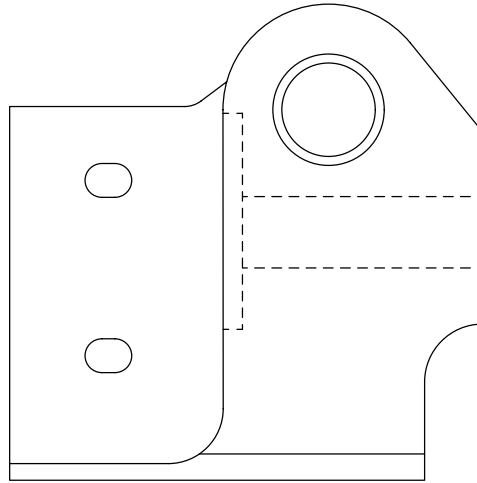


Epoxy Primer Coating

6. Touch up repaired areas with epoxy primer coating (D98).
7. Replace support assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-89. CPG CYCLIC STICK QUICK-DISCONNECT SUPPORT ASSEMBLY — CLEANING/
INSPECTION/REPAIR (CONT)



SUPPORT ASSEMBLY

DAMAGE LOCATION SYMBOL



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL MAXIMUM REPAIR DEPTH	0.010 in.
MAXIMUM DEPTH OF CORROSION BEFORE REPAIR	0.005 in.
AFTER REPAIR	0.010 in.
MAXIMUM EDGE CHAMFER	0.040 in. x 45°
BORES	0.002 in. for 1/4 circumference
THREAD DAMAGE	
Depth	N/A 1/3 of thread height
Length	N/A 1/4 of thread circumference
Number	N/A Two threads

- NOTES: 1. No cracks permitted.
2. Total depth of repeated repairs not to exceed limits shown.

406001-294
J1845

CPG Cyclic Stick Quick-Disconnect Support Assembly — Damage Limits

END OF TASK

11-3-90. CPG CYCLIC STICK QUICK-DISCONNECT ANCHOR BALL ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Wiping Rag (D164)
Drycleaning Solvent (D199)
Acetone (D2)
Sandpaper (D175)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean anchor ball assembly surface with drycleaning solvent (D199).
2. Dry anchor ball assembly with a dry wiping rag (D164).

INSPECT

3. Inspect anchor ball assembly to limits shown. See figure CPG Cyclic Stick Quick-Disconnect Anchor Ball Assembly — Damage Limits. If cracks in CPG cyclic stick quick-disconnect anchor ball assembly are suspected perform fluorescent penetrant inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Remove nicks, scratches, and corrosion on anchor ball assembly with 400 grit sandpaper (D175).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



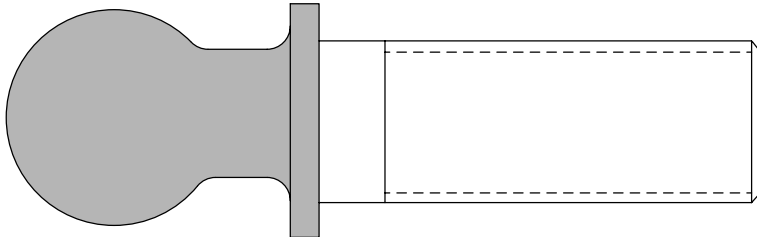
Epoxy Primer Coating

6. Touch up repaired areas with epoxy primer coating (D98).

7. Replace anchor ball assembly if wear or damage limits are exceeded.

GO TO NEXT PAGE

11-3-90. CPG CYCLIC STICK QUICK-DISCONNECT ANCHOR BALL ASSEMBLY — CLEANING/
INSPECTION/REPAIR (CONT)



ANCHOR BALL ASSEMBLY

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
MECHANICAL		
MAXIMUM REPAIR DEPTH	0.010 in.	N/A
MAXIMUM DEPTH OF CORROSION		
BEFORE REPAIR	0.005 in.	N/A
AFTER REPAIR	0.010 in.	
THREAD DAMAGE		
Depth	N/A	1/3 of thread height
Length	N/A	1/4 of thread circumference
Number	N/A	Two threads

- NOTES: 1. No cracks permitted.
2. Protrusions from the spherical surface must be removed completely.
3. Total depth of repeated repairs not to exceed limits shown.

406001-293
J1845

CPG Cyclic Stick Quick-Disconnect Anchor Ball Assembly — Damage Limits

END OF TASK

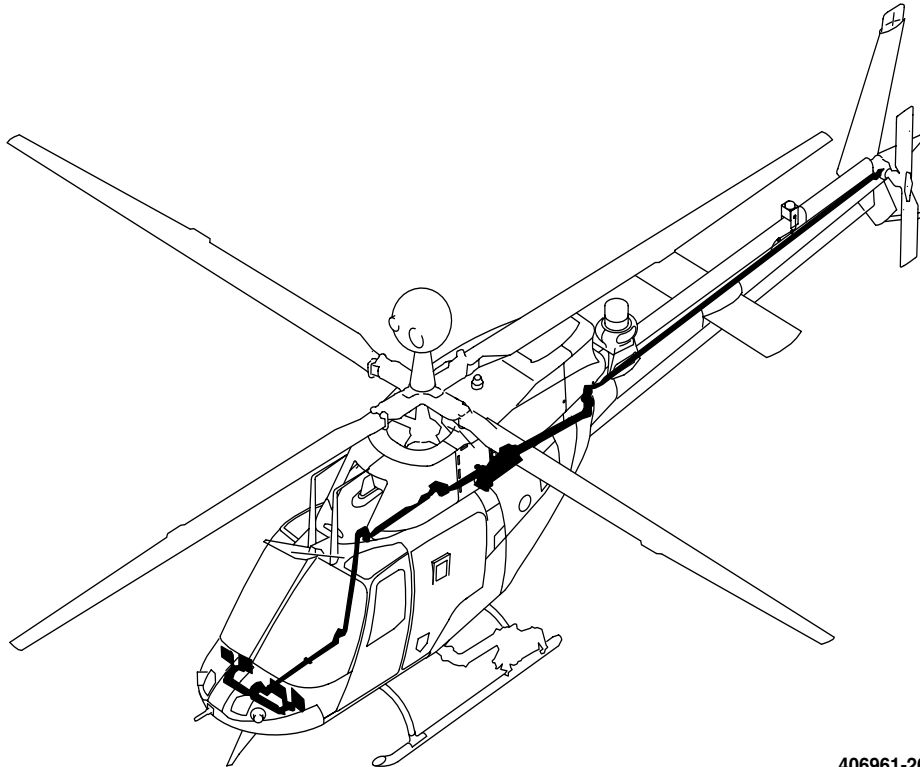
Section IV. DIRECTIONAL CONTROLS

11-11. **DIRECTIONAL CONTROLS**

maintenance procedures for removal, cleaning, inspection, repair, replacement, and installation of directional control system components for the OH-58D and OH-58D(R) helicopters. Standard torques are provided in Appendix P and TM 1-1500-204-23.

11-12. INTRODUCTION

This section covers the maintenance procedures for the directional controls. It includes



406961-265
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11-13. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Directional Control Pedal Adjustment and Support Assembly — Removal/Installation	11-4-1	11-420
Directional Control Pedals from Support Assembly — Removal	11-4-2	11-421
Pedal Adjustment and Support Assembly — Cleaning/Inspection/Repair	11-4-3	11-422
Directional Control Pedals — Cleaning/Inspection/Repair	11-4-4	11-423
Directional Control Pedal Bearing (AVIM) — Removal/Installation	11-4-5	11-425
Directional Control Pedals in Support Assembly — Installation	11-4-6	11-427
Directional Control Pedal Bellcrank — Removal/Installation	11-4-7	11-428
Directional Control Pedal Bellcrank Bushing and Bearing (AVIM) — Removal/Installation	11-4-8	11-429
Directional Control Pedal Adjustment Clevis — Removal/Inspection/Installation	11-4-9	11-431
Directional Control Pedal Tube — Removal/Installation	11-4-10	11-436
Directional Control Combining Bellcrank — Removal/Installation	11-4-11	11-439
Combining Bellcrank Bearing Sleeve (AVIM) — Removal/Installation	11-4-12	11-442
Directional Control Eyebolt and Spring — Removal/Inspection/Installation	11-4-13	11-443
Directional Control Lower Forward Horizontal Tube — Removal/Installation	11-4-14	11-446
Directional Control Transducer Bellcrank and Support — Removal/Installation	11-4-15	11-449
Transducer Bellcrank Bearing (AVIM) — Removal/Installation	11-4-16	11-452
Transducer Bellcrank Support Bushing (AVIM) — Removal/Installation	11-4-17	11-454
Directional Control Transducer — Removal/Installation	11-4-18	11-455
Directional Control Lower Aft Horizontal Tube — Removal/Installation	11-4-19	11-458
Directional Control Lower Tunnel Bellcrank — Removal/Installation	11-4-20	11-461
Directional Control Lower Tunnel Bellcrank Bushing — Removal/Installation	11-4-21	11-463
Directional Control Vertical Tube — Removal/Installation	11-4-22	11-464
Directional Control Upper Tunnel Bellcrank — Removal/Installation	11-4-23	11-467
Directional Control Upper Horizontal Tube — Removal/Installation	11-4-24	11-469
Directional Control Forward Walking Beam — Removal/Installation	11-4-25	11-474
Directional Control Nonboosted Tube — Removal/Installation	11-4-26	11-476
Directional Control Adjustable Tube Bearing (Typical) — Removal/Installation	11-4-27	11-479
Directional Control Actuator Input Idler Assembly — Removal/Installation	11-4-28	11-480
Actuator Idler Bearing (AVIM) — Removal/Installation	11-4-29	11-483
Directional Control Servoactuator Support — Removal/Installation	11-4-30	11-485
Actuator Support Bushing (AVIM) — Removal/Installation	11-4-31	11-486
Directional Control Force Gradient — Removal/Installation	11-4-32	11-488

LIST OF TASKS (CONT)

TASK	TASK NUMBER	PAGE NUMBER
Directional Control Force Gradient — Cleaning/Inspection/Repair	11-4-33	11-490
Directional Control Force Gradient Bearing and Sleeve (AVIM) — Removal/Installation	11-4-34	11-492
Directional Control Force Gradient Switch — Removal/Installation	11-4-35	11-494
Directional Control Force Gradient Spring/Guides/Shaft — Removal/Installation	11-4-36	11-497
Directional Control Rotary Actuator — Removal/Installation	11-4-37	11-500
Directional Control Rotary Actuator — Cleaning/Inspection/Repair	11-4-38	11-503
Directional Control Boosted Tube — Removal/Installation	11-4-39	11-505
Directional Control Aft Walking Beam — Removal/Installation	11-4-40	11-508
Directional Control Aft Walking Beam Bearing (AVIM) — Removal/ Installation	11-4-41	11-511
Directional Control Tailboom Tube — Removal/Installation	11-4-42	11-513
Tail Rotor Bellcrank — Removal/Installation	11-4-43	11-516
Tail Rotor Bellcrank Bearing (AVIM) — Removal/Installation	11-4-44	11-519

11-4-1. DIRECTIONAL CONTROL PEDAL ADJUSTMENT AND SUPPORT ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B236)
Torque Wrench (B237)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-204-23

Equipment Condition:
Helicopter safed (Task 1-6-7)

REMOVE

WARNING

- Do not operate directional controls during pedal adjust and support assembly replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

NOTE

To aid in pedal removal, adjust pedal travel full aft with knob; then push inboard pedal fully forward.

1. Remove cotter pin (1), nut (2), washer (3), bolt (4), spacer (5), and control tube (6). Discard cotter pin (1).

2. Remove three bolts (7) and washers (8).

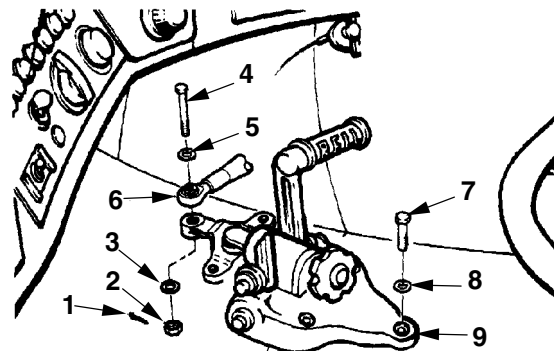
3. Remove support assembly (9) from helicopter.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

INSTALL

4. Install pedal support assembly (9) with three bolts (7) and three washers (8). Torque bolts (7) **50 TO 70 INCH-POUNDS**.



LEFT SIDE SHOWN;
RIGHT SIDE OPPOSITE

406001-91
J0536

5. Connect control tube (6) with bolt (4), spacer (5), washer (3), and nut (2). Torque nut (2) **30 TO 40 INCH-POUNDS**.

6. Install cotter pin (1) through nut (2).

INSPECT

FOLLOW-ON MAINTENANCE

Check rigging of directional control system (Task 11-1-4).

END OF TASK

11-4-2. DIRECTIONAL CONTROL PEDALS FROM SUPPORT ASSEMBLY — REMOVAL

This task covers: Removal (Off Helicopter)

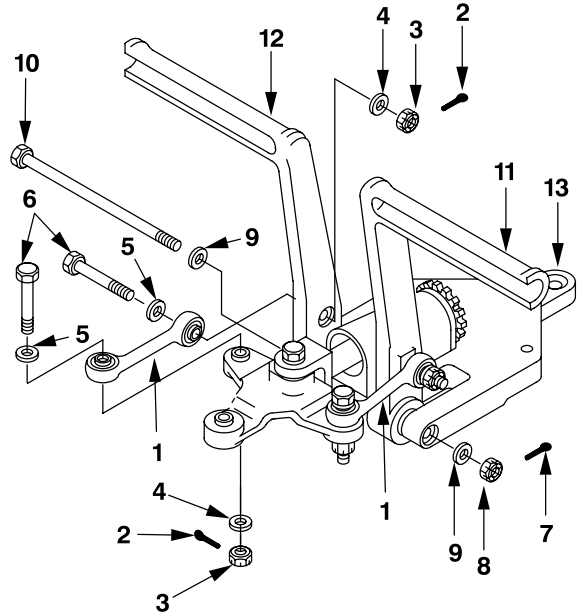
INITIAL SETUP

Tools:
General Mechanic Tool Kit (B178)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Repairer

1. Disconnect link (1) from outboard pedal by removing two cotter pins (2), nuts (3), washers (4), spacers (5), and bolts (6). Discard cotter pins.
2. Repeat step 1. for inboard pedal.
3. Remove cotter pin (7), nut (8), two washers (9), and bolt (10). Discard cotter pin.
4. Remove left pedal (11) and right pedal (12) from support assembly (13).



406001-95
J0536

END OF TASK

11-4-3. PEDAL ADJUSTMENT AND SUPPORT ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

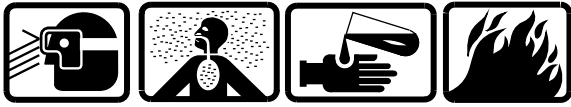
Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Drycleaning Solvent (D199)
Rubber Gloves (D111)
Wiping Rag (D164)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

CLEAN



Drycleaning Solvent

1. Clean pedal adjustment and support assemblies with drycleaning solvent (D199).
2. Dry pedal adjustment and support assemblies with wiping rag (D164).

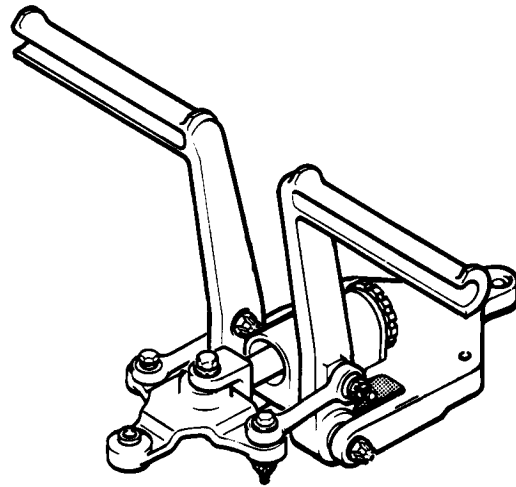
INSPECT

3. Inspect pedal support assembly to limits specified in Task 11-5-3 and inspect components of pedal adjustment assembly for visible evidence of damage or wear.

REPAIR

4. Replace components of either assembly if damaged or worn.

INSPECT



406001-285
J0536

END OF TASK

11-4-4. DIRECTIONAL CONTROL PEDALS — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Wiping Rag (D164)
Drycleaning Solvent (D199)
Sandpaper (D175)

Crocus Cloth (D90)
Epoxy Primer Coating (D98)
Black Paint (D127)
Rubber Gloves (D111)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 55-1500-345-23

CLEAN



Drycleaning Solvent

1. Clean pedals with drycleaning solvent (D199).
2. Dry pedals with wiping rag (D164).

INSPECT

3. Inspect pedal to limits shown. Replace pedal if it exceeds limits. See figure Directional Control Pedals — Damage Limits.

REPAIR



Sanding Operations

4. Repair damage within limits shown using 400 grit sandpaper (D175). Smooth surface with crocus cloth (D90).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

INSPECT



Epoxy Primer Coating

6. Apply epoxy primer coating (D98) and let dry in accordance with TM 55-1500-345-23.

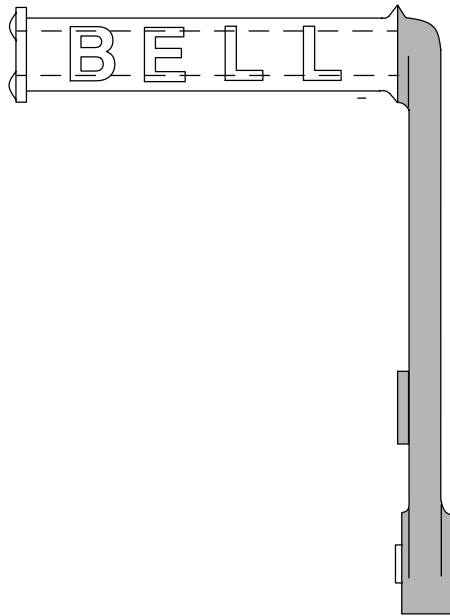
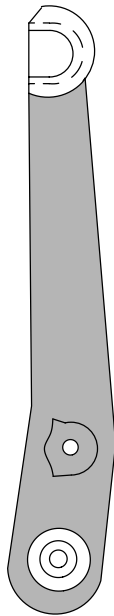


Acrylic Lacquer

7. Apply black paint (D127) and let dry in accordance with TM 55-1500-345-23.

GO TO NEXT PAGE

11-4-4. DIRECTIONAL CONTROL PEDALS — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	Dark Gray Symbol	White Symbol
MECHANICAL	0.020 in. after repair	0.040 in. after repair
CORROSION	0.010 in. before and 0.020 in. after repair	0.020 in. before and 0.040 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	0.25 sq. in.
NUMBER OF REPAIRS	One per area	Two per area
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in. x 45 degrees	0.060 in. x 45 degrees

- NOTES: 1. Bearing bore damage not to exceed 0.001 inch for one-fourth circumference. Limit one repair per bore.
2. Bolt bore damage not to exceed 0.002 inch for one-fourth circumference. Limit one repair per bore.
3. Overlapping of repairs in the same area not allowed.

406001-12
J0536

Directional Control Pedals — Damage Limits

END OF TASK

11-4-5. DIRECTIONAL CONTROL PEDAL BEARING (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Epoxy Primer Coating (D98)
Cheesecloth (D56)
Rubber Gloves (D111)

Applicable Configurations:
All

Personnel Required:

67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

Tools:

Powertrain Repairer Tool Kit (B180)
Hand Arbor Press (B107)

References:

TM 55-1500-322-24

Material:

Acetone (D2)
Abrasive Mats (D1)

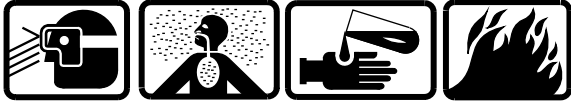
GO TO NEXT PAGE

11-4-5. DIRECTIONAL CONTROL PEDAL BEARING (AVIM) — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Using hand arbor press (B107), press bearing (1) from pedal (2).

PREPARE

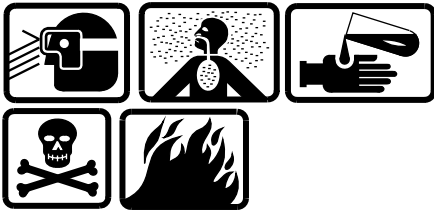


Acetone

2. Clean old primer from bore in pedal using acetone (D2) and abrasive mats (D1).

CAUTION

If extreme interference fit occurs during press fit operation, stop and determine cause. Pressing with extreme interference fit can damage components. Do not proceed until cause is eliminated or remedied.



Epoxy Primer Coating

3. Apply epoxy primer coating (D98) to bore (3) in pedal (2).

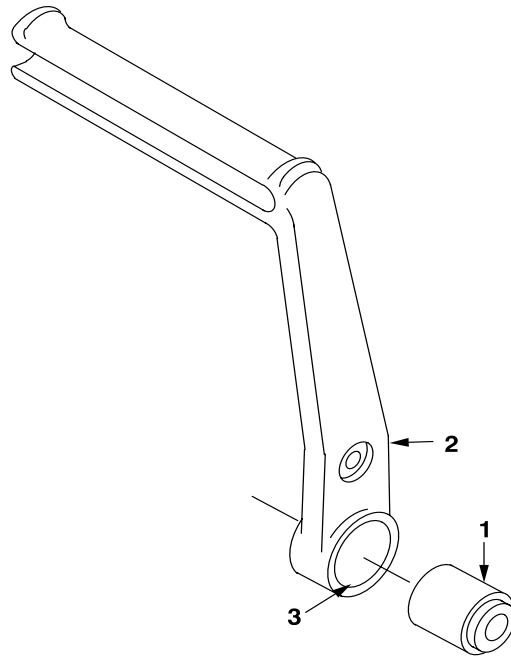
INSTALL

4. Apply epoxy primer coating (D98) to outside surface of bearing (1).

5. Press bearing (1) into pedal (2) while primer is still wet until centered equally from each side. Bearing interference fit is **0.000 to 0.001 inch**.

6. Remove excess epoxy primer coating using cheesecloth (D56) dampened with acetone (D2).

INSPECT



406001-96
J0536

END OF TASK

 11-4-6. DIRECTIONAL CONTROL PEDALS IN SUPPORT ASSEMBLY — INSTALLATION

This task covers: Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Torque Wrench (B236)
■ Torque Wrench (B239)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

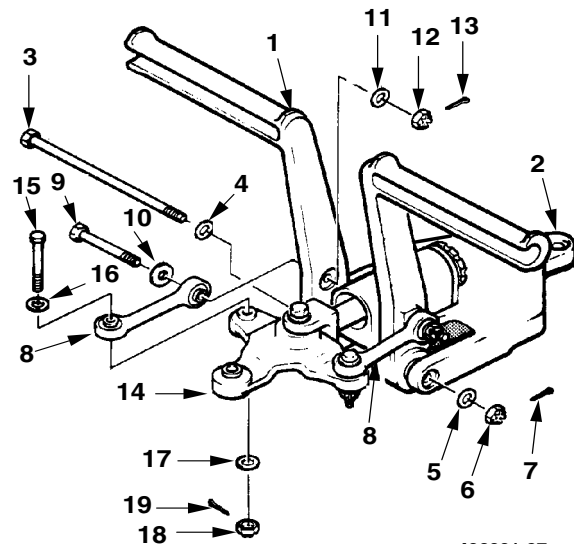
References:

TM 1-1500-204-23

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

1. Install pedals (1) on support assembly (2) with bolt (3), washers (4 and 5), and nut (6).
■ Torque nut (6) **100 TO 140 INCH-POUNDS**.
2. Install cotter pin (7) through nut (6).
3. Install aft end of links (8) to pedals (1) using two bolts (9), two spacers (10), two washers (11), and two nuts (12). Torque nuts (12) **30 TO 40 INCH-POUNDS**.
4. Install two cotter pins (13) through nuts (12).
5. Install forward end of links (8) to bellcrank (14) using two bolts (15), two spacers (16), two washers (17), and two nuts (18). Torque nuts (18) **30 TO 40 INCH-POUNDS**.
6. Install two cotter pins (19) through nuts (18).



406001-97
J0536

INSPECT

END OF TASK

11-4-7. DIRECTIONAL CONTROL PEDAL BELLCRANK — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

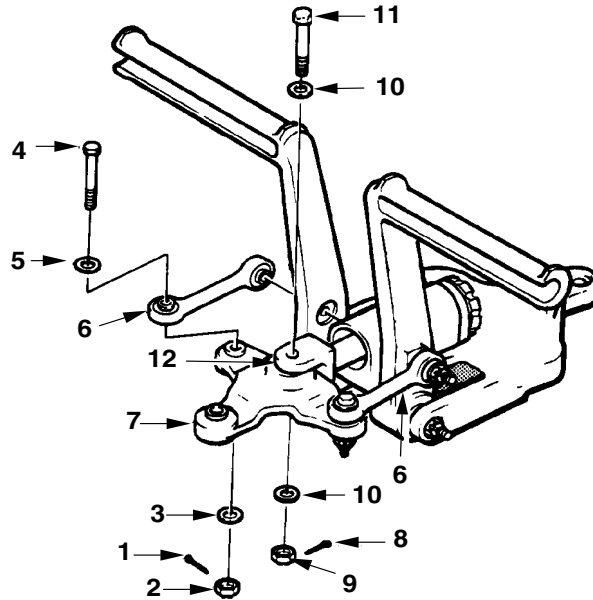
Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B236)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-204-23

REMOVE

1. Remove cotter pin (1) and discard.
2. Remove nut (2), washer (3), bolt (4), and spacer (5).
3. Disconnect link (6) from bellcrank (7).
4. Repeat steps 1, 2, and 3 to disconnect opposite link (6).
5. Remove cotter pin (8) and discard.
6. Remove nut (9), two washers (10), and bolt (11).
7. Remove bellcrank (7) from clevis (12).
8. Refer to Task 11-5-2 for bellcrank repair limits.



406001-98
J0536

INSTALL

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

9. Install bellcrank (7) in clevis (12) with bolt (11), two washers (10), and nut (9).
10. Torque nut (9) **30 TO 40 INCH-POUNDS** and install cotter pin (8) through nut (9).
11. Connect link (6) to bellcrank (7) with bolt (4), spacer (5), washer (3), and nut (2).

12. Torque nut (2) **30 TO 40 INCH-POUNDS** and install cotter pin (1) through nut (2).

13. Repeat steps 11 and 12 for opposite link.

INSPECT

END OF TASK

**11-4-8. DIRECTIONAL CONTROL PEDAL BELLCRANK BUSHING AND BEARING (AVIM) —
REMOVAL/INSTALLATION**

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Cheesecloth (D56)
Acetone (D2)
Rubber Gloves (D111)

Applicable Configurations:
All

Personnel Required:

67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

Tools:

Powertrain Repairer Tool Kit (B180)
Hand Arbor Press (B107)

References:

TM 55-1500-322-24

Material:

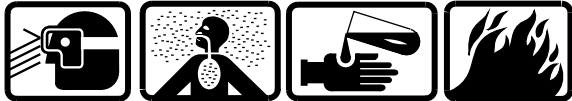
Abrasive Mats (D1)
Epoxy Primer Coating (D98)

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11-4-8. DIRECTIONAL CONTROL PEDAL BELLCRANK BUSHING AND BEARING (AVIM) —
REMOVAL/INSTALLATION (CONT)

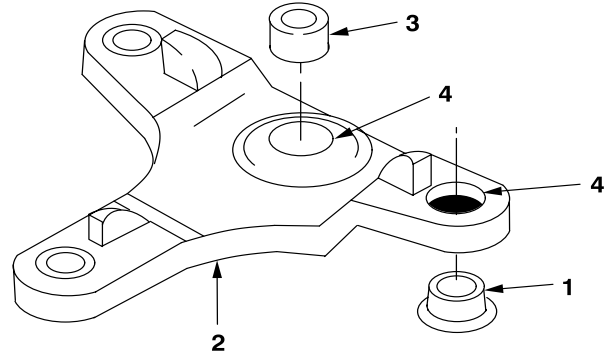
REMOVE

1. Using hand arbor press (B107), press bushing (1) from bellcrank (2) (TM 55-1500-322-24). Discard bushing.
2. Using hand arbor press (B107), press bearing (3) from bellcrank (2) (TM 55-1500-322-24).



Acetone

3. Clean bellcrank bores (4) with acetone (D2) and abrasive mats (D1).



406001-99
J0536

INSTALL



Epoxy Primer Coating

4. Apply epoxy primer coating (D98) to bellcrank bores (4) and outside surfaces of bushing (1) and bearing (3).
5. Using hand arbor press (B107), press bearing (3) into bellcrank (2) until centered equally on both sides (TM 55-1500-322-24).
6. Using hand arbor press (B107), press bushing (1) into bellcrank (2) until flange is flush with bellcrank (TM 55-1500-322-24).
7. Wipe away excess primer with cheesecloth (D56) dampened with acetone (D2).

INSPECT

8. Refer to Task 11-5-2 for inspection and repair procedures.

END OF TASK

**11-4-9. DIRECTIONAL CONTROL PEDAL ADJUSTMENT CLEVIS — REMOVAL/INSPECTION/
INSTALLATION**

This task covers: Removal, Inspection, and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Corrosion Preventive Compound (D82)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-204-23
TM 1-1500-344-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Control Tube Disconnected From Bellcrank
(Task 11-4-10)
Bellcrank Removed From Pedal Support
Assembly (Task 11-4-7)

GO TO NEXT PAGE

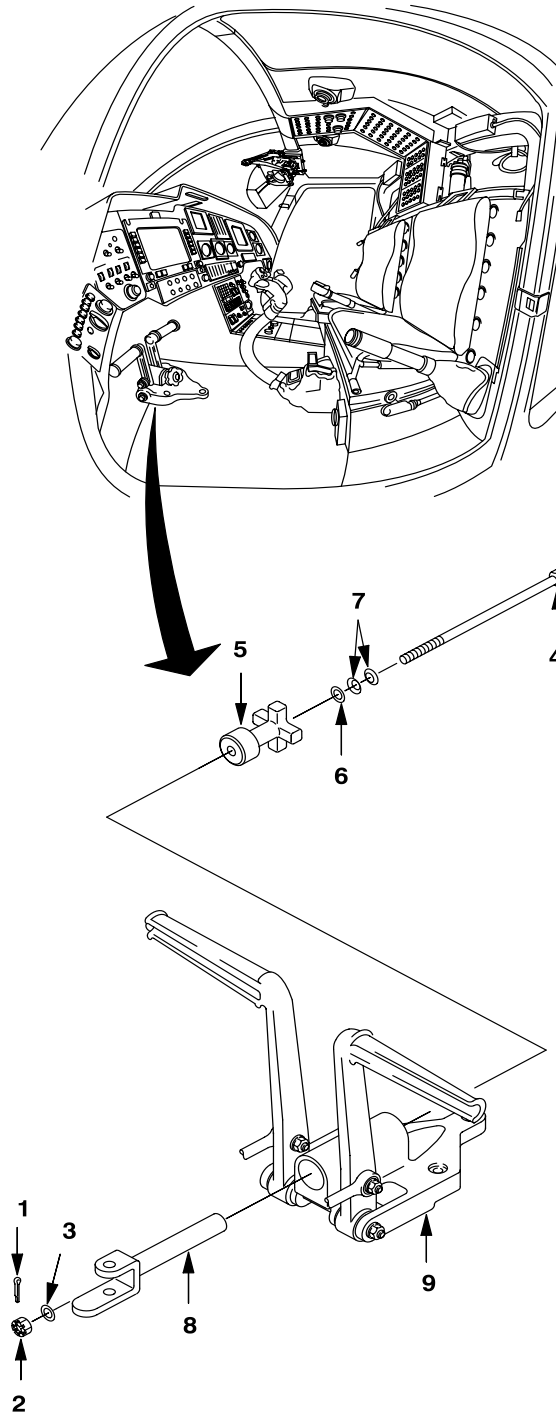
11-4-9. DIRECTIONAL CONTROL PEDAL ADJUSTMENT CLEVIS — REMOVAL/INSPECTION/INSTALLATION (CONT)

REMOVE

1. Remove cotter pin (1), nut (2), washer (3), and pull bolt (4) from knob (5). Discard cotter pin (1).
2. Remove washer (6) and two spring tension washers (7) from bolt (4).
3. Remove knob (5) and pedal adjustment clevis (8) from support (9).

INSPECT

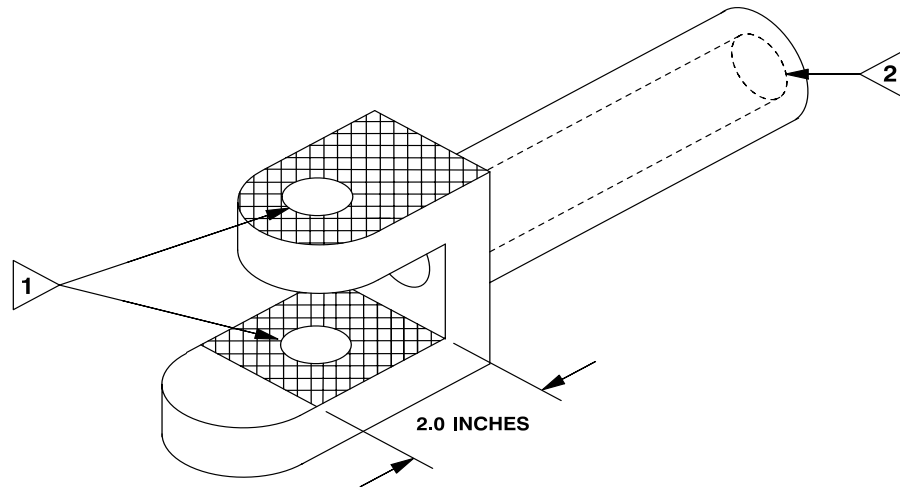
4. Inspect pedal adjustment clevis (8) for mechanical damage, bore damage, and wear as shown. If limits are exceeded, replace clevis. See figure Directional Control Pedal Adjustment Clevis — Damage Limits.
5. Inspect pedal adjustment clevis (8) for corrosion (TM 1-1500-344-23).
6. Inspect pedal adjustment clevis (8) for cracks, no cracks allowed (TM 1-1500-204-23).



406001-312
J1845

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11-4-9. DIRECTIONAL CONTROL PEDAL ADJUSTMENT CLEVIS — REMOVAL/INSPECTION/INSTALLATION (CONT)



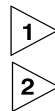
CLEVIS
PEDAL ADJUSTMENT

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	0.010 in.	0.020 in.
MECHANICAL	0.010 in.	0.020 in.
CORROSION	0.005 in. before and 0.010 in. after repair	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	0.10 sq. in.
NUMBER OF REPAIRS	One/Surface	Two/Surface
EDGE CHAMFER TO REMOVE DAMAGE	0.040 inch X 45°	0.040 inch X 45°

BORES



0.002 inch for 1/4 circumference

0.004 Inch for 1/4 circumference

CRACKS

No cracks allowed

406001-814
J1845

Directional Control Pedal Adjustment Clevis — Damage Limits

GO TO NEXT PAGE

11-4-9. DIRECTIONAL CONTROL PEDAL ADJUSTMENT CLEVIS — REMOVAL/INSPECTION/INSTALLATION (CONT)

INSTALL

7. Install pedal adjustment clevis (8) in forward side of support (9).

8. Thread knob (5) into aft side of support (9) until bottomed out and contacting clevis (8).

CAUTION

Ensure concave side of spring tension washers (7) are placed face-to-face on bolt (4).

9. Insert two spring tension washers (7) (concave side face-to-face) and washer (6) under head of bolt (4).

10. Insert bolt (4) with washers (7 and 6) through knob (5) and pedal adjustment clevis (8).

11. Install washer (3) and nut (2) on bolt (4) at end of pedal adjustment clevis (8).

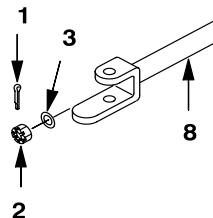
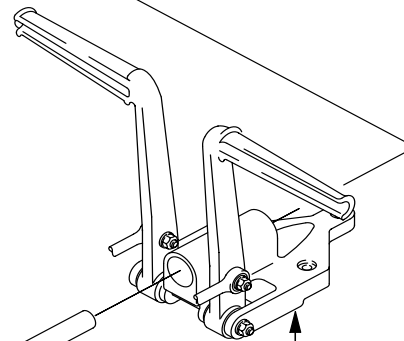
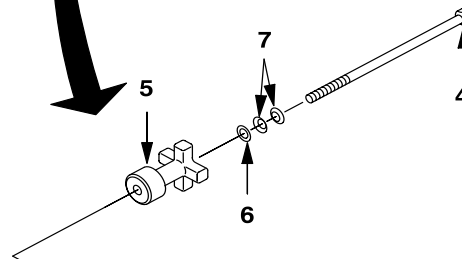
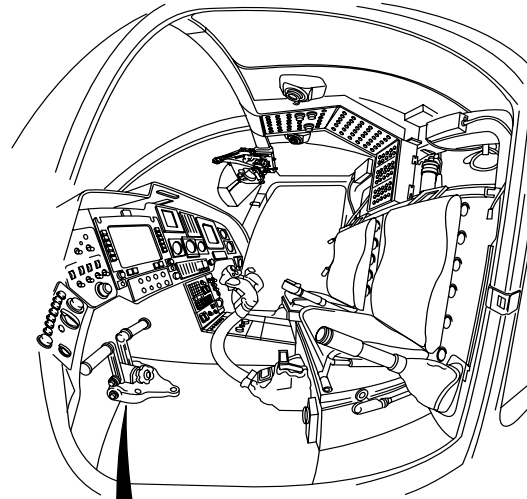
NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

12. Tighten nut (2) until all free play is removed, then tighten one additional nut castellation.

13. Install cotter pin (1) through nut (2).

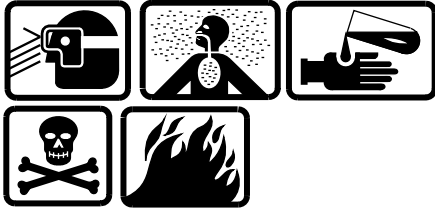
INSPECT



406001-312
J1845

GO TO NEXT PAGE

**11-4-9. DIRECTIONAL CONTROL PEDAL ADJUSTMENT CLEVIS — REMOVAL/INSPECTION/
INSTALLATION (CONT)**

**Corrosion Preventive Compound**

14. After assembly, apply a light coat of corrosion preventive compound (D82) to external areas and exposed threads.

FOLLOW-ON MAINTENANCE

Install bellcrank on pedal support assembly (Task 11-4-7).

Install control tube on bellcrank (Task 11-4-10).

END OF TASK

11-4-10. DIRECTIONAL CONTROL PEDAL TUBE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

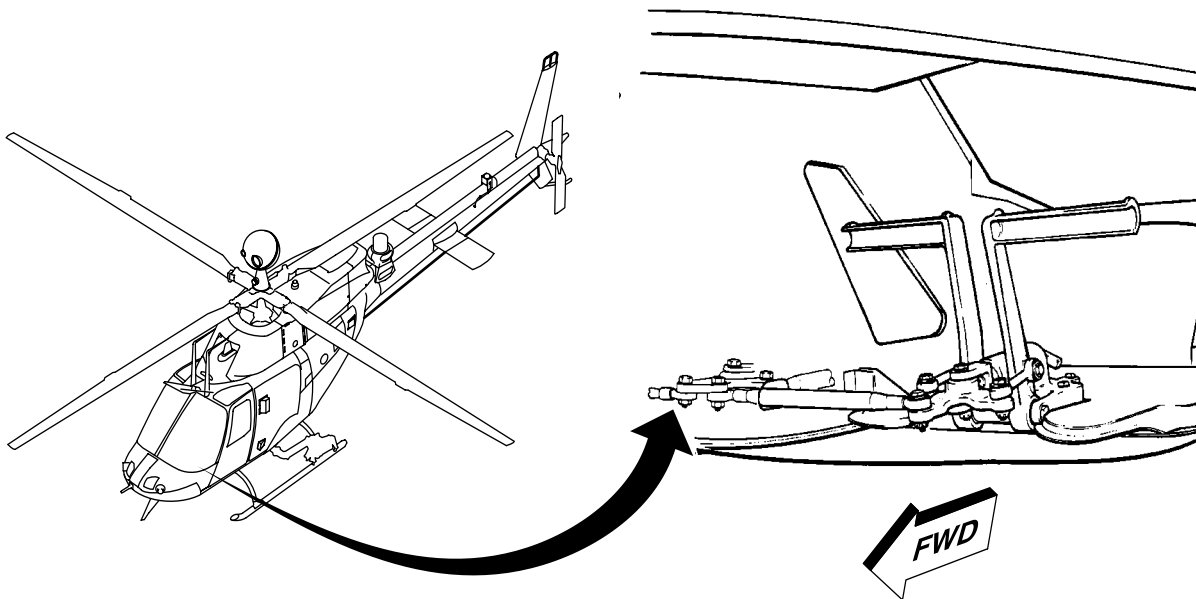
Applicable Configurations:
All

Tools:
■ Airframe Repairer Tool Kit (B176)
General Mechanic Tool Kit (B178)
Torque Wrench (B236)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68G Aircraft Structural Repairer ■

References:
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Lower Wire Cutter Removed (Task 2-2-60) ■



406001-101
J0538

GO TO NEXT PAGE

11-4-10. DIRECTIONAL CONTROL PEDAL TUBE — REMOVAL/INSTALLATION (CONT)

NOTE

Removal and installation of pilot and CPG pedal tubes are identical.

REMOVE

WARNING

- Do not operate directional controls during directional control pedal tube replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Remove access panel (1)

2. Disconnect tube assembly (2) from combining bellcrank (3) by removing cotter pin (4), nut (5), spacer (6), washer (7), and bolt (8). Discard cotter pin.

3. Disconnect tube (2) from pedal bellcrank (9) by removing cotter pin (10), nut (11), washer (12), spacer (13), and bolt (14). Discard cotter pin.

4. Remove tube (2) from helicopter.

INSTALL

NOTE

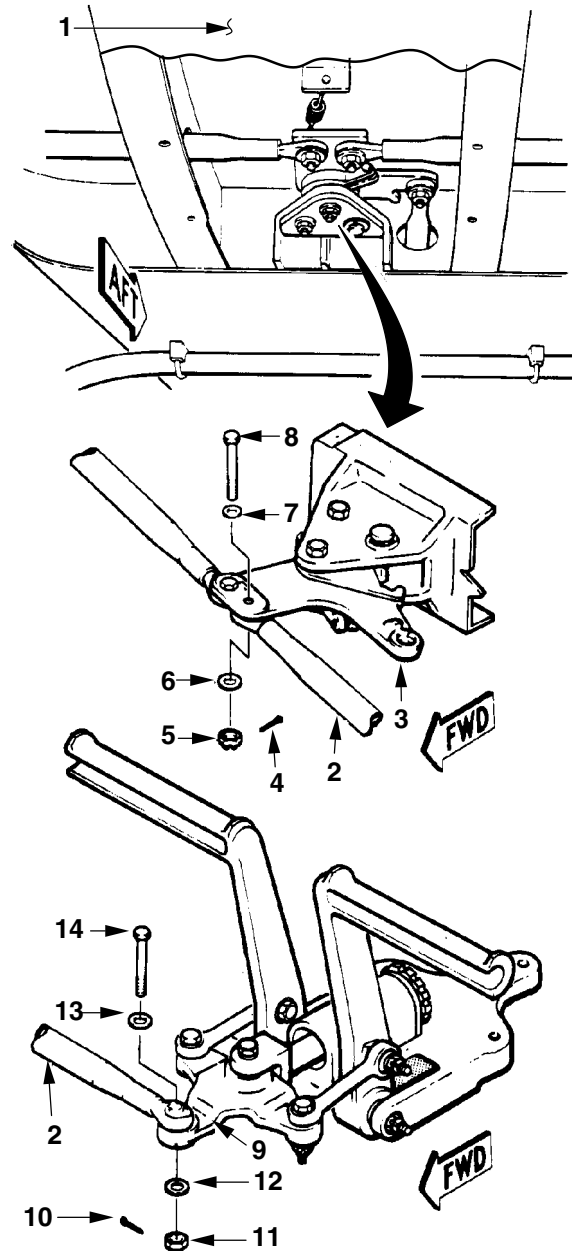
Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

5. Connect outboard end of tube (2) to pedal bellcrank (9) with bolt (14), spacer (13), washer (12), and nut (11). Torque nut (11) **30 TO 40 INCH-POUNDS**.

6. Install cotter pin (10) through nut (11).

7. Connect inboard end of tube (2) to combining bellcrank (3) with bolt (8), washer (7), spacer (6), and nut (5). Torque nut (5) **30 TO 40 INCH-POUNDS**.

8. Install cotter pin (4) through nut (5).



406961-266
J0536

GO TO NEXT PAGE

11-4-10. DIRECTIONAL CONTROL PEDAL TUBE — REMOVAL/INSTALLATION (CONT)

INSPECT

9. Using pedal adjusting knob, adjust pedals full forward.

10. While observing directional control tube assembly (2), move pedals full forward and full aft. A minimum clearance of **0.25 inch** is required between control tube assembly (2) and web.

11. Adjust pedals full aft; repeat inspection in step 9. above.

12. If opening is less than minimum, enlarge opening in web to provide a **0.25 inch** clearance (TM 1-1500-204-23).

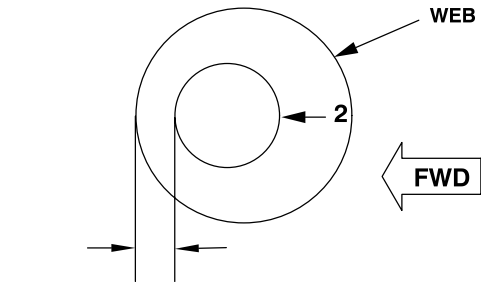
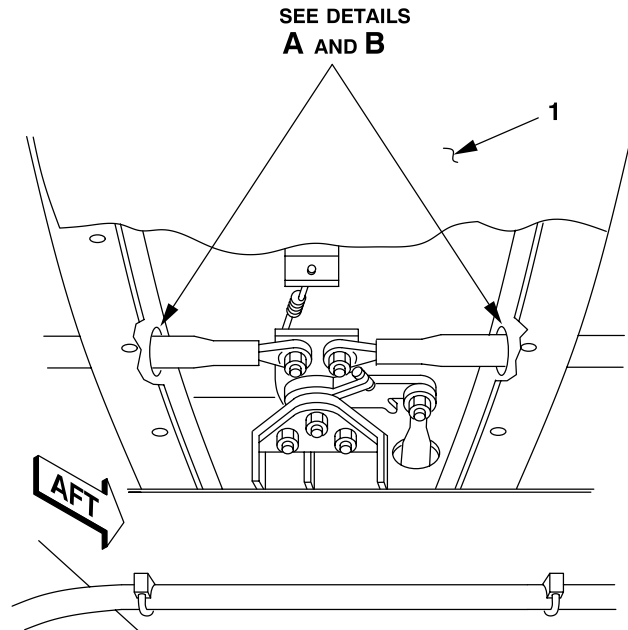
13. Install access panel (1).

INSPECT

FOLLOW-ON MAINTENANCE

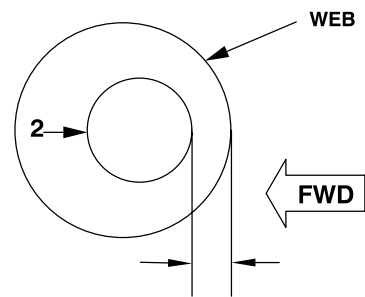
Install lower wire cutter (Task 2-2-60).

Check rigging of directional control system (Task 11-1-4).



0.25 INCH MINIMUM WITH PEDALS ADJUSTED FULL FORWARD

DETAIL A



0.25 INCH MINIMUM WITH PEDALS ADJUSTED FULL AFT

DETAIL B

406001-320
J1852

END OF TASK

11-4-11. DIRECTIONAL CONTROL COMBINING BELLCRANK — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

- General Mechanic Tool Kit (B178)
- Torque Wrench (B235)
- Torque Wrench (B236)
- Torque Wrench (B237)
- Torque Wrench (B239)
- Spring Scale (B120)
- Hydraulic Test Stand

Personnel Required:

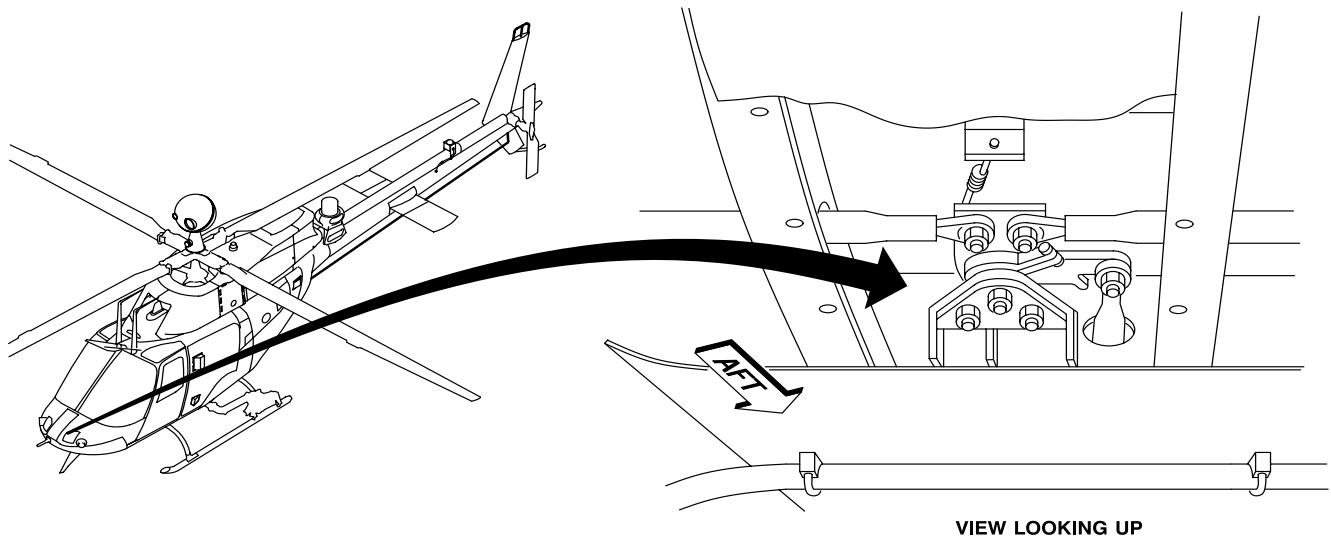
- 67S Scout Helicopter Technical Inspector (TI)
- 67S Scout Helicopter Repairer

References:

TM 1-1500-204-23

Equipment Condition:

- Helicopter Safed (Task 1-6-7)
- Lower Wire Cutter Removed (Task 2-2-60)



406001-102
J1838

GO TO NEXT PAGE

11-4-11. DIRECTIONAL CONTROL COMBINING BELLCRANK — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove access panel (1).

WARNING

- Do not operate directional controls during combining bellcrank replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

2. Disconnect two tube assemblies (2) from bellcrank (3) by removing two cotter pins (4), two nuts (5), two spacers (6), two washers (7), and two bolts (8). Discard cotter pins.

3. Disconnect spring (9).

4. Remove cotter pin (10), nut (11), spacer (12), two washers (13), spacer (14), and bolt (15) to disconnect tube (16).

5. Disconnect friction clamp (17) from bellcrank support (18) by removing nut (19), three washers (20), and bolt (21).

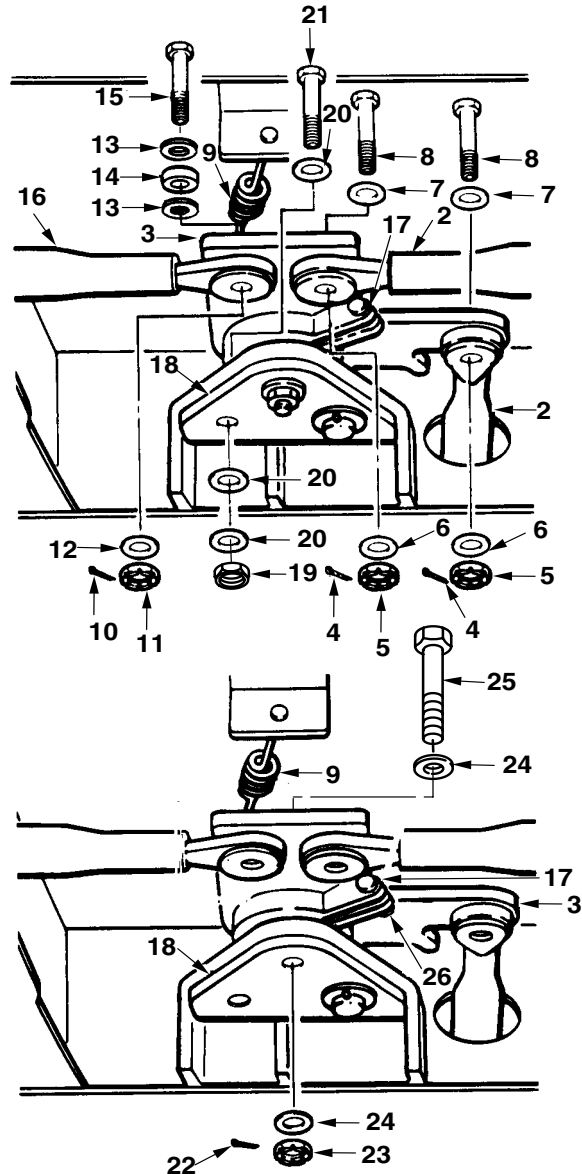
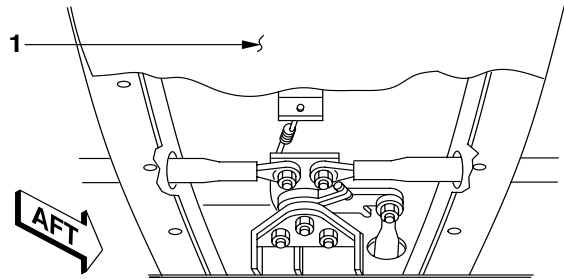
6. Remove bellcrank (3) with friction clamp (17) from bellcrank support (18) by removing cotter pin (22), nut (23), two washers (24), and bolt (25). Discard cotter pin.

7. Separate friction clamp (17) from bellcrank (3) by loosening nut (26).

8. Refer to Task 11-5-2 for inspection and repair.

INSTALL

9. Position friction clamp (17) onto bellcrank (3). Do not tighten nut (26).



406961-103
J1840

GO TO NEXT PAGE

11-4-11. DIRECTIONAL CONTROL COMBINING BELLCRANK — REMOVAL/INSTALLATION (CONT)

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

10. Install bellcrank (3) and friction clamp (17) in bellcrank support (18) with bolt (25), two washers (24), and nut (23). Torque nut (23) **100 TO 140 INCH-POUNDS**.

11. Install cotter pin (22) through nut (23).

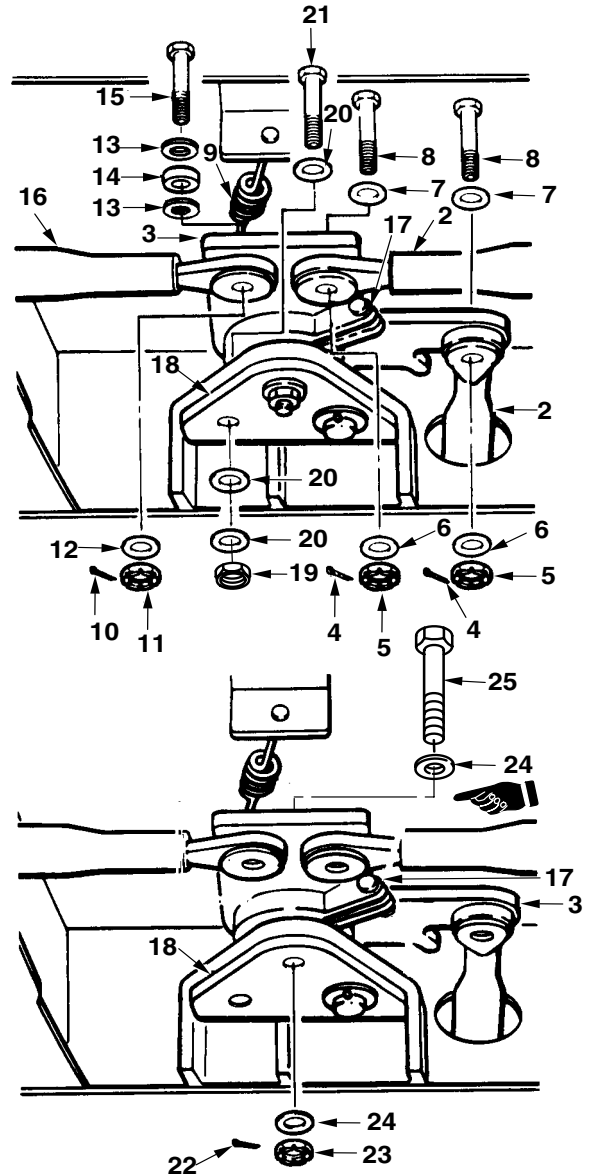
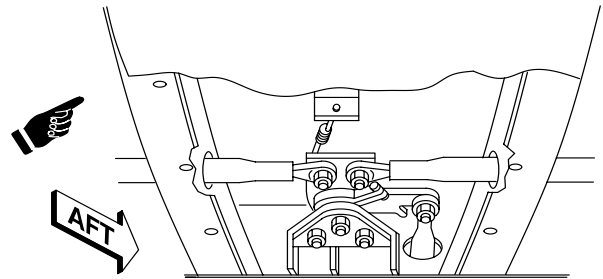
12. Connect friction clamp (17) to bellcrank support (18) with bolt (21), three washers (20), and nut (19). Torque nut (19) **50 TO 70 INCH-POUNDS**.

13. Connect tube (16) to bellcrank (3) with bolt (15), two washers (13), spacers (12 and 14), and nut (11). Torque nut (11) **30 TO 40 INCH-POUNDS**.

14. Install cotter pin (10) through nut (11).

15. Connect two tube assemblies (2) to bellcrank (3) with two bolts (8), two washers (7), two spacers (6), and two nuts (5). Torque nuts (5) **30 TO 40 INCH-POUNDS**.

16. Install cotter pins (4) through nuts (5).



406961-103-3
J2889

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11-4-11. DIRECTIONAL CONTROL COMBINING BELLCRANK — REMOVAL/INSTALLATION (CONT)

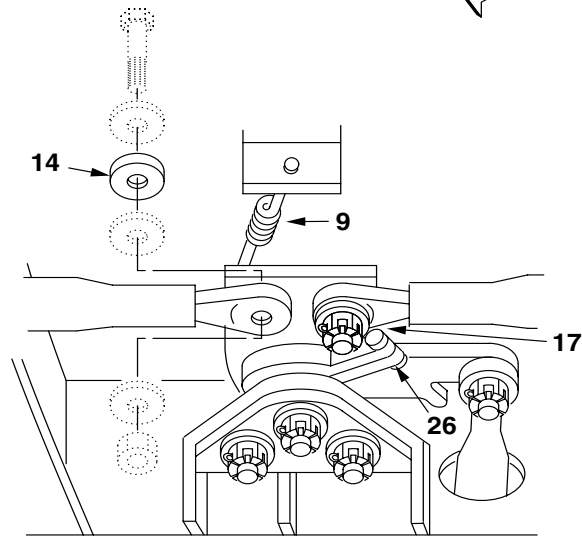
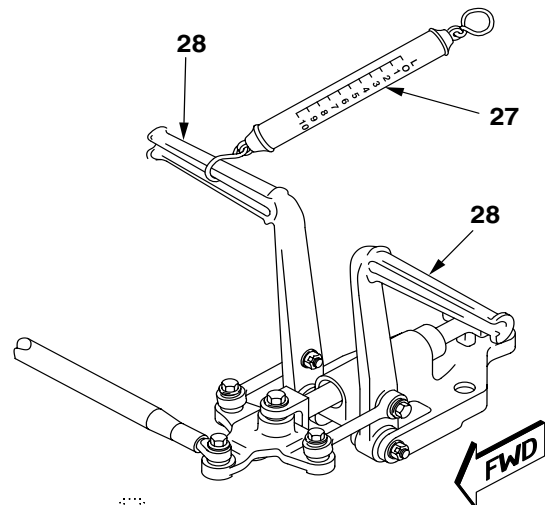
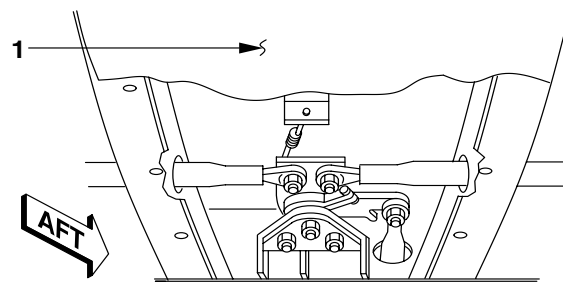
ADJUST

17. Connect spring (9) to top spacer (14).
18. Connect and operate hydraulic test stand (Task 7-2-1).
19. Attach spring scale (B120) (27) to center of pedal (28).
20. Pull spring scale (B120) (27) slowly and evenly parallel with centerline of helicopter and adjust friction clamp (17) for 3 to 4 pounds breakout force with each pedal in neutral position.
21. Adjust friction clamp (17) for 3 to 4 pounds breakout force with each pedal in neutral position.
22. Torque clamp nut (26) a maximum of **15 INCH-POUNDS**.
23. Disconnect hydraulic test stand (Task 7-2-1).
24. Install access panel (1).

INSPECT

FOLLOW-ON MAINTENANCE

- Check rigging of directional control system (Task 11-1-4).
- Install lower wire cutter (Task 2-2-60).

406961-103-4
J2889

END OF TASK

11-4-12. COMBINING BELLCRANK BEARING SLEEVE (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Repairer Tool Kit (B180)
Hand Arbor Press (B107)
Rotary Tool Kit (B85)

Material:

Acetone (D2)
Abrasive Mats (D1)
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

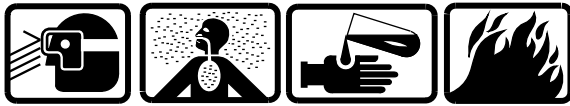
Personnel Required:

67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

REMOVE

1. Remove sleeve (1) from combining bellcrank (2). Discard sleeve.

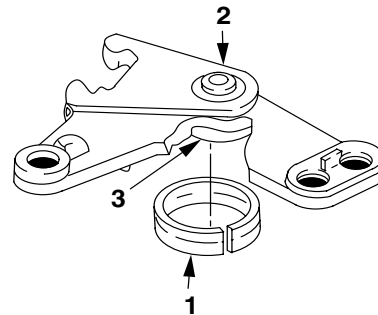
CLEANING



Acetone



Epoxy Primer Coating



406001-104
J1831

2. Clean epoxy primer coating from bellcrank sleeve trunnion (3) with acetone (D2) and abrasive mats (D1).

INSTALL

3. Apply epoxy primer coating (D98) to outside surface of trunnion (3) and inside surface of sleeve (1).

4. Using hand arbor press (B107), press sleeve (1) onto trunnion (3) to dimension of **0.440 inch** between outer edge of sleeve and machine edge of trunnion. Check using feeler gauge.

INSPECT

END OF TASK

11-4-13. DIRECTIONAL CONTROL EYEBOLT AND SPRING — REMOVAL/INSPECTION/INSTALLATION

This task covers: Removal, Inspection, and Installation (On Helicopter)

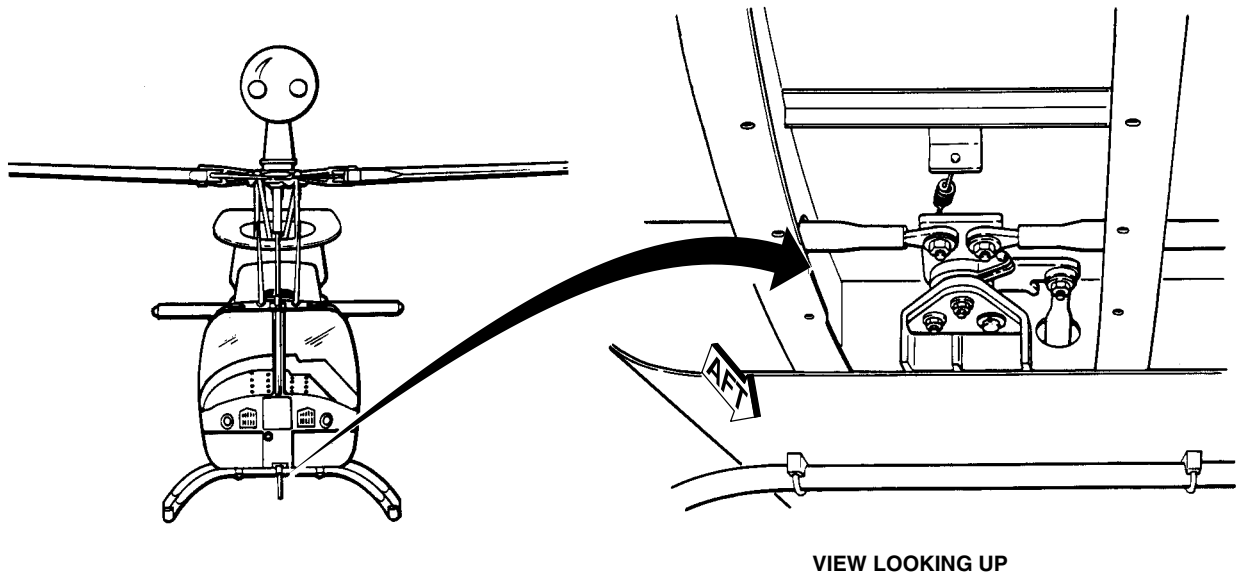
INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Spring Scale (B120)
Torque Wrench (B235)
Hydraulic Test Stand

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Lower Wire Cutter Removed (Task 2-2-60)



406001-107
J0538

GO TO NEXT PAGE

11-4-13. DIRECTIONAL CONTROL EYEBOLT AND SPRING — REMOVAL/INSPECTION/INSTALLATION (CONT)

REMOVE

1. Remove access panel (1).

WARNING

- Do not operate directional controls during eyebolt and spring replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

2. Remove nut (2) and washer (3) and remove eyebolt (4) and spring (5).

3. Disconnect spring (5) from eyebolt (4) and remove jamnut (6) from eyebolt (4).

4. Remove eyebolt (4) from center hole (7) of airframe support (8).

5. Remove spring (5) from bellcrank (9).

INSPECT

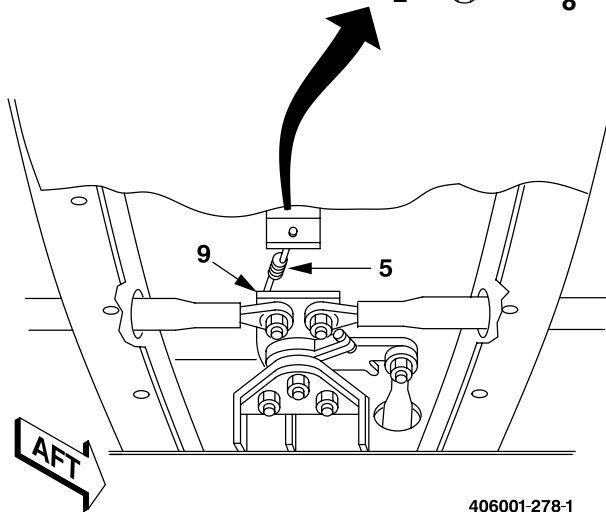
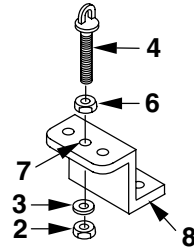
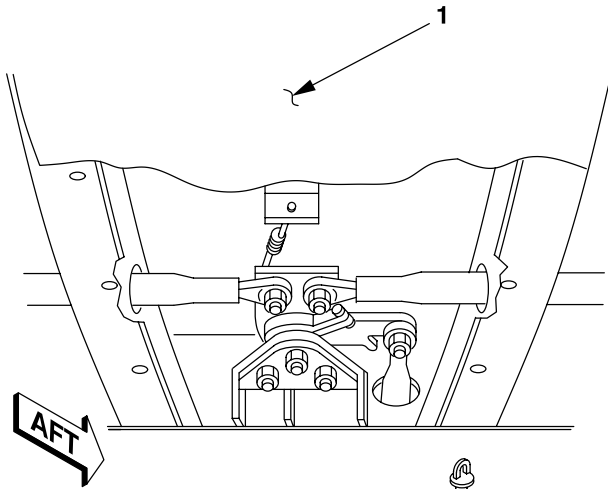
6. Inspect spring to limits shown in figure Directional Control Spring — Damage Limits and inspect eyebolt to limits shown in figure Directional Control Eyebolt — Damage Limits.

INSTALL

7. Install jamnut (6) on serviceable eyebolt (4). Install eyebolt (4) in center hole (7) of airframe support (8) with washer (3) and nut (2).

8. Connect spring (5) to bellcrank (9) and eyebolt (4).

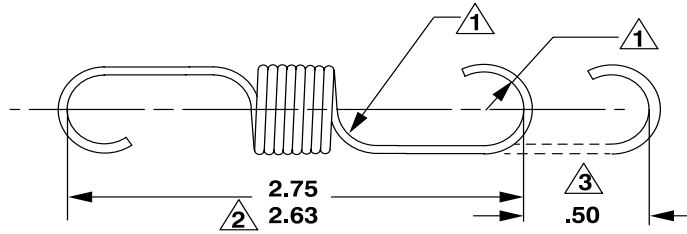
9. With pedals in neutral position, adjust nut (2) on eyebolt (4) until all slack is removed from spring (5).



406001-278-1
J0536

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11-4-13. DIRECTIONAL CONTROL EYEBOLT AND SPRING — REMOVAL/INSPECTION/INSTALLATION (CONT)



**ANTITORQUE CONTROLS
BALANCE SPRING
206-001-721-001**

TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR
MECHANICAL	None
CORROSION	None
SPRING DEFORMATION	1
SPRING LENGTH	2
SPRING FORCE	3

NOTES:

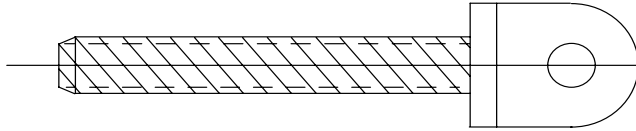
- 1 There shall be no deformation of the spring extension or loops.
- 2 The overall length of spring must be between 2.75 and 2.63 inches.
- 3 The spring force at 0.50 inch deflection must be between 5.5 and 6.8 pounds.

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J2741

Directional Control Spring — Damage Limits

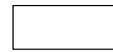
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11-4-13. DIRECTIONAL CONTROL EYEBOLT AND SPRING — REMOVAL/INSPECTION/
INSTALLATION (CONT)



**ANTITORQUE CONTROLS
BALANCE SPRING
EYEBOLT
206-001-754-001**

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL

0.010 Inch

CORROSION

0.010 Inch

**MAXIMUM AREA PER
FULL DEPTH REPAIR**

0.010 sq.in.

**NUMBER OF
OVERLAPPING
REPAIRS**

2

THREAD DAMAGE

**Depth
Length
Number**

**One-third of thread
0.12 inch
2 per segment**

**EDGE CHAMFER TO
REMOVE DAMAGE**

0.02 inch

BORE



NOTES:



Bore damage not critical. Polish out mechanical or corrosion damage.

406961-1401-339
J2741

Directional Control Eyebolt — Damage Limits

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11-4-13. DIRECTIONAL CONTROL EYEBOLT AND SPRING — REMOVAL/INSPECTION/INSTALLATION (CONT)

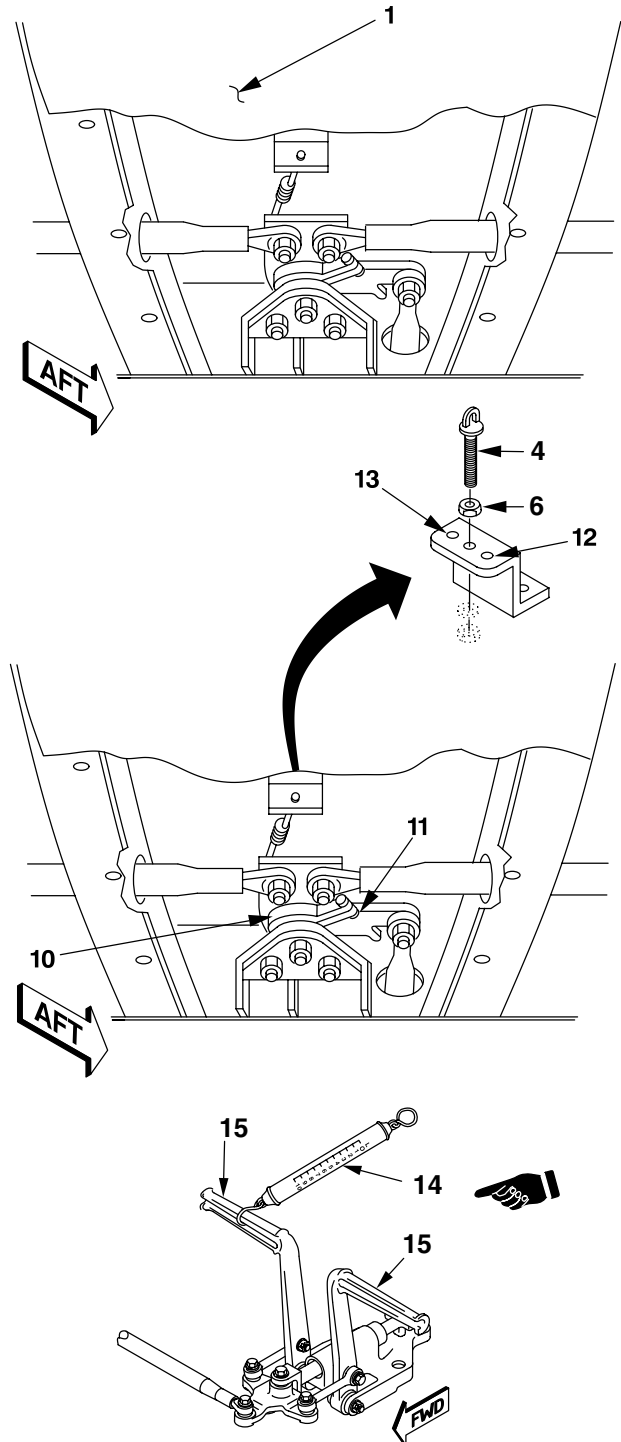
ADJUST

10. Loosen friction clamp (10) nut (11).
11. Connect hydraulic test stand to helicopter and operate (Task 7-2-1).
12. Apply slight forward force on either pedal and release. Pedal should remain in same position as when force is released.
13. If left pedal motors forward, relocate eyebolt (4) to left hole (12) position of support. If right pedal motors forward, relocate eyebolt (4) to right hole (13) position of support.
14. At position where motoring effect is reduced to creep, adjust spring tension until creep is eliminated. Torque jamnut (6) **20 TO 25 INCH-POUNDS**.
15. Attach spring scale (B120) (14) to center of pedal (15).
16. Pull spring scale (B120) (14) slowly and evenly parallel with centerline of helicopter and adjust friction clamp for breakout force of 3 to 4 pounds measured at each pedal.
17. Torque friction clamp (10) nut (11) a maximum of **15 INCH-POUNDS**.
18. Disconnect hydraulic test stand (Task 7-2-1).
19. Install access panel (1).

INSPECT

FOLLOW-ON MAINTENANCE

- Install lower wire cutter (Task 2-2-60).



406001-278-2
J2889

END OF TASK

11-4-14. DIRECTIONAL CONTROL LOWER FORWARD HORIZONTAL TUBE — REMOVAL/
INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B236)
Torque Wrench (B237)

Material:
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-204-23

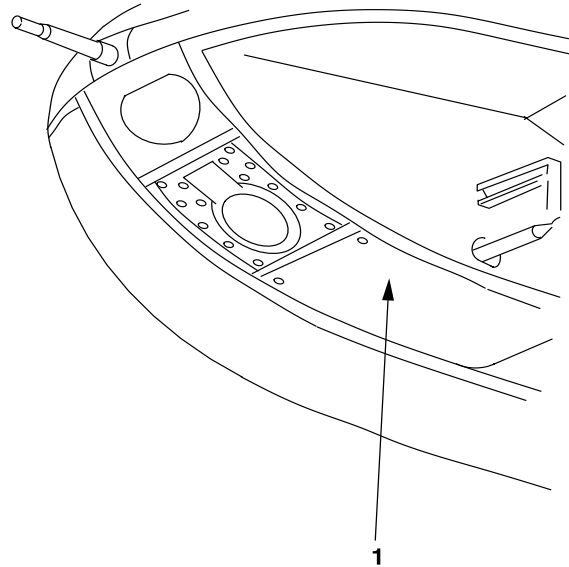
Equipment Condition:
Helicopter Safed (Task 1-6-7)
Center Post Duct and Panels Removed
(Task 2-2-69)
Lower Wire Cutter Removed (Task 2-2-60)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)
Center Console Top Cover Removed
(Task 2-2-99)

REMOVE

WARNING

- Do not operate directional controls during lower forward horizontal tube replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Remove access panel (1).



406001-325
J2588

GO TO NEXT PAGE

 11-4-14. DIRECTIONAL CONTROL LOWER FORWARD HORIZONTAL TUBE — REMOVAL/
 INSTALLATION (CONT)

2. Remove lockwire from three bolts (2).

3. Remove three bolts (2) and three washers (3) to raise support (4) from cabin floor for access to hardware securing tube (5) to bellcrank assembly (6).

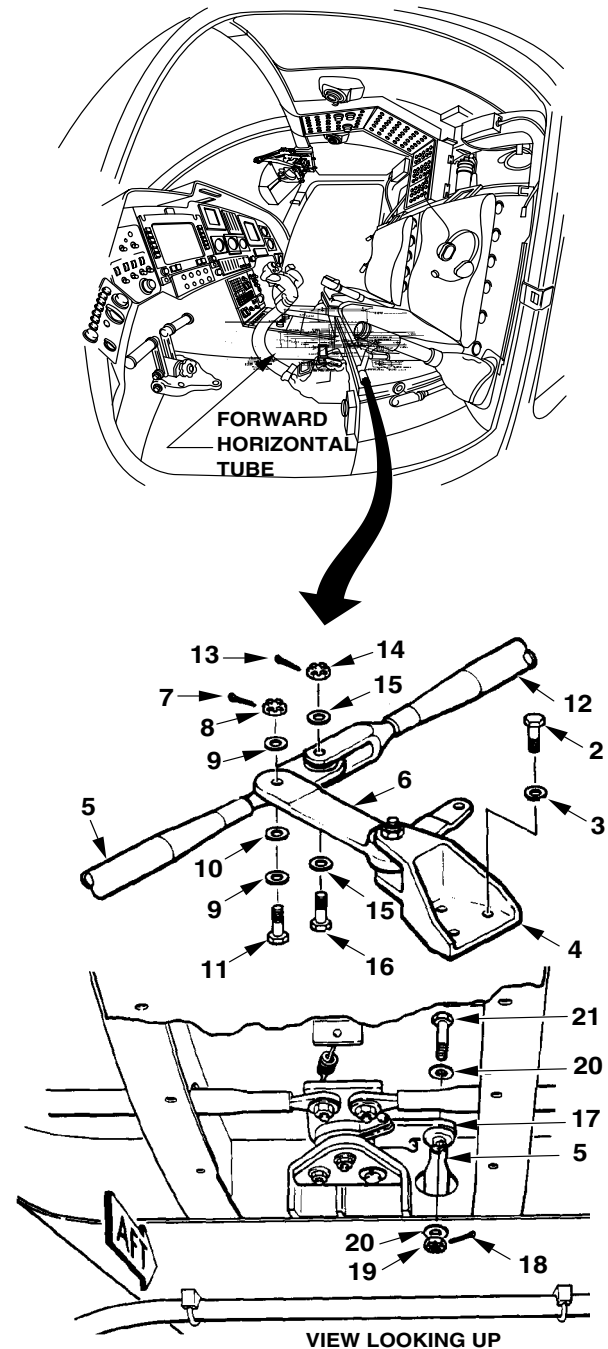
4. Disconnect tube (5) from bellcrank assembly (6) by removing cotter pin (7), nut (8), two washers (9), spacer (10), and bolt (11). Discard cotter pin.

5. Disconnect tube (12) from tube (5) by removing cotter pin (13), nut (14), two washers (15), and bolt (16).

6. Disconnect tube (5) from bellcrank (17) by removing cotter pin (18), nut (19), two washers (20), and bolt (21). Discard cotter pin.

7. Slide tube forward out of helicopter through lower access panel opening.

8. Refer to Task 11-5-1 for inspection and repair procedures.



406001-111-1
 J0536

GO TO NEXT PAGE

11-4-14. DIRECTIONAL CONTROL LOWER FORWARD HORIZONTAL TUBE — REMOVAL/
INSTALLATION (CONT)

INSTALL

9. Slide tube (5) aft into helicopter through lower access panel opening.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

10. Connect forward end of tube (5) to combining bellcrank (17) with bolt (21), two washers (20), and nut (19). Torque nut (19) **30 TO 40 INCH-POUNDS** and install cotter pin (18).

11. Connect aft end of tube (5) to transducer bellcrank assembly (6) with bolt (11) installed head down, two washers (9), spacer (10), and nut (8). Torque nut (8) **30 TO 40 INCH-POUNDS**.

12. Install cotter pin (7) through nut (8).

13. Connect tube (12) to tube (5) with bolt (16) installed head down; two washers (15), and nut (14). Torque nut (14) **30 TO 40 INCH-POUNDS**.

14. Install cotter pin (13) through nut (14).

15. Secure support (4) to cabin floor with three bolts (2) and three washers (3). Torque bolts (2) **50 TO 70 INCH-POUNDS** and secure with lockwire (D132).

16. Install access panel (1).

INSPECT

FOLLOW-ON MAINTENANCE

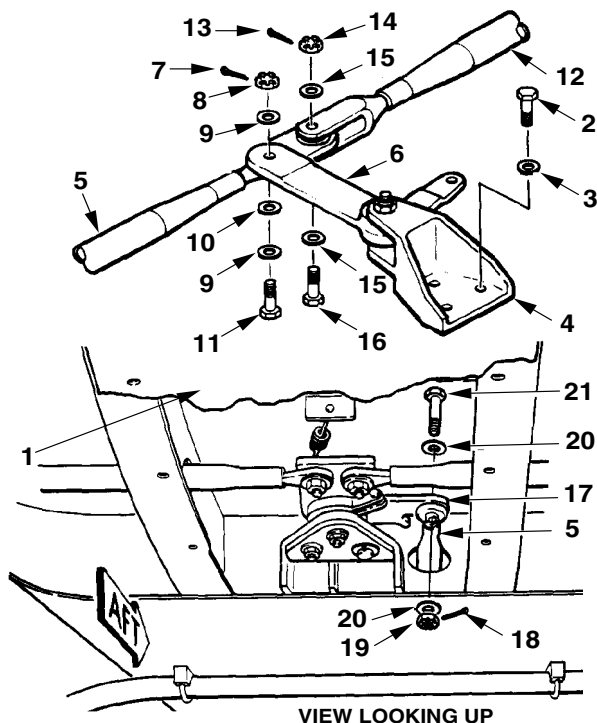
Check rigging of directional control system (Task 11-1-4).

Install center console top cover (Task 2-2-99).

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Install center post duct and panel (Task 2-2-69).

Install lower wire cutter (Task 2-2-60).



406001-111-2
J0536

END OF TASK

11-4-15. DIRECTIONAL CONTROL TRANSDUCER BELLCRANK AND SUPPORT — REMOVAL/
INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

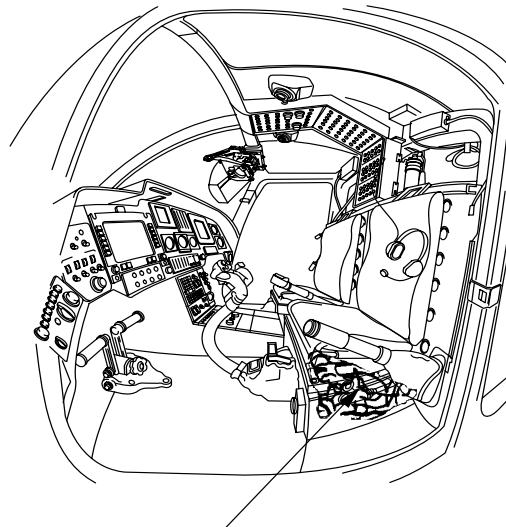
Tools:
 General Mechanic Tool Kit (B178)
 Torque Wrench (B237)
 Torque Wrench (B236)

Material:
Lockwire (D132)

Personnel Required:
 67S Scout Helicopter Technical Inspector (TI)
 67S Scout Helicopter Repairer

References:
TM 1-1500-204-23

Equipment Condition:
 Helicopter Safed (Task 1-6-7)
 Crew Seat and Armor Seat Panel Removed
 (Task 2-2-33) or Seat Pan Assembly
 Removed (Task 2-2-34)
 Center Console Top Cover Removed
 (Task 2-2-99)



**TRANSDUCER
BELLCRANK**

406001-227
J0536

GO TO NEXT PAGE

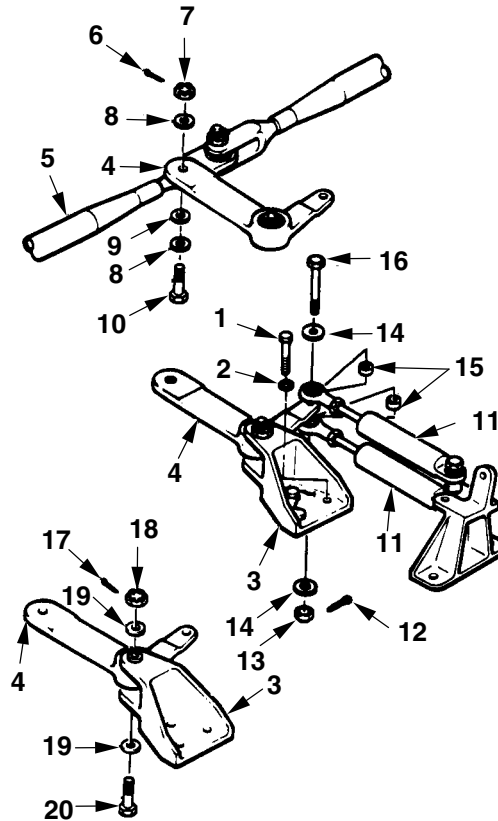
11-4-15. DIRECTIONAL CONTROL TRANSDUCER BELLCRANK AND SUPPORT — REMOVAL/INSTALLATION (CONT)

REMOVE

WARNING

- Do not operate directional controls during transducer bellcrank and support replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Remove lockwire from three bolts (1).
2. Remove three bolts (1) and three washers (2) securing support (3) to cabin floor.
3. Disconnect bellcrank (4) from tube (5) by removing cotter pin (6), nut (7), two washers (8), spacer (9), and bolt (10). Discard cotter pin.
4. Disconnect transducers (11) electrical connectors.
5. Remove cotter pin (12), nut (13), four spacers (14 and 15), and bolt (16). Discard cotter pin. Remove support (3) and bellcrank (4) from helicopter.
6. Separate bellcrank (4) from support (3) by removing cotter pin (17), nut (18), two washers (19), and bolt (20). Discard cotter pin.
7. Refer to Task 11-5-2 for bellcrank inspection and repair procedures.
8. Refer to Task 11-5-3 for support inspection and repair procedures.



406001-115
J0536

GO TO NEXT PAGE

 11-4-15. DIRECTIONAL CONTROL TRANSDUCER BELLCRANK AND SUPPORT — REMOVAL/
 INSTALLATION (CONT)

INSTALL

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

9. Attach bellcrank (4) to support (3) with bolt (20) installed head down, two washers (19), and nut (18). Torque nut (18) **30 TO 40 INCH-POUNDS**.

10. Install cotter pin (17) through nut (18).

11. Position support (3) and bellcrank (4) assembly in helicopter.

12. Connect two transducers (11) to bellcrank (4) with bolt (16), two spacers (14), two spacers (15), and nut (13). Torque nut (13) **20 TO 25 INCH-POUNDS**.

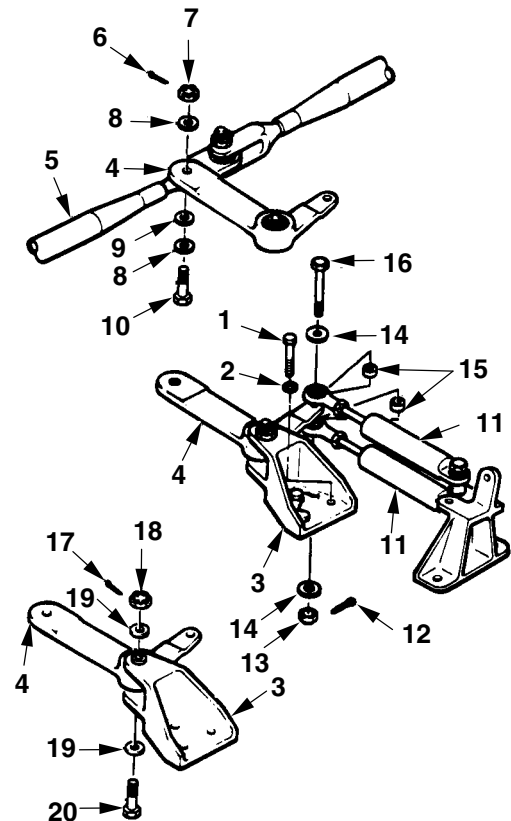
13. Install cotter pin (12) through nut (13).

14. Connect transducers (11) electrical connectors.

15. Connect bellcrank (4) to tube (5) with bolt (10) installed head down, two washers (8), spacer (9), and nut (7). Torque nut (7) **30 TO 40 INCH-POUNDS**.

16. Install cotter pin (6) through nut (7).

17. Install three bolts (1) with washers (2) in support (3). Torque bolts (1) **50 TO 70 INCH-POUNDS** and secure with lockwire (D132).



406001-115
J0536

INSPECT

FOLLOW-ON MAINTENANCE

Check rigging of directional control system (Task 11-1-4).

Install center console top cover (Task 2-2-99).

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

END OF TASK

11-4-16. TRANSDUCER BELLCRANK BEARING (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Repairer Tool Kit (B180)
Hand Arbor Press (B107)
Bearing Staking Tool Set (B189)
Reamer Set (B114)
Outside Micrometer Caliper Set (B12)

Material:
Acetone (D2)
Wiping Rag (D164)
Epoxy Primer Coating (D98)
Abrasive Mats (D1)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:
TM 55-1500-322-24

GO TO NEXT PAGE

11-4-16. TRANSDUCER BELLCRANK BEARING (AVIM) — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Using hand arbor press (B107), press unserviceable bearing (1) and sleeve (2) from bellcrank (3).

**Acetone**

2. Clean bellcrank bore with acetone (D2) and abrasive mats (D1).

**Epoxy Primer Coating**

3. Apply epoxy primer coating (D98) to bore in bellcrank (3) and outside surface of sleeve (2).

NOTE

If extreme interference fit occurs when starting press fit, stop and determine cause. Do not proceed until cause is eliminated or satisfactorily remedied.

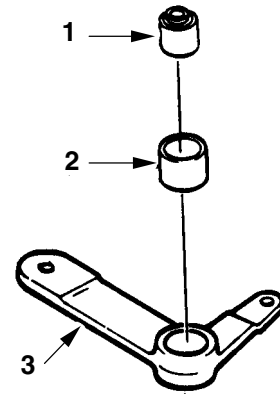
4. Using hand arbor press (B107), press sleeve (2) into bellcrank until centered from each side.

5. Using reamer (Part of reamer set (B114)), ream sleeve (2) to **0.7488 to 0.7493 inch**.

6. Break edges **0.005 inch** max. on both sides of sleeve (2).

7. Apply epoxy primer coating (D98) to inside diameter of sleeve (2) and outside surface of bearing (1).

INSTALL



406001-116
J0536

8. Using hand arbor press (B107), press bearing (1) into sleeve (2), while epoxy primer coating is still wet, until bearing is centered equally from each side. Bearing interference fit to sleeve is **0.0012 inch** max.

9. Using ring stake tool (Part of bearing staking tool set (B189)), ring stake sleeve (2) (both sides) (TM 55-1500-322-24).

10. Wipe away excess epoxy primer coating with a wiping rag (D164) dampened with acetone (D2).

INSPECT

END OF TASK

11-4-17. TRANSDUCER BELLCRANK SUPPORT BUSHING (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Repairer Tool Kit (B180)
Hand Arbor Press (B107)
1.5 Cubic Foot Freezer (B46)
Vernier Caliper (B14)
Reamer Set (B114)

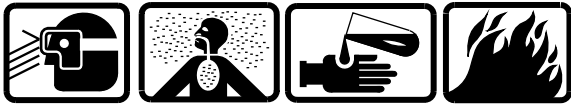
Material:
Acetone (D2)
Abrasive Mats (D1)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

REMOVE

1. Using hand arbor press (B107), press flanged bushing (1) from support (2).
2. Using hand arbor press (B107), press straight bushing (3) from support (2).

PREPARE



Acetone

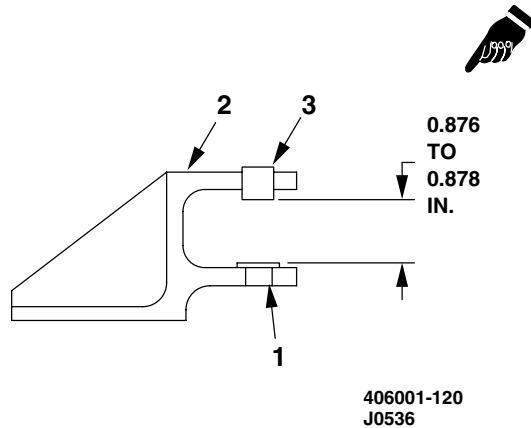
3. Clean bore with acetone (D2) and abrasive mat (D1).
4. Chill bushings in freezer (B46) as required.

INSTALL

5. Using hand arbor press (B107), press flanged bushing (1) into support (2) until flange is flush with support.
6. Using hand arbor press (B107), press straight bushing (3) into support (2) to dimension shown without loading ears of clevis.

NOTE

Bushings must be in line and surface finished to a 32 RHRC (Roughness Height Rating, Micro-Inches).



7. Using reamer (Part of reamer set (B114)), line ream bushings to **0.2495 to 0.2505 inch** and deburr.

INSPECT

END OF TASK

11-4-18. DIRECTIONAL CONTROL TRANSDUCER — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

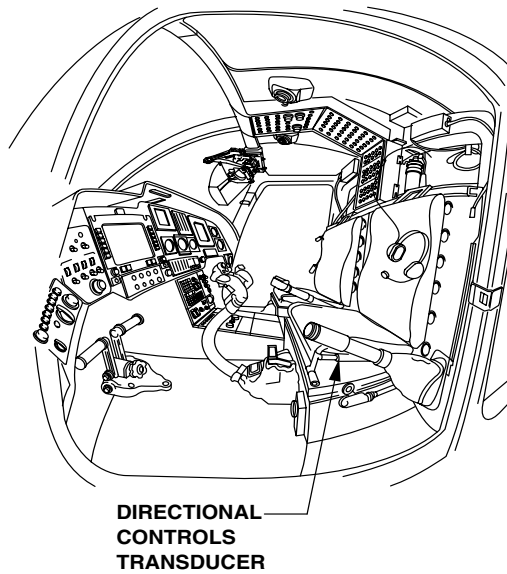
References:
TM 1-1520-248-MTF

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Forward Fairing Assembly Removed
(Task 2-2-47)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)
Center Console Top Cover Removed
(Task 2-2-99)

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B235)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot



406001-2
J0536

GO TO NEXT PAGE

11-4-18. DIRECTIONAL CONTROL TRANSDUCER — REMOVAL/INSTALLATION (CONT)

WARNING

- Do not operate directional controls during transducer replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

REMOVE

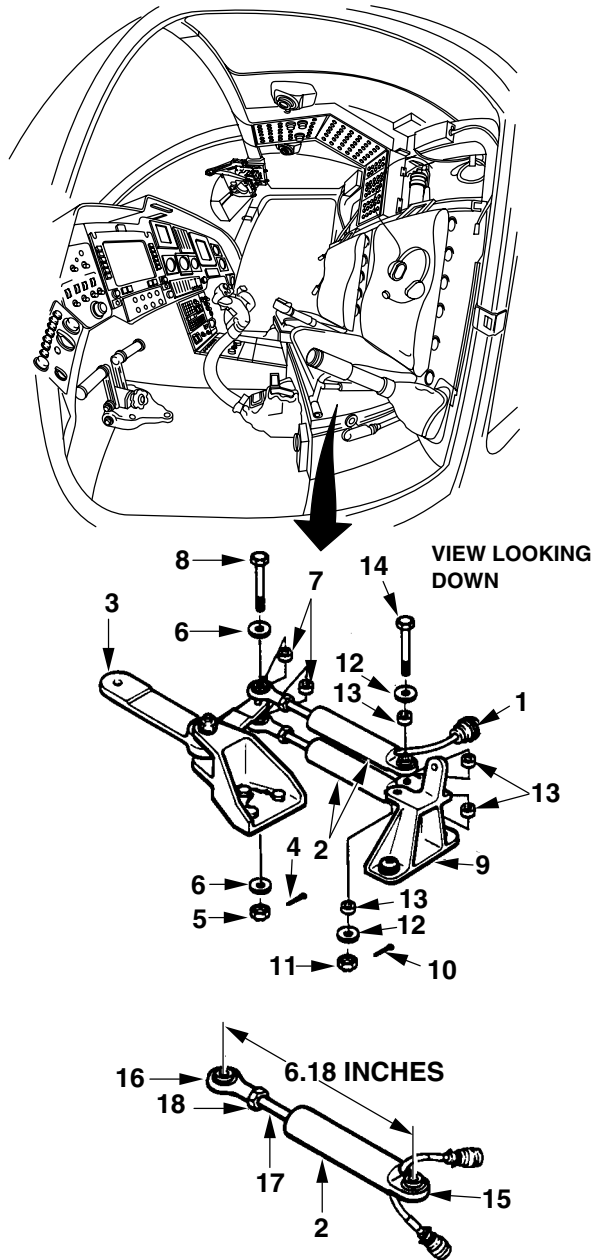
1. Disconnect two electrical connectors (1) for each transducer (2) from connector panel.

2. Disconnect two transducers (2) from bellcrank (3) by removing cotter pin (4), nut (5), two spacers (6), two spacers (7), and bolt (8). Discard cotter pin (4).

3. Disconnect transducers (2) from support (9) by removing cotter pin (10), nut (11), two spacers (12), four spacers (13), and bolt (14). Remove two transducers from helicopter.

ADJUST

4. Adjust both transducers (2) to obtain **6.18 inch** dimension between center of rod end bearing (15) and adjustable rod end bearing (16), with transducer moveable rod (17) at midstroke position. Torque jamnut (18) **12 TO 15 INCH-POUNDS**.



406074-3
J0536

GO TO NEXT PAGE

11-4-18. DIRECTIONAL CONTROL TRANSDUCER — REMOVAL/INSTALLATION (CONT)

INSTALL

5. Connect two electrical connectors (1) for each transducer (2) to connector panel.

6. Install two transducers (2) on support (9) with bolt (14), four spacers (13), two spacers (12) (next to bolt head and nut), and nut (11). Torque nut (11) **12 TO 15 INCH-POUNDS** and install cotter pin (10).

ADJUST

7. Place directional control pedals against one extreme pedal stop and then the other. Check to see if transducers would bottom out in either the retracted or extended position if transducers were connected to bellcrank. If bottom out would occur, adjust rod end bearing on transducer until bottoming is eliminated.

INSTALL

8. Connect two transducers (2) to bellcrank (3) with bolt (8), two spacers (6) (next to bolt head and nut), two spacers (7), and nut (5). Torque nut (5) **12 TO 15 INCH-POUNDS** and install cotter pin (4).

INSPECT

FOLLOW-ON MAINTENANCE

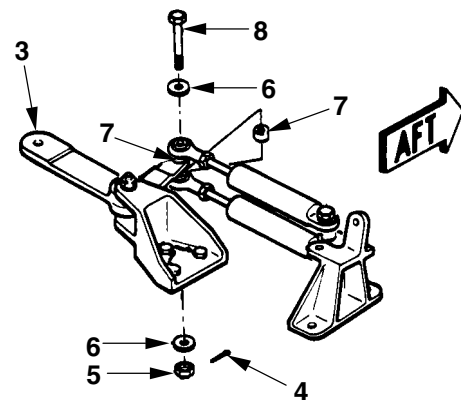
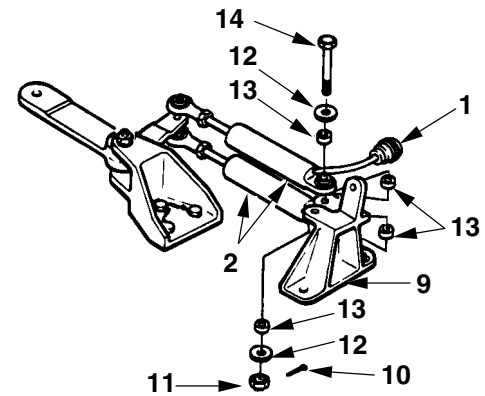
Clean, inspect, and/or repair transducers (Task 11-5-5).

Install center console top cover (Task 2-2-99).

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Install forward fairing assembly (Task 2-2-47).

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).



406074-4
J0536

END OF TASK

11-4-19. DIRECTIONAL CONTROL LOWER AFT HORIZONTAL TUBE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B236)
Torque Wrench (B237)
■ Torque Wrench (B239)

Material:
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Center Console Top Cover Removed
(Task 2-2-99)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)
Center Post Duct and Panels Removed
(Task 2-2-69)

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 11-4-19. DIRECTIONAL CONTROL LOWER AFT HORIZONTAL TUBE — REMOVAL/INSTALLATION (CONT)

REMOVE

WARNING

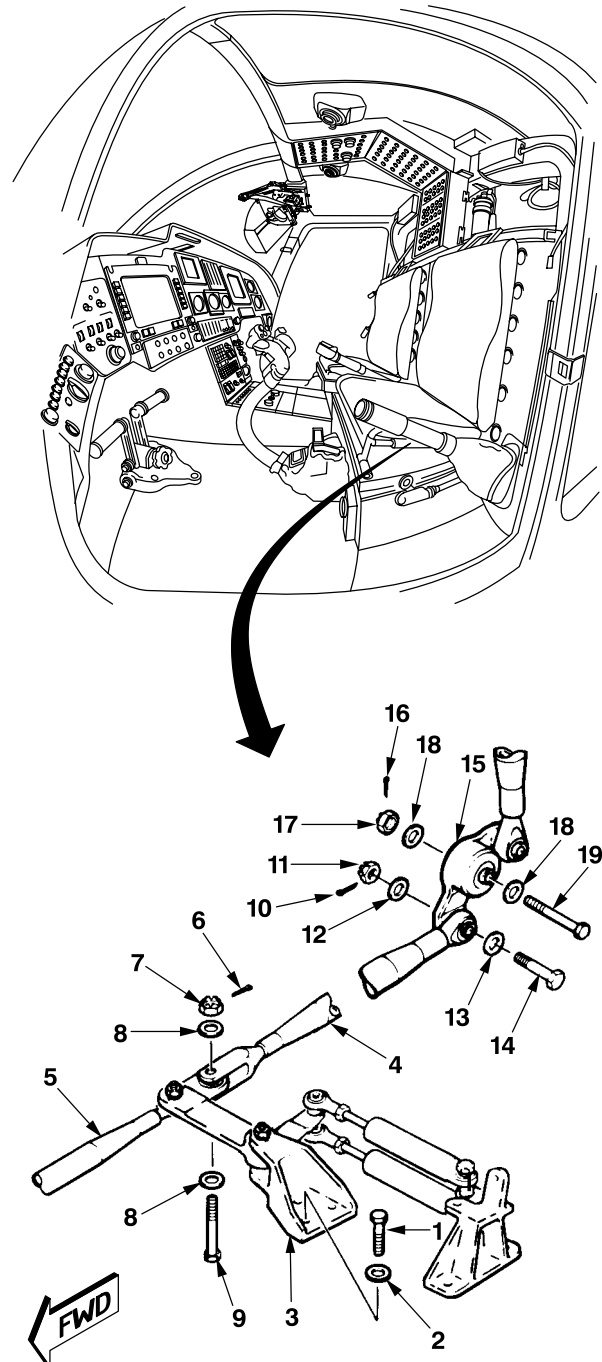
- Do not operate directional controls during lower aft horizontal tube replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Remove lockwire from three bolts (1).
2. Remove three bolts (1), three washers (2), raise up support (3).
3. Disconnect tube (4) from tube (5) by removing cotter pin (6), nut (7), two washers (8), and bolt (9). Discard cotter pin.
4. Remove cotter pin (10), nut (11), and washer (12). Leave spacer (13) and bolt (14) installed. Discard cotter pin.

NOTE

Bolt through aft end of tube cannot be removed until bellcrank (15) is disconnected from tunnel bulkhead.

5. Remove cotter pin (16), nut (17), two washers (18), and bolt (19). Discard cotter pin.
6. Remove bolt (14) and spacer (13) and remove tube (4).
7. Refer to Task 11-5-1 for inspection and repair procedures.


 406001-122
 J0536

GO TO NEXT PAGE

11-4-19. DIRECTIONAL CONTROL LOWER AFT HORIZONTAL TUBE — REMOVAL/INSTALLATION
(CONT)

INSTALL

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

8. Connect tube (4) to tube (5) with bolt (9) installed head down, two washers (8), and nut (7). Torque nut (7) **30 TO 40 INCH-POUNDS**.

9. Install cotter pin (6) through nut (7).

10. Install three bolts (1) with washers (2) in support (3). Torque bolts (1) **50 TO 70 INCH-POUNDS** and secure with lockwire (D132).

11. Connect tube (4) to lower tunnel bellcrank (15) with bolt (14), spacer (13), washer (12), and nut (11). Torque nut (11) **30 TO 40 INCH-POUNDS**.

12. Install cotter pin (10) through nut (11).

13. Install bellcrank (15) with bolt (19), two washers (18), and nut (17). Torque nut (17) **100 TO 140 INCH-POUNDS**.

14. Install cotter pin (16) through nut (17).

INSPECT

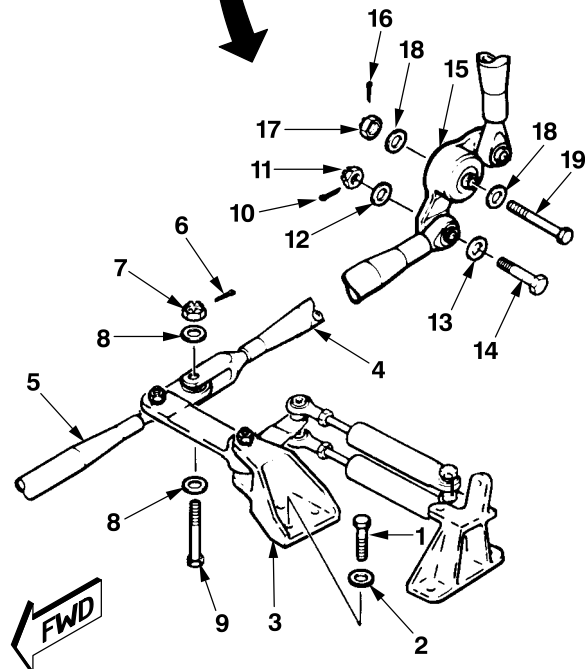
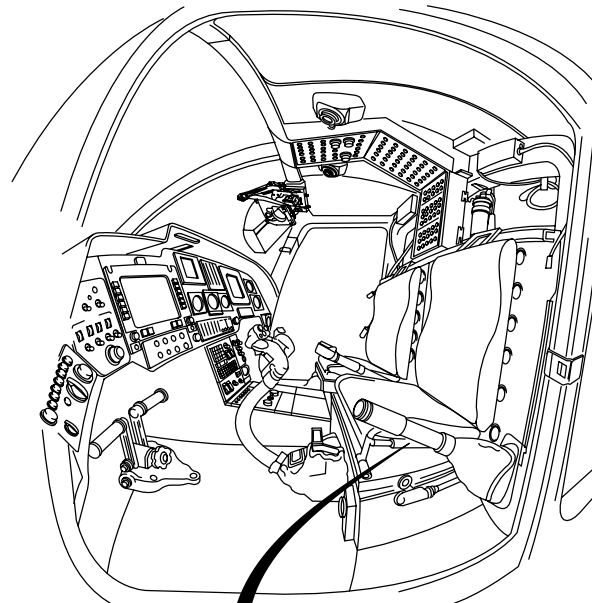
FOLLOW-ON MAINTENANCE

Check rigging of directional control system (Task 11-1-4).

Install center console top cover (Task 2-2-99).

Install armor seat panel and crew seat (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Install center post duct and panels (Task 2-2-69).



406001-122
J0536

END OF TASK

11-4-20. DIRECTIONAL CONTROL LOWER TUNNEL BELLCRANK — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Torque Wrench (B236)
Torque Wrench (B237)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:

TM 1-1500-204-23

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Center Post Duct and Panels Removed
(Task 2-2-69)

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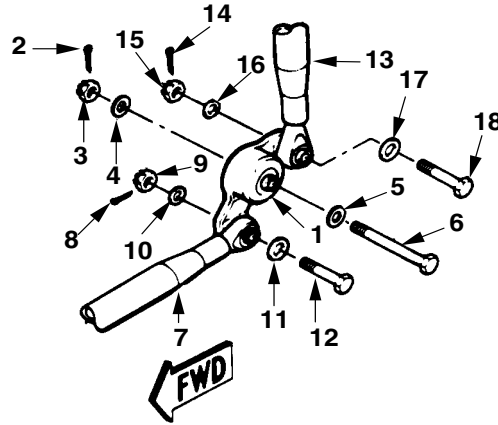
11-4-20. DIRECTIONAL CONTROL LOWER TUNNEL BELLCRANK — REMOVAL/INSTALLATION
(CONT)

WARNING

- Do not operate directional controls during lower tunnel bellcrank replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

CAUTION

Do not operate directional controls during bellcrank removal and installation. Control tube chafing could occur.



406001-126
J0536

1. Disconnect bellcrank (1) by removing cotter pin (2), nut (3), washer (4), washer (5), and bolt (6). Discard cotter pin.

2. Disconnect tube (7) from bellcrank (1) by removing cotter pin (8), nut (9), washer (10), spacer (11), and bolt (12). Discard cotter pin.

3. Disconnect vertical tube (13) from bellcrank (1) by removing cotter pin (14), nut (15), washer (16), spacer (17), and bolt (18). Discard cotter pin and remove bellcrank from helicopter.

4. Refer to Task 11-5-2 for inspection and repair procedures.

INSTALL

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

5. Connect bellcrank (1) to tube (7) with bolt (12), spacer (11), washer (10), and nut (9). Torque nut (9) **30 TO 40 INCH-POUNDS**.

6. Install cotter pin (8) through nut (9).

7. Connect vertical tube (13) to bellcrank (1) with bolt (18), spacer (17), washer (16), and nut (15). Torque nut (15) **30 TO 40 INCH-POUNDS**.

8. Install cotter pin (14) through nut (15).

9. Install bellcrank (1) with bolt (6), washer (5), washer (4), and nut (3). Torque nut (3) **60 TO 85 INCH-POUNDS**.

10. Install cotter pin (2) through nut (3).

INSPECT

FOLLOW-ON MAINTENANCE

Check rigging of directional control system (Task 11-1-4).

Install center post duct and panels (Task 2-2-69). ■

END OF TASK

11-4-21. DIRECTIONAL CONTROL LOWER TUNNEL BELLCRANK BUSHING — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Hand Arbor Press (B107)
Reamer Set (B114)

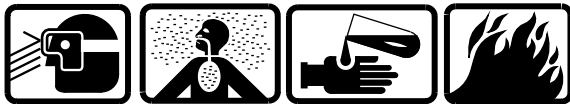
Material:
Cheesecloth (D56)
Acetone (D2)
Abrasive Mats (D1)
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
68D Aircraft Powertrain Repairer

REMOVE

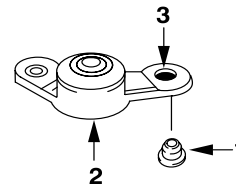
1. Using hand arbor press (B107), press bushing (1) from bellcrank (2). Discard bushing.

PREPARE



Acetone

2. Clean epoxy primer coating from bellcrank bore (3) with acetone (D2) and abrasive mats (D1).



406001-127
J0536



Epoxy Primer Coating

3. Apply epoxy primer coating (D98) to outside surface of replacement bushing (1) and bellcrank bore (3).

with cheesecloth (D56) dampened with acetone (D2).

5. Using reamer (Part of reamer set (B114)), ream bushing (1) to **0.2495 to 0.2505 inch**.

INSTALL

4. While epoxy primer coating is still wet, press bushing (1) into bellcrank (2) until flange is flush with bellcrank. Wipe away excess primer

INSPECT

END OF TASK

11-4-22. DIRECTIONAL CONTROL VERTICAL TUBE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B237)
Torque Wrench (B238)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Center Post Duct and Panels Removed
(Task 2-2-69)
Forward Fairing Assembly Removed (Task 2-2-47)

GO TO NEXT PAGE

11-4-22. DIRECTIONAL CONTROL VERTICAL TUBE — REMOVAL/INSTALLATION (CONT)

REMOVE

WARNING

- Do not operate directional controls during vertical tube replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

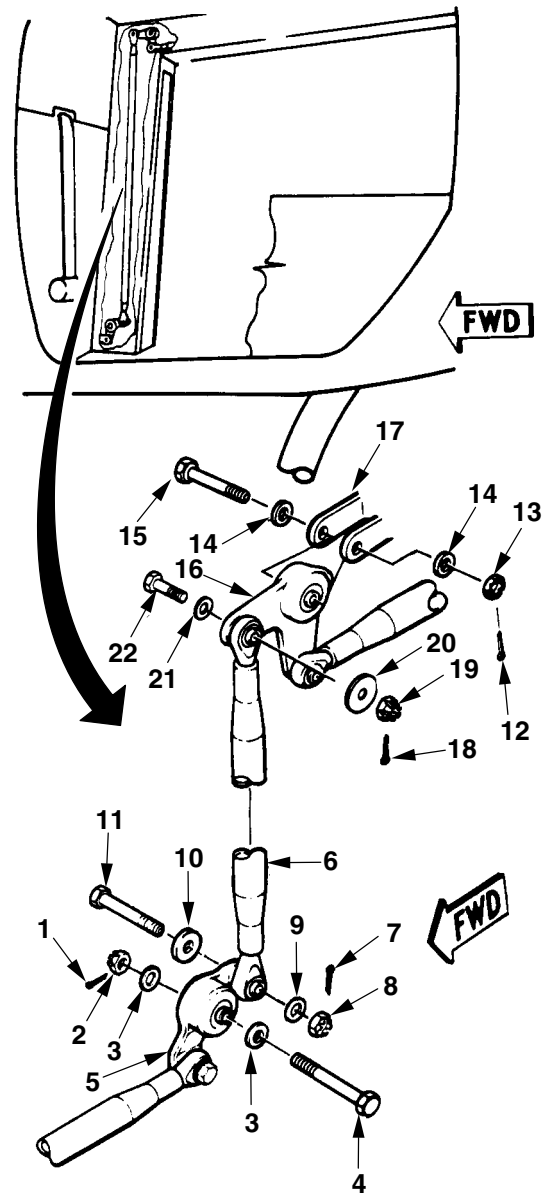
1. Remove cotter pin (1), nut (2), two washers (3), and bolt (4) securing bellcrank (5) to wall of tunnel. Discard cotter pin.

2. Disconnect lower end of tube (6) from bellcrank (5) by removing cotter pin (7), nut (8), spacer (9), washer (10), and bolt (11). Discard cotter pin.

3. Remove cotter pin (12), nut (13), two washers (14), and bolt (15) securing bellcrank (16) to bracket (17). Discard cotter pin.

4. Disconnect upper end of tube (6) from bellcrank (16) by removing cotter pin (18), nut (19), spacer (20), washer (21), and bolt (22). Remove tube assembly up through roof. Discard cotter pin.

5. Refer to Task 11-5-1 for inspection and repair procedures.



406001-131
J0536

GO TO NEXT PAGE

11-4-22. DIRECTIONAL CONTROL VERTICAL TUBE — REMOVAL/INSTALLATION (CONT)

INSTALL

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

6. Install tube (6) down through roof and connect upper end to bellcrank (16) with bolt (22), washer (21), spacer (20), and nut (19).

7. Torque nut (19) **30 TO 40 INCH-POUNDS** and install cotter pin (18) through nut (19).

8. Connect bellcrank (16) to bracket (17) with bolt (15), two washers (14), and nut (13).

9. Torque nut (13) **30 TO 40 INCH-POUNDS** and install cotter pin (12) through nut (13).

10. Connect lower end of tube (6) to bellcrank (5) with bolt (11), washer (10), spacer (9), and nut (8).

11. Torque nut (8) **30 TO 40 INCH-POUNDS** and install cotter pin (7) through nut (8).

12. Connect bellcrank (5) to wall of tunnel with bolt (4), two washers (3), and nut (2).

13. Torque nut (2) **60 TO 85 INCH-POUNDS** and install cotter pin (1) through nut (2).

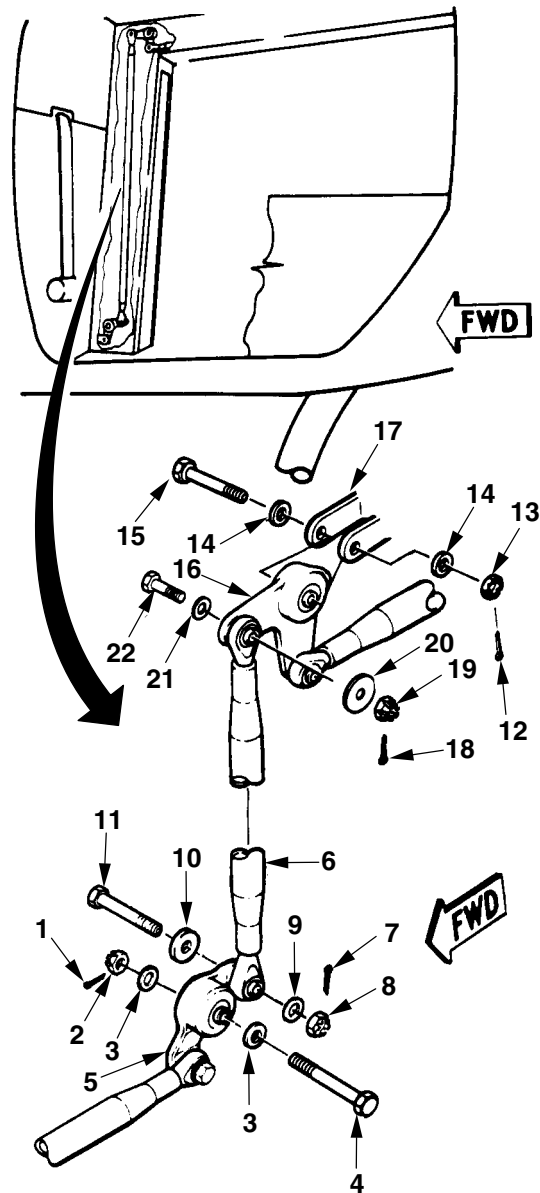
INSPECT

FOLLOW-ON MAINTENANCE

Check rigging of directional control system (Task 11-1-4).

Install center post duct and panels (Task 2-2-69).

Install forward fairing assembly (Task 2-2-47).



406001-131
J0536

END OF TASK

11-4-23. DIRECTIONAL CONTROL UPPER TUNNEL BELLCRANK — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

References:
TM 1-1500-204-23

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Center Post Duct and Panels Removed
(Task 2-2-69)

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B236)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

GO TO NEXT PAGE

11-4-23. DIRECTIONAL CONTROL UPPER TUNNEL BELLCRANK — REMOVAL/INSTALLATION (CONT)

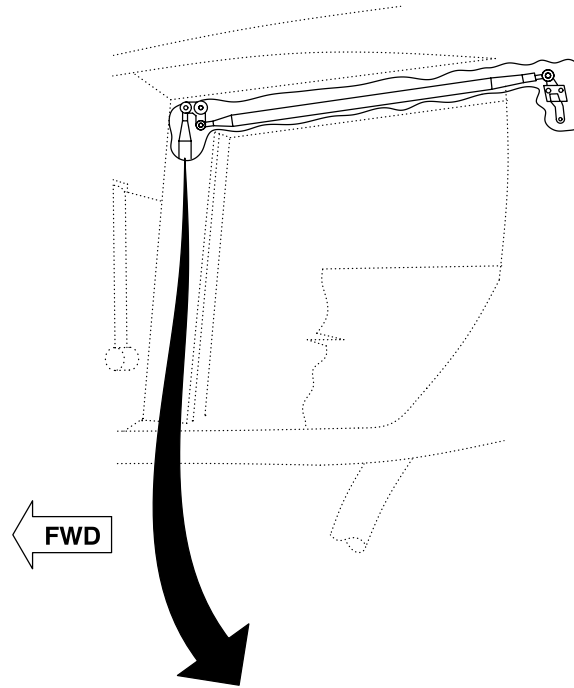
REMOVE

WARNING

- Do not operate directional controls during upper tunnel bellcrank replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Disconnect directional control vertical tube (1) and upper horizontal tube (2) by removing two cotter pins (3), two nuts (4), two spacers (5), two washers (6), and two bolts (7). Discard cotter pins.

2. Remove upper tunnel bellcrank (8) from support (9) by removing cotter pin (10), nut (11), two washers (12), and bolt (13). Discard cotter pin and remove bellcrank (8) from helicopter.



INSTALL

NOTE

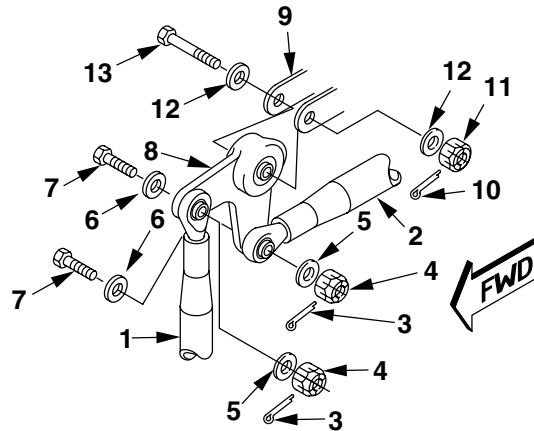
Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

3. Install serviceable bellcrank (8) in support (9) with bolt (13), two washers (12), and nut (11). Torque nut (3) **30 TO 40 INCH-POUNDS**.

4. Install cotter pin (10) through nut (11).

5. Connect vertical tube (1) and upper horizontal tube (2) to bellcrank (8) with two bolts (7), two washers (6), two spacers (5), and two nuts (4). Torque nut (4) **30 TO 40 INCH-POUNDS**.

6. Install cotter pins (3) through nuts (4).



406001-135
J0536

INSPECT

FOLLOW-ON MAINTENANCE

Check rigging of directional control system (Task 11-1-4).

Install center post duct and panels (Task 2-2-69).

END OF TASK

11-4-24. DIRECTIONAL CONTROL UPPER HORIZONTAL TUBE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Maintenance Stand (B162)
Torque Wrench (B236)
■ Torque Wrench (B237)

Material:

Sealant (D180)
Acetone (D2)
Rubber Gloves (D111)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:

TM 1-1500-204-23

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Center Post Duct and Panels Removed
(Task 2-2-69)
Engine Assembly Removed
(Task 4-1-1 or 4-1-2)

GO TO NEXT PAGE

11-4-24. DIRECTIONAL CONTROL UPPER HORIZONTAL TUBE — REMOVAL/INSTALLATION
(CONT)

REMOVE

WARNING

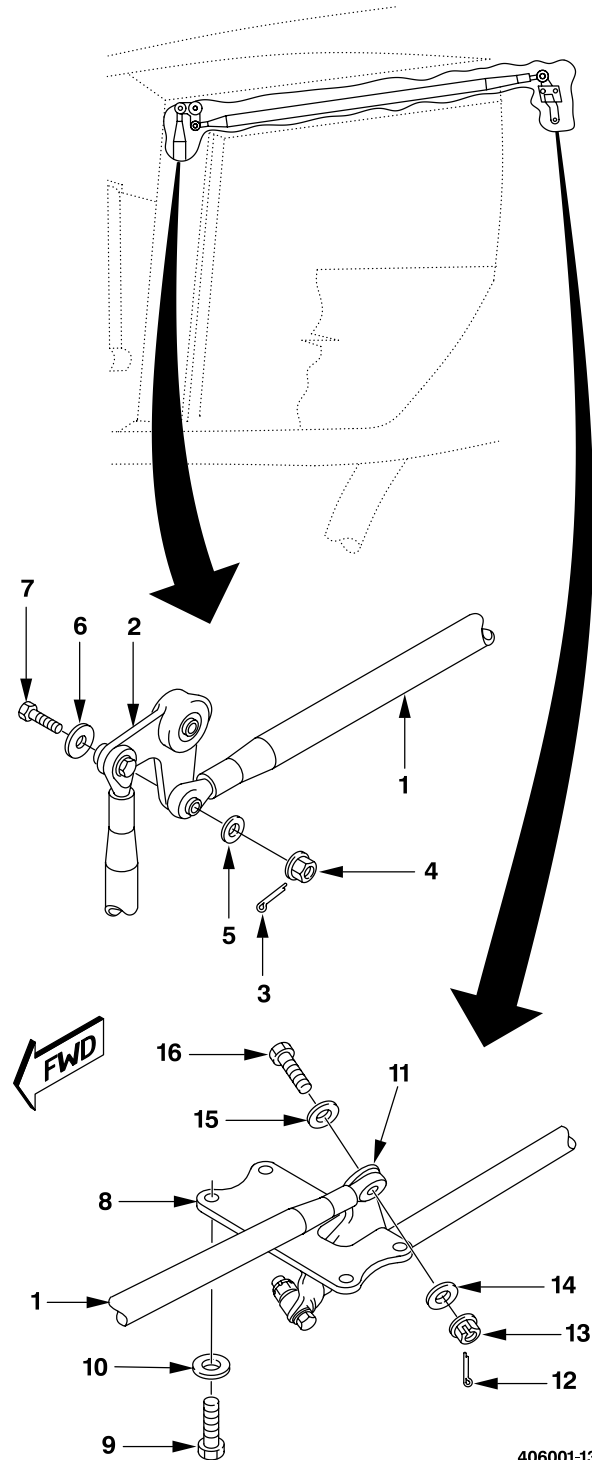
- Do not operate directional controls during upper horizontal tube replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Position maintenance stand (B162) next to helicopter.

2. Disconnect horizontal tube (1) from upper tunnel bellcrank (2) by removing cotter pin (3), nut (4), spacer (5), washer (6), and bolt (7). Discard cotter pin.

3. Remove walking beam support (8) by removing four bolts (9) and four washers (10).

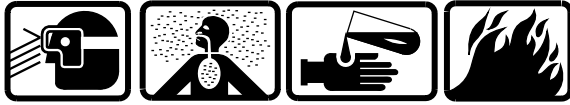
4. Disconnect walking beam (11) from horizontal tube (1) by removing cotter pin (12), nut (13), spacer (14), washer (15), and bolt (16). Discard cotter pin.



406001-137
J1852

GO TO NEXT PAGE

 11-4-24. DIRECTIONAL CONTROL UPPER HORIZONTAL TUBE — REMOVAL/INSTALLATION
 (CONT)

**Acetone**

5. Remove sealant from around plug (17) in front of engine compartment with plastic scraper and remove plug from engine deck. Clean old sealant off plug and from around hole (18) with acetone (D2).

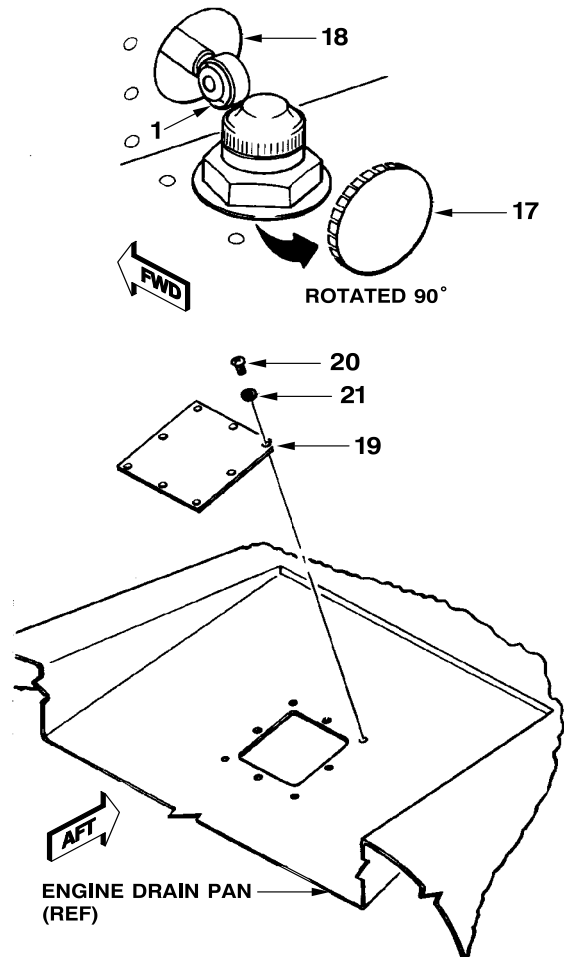
6. Remove sealant from pan and cover (19) with plastic scraper.

7. Remove eight screws (20) and washers (21) from engine drain pan cover (19).

8. Remove cover (19) from engine drain pan and clean old sealant from pan and cover (19) with acetone (D2).

9. Remove horizontal tube (1) by sliding tube aft through drain pan hole (18).

10. Refer to Task 11-5-1 for inspection and repair procedures.

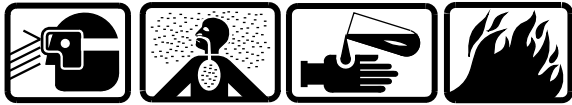

 406001-138
 J1825

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11-4-24. DIRECTIONAL CONTROL UPPER HORIZONTAL TUBE — REMOVAL/INSTALLATION
(CONT)

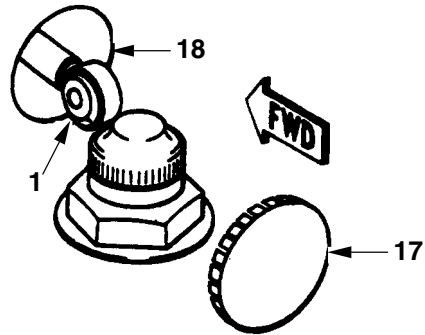
INSTALL

11. Slide upper horizontal tube (1) forward through hole (18) in engine compartment until tube is in place at upper tunnel bellcrank (2) and forward walking beam (11).



Sealing Compound

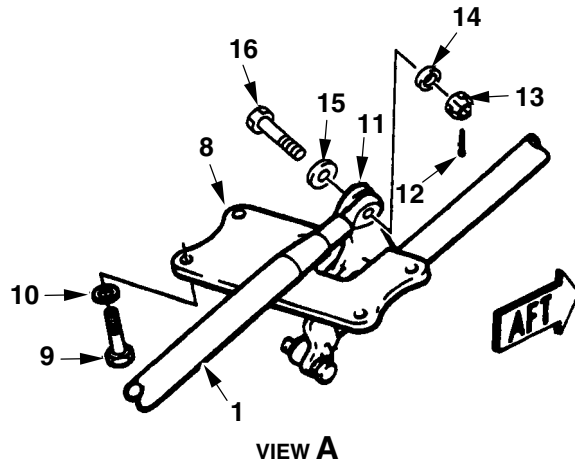
12. Apply coating of sealant (D180) around plug hole (18) and on mating surface of plug (17), and install plug in hole.



NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

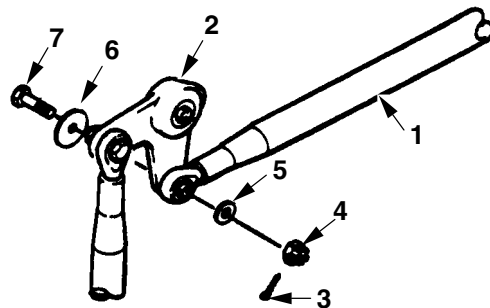
13. Connect tube (1, view A) to upper end of walking beam (11) with bolt (16), washer (15), spacer (14), and nut (13). Torque nut (13) **30 TO 40 INCH-POUNDS**.



14. Install cotter pin (12) through nut (13).

15. Install support (8) with four bolts (9) and four washers (10). Torque bolts (9) **50 TO 70 INCH-POUNDS**.

16. Connect tube (1, view B) to upper tunnel bellcrank (2) with bolt (7), washer (6), spacer (5), and nut (4). Torque nut (4) **30 TO 40 INCH-POUNDS**.



17. Install cotter pin (3) through nut (4).

INSPECT

VIEW B

406001-140
J0536

GO TO NEXT PAGE

11-4-24. DIRECTIONAL CONTROL UPPER HORIZONTAL TUBE — REMOVAL/INSTALLATION
(CONT)

18. Install engine drain pan cover (19) with eight screws (20) and washers (21).

19. Apply coating of sealant (D180) around engine drain pan cover (19).

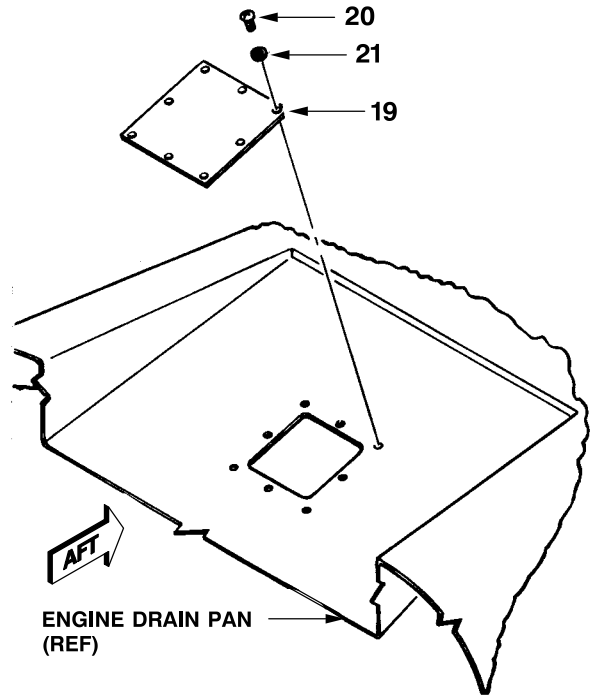
INSPECT

FOLLOW-ON MAINTENANCE

Check rigging of directional control system (Task 11-1-4).

Install center post duct and panels (Task 2-2-69).

Install engine assembly (Task 4-1-5 or 4-1-6).



406961-269
J2498

END OF TASK

11-4-25. DIRECTIONAL CONTROL FORWARD WALKING BEAM — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B236)
■ Torque Wrench (B237)

Material:
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

11-4-25. DIRECTIONAL CONTROL FORWARD WALKING BEAM — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Disconnect nonboosted tube (1) from lower end at walking beam (2) by removing cotter pin (3), nut (4), spacer (5), washer (6), and bolt (7). Discard cotter pin.
2. Cut lockwire on pivot bolt (8) and remove bolt (8) and washer (9).
3. Remove walking beam support (10) by removing four bolts (11) and four washers (12).
4. Disconnect upper horizontal tube (13) from walking beam (2) by removing cotter pin (14), nut (15), washer (16), spacer (17), and bolt (18). Discard cotter pin.
5. Remove walking beam (2) from helicopter.
6. Refer to Task 11-5-2 for inspection and repair procedures.

INSTALL

NOTE

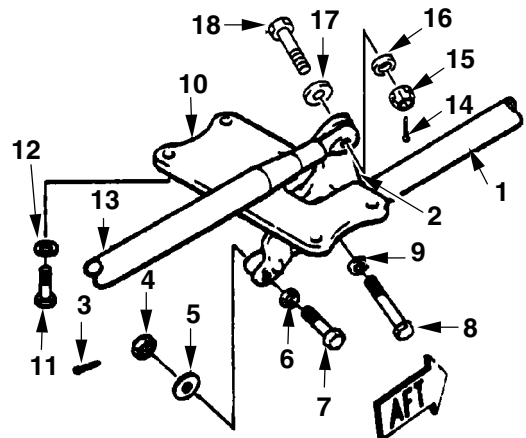
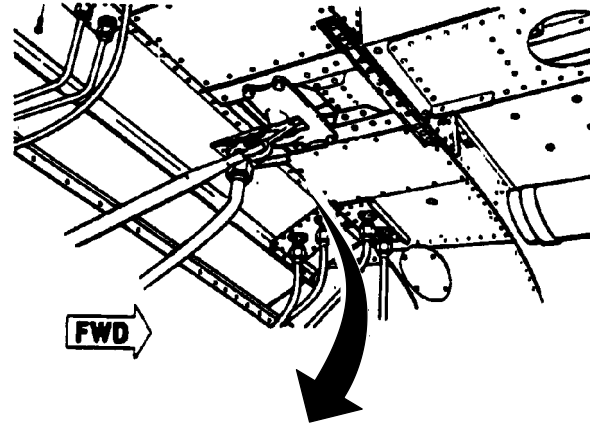
Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

7. Connect upper horizontal tube (13) to upper end of walking beam (2) with bolt (18), spacer (17), washer (16), and nut (15). Torque nut (15) **30 TO 40 INCH-POUNDS**.
8. Install cotter pin (14) through nut (15).
9. Install support (10) with four bolts (11) and four washers (12). Torque bolts (11) **50 TO 70 INCH-POUNDS**.
10. Install walking beam (2) in support (10) with bolt (8) and washer (9). Torque bolt (8) **50 TO 70 INCH-POUNDS** and secure with lockwire (D132).
11. Connect nonboosted tube (1) to lower end of walking beam (2) with bolt (7), washer (6), spacer (5), and nut (4). Torque nut (4) **30 TO 40 INCH-POUNDS**.
12. Install cotter pin (3) through nut (4).

INSPECT

FOLLOW-ON MAINTENANCE

Check rigging of directional control system (Task 11-1-4).



406001-142-2
J0536

END OF TASK

11-4-26. DIRECTIONAL CONTROL NONBOOSTED TUBE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Left Access Panel Removed (Task 2-2-83) ■

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B236)
Torque Wrench (B237)

GO TO NEXT PAGE

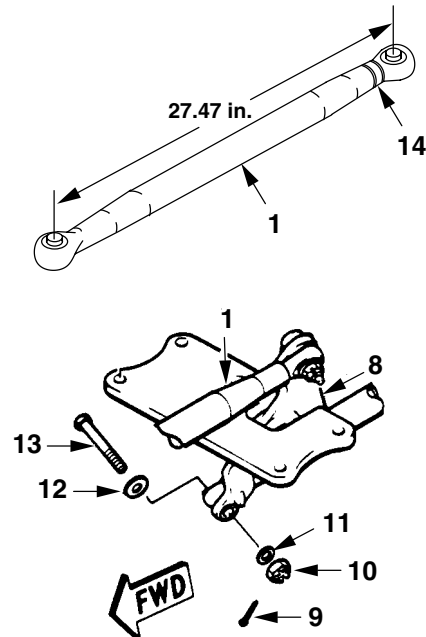
11-4-26. DIRECTIONAL CONTROL NONBOOSTED TUBE — REMOVAL/INSTALLATION (CONT)

REMOVE

WARNING

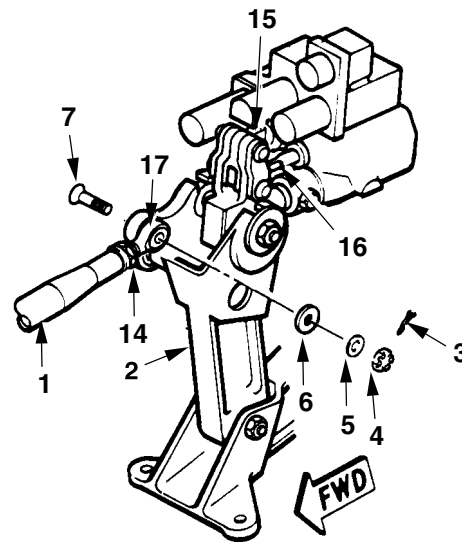
- Do not operate directional controls during nonboosted tube replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Open aft electrical compartment door.
2. Disconnect aft end of nonboosted tube (1) from actuator idler (2) by removing cotter pin (3), nut (4), washer (5), spacer (6), and bolt (7). Discard cotter pin (3).
3. Disconnect forward end of nonboosted tube (1) from forward walking beam (8) by removing cotter pin (9), nut (10), washer (11), spacer (12), and bolt (13). Discard cotter pin and remove tube from helicopter.
4. Refer to Task 11-5-1 for inspection and repair procedures.



INSTALL

5. Open aft electrical compartment door.
6. Preset tube (1) to **27.47 inches** between bolt hole centers. Do not tighten jamnut (14) at this time.
7. Connect forward end of tube (1) to forward walking beam (8) with bolt (13), spacer (12), washer (11), and nut (10). Torque nut (10) **30 TO 40 INCH-POUNDS** and install cotter pin (9).
8. Position and hold pilot left pedal against extreme forward left pedal stop.
9. Position bottom servo actuator (15) forward and servo actuator valve (16) aft. Adjust tube (1) to fit actuator idler (2), then lengthen tube 6.5 complete turns of adjustable rod end bearing (17).
10. Torque jamnut (14) **90 TO 100 INCH-POUNDS**.
11. Connect tube (1) to idler (2) with bolt (7), spacer (6), washer (5), and nut (4). Torque nut (4) **50 TO 70 INCH-POUNDS** and install cotter pin (3).
12. Close aft electrical compartment door.

406001-149
J0536

GO TO NEXT PAGE

11-4-26. DIRECTIONAL CONTROL NONBOOSTED TUBE — REMOVAL/INSTALLATION (CONT)

INSPECT

FOLLOW-ON MAINTENANCE

Check rigging of directional control system (Task 11-1-4).

- Install left access panel (Task 2-2-83).

END OF TASK

11-4-27. DIRECTIONAL CONTROL ADJUSTABLE TUBE BEARING (TYPICAL) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Torque Wrench (B238)

Personnel Required:

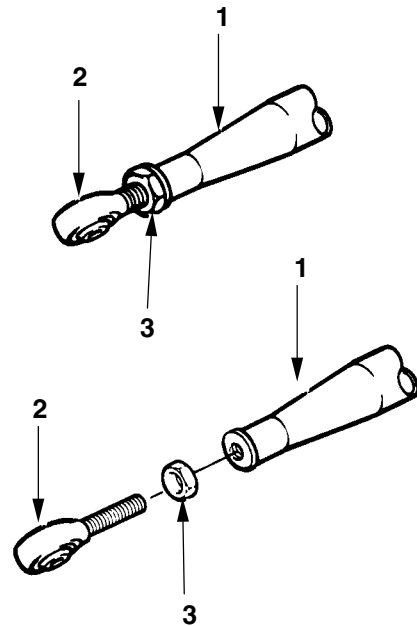
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

REMOVE

1. Measure and record distance between end of tube (1) and center line of bolt hole in rod end bearing (2).
2. Hold control tube (1) and loosen jamnut (3).
3. Unscrew rod end (2) and remove jamnut (3).

INSTALL

4. Thread jamnut (3) on rod end bearing (2) and install rod end bearing in tube (1).
5. Set rod end (2) to dimension recorded in step 1.
6. Torque jamnut (3) **95 TO 110 INCH-POUNDS**.

INSPECT

406001-147
J1831

END OF TASK

11-4-28. DIRECTIONAL CONTROL ACTUATOR INPUT IDLER ASSEMBLY — REMOVAL/
INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B237)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Servo Trunnion Bearing Removed (Task 7-1-3)

GO TO NEXT PAGE

 11-4-28. DIRECTIONAL CONTROL ACTUATOR INPUT IDLER ASSEMBLY — REMOVAL/
 INSTALLATION (CONT)

REMOVE

WARNING

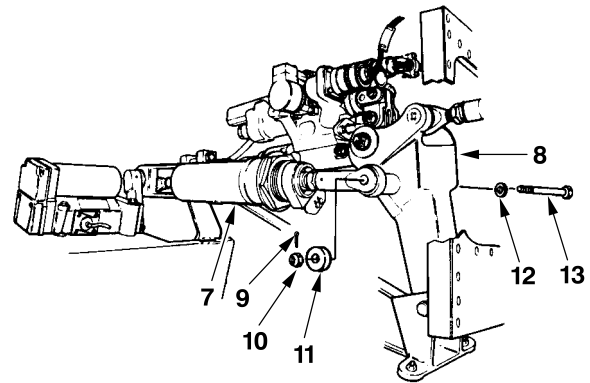
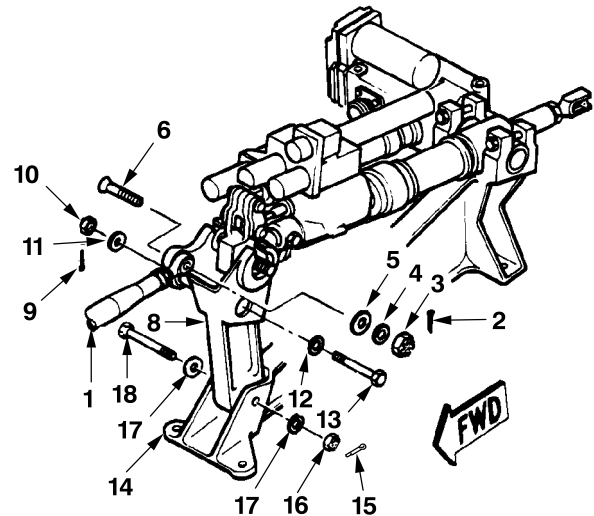
- Do not operate directional controls during actuator input idler assembly replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Remove control tube (1) by removing cotter pin (2), nut (3), washer (4), spacer (5), and bolt (6). Discard cotter pin.

2. Disconnect force gradient (7) from idler (8) by removing cotter pin (9), nut (10), spacer (11), washer (12), and bolt (13). Discard cotter pin.

3. Remove idler (8) from actuator support (14) by removing cotter pin (15), nut (16), two washers (17), and bolt (18). Discard cotter pin.

4. Refer to Task 11-5-2 for inspection and repair procedures.



VIEW LOOKING AFT

406001-151
J1831

GO TO NEXT PAGE

11-4-28. DIRECTIONAL CONTROL ACTUATOR INPUT IDLER ASSEMBLY — REMOVAL/
INSTALLATION (CONT)

INSTALL

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT
PART (FSCAP)

Correct installation of cotter pin (15) is a characteristic critical to flight safety.

5. Position idler (8) on actuator support (14) and install with bolt (18), two washers (17), and nut (16).

6. Torque nut (16) **50 TO 70 INCH-POUNDS**. Install cotter pin (15) through nut (16).

7. Connect force gradient (7) with bolt (13), washer (12), spacer (11), and nut (10).

8. Torque nut (10) **50 TO 70 INCH-POUNDS**. Install cotter pin (9) through nut (10).

9. Connect control tube (1) with bolt (6), spacer (5), washer (4), and nut (3).

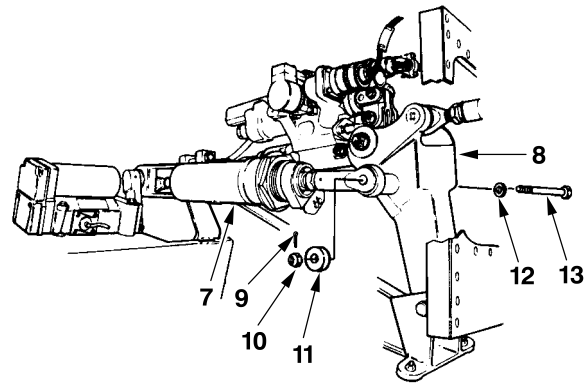
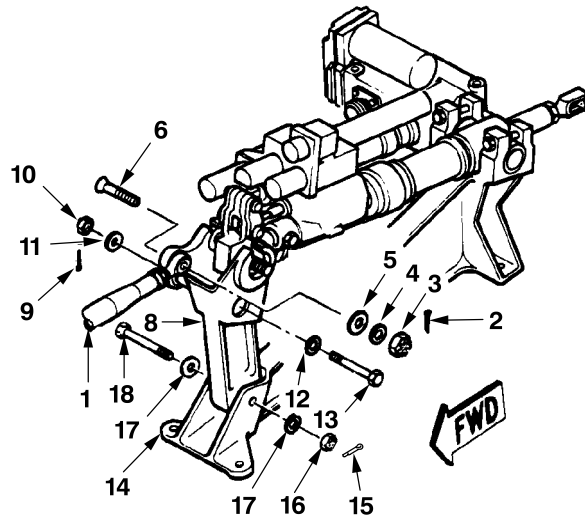
10. Torque nut (3) **50 TO 70 INCH-POUNDS**. Install cotter pin (2) through nut (3).

INSPECT

FOLLOW-ON MAINTENANCE

Install servo trunnion bearing (Task 7-1-3).

Check rigging of directional control system (Task 11-1-4).



VIEW LOOKING AFT

406001-151
J1831

END OF TASK

11-4-29. ACTUATOR IDLER BEARING (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

Powertrain Repairer Tool Kit (B180)
Bearing Staking Tool Set (B189)
Hand Arbor Press (B107)
Reamer Set (B114)

Material:

Abrasive Mats (D1)
Wiping Rag (D164)
Epoxy Primer Coating (D98)
Drycleaning Solvent (D199)
Rubber Gloves (D111)
Acetone (D2)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:

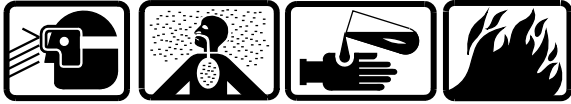
TM 55-1500-322-24

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11-4-29. ACTUATOR IDLER BEARING (AVIM) — REMOVAL/INSTALLATION (CONT)

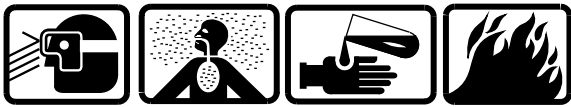
REMOVE

1. Using hand arbor press (B107), press bearing (1) and sleeve (2) from idler (3).



Drycleaning Solvent

2. Clean all surfaces with drycleaning solvent (D199) and wipe dry with wiping rag (D164).

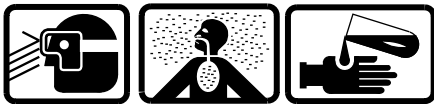


Acetone

3. Clean idler bore with acetone (D2) and abrasive mats (D1).

4. Inspect idler bore for damage (Task 11-5-2).

INSTALL



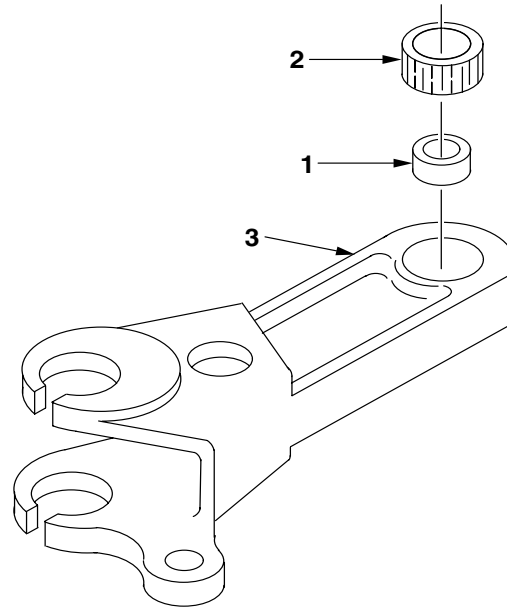
Epoxy Primer Coating

5. Apply epoxy primer coating (D98) to inside surface of idler bore and outside surface of sleeve (2).

6. Using hand arbor press (B107), press sleeve (2) into idler, while epoxy primer coating is still wet, until sleeve is centered equally on both sides.

7. Using reamer (Part of reamer set (B114)), ream sleeve (2) to **0.7488 to 0.7493 inch**.

8. Apply epoxy primer coating (D98) to inside surface of sleeve (2) and outside surface of bearing (1).



406001-152
J0564

9. Using hand arbor press (B107), press bearing (1) into sleeve (2), while primer is still wet, until bearing is centered equally on both sides.

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

The accomplishment of ring stake of sleeve on both sides is the critical characteristic of the directional control actuator input idler assembly.

10. Using bearing staking tool set (B189), ring stake sleeve (2) (both sides) TM 55-1500-322-24.

11. Remove excess epoxy primer coating with wiping rag (D164) dampened with acetone (D2).

INSPECT

END OF TASK

 11-4-30. DIRECTIONAL CONTROL SERVOACTUATOR SUPPORT — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
 ■ General Mechanic Tool Kit (B178)
 ■ Torque Wrench (B237)

Personnel Required:
 67S Scout Helicopter Technical Inspector (TI)
 67S Scout Helicopter Repairer

Equipment Condition:
 Helicopter Safed (Task 1-6-7)
 Actuator Input Idler Removed (Task 11-4-28)
 Servoactuator Removed (Task 7-1-1)

REMOVE

WARNING

- Do not operate directional controls during servoactuator support replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Remove support assembly (1) by removing four bolts (2) and four washers (3).

2. Refer to Task 11-5-3 for inspection and repair procedures.

INSTALL

3. Install support assembly (1) in helicopter with four bolts (2) and four washers (3). Torque bolts (2) **50 TO 70 INCH-POUNDS**.

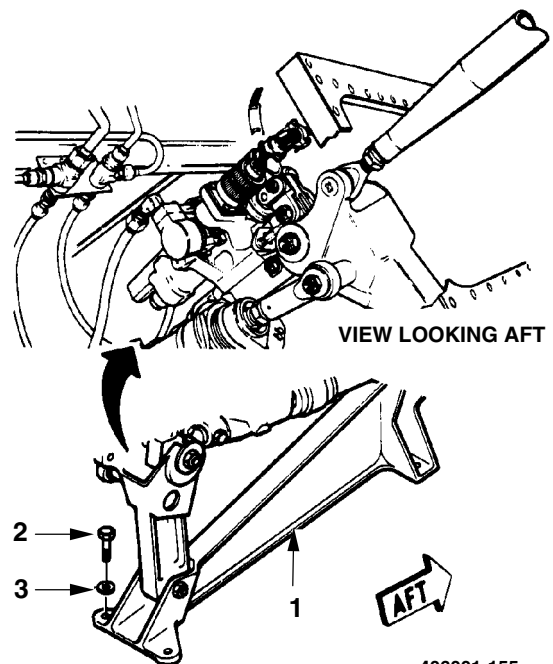
INSPECT

FOLLOW-ON MAINTENANCE

Install actuator input idler (Task 11-4-28).

Install servoactuator (Task 7-1-1).

Check rigging of directional control system (Task 11-1-4).



406001-155
J0536

END OF TASK

11-4-31. ACTUATOR SUPPORT BUSHING (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Repairer Tool Kit (B180)
Hand Arbor Press (B107)
Telescoping Gage Set (B47)
Reamer Set (B114)
Locator Tool (Work Aid) (H-27)

Material:
Acetone (D2)
Abrasive Mats (D1)
Epoxy Primer Coating (D98)
Cheesecloth (D56)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

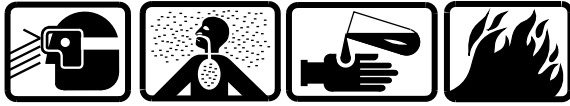
References:
TM 1-1500-204-23

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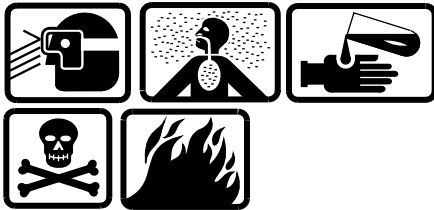
11-4-31. ACTUATOR SUPPORT BUSHING (AVIM) — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Using hand arbor press (B107), press flanged bushing (1) and bushing (2) from support (3).

**Acetone**

2. Clean primer from support bores with acetone (D2) and abrasive mat (D1).

INSTALL**Epoxy Primer Coating**

3. Apply epoxy primer coating (D98) to outside surface of replacement flanged bushing (1) and bore in support (3).

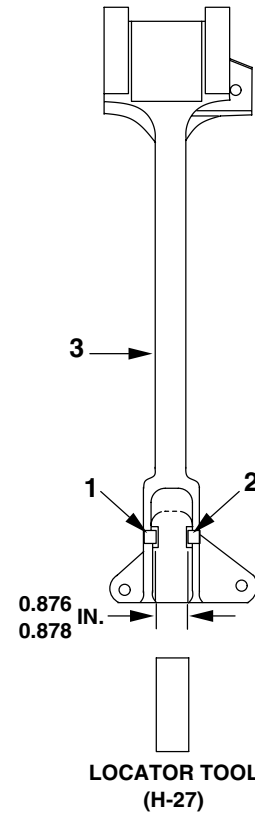
4. Using hand arbor press (B107), press flanged bushing (1) into support (3) until flange is flush with support. Wipe away excess epoxy primer coating with cheesecloth (D56) dampened with acetone (D2).

5. Apply epoxy primer coating (D98) to outside surface of bushing (2) and bore in support (3).

6. Position bushing (2) into hole of support (3). Place locator tool (work aid H-27) between flanged bushing (1) and support.

7. Using hand arbor press (B107), press bushing (2) into support until bushing touches tool. Wipe away excess primer with cheesecloth (D56) dampened with acetone (D2).

8. Using reamer (Part of reamer set (B114)) and telescoping gage set (B47), line ream bushings to **0.2495 to 0.2505 inch** (TM 1-1500-204-23).

INSPECT

406001-157
J1831

END OF TASK

11-4-32. DIRECTIONAL CONTROL FORCE GRADIENT — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B236)
Torque Wrench (B238)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-204-23

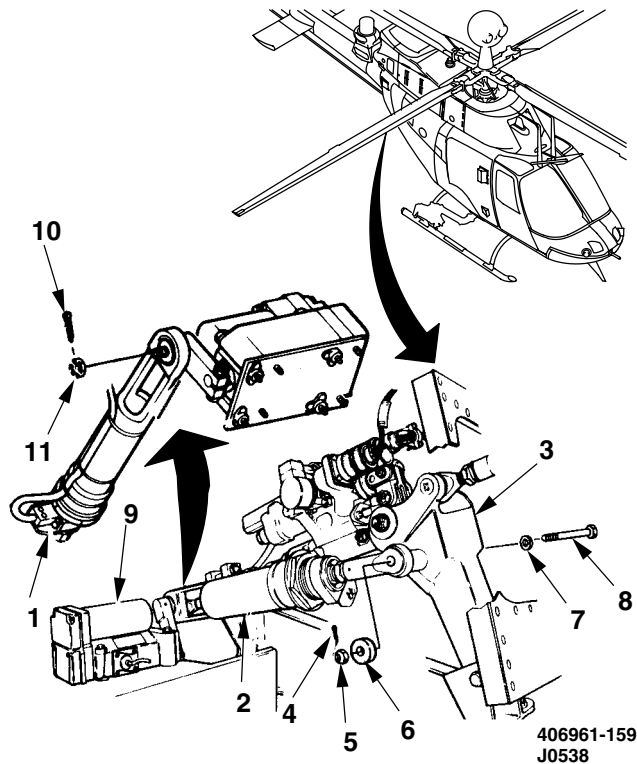
Equipment Condition:
Helicopter Safed (Task 1-6-7)
Right Access Panel Removed (Task 2-2-83)

REMOVE

WARNING

- Do not operate directional controls during nonboosted tube replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Disconnect electrical connector (1).
2. Disconnect force gradient (2) from actuator idler (3) by removing cotter pin (4), nut (5), spacer (6), washer (7), and bolt (8). Discard cotter pin.
3. Disconnect force gradient (2) from rotary trim actuator (9) by removing cotter pin (10) and nut (11). Discard cotter pin.
4. Remove force gradient (2) from helicopter.



GO TO NEXT PAGE

11-4-32. DIRECTIONAL CONTROL FORCE GRADIENT — REMOVAL/INSTALLATION (CONT)

5. Loosen jamnut (12) and remove rod end (13).

6. Refer to Task 11-4-33 for inspection and repair procedures.

INSTALL

7. Install jamnut (12) and rod end (13).

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

8. Connect force gradient (2) to rotary trim actuator (9) with nut (11). Torque nut (11) **30 TO 40 INCH-POUNDS**.

9. Install cotter pin (10) through nut (11).

10. Position and hold pilot left pedal forward against stop. Position arm rotary trim actuator (9) against forward stop.

11. Adjust rod end (13) to fit idler (3), then lengthen by 1.5 turns of rod end (13). Torque jamnut (12) **95 TO 110 INCH-POUNDS**.

12. Connect force gradient (2) to idler (3) with bolt (8), washer (7), spacer (6), and nut (5). Torque nut (5) **30 TO 40 INCH-POUNDS**.

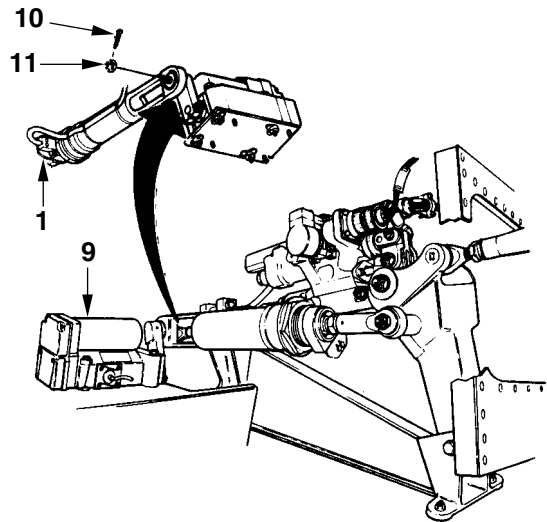
13. Install cotter pin (4) through nut (5).

14. Connect electrical connector (1).

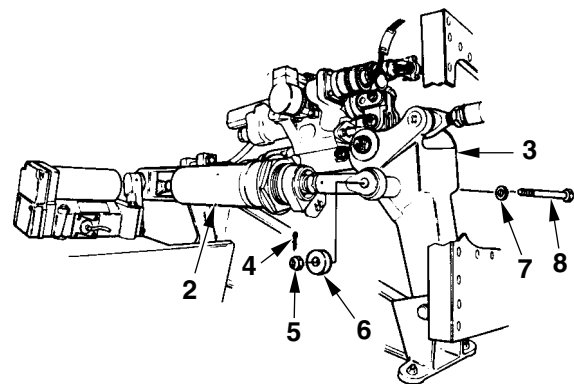
INSPECT

FOLLOW-ON MAINTENANCE

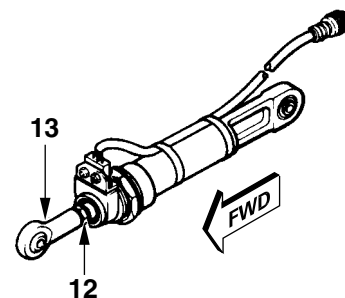
Install right access panel (Task 2-2-83).



VIEW LOOKING AFT



VIEW LOOKING AFT



406001-160
H2034

END OF TASK

11-4-33. DIRECTIONAL CONTROL FORCE GRADIENT — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Dial Indicating Depth Gage (B49)

Material:

Crocus Cloth (D90)
Sandpaper (D175)
Drycleaning Solvent (D199)
Epoxy Primer Coating (D98)
Wiping Rag (D164)
Rubber Gloves (D111)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

CLEAN



Drycleaning Solvent

1. Clean force gradient surfaces with drycleaning solvent (D199).
2. Dry force gradient with wiping rag (D164).

INSPECT

3. Inspect bearing for binding, freedom of movement, excessive play, and damage to limits shown.
4. Inspect force gradient for damage to limits shown. See figure Directional Control Force Gradient — Damage Limits.
5. Using dial indicating depth gage (B49), check that no end play of shaft is evident.
6. Inspect wire for condition and deterioration.

REPAIR

7. Replace force gradient with damage that exceeds limits shown.



Sanding Operations

8. Repair acceptable damage on exterior surfaces using 400 grit sandpaper (D175). Smooth surface with crocus cloth (D90).

INSPECT

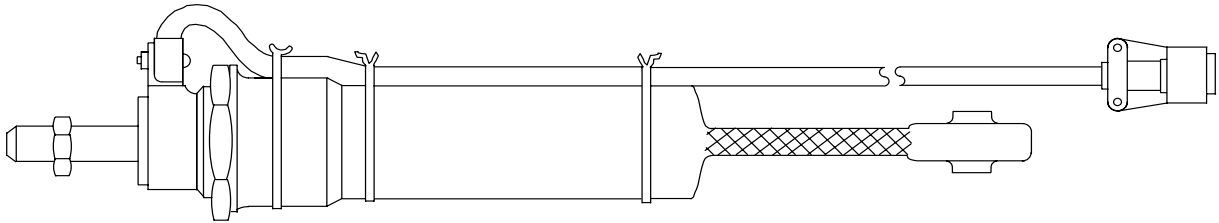


Epoxy Primer Coating

9. Apply epoxy primer coating (D98) to repaired area and let dry.

GO TO NEXT PAGE

11-4-33. DIRECTIONAL CONTROL FORCE GRADIENT — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	0.005 in. before and 0.010 in. after repair	0.007 in. before and 0.015 in. after repair
MECHANICAL AND CORROSION		
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	0.25 sq. in.
NUMBER OF REPAIRS	1 per area	1 per area
EDGE CHAMFER TO REMOVE DAMAGE	0.02 in. x .02	0.04 in. x .04
BORES	0.002 in. for 1/4 circumference	
THREAD DAMAGE:		
Depth:	1/3 of thread	
Length:	1/4 of circumference	
Number:	2 per threaded segment	
BEARING WEAR:		
Axial:	0.006	
Radial:	0.015	

406001-258
J0564

Directional Control Force Gradient — Damage Limits

END OF TASK

11-4-34. DIRECTIONAL CONTROL FORCE GRADIENT BEARING AND SLEEVE (AVIM) — REMOVAL/
INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Repairer Tool Kit (B180)
Hand Arbor Press (B107)
Bearing Staking Tool Set (B189)
Reamer Set (B114)
Upright Drill Press (B108)

Material:
Epoxy Primer Coating (D98)
Cheesecloth (D56)
Acetone (D2)
Abrasive Mats (D1)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

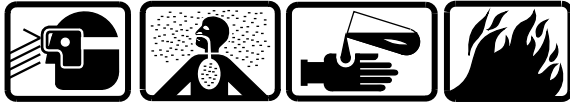
References:
TM 55-1500-322-24

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 11-4-34. DIRECTIONAL CONTROL FORCE GRADIENT BEARING AND SLEEVE (AVIM) — REMOVAL/INSTALLATION (CONT)

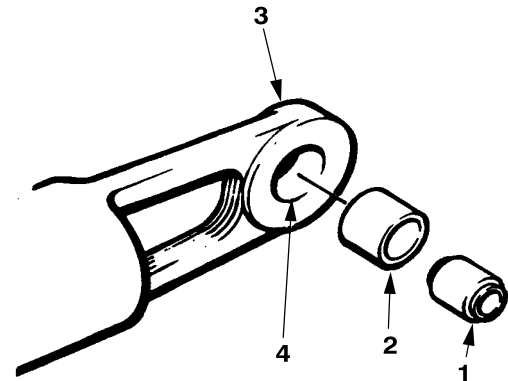
REMOVE

1. Using hand arbor press (B107), press bearing (1) and sleeve (2) from force gradient (3). Ensure pressing hole is slightly larger than outside diameter of bearing sleeve, and pressing plug is slightly smaller than outside diameter of sleeve.



Acetone

2. Clean old epoxy primer coating from bore (4) in force gradient (3) using acetone (D2) and abrasive mat (D1).

406001-161
J1825

INSTALL



Epoxy Primer Coating

3. Apply epoxy primer coating (D98) to outside surface of sleeve (2) and bore (4) of force gradient (3). Press sleeve into bore until sleeve is centered equally from each side.

4. Using reamer (Part of reamer set (B114)), ream sleeve (2) to **0.900 inch**.

5. Apply epoxy primer coating (D98) to inside surface of sleeve (2) and outside surface of bearing (1). Press bearing into sleeve until centered equally from each side.

6. Remove excess epoxy primer coating from surfaces with cheesecloth (D56) dampened with acetone (D2).

7. Using upright drill press (B108), attach bearing staking tool (Part of bearing staking tool set (B189)) and ring stake sleeve (2) (both sides) (TM 55-1500-322-24).

INSPECT

END OF TASK

11-4-35. DIRECTIONAL CONTROL FORCE GRADIENT SWITCH — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Electrical Repairer Tool Kit (B177)
Multimeter (B98)
Panduit Tie Gun (B62)

Material:
Sealing Compound (D183)
Tiedown Strap (D206)
Solder (D196)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68F Aircraft Electrician

GO TO NEXT PAGE

11-4-35. DIRECTIONAL CONTROL FORCE GRADIENT SWITCH — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove tiedown straps (D206) (1) from cable assembly (2).
2. Remove retainer (3) by removing two screws (4), two washers (5), and remove ball (6).
3. Remove two nuts (7), two washers (8), and two screws (9).
4. Remove sealing compound (D183) on switch (10) to enable desoldering wires.

WARNING

Soldering iron is hot and can cause burns. Handle with care. If burn injury occurs, seek medical aid.

5. Identify, tag, and desolder wires of cable assembly (2) from switch (10). Discard switch.

INSTALL

6. Connect and solder (D196) wires of cable assembly (2) to switch (10) and remove tags.

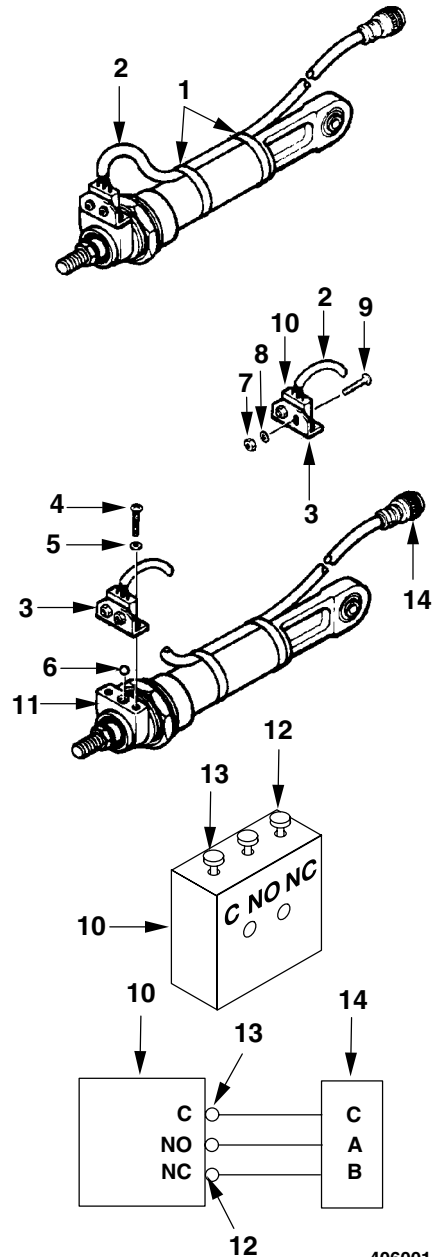


Sealing Compound

7. Install sealing compound (D183) on switch (10).
8. Install retainer (3) on switch (10) with two screws (9), two washers (8), and two nuts (7). Tighten nuts finger tight.
9. Insert ball (6) into cap (11). Attach retainer (3) to cap (11) with two screws (4) and two washers (5).

ADJUST

10. Connect multimeter (B98) to pins B (12) and C (13) of electrical connector (14) and adjust switch (10) up or down until continuity is broken. Switch should actuate and show continuity of connector (14), pins B (12) and C (13), while obtaining maximum shaft travel of **0.040 to 0.060 inch** in and out of cylinder.



406001-162
J0536

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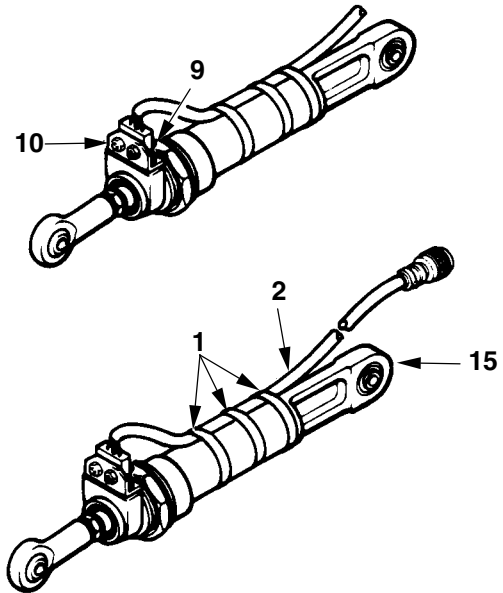
11-4-35. DIRECTIONAL CONTROL FORCE GRADIENT SWITCH — REMOVAL/INSTALLATION
(CONT)

11. After switch adjustment and shaft travel requirements have been coordinated, tighten two screws (9) in switch (10).

SECURE

12. Using panduit tie gun (B62), secure electrical cable assembly (2) to force gradient (15) with three tiedown straps (D206) (1) as shown.

INSPECT



406001-163
J0536

END OF TASK

**11-4-36. DIRECTIONAL CONTROL FORCE GRADIENT SPRING/GUIDES/SHAFT — REMOVAL/
INSTALLATION**

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

- General Mechanic Tool Kit (B178)
- Electrical Repairer Tool Kit (B177)
- Multimeter (B98)
- Panduit Tie Gun (B62)
- Spring Scale (B121)
- Torque Wrench (B238)

Material:

- Lockwire (D132)
- Tiedown Strap (D206)

Personnel Required:

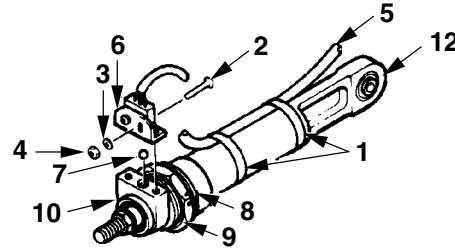
- 67S Scout Helicopter Technical Inspector (TI)
 - 67S Scout Helicopter Repairer
 - 68F Aircraft Electrician
-

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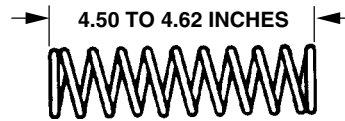
11-4-36. DIRECTIONAL CONTROL FORCE GRADIENT SPRING/GUIDES/SHAFT — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Cut and discard tiedown straps (D206) (1).
2. Remove two screws (2), two washers (3), and two nuts (4) attaching cable and switch assembly (5) to retainer (6). Remove ball (7).
3. Cut lockwire (8) and loosen jamnut (9). Unscrew cap (10). Withdraw spring assembly (11) from cylinder assembly (12).
4. Remove four jamnuts (13), actuator (14), two guides (15), spring (16), and three washers (17) from shaft (18).
5. Check washers (17), spring (16), guides (15), and shaft (18) for damage or corrosion. Replace any components that show signs of damage or corrosion.

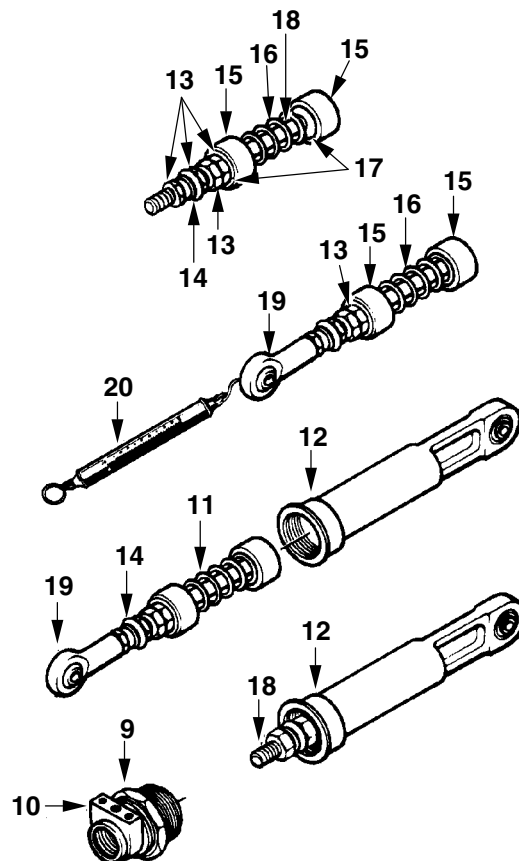


6. Measure free length of spring. Spring should be **4.50 to 4.62 inches** long. If spring exceeds limits, replace spring.



INSTALL

7. To assemble spring assembly (11), install one guide (15), washer (17), spring (16), two washers (17), second guide (15), three jamnuts (13), actuator (14), and jamnut (13) on shaft (18). Do not tighten jamnuts at this time.
8. Install a rod end (19) on shaft (18) and connect a spring scale (B121) (20) in rod end as shown.
9. Hold spring assembly (11) securely. Place spring scale (B121) (20) parallel with shaft (18) and exert 18 to 20 pounds of force on spring. Measure and record length of spring and guides.
10. Release force and remove spring scale (B121) (20) and rod end (19) from shaft (18).
11. Tighten nearest jamnut (13) against guide (15) until spring and guides are compressed to length recorded in step 9., then torque second jamnut (13) **95 TO 110 INCH-POUNDS** against first jamnut (13).
12. Mark with pencil around highpoint circumference of actuator (14) and insert spring assembly (11) into cylinder assembly (12).
13. Thread cap (10) into cylinder assembly (12) until all unnoticeable end play of spring assembly (11) is eliminated.



406001-164
J0536

GO TO NEXT PAGE

11-4-36. DIRECTIONAL CONTROL FORCE GRADIENT SPRING/GUIDES/SHAFT — REMOVAL/INSTALLATION (CONT)

14. Tighten cap jamnut (9) and secure with lockwire (D132) (8).

15. Align mark (21) on actuator (14) from step 12, in center of hole (22) on cap (10) by turning actuator (14) in or out on shaft threads.

16. Attach rod end (19) and pull on rod end until actuator (14) and actuator jamnut (13) are exposed. Torque jamnut (13) **95 TO 110 INCH-POUNDS** against actuator (14).

DO NOT DISTURB ACTUATOR SETTING

17. Release force on rod end. Check for actuator mark (21) alignment in hole (22) achieved in step 15. If alignment is disturbed, repeat steps 15., 16., and 17. until alignment is correct. If actuator mark (21) alignment is correct, proceed to step 18.

18. Insert ball (7) into hole (22) in cap (10). Connect cable and switch assembly (5) to retainer (6) with two screws (2), two washers (3), and two nuts (4). Tighten nuts finger tight.

ADJUST SWITCH

19. Connect multimeter (B98) to pins B (23) and C (24) of electrical connector (25) and adjust connector up or down on retainer (6) until continuity is broken. Switch should actuate and show continuity at connector pins B (23) and C (24) within **0.040 to 0.060 inch** shaft travel in and out of cylinder (Task 11-5-35).

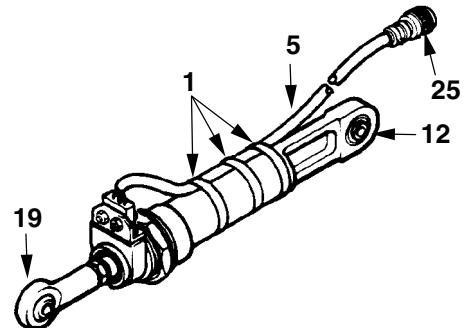
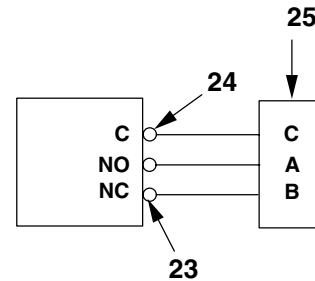
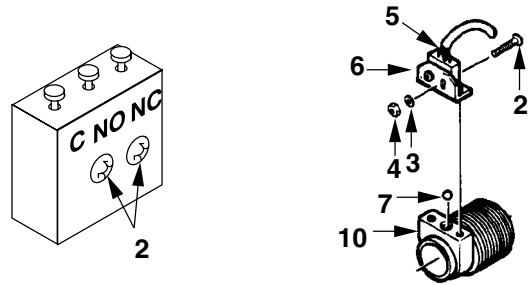
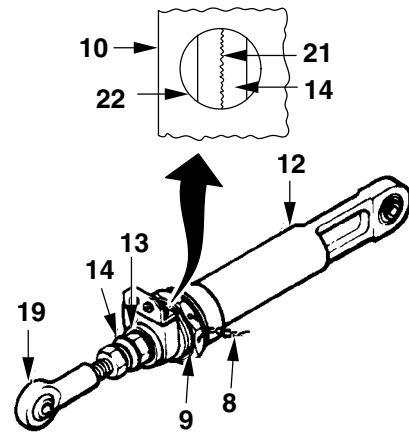
20. After switch adjustment, tighten switch screws (2).

COMPLETE ASSEMBLY

21. Secure cable and switch assembly (5) to cylinder assembly (12) with three tiedown straps (D206) (1) as shown using Panduit tie gun (B62).

22. Remove rod end (19).

INSPECT



406001-165
J0536

END OF TASK

11-4-37. DIRECTIONAL CONTROL ROTARY ACTUATOR — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Applicable Configurations:

All

References:

TM 1-1500-204-23

Tools:

General Mechanic Tool Kit (B178)
Torque Wrench (B237)

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Left Access Panel Removed (Task 2-2-83) ■

Material:

Lockwire (D132)

GO TO NEXT PAGE

11-4-37. DIRECTIONAL CONTROL ROTARY ACTUATOR — REMOVAL/INSTALLATION (CONT)

REMOVE

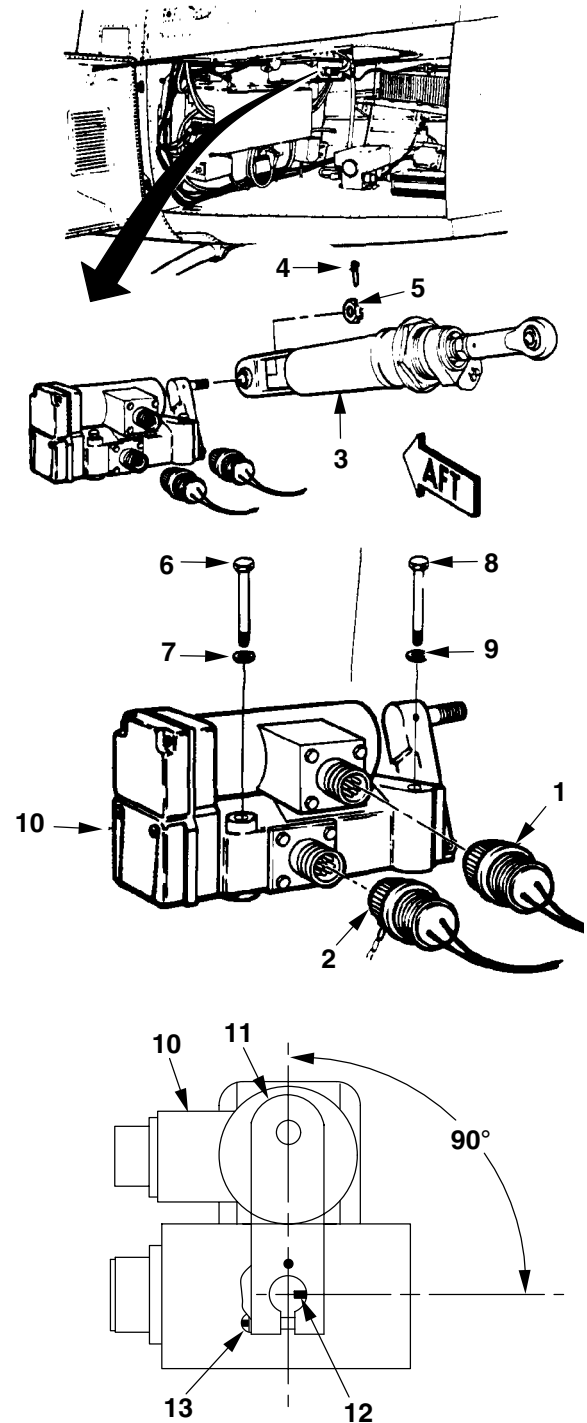
WARNING

- Do not operate directional controls during rotary actuator replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Open aft electrical compartment door.
2. Disconnect electrical connector (1).
3. Cut lockwire and disconnect electrical connector (2).
4. Disconnect force gradient (3) by removing cotter pin (4) and nut (5). Discard cotter pin.
5. Remove one drilled head bolt (6) and washer (7), and three bolts (8) and washers (9).
6. Remove actuator (10).

ADJUST

7. Check that index mark on arm (11) is located 90 degrees (7 teeth) from index mark on shaft (12). If arm is not in this position, adjust as follows:
 - a. Remove screw (13) and arm (11).
 - b. Install arm (11) with index mark on arm positioned 90 degrees (two teeth) counterclockwise from index mark on shaft (12).
 - c. Install screw (13) and secure to arm (11) with lockwire (D132).



406001-169-1
J0536

GO TO NEXT PAGE

11-4-37. DIRECTIONAL CONTROL ROTARY ACTUATOR — REMOVAL/INSTALLATION (CONT)

INSTALL

8. Install drilled head bolt (6) with washer (7) in hole nearest electrical connector.

9. Install three bolts (8) with washers (9).

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

10. Connect force gradient (3) with nut (5). Torque nut (5) **50 TO 70 INCH-POUNDS**.

11. Install cotter pin (4) through nut (5).

12. Connect electrical connector (2) to actuator (10) and secure with lockwire (D132) to drilled head bolt (6).

13. Connect electrical connector (1) to actuator (10).

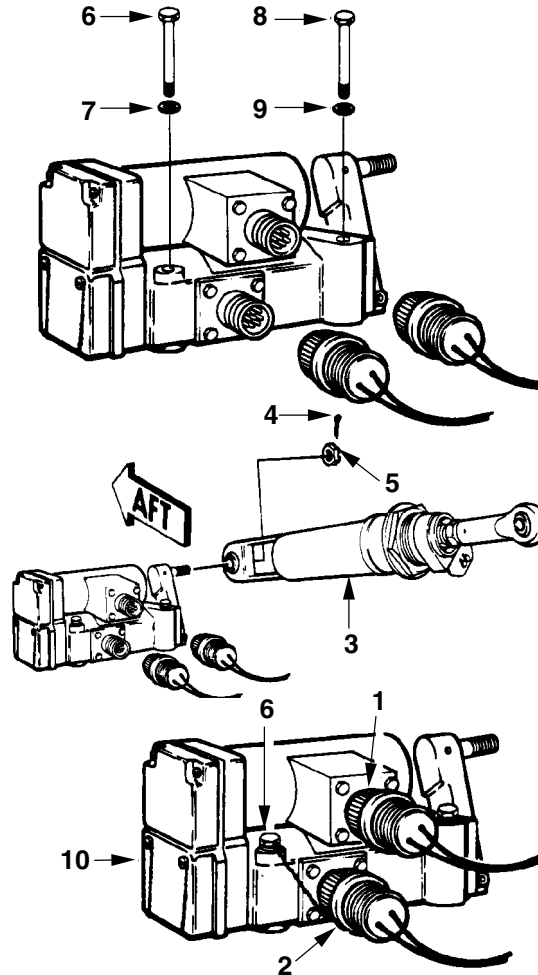
14. Close aft electrical compartment door.

INSPECT

FOLLOW-ON MAINTENANCE

Install left access panel (Task 2-2-83).

Check rigging of directional control system (Task 11-1-4).



406001-169-2
J0536

END OF TASK

11-4-38. DIRECTIONAL CONTROL ROTARY ACTUATOR — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On Helicopter)

INITIAL SETUP

Wiping Rag (D164)
Epoxy Primer Coating (D98)

Applicable Configurations:
All

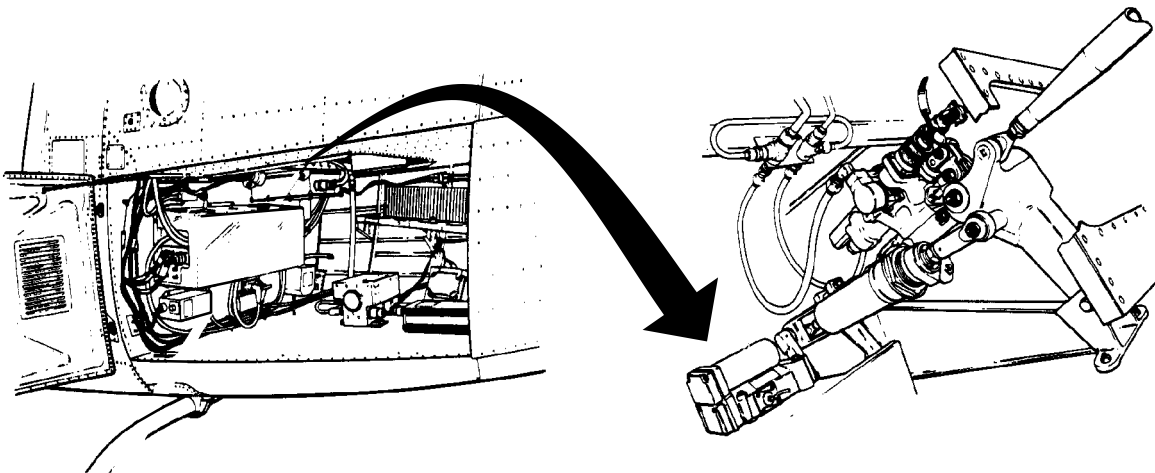
Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Tools:
General Mechanic Tool Kit (B178)

References:
TM 55-1500-345-23

Material:
Low-Lint Cleaning Cloth (D67)
Drycleaning Solvent (D199)
Electrical Contact Brush (D51)
Sandpaper (D175)

Equipment Condition:
Helicopter Safed (Task 1-6-7)



406001-168
J0536

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11-4-38. DIRECTIONAL CONTROL ROTARY ACTUATOR — CLEANING/INSPECTION/REPAIR
(CONT)

CLEAN



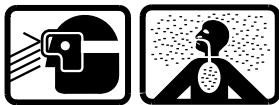
Drycleaning Solvent

1. Remove grease, fungus, and dirt with a clean low-lint cleaning cloth (D67) dampened with drycleaning solvent (D199).
2. Remove moisture, dust, and loose dirt with a wiping rag (D164).
3. Remove dirt from electrical connectors with electrical contact brush (D51).

INSPECT

4. Inspect unit for scratches and bare metal.
5. Inspect unit for security of mounting.
6. Inspect electrical connectors for bent or broken pins or cracked connector inserts.

REPAIR



Sanding Operations

7. Repair any scratches using 400 grit sandpaper (D175).



Epoxy Primer Coating

8. Touch up bare metal with epoxy primer coating (D98) in accordance with TM 55-1500-345-23.
9. Tighten or replace missing mounting hardware.
10. Straighten bent electrical connector pin(s).
11. Replace actuator if any electrical connector pin is broken or insert is cracked.

INSPECT

END OF TASK

11-4-39. DIRECTIONAL CONTROL BOOSTED TUBE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Torque Wrench (B238)
■ Torque Wrench (B236)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:

TM 1-1500-204-23

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Left Access Panel Removed (Task 2-2-83) ■

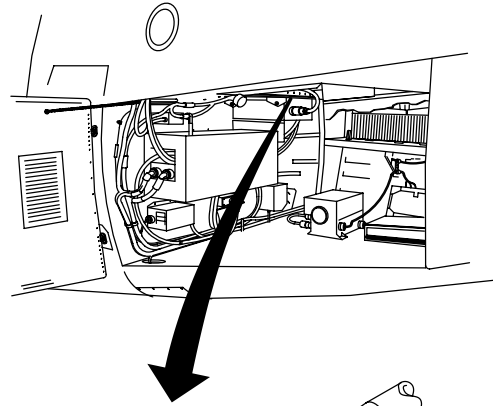
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11-4-39. DIRECTIONAL CONTROL BOOSTED TUBE — REMOVAL/INSTALLATION (CONT)

REMOVE

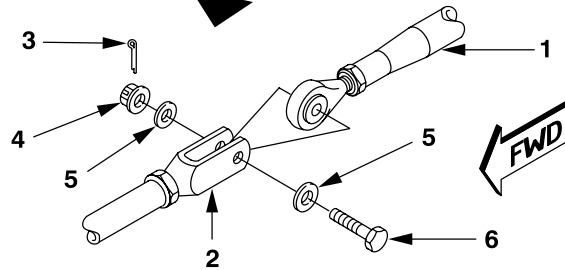
WARNING

- Do not operate directional controls during boosted tube replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.



1. Open aft electrical compartment door.

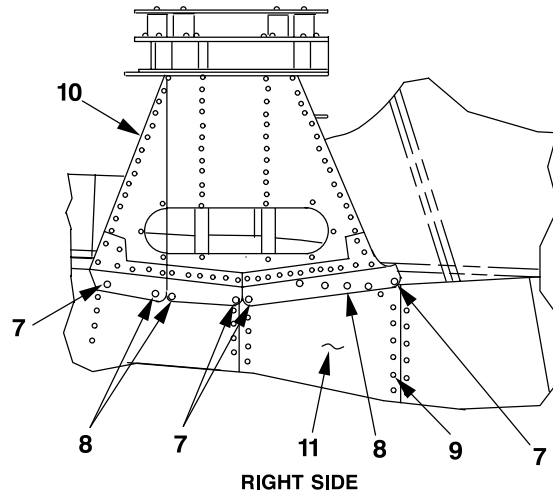
2. Disconnect forward end of tube assembly (1) from actuator (2) by removing cotter pin (3), nut (4), two washers (5), and bolt (6). Discard cotter pin.



3. Identify location and length of screws (7), (8), and (9) to aid in installation.

4. Loosen screws (7 and 8) on AN/ALQ-144 IR jammer mount (10).

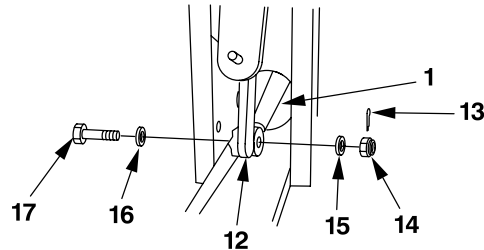
5. Remove tailboom access panel (11) by removing 27 screws (9).



6. Disconnect aft end of tube assembly (1) from boosted walking beam (12) by removing cotter pin (13), nut (14), spacer (15), washer (16), and bolt (17). Discard cotter pin.

7. Remove tube assembly (1) from helicopter.

8. Measure and record length of tube assembly (1).



9. Refer to Task 11-5-1 for inspection and repair procedures.

406001-323-5
J1852

GO TO NEXT PAGE

11-4-39. DIRECTIONAL CONTROL BOOSTED TUBE — REMOVAL/INSTALLATION (CONT)

INSTALL

10. Adjust tube assembly (1) to same length as removed tube assembly and torque jamnut (18) **95 TO 110 INCH-POUNDS**.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

11. Connect aft end of tube assembly (1) to lower end of boosted walking beam (12) with bolt (17), washer (16), spacer (15), and nut (14).
Torque nut (14) 30 TO 40 INCH-POUNDS.

12. Install cotter pin (13) through nut (14).

13. Connect forward end of tube assembly (1) to actuator (2) with bolt (6), two washers (5), and nut (4). Torque nut (4) **30 TO 40 INCH-POUNDS**.

14. Install cotter pin (3) through nut (4).

INSPECT

CAUTION

Screws (7), (8), and (9) are different sizes. To prevent damage to aircraft structure, ensure screws are used in correct location.

15. Install tailboom access panel (11) with 27 screws (9).

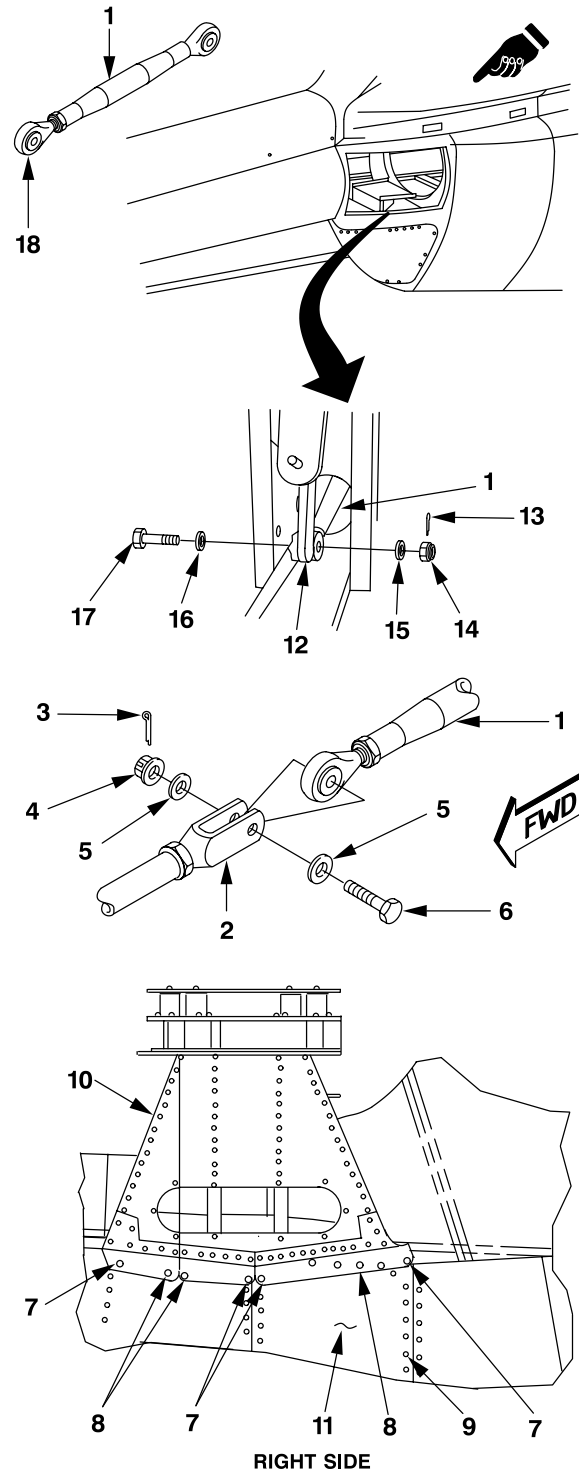
16. Tighten screws (7 and 8) on AN/ALQ-144 IR jammer mount (10).

17. Close aft electrical compartment door.

FOLLOW-ON MAINTENANCE

Check rigging of directional control system (Task 11-1-4).

Install left access panel (Task 2-2-83).



406001-323-6
J1852

END OF TASK

11-4-40. DIRECTIONAL CONTROL AFT WALKING BEAM — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Applicable Configurations:

All

References:

TM 1-1500-204-23

Tools:

General Mechanic Tool Kit (B178)
Torque Wrench (B236)

Equipment Condition:

Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

11-4-40. DIRECTIONAL CONTROL AFT WALKING BEAM — REMOVAL/INSTALLATION (CONT)

REMOVE

WARNING

- Do not operate directional controls during aft walking beam replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Identify location and length of screws (1), (2), and (3) to aid in reinstallation.
2. Loosen screws (1 and 2) on AN/ALQ-144 IR jammer mount (4).
3. Remove tailboom access panel (5) by removing 27 screws (3).
4. Disconnect tail rotor control tube (6) from aft walking beam (7) by removing cotter pin (8), nut (9), washer (11), spacer (10), and bolt (12). Discard cotter pin.
5. Disconnect boosted tube (13) from aft walking beam (7) by removing cotter pin (14), nut (15), spacer (16), washer (17), and bolt (18). Discard cotter pin.

NOTE

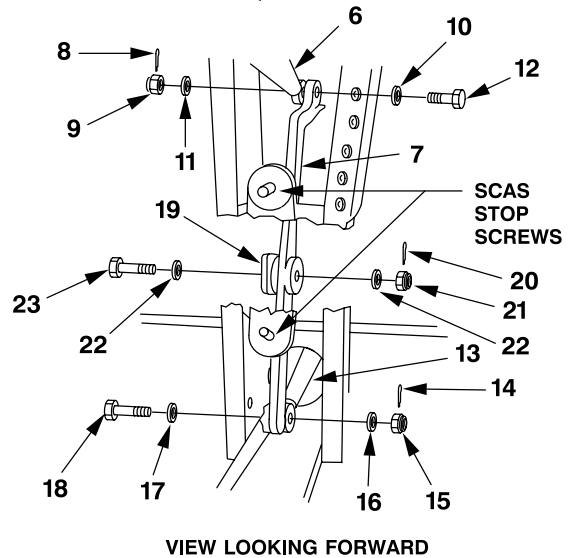
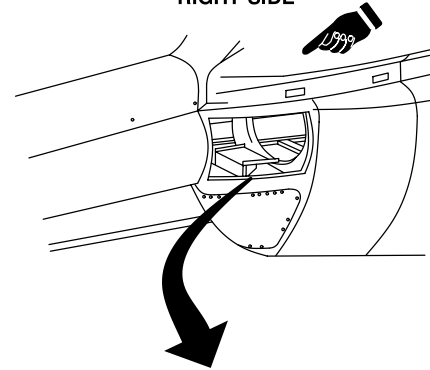
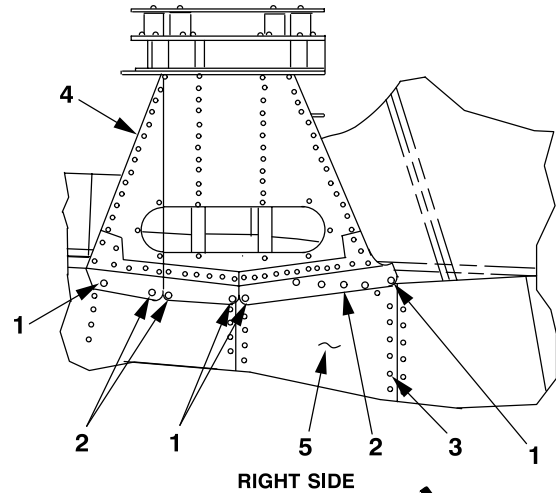
Do not disturb SCAS stop screws.

6. Disconnect walking beam (7) from support (19) by removing cotter pin (20), nut (21), two washers (22), and bolt (23). Discard cotter pin.

CAUTION

Do not force walking beam. If in proper position it should come out with no force applied.

7. Remove walking beam from helicopter by turning walking beam (7) 180 degrees so attach point leg on lower end points aft. Have assistant reach up through hole in deck above aft electrical compartment and pull walking beam up and forward and to the right to clear drain pan assembly under oil cooler blower assembly and clear walking beam mounting bracket.



406001-323-4
J1852

GO TO NEXT PAGE

11-4-40. DIRECTIONAL CONTROL AFT WALKING BEAM — REMOVAL/INSTALLATION (CONT)

8. Refer to Task 11-5-2 for inspection and repair procedures.

INSTALL

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

9. Install walking beam (7) in support (19) with bolt (23), two washers (22), and nut (21). Torque nut (21) **30 TO 40 INCH-POUNDS**.

10. Install cotter pin (20) through nut (21).

11. Connect tail rotor control tube (6) to walking beam (7) with bolt (12), spacer (10), washer (11), and nut (9). Torque nut (9) **30 TO 40 INCH-POUNDS**.

12. Install cotter pin (8) through nut (9).

13. Connect boosted tube (13) to walking beam (7), with bolt (18), washer (17), spacer (16), and nut (15). Torque nut (15) **30 TO 40 INCH-POUNDS**.

14. Install cotter pin (14) through nut (15).

INSPECT

CAUTION

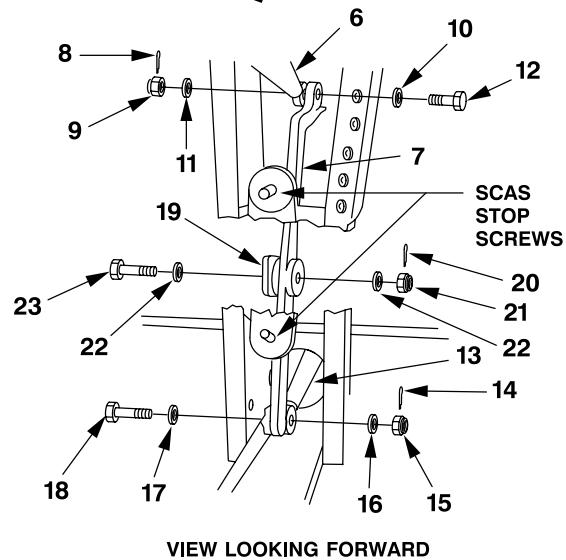
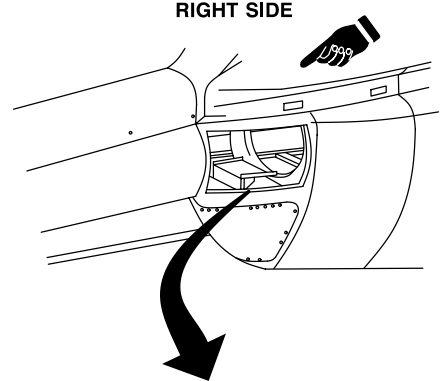
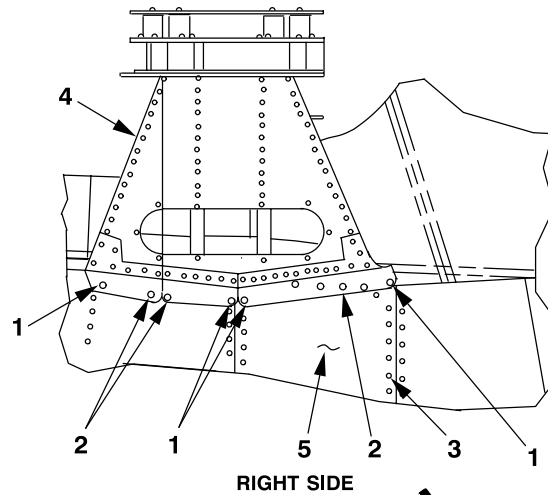
Screws (1), (2), and (3) are different lengths. To prevent damage to aircraft structure, ensure screws are used in correct location.

15. Install tailboom access panel (5) with 27 screws (3).

16. Tighten screws (1 and 2) on AN/ALQ-144 IR jammer mount (4).

FOLLOW-ON MAINTENANCE

Check rigging of directional control system (Task 11-1-4).



406001-323-4
J1852

END OF TASK

**11-4-41. DIRECTIONAL CONTROL AFT WALKING BEAM BEARING (AVIM) — REMOVAL/
INSTALLATION**

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Powertrain Repairer Tool Kit (B180)
Hand Arbor Press (B107)
Upright Drill Press (B108)
Bearing Staking Tool Set (B189)

Material:
Acetone (D2)
Abrasive Mats (D1)
Epoxy Primer Coating (D98)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:
TM 55-1500-322-24

GO TO NEXT PAGE

11-4-41. DIRECTIONAL CONTROL AFT WALKING BEAM BEARING (AVIM) — REMOVAL/
INSTALLATION (CONT)

REMOVE

1. Using hand arbor press (B107), press bearing (1) from walking beam (2) (TM 55-1500-322-24).



Acetone

2. Clean old epoxy primer coating from walking beam bore using acetone (D2) and abrasive mats (D1).

INSTALL



Epoxy Primer Coating

3. Apply epoxy primer coating (D98) to outside surface of bearing (1) and bore of walking beam (2).

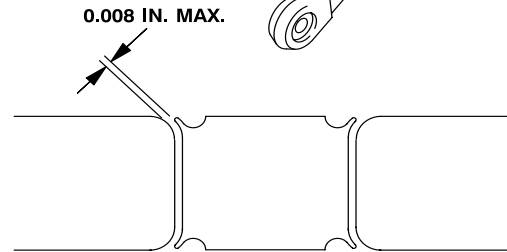
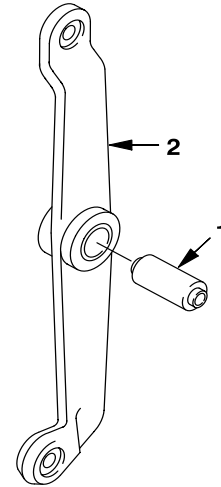
CAUTION

If extreme interference fit occurs when starting press fit operation, stop at once and determine cause, or damage to bore or bearing may occur. DO NOT PROCEED until cause is eliminated or satisfactorily remedied.

4. Using hand arbor press (B107), press bearing (1) into walking beam (2) until bearing is centered.

CAUTION

Bearing must be centered in walking beam and staked an equal amount on both sides. It may be necessary to partially stake one side, stake opposite side and then complete first side to meet this requirement.



406001-315
J1845

5. Using upright drill press (B108), attach bearing staking tool (Part of bearing staking tool set (B189)) and ring stake bearing (1) sleeve (both sides) (TM 55-1500-322-24).

CAUTION

After staking, there shall be no more than **0.008 inch** gap between walking beam outer chamfer and rolled lip of bearing.

6. Restake bearing as required and ensure there is no movement or looseness of bearing outer race. Bearing must be centered in walking beam.

INSPECT

END OF TASK

11-4-42. DIRECTIONAL CONTROL TAILBOOM TUBE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

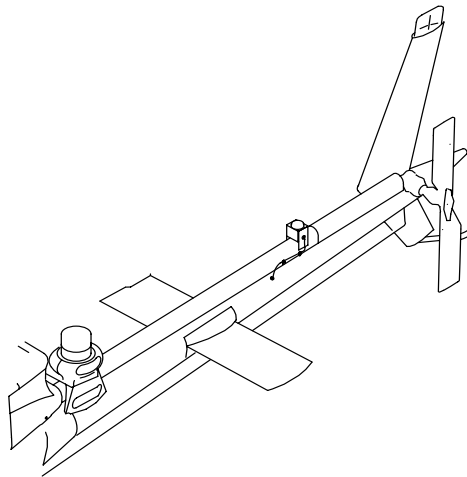
Applicable Configurations:
All

Tools:
 ■ General Mechanic Tool Kit (B178)
 ■ Torque Wrench (B236)

Personnel Required:
 67S Scout Helicopter Technical Inspector (TI)
 67S Scout Helicopter Repairer

References:
 TM 1-1500-204-23

Equipment Condition:
 Helicopter Safed (Task 1-6-7)
 Taillight Support Removed (Task 2-3-31) ■



406001-178
 J0537

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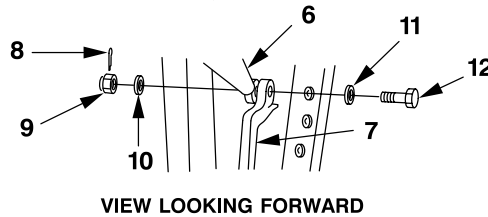
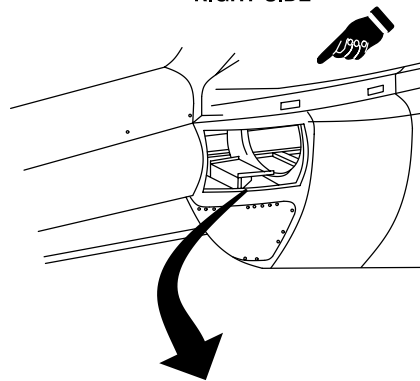
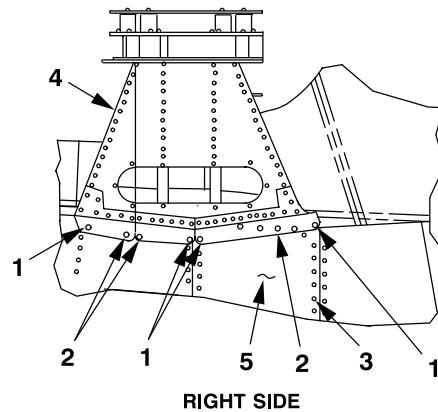
11-4-42. DIRECTIONAL CONTROL TAILBOOM TUBE — REMOVAL/INSTALLATION (CONT)

REMOVE

WARNING

- Do not operate directional controls during tailboom tube replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Identify location and length of screws (1), (2), and (3) to aid in reinstallation.
2. Loosen screws (1 and 2) on AN/ALQ-144 IR jammer mount (4).
3. Remove tailboom access panel (5) by removing 27 screws (3).
4. Disconnect forward end of tube (6) from aft walking beam (7) by removing cotter pin (8), nut (9), spacer (10), washer (11), and bolt (12). Discard cotter pin.
5. Disconnect aft end of tube (6) from tail rotor bellcrank (13) by removing cotter pin (14), nut (15), washer (16), spacer (17), and bolt (18). Discard cotter pin and remove tube through aft tailcone opening.
6. Refer to Task 11-5-1 for inspection and repair procedures.



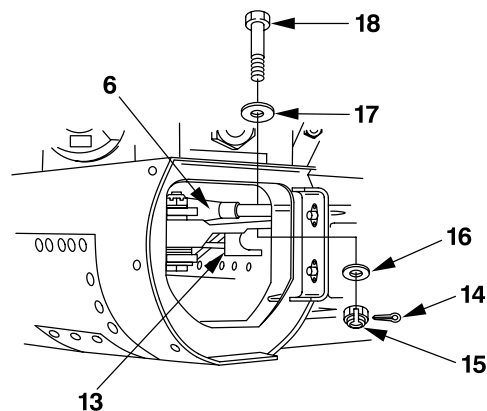
INSTALL

7. Install serviceable tube (6) with shortest segment first through tailcone opening.

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

8. Connect tube (6) to tail rotor bellcrank (13) with bolt (18), spacer (17), washer (16), and nut (15). Torque nut (15) **30 TO 40 INCH-POUNDS**.
9. Install cotter pin (14) through nut (15).



406001-323-8
J1852

GO TO NEXT PAGE

11-4-42. DIRECTIONAL CONTROL TAILBOOM TUBE — REMOVAL/INSTALLATION (CONT)

10. Connect tube (6) to aft walking beam (7) with bolt (12), washer (11), spacer (10), and nut (9). Torque nut (9) **30 TO 40 INCH-POUNDS**.

11. Install cotter pin (8) through nut (9).

CAUTION

Screws (1), (2), and (3) are different sizes. To prevent damage to aircraft structure, screws shall be used in correct location.

12. Install tailboom access panel (5) with 27 screws (3).

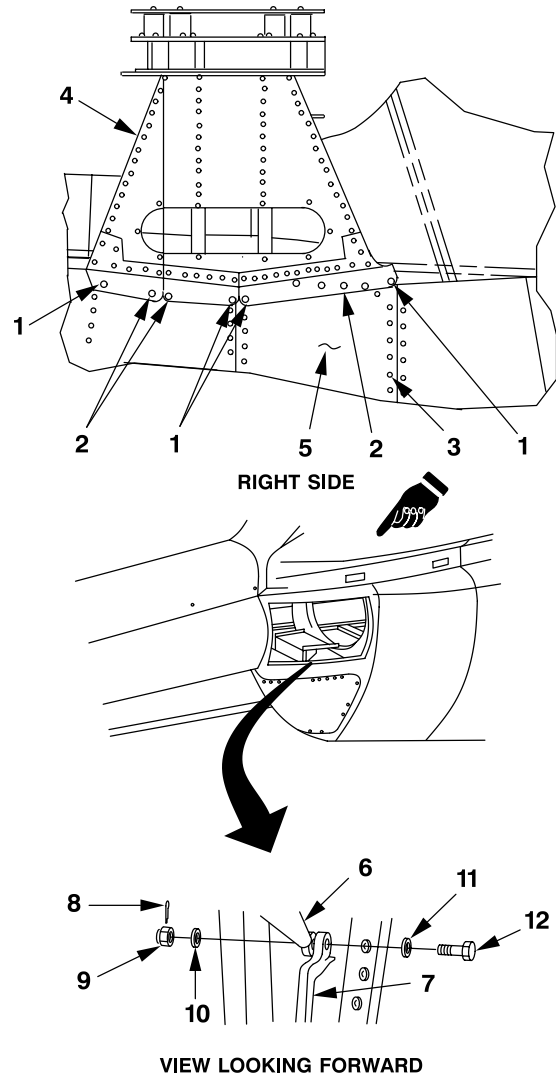
13. Tighten screws (1 and 2) on AN/ALQ-144 IR jammer mount (4).

INSPECT

FOLLOW-ON MAINTENANCE

Check rigging of directional control system (Task 11-1-4).

Install taillight support (Task 2-3-31).



406001-323-7
J1852

END OF TASK

11-4-43. TAIL ROTOR BELLCRANK — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B236)
Torque Wrench (B237)
Torque Wrench (B239)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Taillight Support Removed (Task 2-3-31)
Lower Access Panel Removed (Task 2-3-6)

GO TO NEXT PAGE

11-4-43. TAIL ROTOR BELLCRANK — REMOVAL/INSTALLATION (CONT)

REMOVE

WARNING

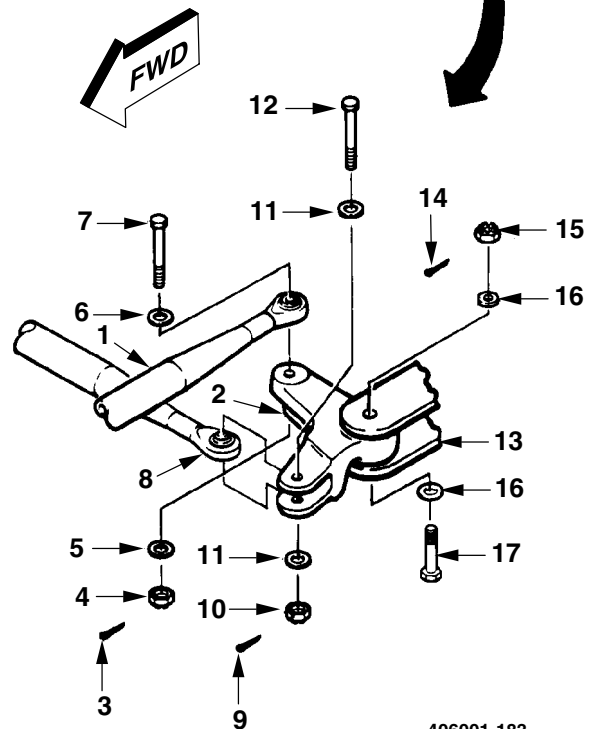
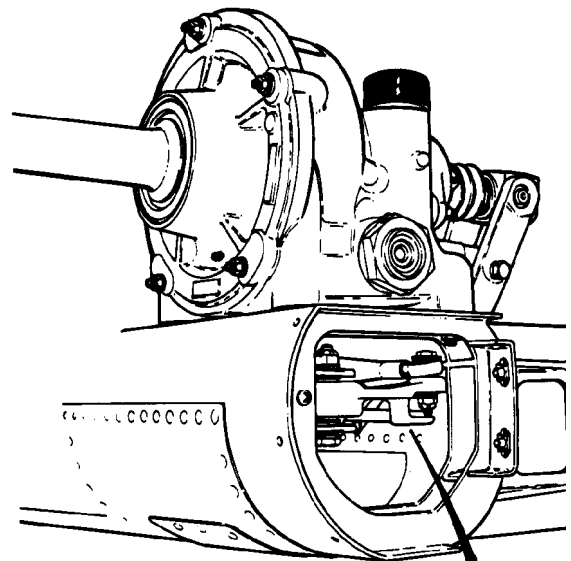
- Do not operate directional controls during tail rotor bellcrank replacement. Physical injury could occur. If injury occurs, seek medical aid.
- A “DO NOT MOVE CONTROLS” sign shall be displayed in the cockpit during the performance of this task.

1. Disconnect tailboom tube (1) from bellcrank (2) by removing cotter pin (3), nut (4), washer (5), spacer (6), and bolt (7). Discard cotter pin.

2. Disconnect tail rotor rod (8) from bellcrank (2) by removing cotter pin (9), nut (10), two washers (11), and bolt (12). Discard cotter pin.

3. Remove bellcrank (2) from support (13) by removing cotter pin (14), nut (15), two washers (16), and bolt (17). Discard cotter pin and remove bellcrank from helicopter.

4. Refer to Task 11-5-2 for inspection and repair procedures.



406001-183
J0537

GO TO NEXT PAGE

11-4-43. TAIL ROTOR BELLCRANK — REMOVAL/INSTALLATION (CONT)

INSTALL

NOTE

Self-locking castellated nuts shall be reused only if they meet minimum breakaway torque value specified in TM 1-1500-204-23.

5. Install bellcrank (2) in support (13) with bolt (17), two washers (16), and nut (15). Torque nut (15) **100 TO 140 INCH-POUNDS**.

6. Install cotter pin (14) through nut (15).

7. Connect tail rotor rod (8) to bellcrank (2) with bolt (12), two washers (11), and nut (10).

8. Torque nut (10) **50 TO 70 INCH-POUNDS** and install cotter pin (9) through nut (10).

9. Connect tailboom tube (1) to bellcrank (2) with bolt (7), spacer (6), washer (5), and nut (4). Torque nut (4) **30 TO 40 INCH-POUNDS**.

10. Install cotter pin (3) through nut (4).

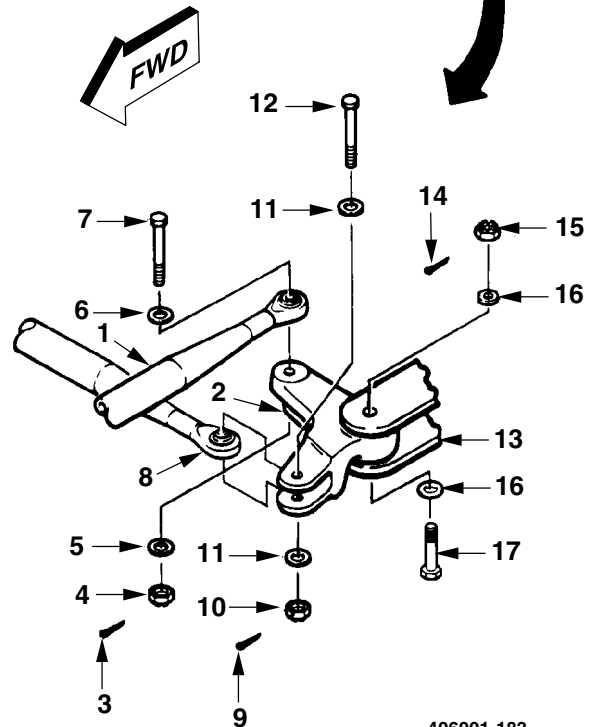
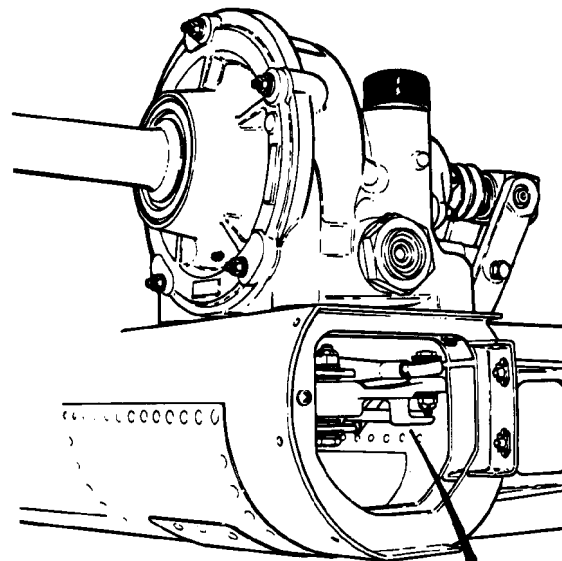
INSPECT

FOLLOW-ON MAINTENANCE

Check rigging of directional control system (Task 11-1-4).

Replace taillight support (Task 2-3-31).

Install lower access panel (Task 2-3-6).



406001-183
J0537

END OF TASK

11-4-44. TAIL ROTOR BELLCRANK BEARING (AVIM) — REMOVAL/INSTALLATION

This task covers: Removal and Installation (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

Powertrain Repairer Tool Kit (B180)
Hand Arbor Press (B107)
Bearing Staking Tool Set (B189)
Reamer Set (B114)

Material:

Acetone (D2)
Epoxy Primer Coating (D98)
Wiping Rag (D164)
Rubber Gloves (D111)

Personnel Required:

67S Scout Helicopter Technical Inspector (TI) ■
68D Aircraft Powertrain Repairer

References:

TM 55-1500-322-24

GO TO NEXT PAGE

11-4-44. TAIL ROTOR BELLCRANK BEARING (AVIM) — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Using hand arbor press (B107), press bearing sleeve (1) and bearing (2) from bellcrank (3) (TM 55-1500-322-24).



Acetone

2. Clean all surfaces with acetone (D2). Wipe dry with wiping rag (D164).

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

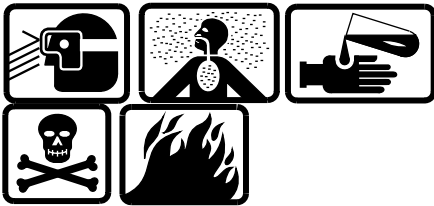
Maximum chamfer of 45 degrees by **0.025 inch** on both sides of pivot bearing bore is a characteristic critical to flight safety.

3. Inspect bellcrank bore (Task 11-5-2).

INSTALL

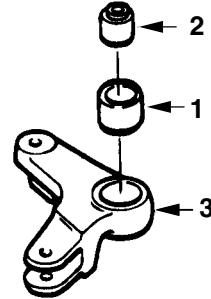
NOTE

Parts should be pressed into bellcrank as soon as possible after applying primer. Ring staking must be performed within 30 minutes after application of primer.



Epoxy Primer Coating

4. Apply epoxy primer coating (D98) to outside surface of sleeve (1) and bore of bellcrank (3).
5. Using hand arbor press (B107), press sleeve (1) into bellcrank (3) until centered equally from each side (TM 55-1500-322-24).
6. Using reamer (Part of reamer set (B114)), ream hole in sleeve (1) **0.873 to 0.874 inch**.



406001-184
J0537

7. Apply epoxy primer coating (D98) to inside surface of sleeve (1) and outside surface of bearing (2).

8. Using hand arbor press (B107), press bearing (2) into sleeve (1) until centered equally from each side (TM 55-1500-322-24).

9. Remove excess epoxy primer coating with a wiping rag (D164) and acetone (D2).

WARNING

FLIGHT SAFETY CRITICAL AIRCRAFT PART (FSCAP)

Accomplishment of ring staking to both sides of pivot sleeve (1) is a characteristic critical to flight safety.

10. Using upright drill press (B108), attach bearing staking tool (Part of bearing staking tool set (B189)) and ring stake sleeve (1) (both sides) (TM 55-1500-322-24).

11. Inspect bearing for freedom of movement by holding inner bearing race and rotating outer race by hand, ensuring there is no looseness.

INSPECT

END OF TASK

Section V. COMPONENT INSPECTION

11-14. COMPONENT INSPECTION

cyclic, and directional controls for the OH-58D and OH-58D(R) helicopters. Standard torques are provided in Appendix P and TM 1-1500-204-23.

11-15. INTRODUCTION

This section covers inspection and damage limits on control tubes, bellcranks, walking beams, idlers, and supports used in the collective pitch,

11-16. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Flight Control Tubes — Cleaning/Inspection/Repair	11-5-1	11-522
Flight Control Bellcranks, Idlers, and Walking Beams — Cleaning/Inspection/Repair	11-5-2	11-531
Flight Control Supports — Cleaning/Inspection/Repair	11-5-3	11-540
Transducer — Functional Test	11-5-4	11-552
Transducer — Cleaning/Inspection/Repair	11-5-5	11-553

11-5-1. FLIGHT CONTROL TUBES — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Dial Indicating Depth Gage (B49)

Material:
Crocus Cloth (D90)
Sandpaper (D175)

Drycleaning Solvent (D199)
Polyamide Epoxy Primer (D98)
Wiping Rag (D164)
Rubber Gloves (D111)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



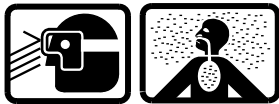
Drycleaning Solvent

1. Clean control tube surfaces with drycleaning solvent (D199).
2. Dry control tube surfaces with wiping rag (D164).

INSPECT

3. Using dial indicating depth gage (B49), inspect control tube to limits shown. Replace control tube if limits are exceeded. See figure Flight Control Tubes — Damage Limits. If cracks in flight control tube are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Repair damage within limits shown using 400 grit sandpaper (D175). Smooth surface with crocus cloth (D90).



Acetone

5. Remove sanding residue with wiping rag (D164) moistened with acetone (D2).

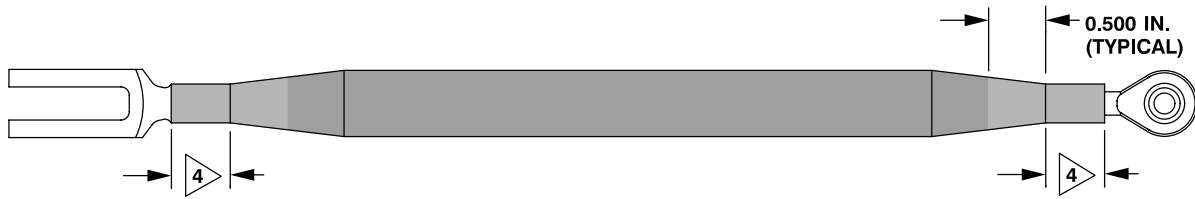


Epoxy Primer Coating

6. Apply polyamide epoxy primer (D98) to repaired areas which were previously primed.

GO TO NEXT PAGE

11-5-1. FLIGHT CONTROL TUBES — CLEANING/INSPECTION/REPAIR (CONT)



P/N 406-001-025-101

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH		
MECHANICAL	0.002 in. before and after repair	0.004 in. before and after repair	0.010 in. before and after repair
CORROSION	0.001 in. before and 0.002 in. after repair	0.002 in. before and 0.004 in. after repair	0.005 in. before and 0.010 in. after repair
EDGE CHAMFER TO REMOVE DAMAGE	0.020 in. x 45°		0.020 in. x 45°
MAXIMUM AREA PER FULL DEPTH REPAIR	0.250 sq. in.	0.500 sq. in.	0.500 sq. in.
NUMBER OF REPAIRS	One per end	One per clevis or bearing	Not critical
THREAD DAMAGE:			
Depth	1/3 of thread		1/3 of thread
Length	1/4 of thread		1/4 of thread
Number	One per threaded segment		One per threaded segment
BEARING WEAR:			
Axial			0.012 in.
Radial			0.005 in.
BORE DAMAGE			0.002 in. for 1/4 circumference after repair

NOTES

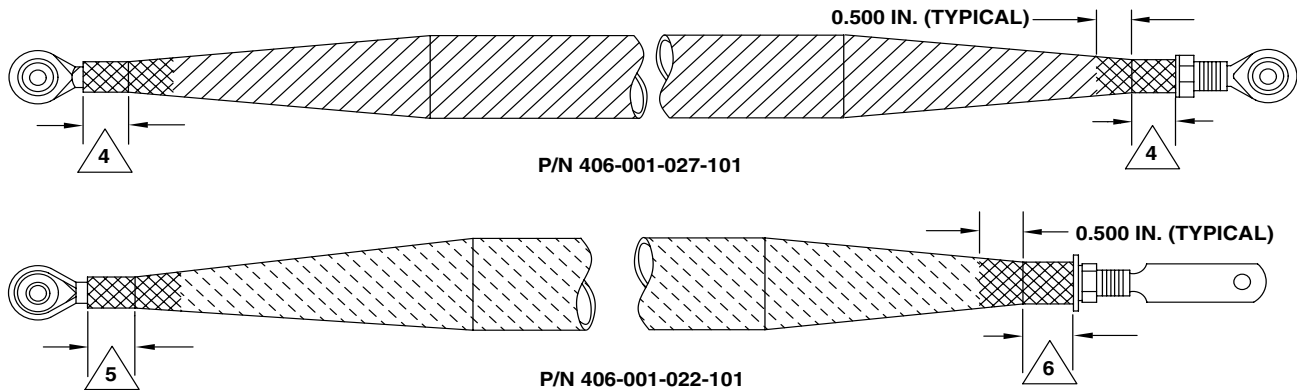
1. No cracks are permitted.
2. Total material removed by repeated repairs not to exceed limits show.
3. No circumferential damage permitted.
4. Diameter must be 0.435 inch minimum after repair.

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Flight Control Tubes — Damage Limits (Sheet 1 of 8)

GO TO NEXT PAGE

11-5-1. FLIGHT CONTROL TUBES — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH			
TYPE OF DAMAGE	0.002 in. before and after repair	0.004 in. before and after repair	0.005 in. before and after repair	0.010 in. before and after repair
TYPE OF DAMAGE	0.001 in. before and 0.002 in. after repair	0.002 in. before and 0.004 in. after repair	0.003 in. before and 0.005 in. after repair	0.005 in. before and 0.010 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.250 sq. in.	0.500 sq. in.	0.500 sq. in.	0.500 sq. in.
NUMBER OF REPAIRS	One per end	Not critical	Not critical	One per clevis and bearing
EDGE CHAMFER TO REMOVE DAMAGE	None allowed			0.020 in. x 45
THREAD DAMAGE	1/3 of thread			1/3 of thread
Depth	1/4 of thread			1/4 of thread
Length	One per thread			One per thread
Number	segment			segment
BEARING WEAR:				
Axial				0.012 in.
Radial				0.005 in.
BORE DAMAGE	0.002 in. for 1/4 circumference after repair			

NOTES

1. No cracks are permitted.
2. Total material removed by repeated repairs not to exceed limits shown.
3. No circumferential damage permitted.

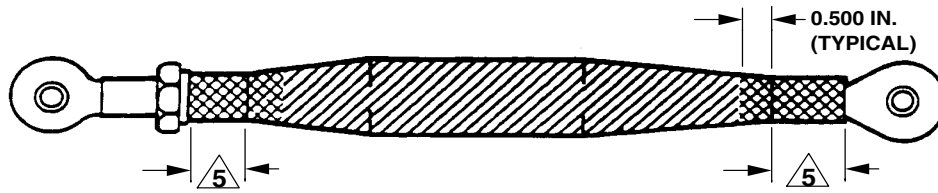
- 4 Diameter must be 0.477 inch minimum after repair.
- 5 Diameter must be 0.535 inch minimum after repair.
- 6 Diameter must be 0.678 inch minimum after repair.

406001-291
J0925

Flight Control Tubes — Damage Limits (Sheet 2 of 8)

GO TO NEXT PAGE



11-5-1. FLIGHT CONTROL TUBES — CLEANING/INSPECTION/REPAIR (CONT)






P/N 406-001-023-113/119

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH		
MECHANICAL	 0.002 in. before and after repair	 0.004 in. before and after repair	0.005 in. before and after repair
CORROSION	0.001 in. before and 0.002 in. after repair	0.002 in. before and 0.004 in. after repair	0.002 in. before and 0.005 in. after repair
EDGE CHAMFER TO REMOVE DAMAGE	0.020 in. x 45°		0.020 in.
MAXIMUM AREA PER FULL DEPTH REPAIR	0.250 sq. in.	0.500 sq. in.	0.100 sq. in.
NUMBER OF REPAIRS	One per end	Not critical	One per lug
THREAD DAMAGE:			
Depth	1/3 of thread	1/3 of thread	
Length	1/4 of thread	1/4 of thread	
Number	One per segment	One per segment	
BEARING WEAR:			
Axial			0.030 in.
Radial			0.012 in.

NOTES

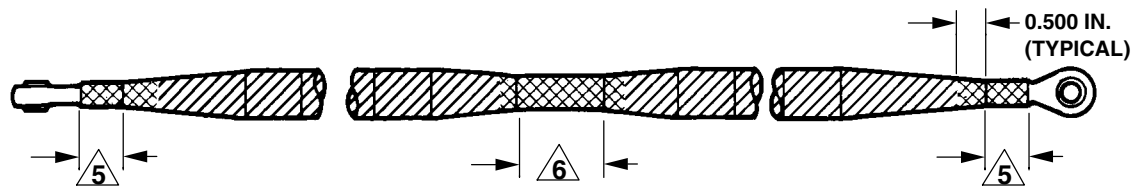
-  Width of repair area on any section of control tube not to exceed one-third tube circumference for damage up to and including 0.002 inch, or one-sixth of tube circumference for damage more than 0.002 inch, but less than 0.004 inch.
- 2. Repair width at any section shall not exceed one-third of tube circumference.
- 3. No cracks permitted.
- 4. No circumferential damage permitted.
-  Diameter must be 0.645 inch minimum after repair.
-  Diameter must be 0.489 inch minimum after repair.

406001-87
J1884

Flight Control Tubes — Damage Limits (Sheet 3 of 8)

GO TO NEXT PAGE

11-5-1. FLIGHT CONTROL TUBES — CLEANING/INSPECTION/REPAIR (CONT)



P/N 406-001-024-107

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH		
MECHANICAL	0.0015 in. before and after repair	0.003 in. before and after repair	0.005 in. before and after repair
CORROSION	0.0015 in. before and 0.003 after repair	0.0015 in. before and 0.0030 in. after repair	0.002 in. before and 0.005 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.250 sq. in.	0.500 sq. in.	0.100 sq. in.
NUMBER OF REPAIRS	One per area	Not critical	One per lug
EDGE CHAMFER TO REMOVE DAMAGE	None allowed		0.020 in. x 45°
THREAD DAMAGE:			
Depth	1/3 of thread		1/3 of thread
Length	1/4 of thread		1/4 of thread
Number	One per segment		One per segment
BEARING WEAR:			
Axial			0.030 in.
Radial			0.012 in.

NOTES:

- Width of repair area on any section of control tube not to exceed one-third tube circumference for damage up to and including 0.0015 inch, or one-sixth of tube circumference for damage more than 0.0015 inch, but less than 0.0030 inch.
- 2. Repair width at any section shall not exceed one-third of tube circumference.
- 3. No cracks are permitted.
- 4. No circumferential damage permitted.
- Diameter must be 0.445 inch minimum after repair.
- Diameter must be 0.620 inch minimum after repair.

406001-89
J1884

Flight Control Tubes — Damage Limits (Sheet 4 of 8)

GO TO NEXT PAGE

11-5-1. FLIGHT CONTROL TUBES — CLEANING/INSPECTION/REPAIR (CONT)



P/N 206-001-020-29, 33

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH		
MECHANICAL	0.002 in. before and after repair	0.004 in. before and after repair	0.010 in. before and after repair
CORROSION	0.001 in. before and 0.002 in. after repair	0.002 in. before and 0.004 in. after repair	0.010 in. before and after repair
EDGE CHAMFER TO REMOVE DAMAGE	0.020 in. x 45°		0.020 in. x 45°
MAXIMUM AREA PER FULL DEPTH REPAIR	0.250 sq. in.	0.500 sq. in.	0.100 sq. in.
NUMBER OF REPAIRS	One per end	Not critical	One per lug
THREAD DAMAGE:			
Depth	1/3 of thread		1/3 of thread
Length	1/4 of thread		1/4 of thread
Number	One per threaded segment		One per segment
BEARING WEAR:			
Axial			0.030 in.
Radial			0.012 in.

NOTES

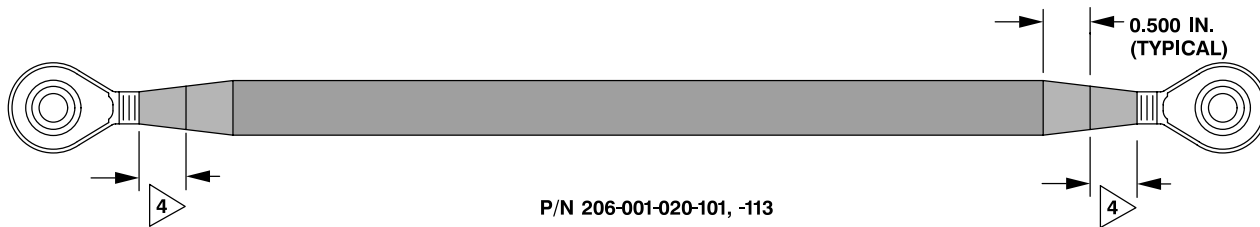
1. No cracks permitted.
2. Total material removed by repeated repairs not to exceed limits show.
3. No circumferential damage permitted.
4. Diameter must be 0.431 inch minimum after repair.

406001-88
J1967

Flight Control Tubes — Damage Limits (Sheet 5 of 8)

GO TO NEXT PAGE

11-5-1. FLIGHT CONTROL TUBES — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH		
	Symbol 1 (Solid Gray)	Symbol 2 (Gray with White Center)	Symbol 3 (White with Black Border)
MECHANICAL	0.002 in. before and after repair	0.004 in. before and after repair	0.010 in. before and after repair
CORROSION	0.001 in. before and 0.002 in. after repair	0.002 in. before and 0.004 in. after repair	0.005 in. before and 0.010 in. after repair
EDGE CHAMFER TO REMOVE DAMAGE	0.020 in. x 45°		0.020 in. x 45°
MAXIMUM AREA PER FULL DEPTH REPAIR	0.250 sq. in.	0.500 sq. in.	0.100 sq. in.
NUMBER OF REPAIRS	One per end	Not critical	One per lug
THREAD DAMAGE:			
Depth	1/3 of thread		1/3 of thread
Length	1/4 of thread		1/4 of thread
Number	One per threaded segment		One per threaded segment
BEARING WEAR:			
Axial			0.012 in.
Radial			0.005 in.

NOTES

1. No cracks are permitted.
2. Total material removed by repeated repairs not to exceed limits show.
3. No circumferential damage permitted.

Diameter must be 0.425 inch minimum after repair.

406001-86
J1967

Flight Control Tubes — Damage Limits (Sheet 6 of 8)

GO TO NEXT PAGE

11-5-1. FLIGHT CONTROL TUBES — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH		
	Symbol 1 (Shaded)	Symbol 2 (Solid Grey)	Symbol 3 (Outlined)
MECHANICAL	Not allowed	0.003 in. before and after repair	0.010 in. before and after repair
CORROSION	Not allowed	0.002 in. before and 0.004 in. after repair	0.005 in. before and 0.010 in. after repair
EDGE CHAMFER TO REMOVE DAMAGE	0.020 in. x 45°		0.020 in. x 45°
MAXIMUM AREA PER FULL DEPTH REPAIR	0.250 sq. in.	0.500 sq. in.	0.100 sq. in.
NUMBER OF REPAIRS	One per end	Not critical	One per clevis or lug
THREAD DAMAGE:			
Depth	1/3 of thread		1/3 of thread
Length	1/4 of thread		1/4 of thread
Number	One per threaded segment		One per threaded segment
BEARING WEAR:			
Axial			0.012 in.
Radial			0.005 in.
BORE DAMAGE			0.002 in. for 1/4 circumference

NOTES

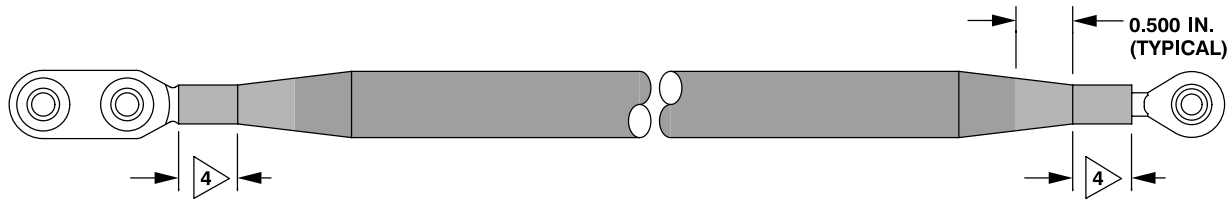
1. No cracks permitted.
2. Total material removed by repeated repairs not to exceed limits show.
3. No circumferential damage permitted.
4. Diameter must be 0.459 Inch minimum after repair.
5. Diameter must be 0.512 inch minimum after repair.

406001-85
J1967

Flight Control Tubes — Damage Limits (Sheet 7 of 8)

GO TO NEXT PAGE

11-5-1. FLIGHT CONTROL TUBES — CLEANING/INSPECTION/REPAIR (CONT)



P/N 406-001-026-101

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH		
	MECHANICAL	0.002 in. before and after repair	0.004 in. before and after repair	0.010 in. before and after repair
CORROSION	0.001 in. before and 0.002 in. after repair	0.002 in. before and 0.004 in. after repair	0.005 in. before and 0.010 in. after repair
EDGE CHAMFER TO REMOVE DAMAGE	0.020 in. x 45°		0.020 in. x 45°
MAXIMUM AREA PER FULL DEPTH REPAIR	0.250 sq. in.	0.500 sq. in.	0.100 sq. in.
NUMBER OF REPAIRS	One per end	Not critical	One per lug
THREAD DAMAGE:			
Depth	1/3 of thread		1/3 of thread
Length	1/4 of thread		1/4 of thread
Number	One per threaded segment		One per threaded segment
BEARING WEAR:			
Axial			0.012 in.
Radial			0.005 in.

NOTES

1. No cracks are permitted.
 2. Total material removed by repeated repairs not to exceed limits show.
 3. No circumferential damage permitted.
- Diameter must be 0.445 inch minimum after repair.

406001-5
J1967

Flight Control Tubes — Damage Limits (Sheet 8 of 8)

END OF TASK

11-5-2. FLIGHT CONTROL BELLCRANKS, IDLERS, AND WALKING BEAMS — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Dial Indicating Depth Gage (B49)

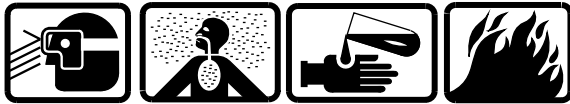
Material:
Crocus Cloth (D90)
Sandpaper (D175)

Drycleaning Solvent (D199)
Epoxy Primer Coating (D98)
Wiping Rag (D164)
Rubber Gloves (D111)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean bellcrank, walking beam, or idler surfaces with drycleaning solvent (D199).
2. Dry bellcrank, walking beam, or idler with wiping rag (D164).

INSPECT

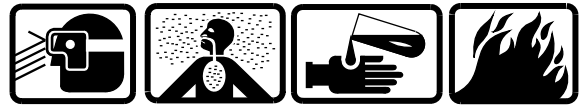
3. Using dial indicating depth gage (B49), inspect bellcrank, walking beam, or idler to limits shown. Replace bellcrank, walking beam, or idler if limits are exceeded. See applicable figure for damage limits. If cracks in bellcranks, idlers, or walking beams are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Repair damage within limits shown using 400 grit sandpaper (D175). Smooth surface with crocus cloth (D90).



Acetone

5. Remove sanding residue with wiping rags (D164) moistened with acetone (D2).

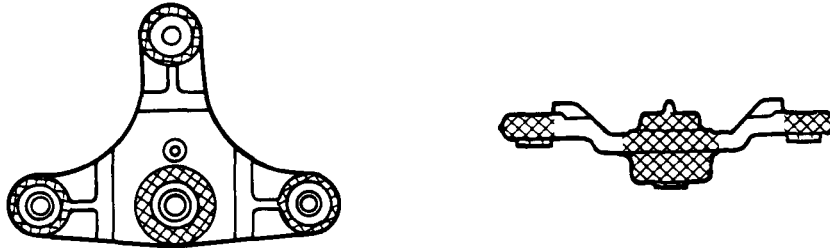


Epoxy Primer Coating

6. Apply epoxy primer coating (D98) to repaired areas which were previously primed.

GO TO NEXT PAGE

11-5-2. FLIGHT CONTROL BELLCRANKS, IDLERS, AND WALKING BEAMS — CLEANING/
INSPECTION/REPAIR (CONT)



BELLCRANK ASSEMBLY
206-001-702-9

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	Symbol 1 (Cross-hatch)	Symbol 2 (Plain)
MECHANICAL	0.020 in. before and after repair	0.040 in. before and after repair
CORROSION	0.010 in. before and 0.020 in. after repair	0.020 in. before and 0.040 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	0.25 sq. in.
NUMBERS OF REPAIRS	One per area	Two per area
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in. x 45 degrees	0.060 in. x 45 degrees

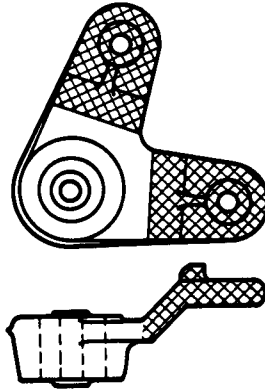
- NOTES:
1. Bearing bore damage not to exceed 0.001 inch for one-fourth circumference. Limit one repair per bore.
 2. Bolt bore damage not to exceed 0.002 inch for one-fourth circumference. Limit one repair per bore.
 3. Axial bearing wear shall not exceed 0.030 inch; radial bearing wear shall not exceed 0.005 inch.
 4. Overlapping of repairs in same area not allowed.
 5. Refer to Task 11-4-8 for bushing/bearing replacement.

406001-10
J2588

Directional Control Pedal Bellcrank Assembly — Damage Limits

GO TO NEXT PAGE

11-5-2. FLIGHT CONTROL BELLCRANKS, IDLERS, AND WALKING BEAMS — CLEANING/
INSPECTION/REPAIR (CONT)



BELLCRANK ASSEMBLY
206-001-712-1

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	Symbol 1 (Cross-hatch)	Symbol 2 (Empty)
MECHANICAL	0.020 in. before and after repair	0.040 in. before and after repair
CORROSION	0.010 in. before and 0.020 in. after repair	0.020 in. before and 0.040 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.100 sq. in.	0.250 sq. in.
NUMBER OF REPAIRS	One per area	Two per area
BORES	0.005 in.	0.005 in.
BEARING WEAR:		
AXIAL:	0.030 in.	
RADIAL:	0.005 in.	

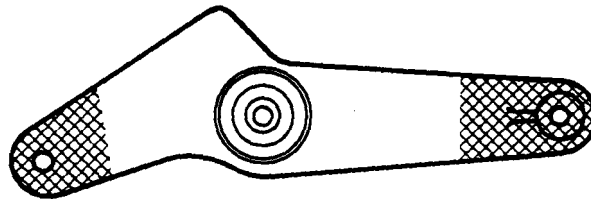
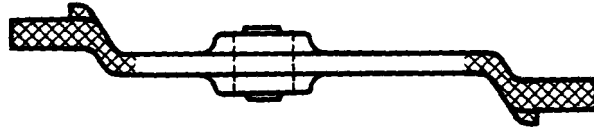
- NOTES:
1. No cracks are permitted.
 2. Overlapping of repairs in the same area not allowed.
 3. Refer to Task 11-4-8 for bushing/bearing replacement.

406001-81
J2588

Directional Control Upper Tunnel Bellcrank Assembly — Damage Limits

GO TO NEXT PAGE

11-5-2. FLIGHT CONTROL BELLCRANKS, IDLERS, AND WALKING BEAMS — CLEANING/
INSPECTION/REPAIR (CONT)



FORWARD WALKING BEAM ASSEMBLY
206-001-735-5

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL	0.020 in. before and after repair	0.040 in. before and after repair
CORROSION	0.001 in. before and after repair	0.020 in. before and 0.040 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.100 sq. in.	0.250 sq. in.
NUMBER OF REPAIRS	One per area	Two per area
BORES	0.005 in.	0.005 in.
BEARING WEAR:		
AXIAL:	0.030 in.	
RADIAL:	0.005 in.	

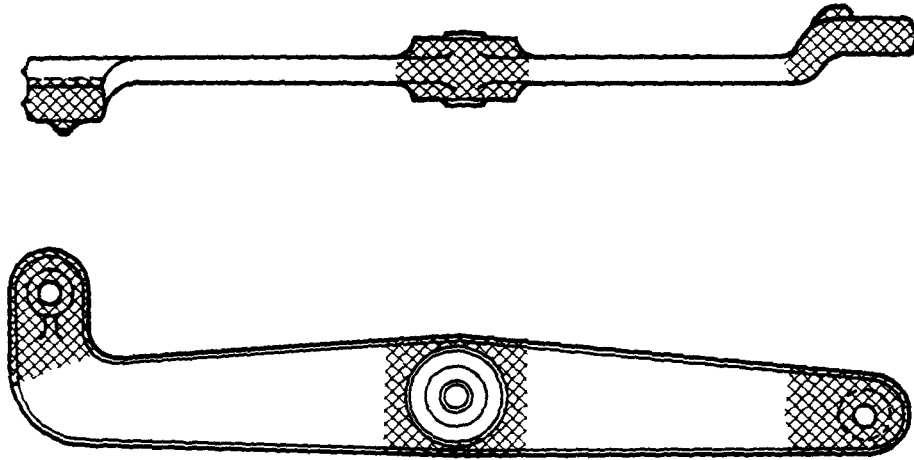
- NOTES:**
1. No cracks are permitted.
 2. Overlapping of repairs in the same area not allowed.

406001-84
J2588

Forward Walking Beam Assembly — Damage Limits

GO TO NEXT PAGE

11-5-2. FLIGHT CONTROL BELLCRANKS, IDLERS, AND WALKING BEAMS — CLEANING/
INSPECTION/REPAIR (CONT)



AFT WALKING BEAM ASSEMBLY
206-001-754-1

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	Symbol 1 (Cross-hatch)	Symbol 2 (Empty)
MECHANICAL	0.010 in. before and after repair	0.020 in. before and after repair
CORROSION	0.005 in. before and 0.010 in. after repair	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.100 sq. in.	0.250 sq. in.
NUMBER OF REPAIRS	One per lug	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in.	0.060 in.
BORES	0.001 in. for 1/4 circumference	
BEARING WEAR:		
AXIAL:	0.030 in.	
RADIAL:	0.006 in.	

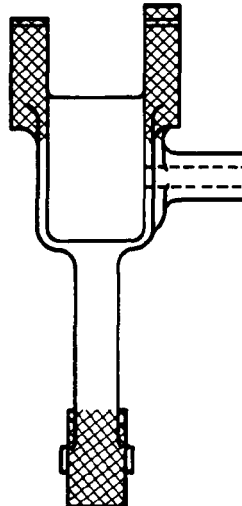
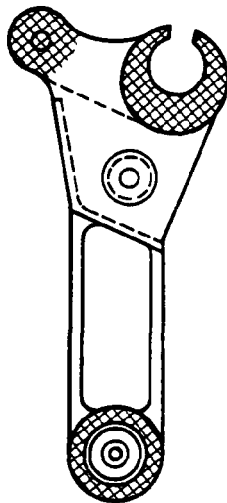
- NOTES:
1. No cracks are permitted.
 2. Refer to Task 11-4-41 for bearing replacement.

406001-7
J2588

Aft Walking Beam Assembly — Damage Limits

GO TO NEXT PAGE

11-5-2. FLIGHT CONTROL BELLCRANKS, IDLERS, AND WALKING BEAMS — CLEANING/
INSPECTION/REPAIR (CONT)



IDLER ASSEMBLY
406-001-702-101

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	0.010 in. before and after repair	0.020 in. before and after repair
MECHANICAL	0.010 in. before and after repair	0.020 in. before and after repair
CORROSION	0.005 in. before and 0.010 in. after repair	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.100 sq. in.	Not critical
NUMBER OF REPAIRS	One per lug	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in.	0.060 in.
BORES	0.001 in. for 1/4 circumference	
BEARING WEAR:		
AXIAL:	0.012 in.	
RADIAL:	0.030 in.	

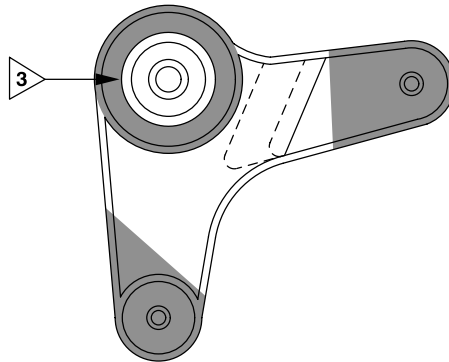
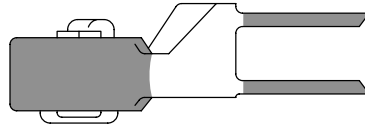
- NOTES: 1. No cracks are permitted.
2. Refer to Task 11-4-29 for bearing replacement.

406001-8
J0537

Directional Control Actuator Input Idler Assembly — Damage Limits

GO TO NEXT PAGE

11-5-2. FLIGHT CONTROL BELLCRANKS, IDLERS, AND WALKING BEAMS — CLEANING/INSPECTION/REPAIR (CONT)



WARNING

FLIGHT SAFETY PART

MAXIMUM CHAMFER OF 45 DEGREES BY 0.025 INCH ON BOTH SIDES OF PIVOT BEARING BORE IS A CHARACTERISTIC CRITICAL TO FLIGHT SAFETY.

BELLCRANK ASSEMBLY
406-001-704-101

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	(Solid Gray)	(White with Border)
MECHANICAL	0.010 in. before and after repair	0.020 in. before and after repair
CORROSION	0.005 in. before and 0.010 after repair	0.010 in. before and 0.020 after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.100 sq. in.	
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in.	0.060 in.
BORES	0.001 in. for 1/4 circumference	
BEARING WEAR:		
Radial:	0.006 in.	
Axial:	0.030 in.	

NOTES:

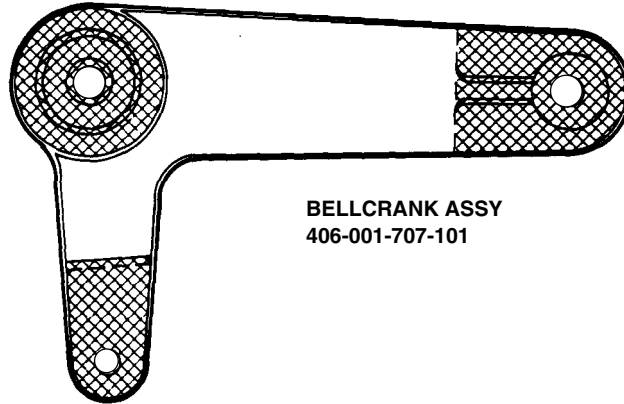
1. No cracks are permitted.
2. Refer to Task 11-4-44 for bearing replacement.
3. Maximum chamfer of 45 degrees by 0.025 Inch on both sides of pivot bearing bore.

406001-6
J2588

Tail Rotor Bellcrank Assembly — Damage Limits

GO TO NEXT PAGE

11-5-2. FLIGHT CONTROL BELLCRANKS, IDLERS, AND WALKING BEAMS — CLEANING/
INSPECTION/REPAIR (CONT)



BELLCRANK ASSY
406-001-707-101

TYPE OF DAMAGE

DAMAGE LOCATION SYMBOLS



MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL	0.010 in. before and after repair	0.020 in. before and after repair
CORROSION	0.005 in. before and 0.010 in. after repair	0.020 in. before and 0.040 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	Not critical
NUMBER OF REPAIRS	1 per lug	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in.	0.060 in.
BORES	0.002 in. for 1/4 circumference	

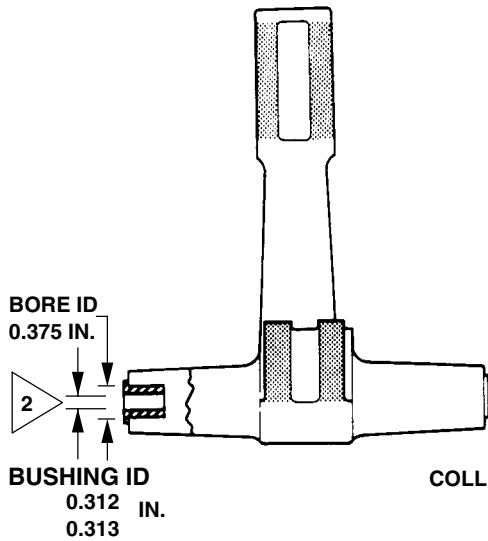
- NOTES:
1. No cracks are permitted.
 2. Bore damage not to exceed 0.001 for full circumference bearing.
Bore damage not to exceed 0.002 for one quarter circumference.
 3. Bearing play: Axial 0.030, Radial 0.012.
 4. Refer to Task 11-4-16 for bearing replacement.

406961-801
J0537

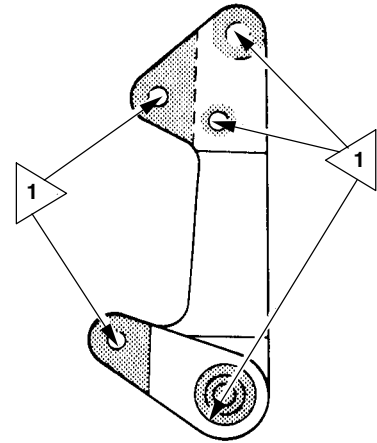
Directional Control Transducer Bellcrank Assembly — Damage Limits

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11-5-2. FLIGHT CONTROL BELLCRANKS, IDLERS, AND WALKING BEAMS — CLEANING/INSPECTION/REPAIR (CONT)



COLLECTIVE MIXING LEVER ASSEMBLY
406-001-102-101



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	MECHANICAL	CORROSION
MECHANICAL	0.020 in. before and after repair	0.040 in. before and after repair
CORROSION	0.010 in. before and 0.020 in. after repair	0.020 in. before and 0.040 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	0.25 sq. in.
NUMBER OF REPAIRS	One per area	Not critical
EDGE CHAMFER	0.030 in. by 45 degrees	0.060 in. by 45 degrees

NOTES:

- 1 Bore damage not to exceed 0.002 inch for one-fourth circumference. Limit one repair per bore.
- 2 Bushing bores shall be in line and concentric with bushing holes.
- 3. Axial bearing wear shall not exceed 0.030 inch; radial bearing wear shall not exceed 0.006 inch.
- 4. Refer to Task 11-2-49 for bushing replacement.

406001-44
J0537

Collective Mixing Lever Assembly — Damage Limits

END OF TASK

11-5-3. FLIGHT CONTROL SUPPORTS — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Dial Indicating Depth Gage (B49)

Material:
Crocus Cloth (D90)
Sandpaper (D175)

Drycleaning Solvent (D199)
Epoxy Primer Coating (D98)
Wiping Rag (D164)
Rubber Gloves (D111)
Acetone (D2)

Personnel Required:
67S Scout Helicopter Repairer

References:
TM 1-1520-266-23

CLEAN



Drycleaning Solvent

1. Clean support surfaces with drycleaning solvent (D199).
2. Dry support with wiping rag (D164).

INSPECT

3. Using dial indicating depth gage (B49), inspect support to limits shown. Replace support if limits are exceeded. See applicable Flight Control Support — Damage Limits figure. If cracks in flight control supports are suspected perform eddy current inspection (TM 1-1520-266-23).

REPAIR



Sanding Operations

4. Repair damage within limits shown using 400 grit sandpaper (D175). Smooth surface with crocus cloth (D90).



Acetone

5. Remove sanding residue with wiping rags (D164) moistened with acetone (D2).

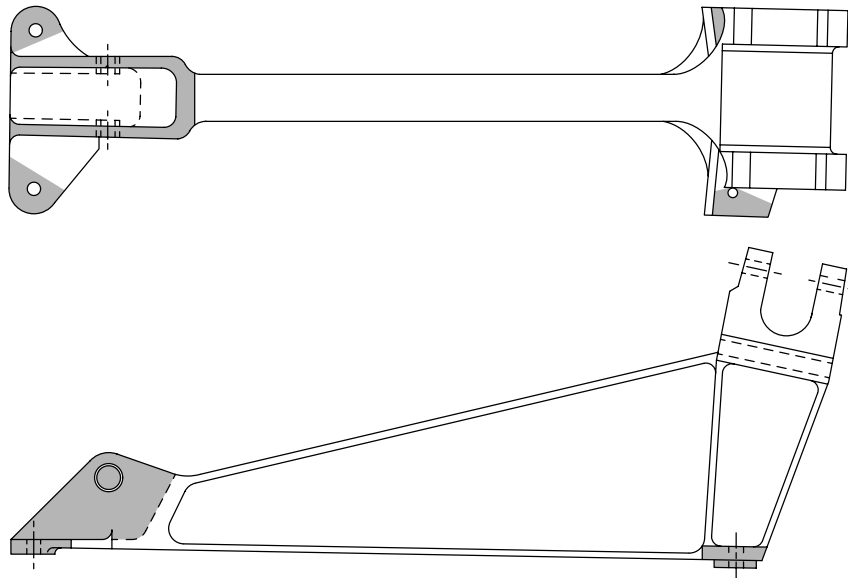


Epoxy Primer Coating

6. Apply epoxy primer coating (D98) to repaired areas which were previously primed.

GO TO NEXT PAGE

11-5-3. FLIGHT CONTROL SUPPORTS — CLEANING/INSPECTION/REPAIR (CONT)



SUPPORT ASSEMBLY
406-001-701-101

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	Shaded Symbol	White Symbol
MECHANICAL	0.010 in. before and after repair	0.020 in. before and after repair
CORROSION	0.005 in. before and 0.010 in. after repair	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.100 sq. in.	Not critical
NUMBER OF REPAIRS	One per lug	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in.	0.060 in.
BORES		
Mount Bolt Bores:	0.002 in. for full circumference	
Pivot Bores:	0.001 in. for 1/4 circumference	

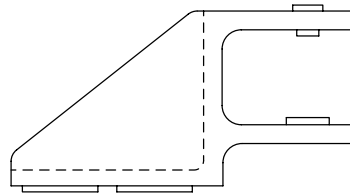
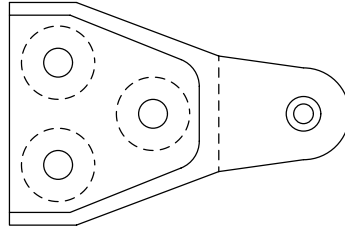
- NOTES: 1. No cracks permitted.
2. Refer to Task 11-4-31 for bushing replacement.

406001-9
J1845

Directional Control Servoactuator Support Assembly — Damage Limits

GO TO NEXT PAGE

11-5-3. FLIGHT CONTROL SUPPORTS — CLEANING/INSPECTION/REPAIR (CONT)



SUPPORT ASSEMBLY
406-001-708-101

DAMAGE LOCATION SYMBOL



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH
MECHANICAL	0.040 in. before and after repair
CORROSION	0.020 in. before and after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.250 sq. in.
NUMBER OF REPAIRS	Two per area
BORES	0.005 in.

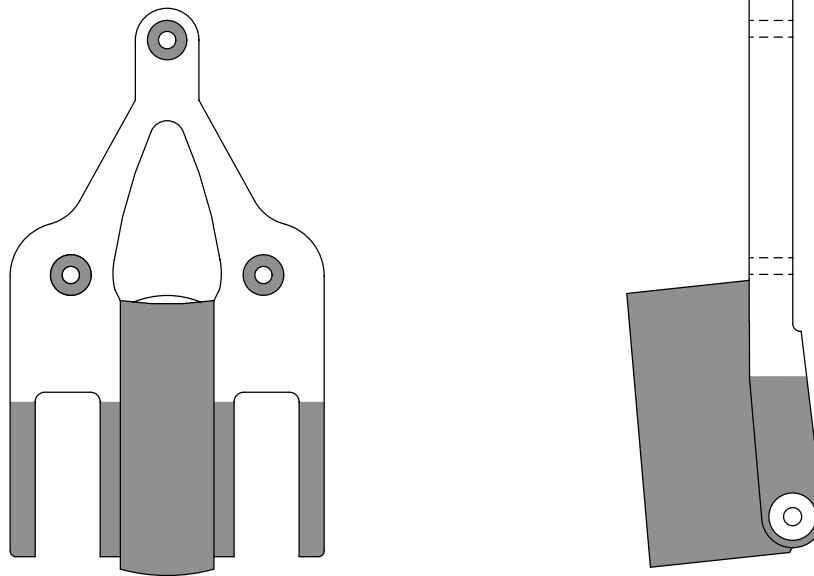
- NOTES:**
1. Overlapping of repairs in same area not allowed.
 2. No cracks are permitted.
 3. Refer to Task 11-4-17 for bushing replacement.

406001-82
J1845

Directional Control Transducer Bellcrank Support Assembly — Damage Limits

GO TO NEXT PAGE

11-5-3. FLIGHT CONTROL SUPPORTS — CLEANING/INSPECTION/REPAIR (CONT)



SUPPORT ASSEMBLY
206-001-713-001

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
MECHANICAL	0.020 in. before and after repair	0.040 in. before and after repair
CORROSION	0.010 in. before and 0.020 in. after repair	0.020 in. before and 0.040 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	0.25 sq. in.
NUMBER OF REPAIRS	One per area	Two per area
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in. x 45°	0.060 in. x 45°

- NOTES:
1. Clevis bore damage not to exceed 0.004 inch for one-fourth circumference. Limit one repair.
 2. Bolt bore damage not to exceed 0.002 inch for one-fourth circumference. Limit one repair per bore.
 3. Overlapping of repairs in same area not allowed.
 4. No cracks are permitted.

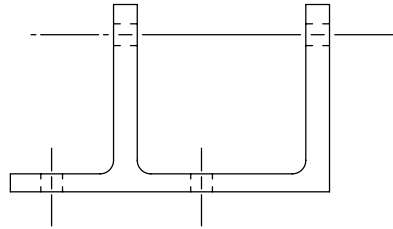
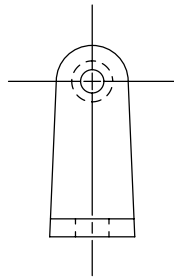
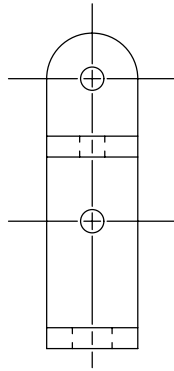


406001-11
J2744

Directional Control Pedal Support — Damage Limits

GO TO NEXT PAGE

11-5-3. FLIGHT CONTROL SUPPORTS — CLEANING/INSPECTION/REPAIR (CONT)



TRANSDUCER SUPPORT
406-001-127-101

DAMAGE LOCATION SYMBOL



TYPE OF DAMAGE

MECHANICAL AND CORROSION

MAXIMUM AREA PER FULL DEPTH REPAIR

NUMBER OF REPAIRS

EDGE CHAMFER TO REMOVE DAMAGE

BORES

MAXIMUM DAMAGE AND REPAIR DEPTH

0.010 in. before and
0.020 in. after repair

0.25 sq. in.

Not critical

0.030 in. x 45°

0.002 in. for 1/4 circumference
One damaged area per hole.

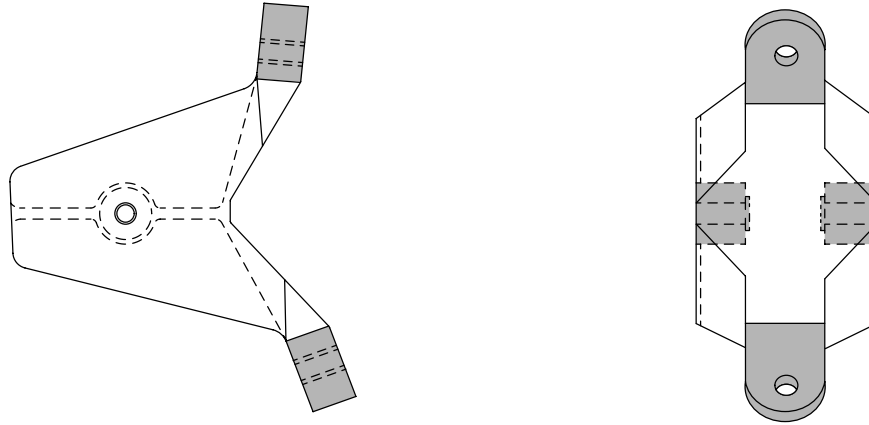
NOTE: No cracks are permitted.

406001-309
J1845

Collective Transducer Lower Support — Damage Limits

GO TO NEXT PAGE

11-5-3. FLIGHT CONTROL SUPPORTS — CLEANING/INSPECTION/REPAIR (CONT)



SUPPORT ASSEMBLY
206-032-368-101

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	Gray Symbol	White Symbol
MECHANICAL	0.010 in. before and after repair	0.020 in. before and after repair
CORROSION	0.005 in. before and 0.010 in. after repair	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.100 sq. in.	0.250 sq. in.
NUMBER OF REPAIRS	One per area	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in. x 45°	0.050 in. x 45°

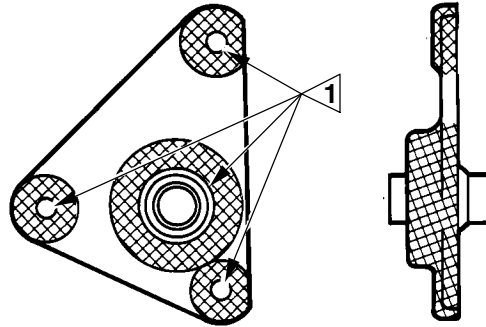
NOTE: No cracks are permitted.

406032-1
J1845

Directional Control SCAS Stop Bolt Support — Damage Limits

GO TO NEXT PAGE

11-5-3. FLIGHT CONTROL SUPPORTS — CLEANING/INSPECTION/REPAIR (CONT)



SUPPORT ASSEMBLY
206-001-139-1

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MECHANICAL AND CORROSION

MAXIMUM AREA PER FULL DEPTH REPAIR

NUMBER OF REPAIRS

EDGE CHAMFER TO REMOVE DAMAGE

BEARING PLAY

Axial 0.030 in.

Radial 0.012 in.

MAXIMUM DAMAGE AND REPAIR DEPTH

0.010 in. before and
0.020 in. after repair

0.10 sq. in.

One per area

0.030 in. x 45°

0.020 in. before and
0.040 in. after repair

0.25 sq. in.

Not critical

0.060 in. x 45°

NOTES: 1 Bore damage not to exceed 0.002 inch for one-fourth circumference.
Limit one repair per bore.

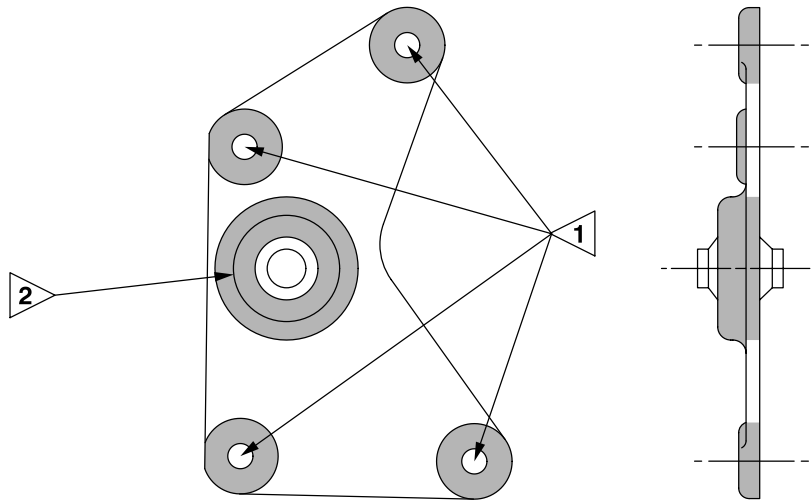
2. No cracks are permitted.

406001-20
J2588

Collective Mixing Lever Left Support Assembly — Damage Limits

GO TO NEXT PAGE

11-5-3. FLIGHT CONTROL SUPPORTS — CLEANING/INSPECTION/REPAIR (CONT)



SUPPORT ASSEMBLY
206-001-140-101

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	Shaded Symbol	Unshaded Symbol
MECHANICAL	0.010 in. before and after repair	0.020 in. before and after repair
CORROSION	0.005 in. before and 0.010 in. after repair	0.020 in. before and 0.040 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.100 sq. in.	Not critical
NUMBER OF REPAIRS	One per lug	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in.	0.060 in.
BORES	0.002 in. for 1/4 circumference	
BEARING PLAY Axial 0.030 in. Radial 0.012 in.		

- NOTES:
- 1 Bolt bore damage not to exceed 0.002 inch for one-fourth circumference. Limit one repair per bore.
 - 2 Bearing bore damage not to exceed 0.001 inch for one-fourth circumference. Limit one repair per bore.
 - 3. No cracks are permitted.

406001-19
J1845

Collective Mixing Lever Right Support Assembly — Damage Limits

GO TO NEXT PAGE

11-5-3. FLIGHT CONTROL SUPPORTS — CLEANING/INSPECTION/REPAIR (CONT)

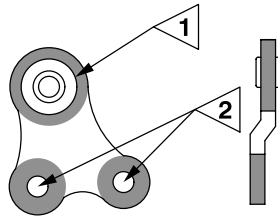


PLATE
206-001-185-1

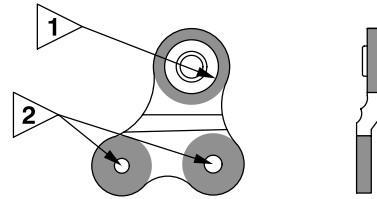


PLATE
206-001-188-1

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	0.010 in. before and 0.020 in. after repair	0.020 in. before and 0.040 in. after repair
MECHANICAL AND CORROSION		
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	0.25 sq. in.
NUMBER OF REPAIRS	Two per boss	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.030 in. x 45°	0.060 in. x 45°
THREAD:		
Depth	1/3 of thread	
Length	1/3 of circumference	
Number	One thread	

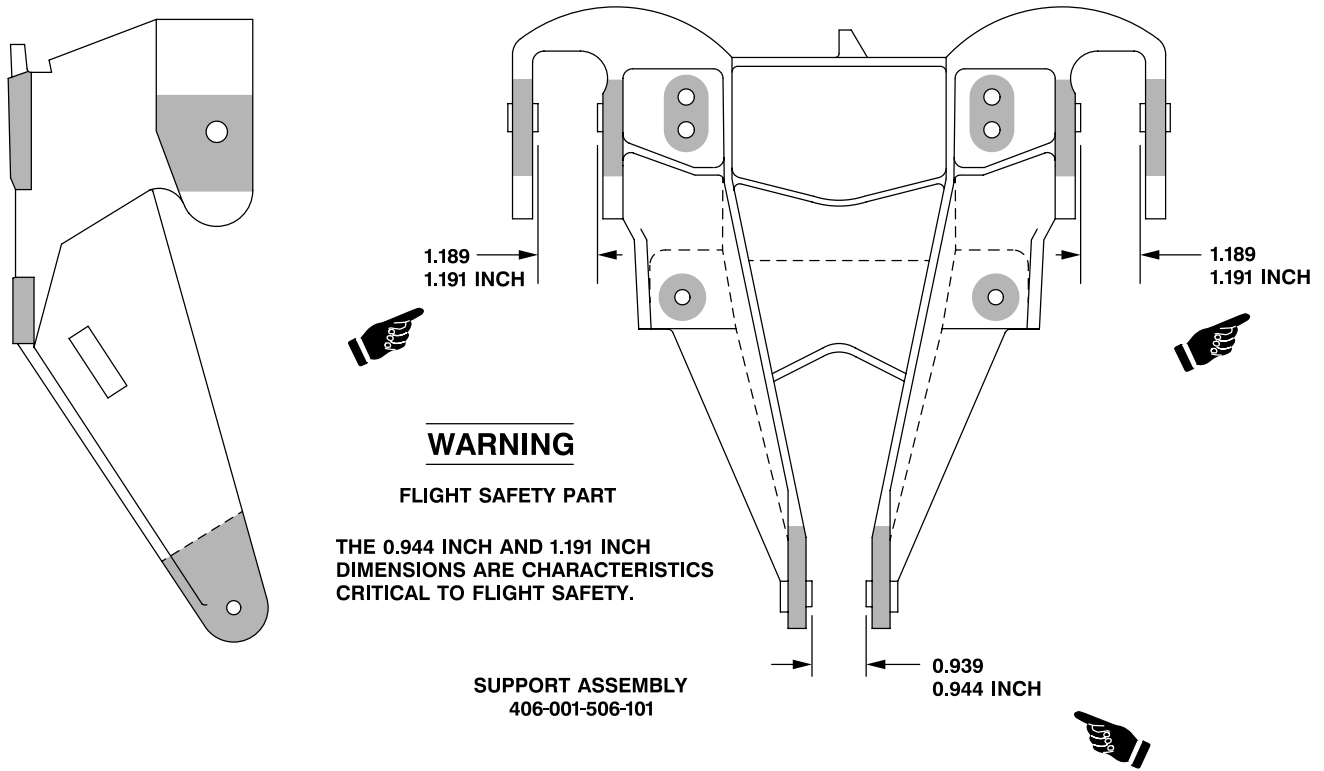
- NOTES:
- 1 Bearing bore damage not to exceed 0.001 inch for one-fourth circumference. Limit one repair per bore.
 - 2 Bolt bore damage not to exceed 0.002 Inch for one-fourth circumference. Limit one repair per bore.
 - 3. No cracks are permitted.

406001-30
J2588

Trunnion Bearing Plate Assembly — Damage Limits

GO TO NEXT PAGE

11-5-3. FLIGHT CONTROL SUPPORTS — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	MECHANICAL	CORROSION
MECHANICAL	0.010 in. before and after repair	0.020 in. before and after repair
CORROSION	0.005 in. before and 0.010 in. after repair	0.010 in. before and 0.020 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	Not critical
NUMBER OF REPAIRS	One per lug	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.040 in.	0.060 in.
BORES		
Mount bolt bores:	0.001 in. for 1/4 circumference	
Pivot bores:	0.001 in. for 1/4 circumference	

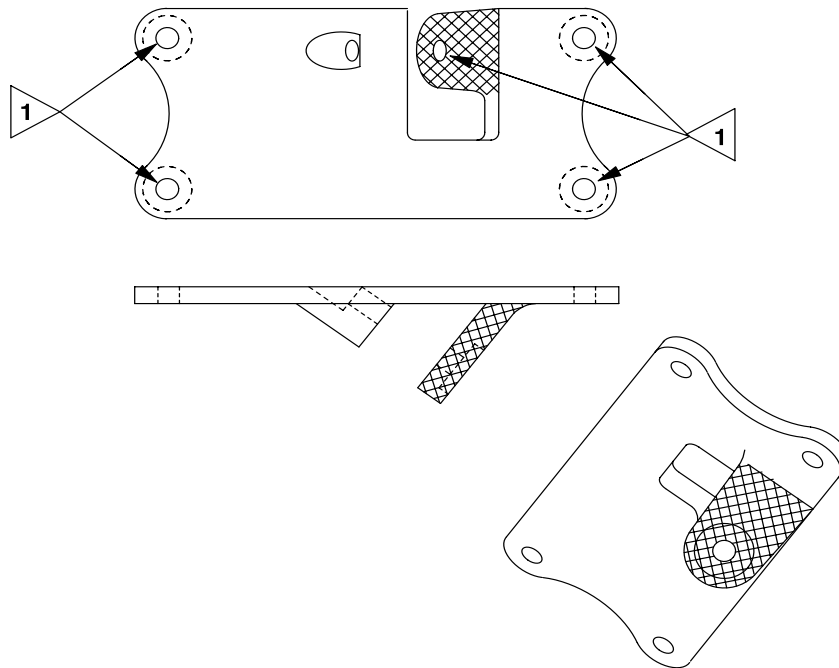
- NOTES:
- No cracks are permitted.
 - Bushing bores shall be in line and perpendicular to adjacent surface within 0.005 inch.

406001-80
 J1845

Control Support Assembly — Damage Limits

GO TO NEXT PAGE

11-5-3. FLIGHT CONTROL SUPPORTS — CLEANING/INSPECTION/REPAIR (CONT)



SUPPORT ASSEMBLY
206-001-734-101


DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL	0.010 in. before and after repair	0.030 in. before and after repair
CORROSION	0.005 in. before and 0.010 in. after repair	0.015 in. before and 0.030 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 sq. in.	0.10 sq. in.
NUMBER OF REPAIRS	One per area	Not critical
EDGE CHAMFER TO REMOVE DAMAGE	0.015 in. X 45	0.030 in. X 45

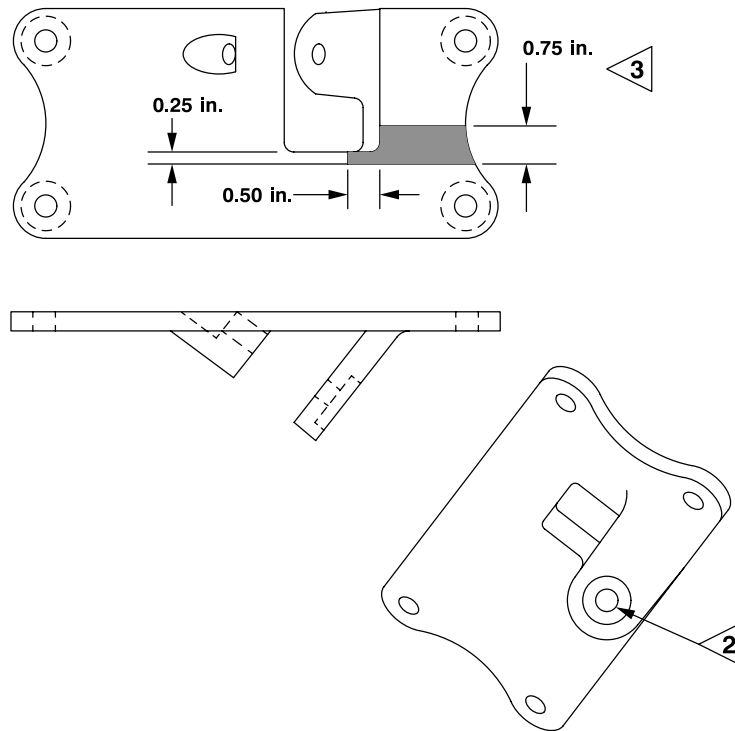
NOTE:  Bore damage not to exceed 0.002 inch for one-fourth circumference. Limit one per bore.

406001-324
J1845

Directional Control Forward Walking Beam Support Assembly — Damage Limits (Sheet 1 of 2)

GO TO NEXT PAGE

11-5-3. FLIGHT CONTROL SUPPORTS — CLEANING/INSPECTION/REPAIR (CONT)





SUPPORT ASSEMBLY
206-001-734-101

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	MECHANICAL	CORROSION
MECHANICAL	0.020 in. after repair	0.040 in. after repair
CORROSION	0.010 in. before and 0.020 in. after repair	0.020 in. before and 0.040 in. after repair

- NOTES:
-  Lug hole may be reamed and bushed to clean up damage or corrosion to a maximum diameter of 0.3145 inch.
 -  0.190 Inch minimum wall thickness after repair.

406001-321
J2588

Directional Control Forward Walking Beam Support Assembly — Damage Limits (Sheet 2 of 2)

END OF TASK

11-5-4. TRANSDUCER — FUNCTIONAL TEST

This task covers: Functional Test (Off Helicopter)

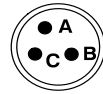
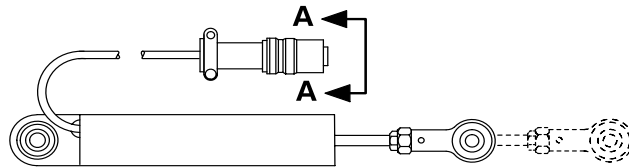
INITIAL SETUP

Tools:
Digital Multimeter (B98)

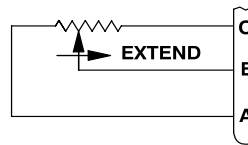
Applicable Configurations:
All

Personnel Required:
68F Aircraft Electrician

1. Check for smooth movement throughout full range of travel.
2. Using multimeter (B98), check for continuity between pins A and C on each electrical connector. Continuity should be present.
3. Using multimeter (B98), check for continuity between pins B and C throughout entire range of travel. Resistance will vary from one end of travel to the other.
4. Replace transducer for lack of continuity or erratic movement during travel.



VIEW A-A



SCHEMATIC

406074-15
J1845

END OF TASK

11-5-5. TRANSDUCER — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Electrical Repairer Tool Kit (B177)

Material:
Wiping Rag (D164)
Drycleaning Solvent (D199)

Rubber Gloves (D111)
Sandpaper (D175)
Epoxy Primer Coating (D98)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68F Aircraft Electrician

References:
TM 55-1500-323-24

CLEAN



Drycleaning Solvent

CAUTION

Do not clean shaft using drycleaning solvent (D199). Use clean, dry wiping rag (D164) only.

1. Clean transducer surface with drycleaning solvent (D199).
2. Dry transducer with a wiping rag (D164).

INSPECT

3. Inspect transducer to limits shown. See figure Transducer — Damage Limits.

REPAIR



Sanding Operations

4. Remove scratches, nicks, and corrosion on metal surfaces of transducer with 400 grit sandpaper (D175).

5. Remove sanding residue with wiping rag (D164).



Epoxy Primer Coating

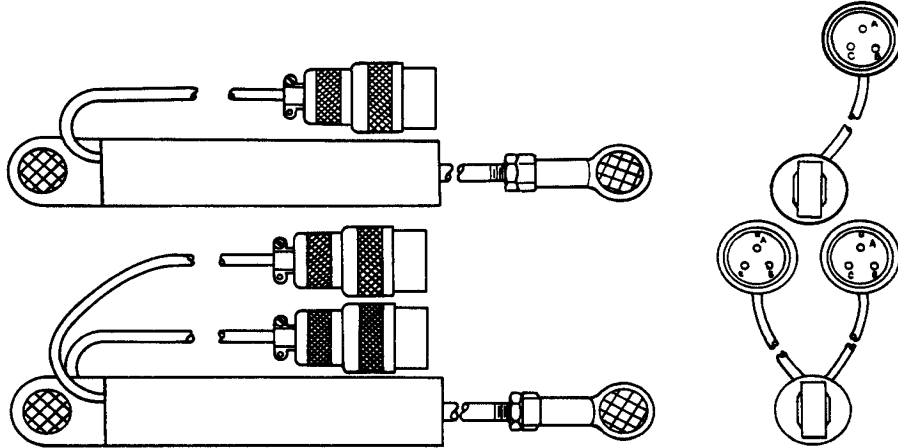
6. Touch up repaired areas using epoxy primer coating (D98).

7. Repair transducer wiring/connection (TM 55 1500-323-24) as required.

8. Replace transducer if wear and damage limits are exceeded.

GO TO NEXT PAGE

11-5-5. TRANSDUCER — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL AND CORROSION

0.010 in. before and 0.020 in. after repair

MAXIMUM AREA PER FULL DEPTH REPAIR

0.125 sq. in.

NUMBER OF REPAIRS

Not critical

EDGE CHAMFER TO REMOVE DAMAGE

0.016 in.

BORE DAMAGE 0.002 x 1/4 circumference

BEARING WEAR:

Axial: 0.005 in.
Radial: 0.002 in.

WIRE AND PIN DAMAGE:

Broken/bent connector pins to be replaced. Repair broken wires at connector end permissible if wire length reduction is less than 0.4 in.

NOTES

Detectable binding of shaft within unit shall be cause for replacement.

406074-5
J1909

Transducer — Damage Limits

END OF TASK

CHAPTER 12

ENVIRONMENTAL CONTROL SYSTEMS

12-1. ENVIRONMENTAL CONTROL SYSTEMS

and OH-58D(R) helicopters. The chapter is divided into two sections.

This chapter contains maintenance procedures for the environmental control systems for the OH-58D

		Page
Section I	Heating System	12-2
Section II	Ventilating System	12-38

Section I. HEATING SYSTEM

12-2. HEATING SYSTEM

OH-58D and OH-58D(R) helicopters. Standard torques are provided in Appendix P and TM 1-1500-204-23.

12-3. INTRODUCTION

This section contains maintenance procedures for: removal, cleaning, inspection, repair, and installation of heating system components for the

12-4. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Mixing Valve — Removal	12-1-1	12-3
Mixing Valve — Disassembly	12-1-2	12-5
Mixing Valve — Cleaning/Inspection/Repair	12-1-3	12-7
Mixing Valve — Assembly	12-1-4	12-10
Mixing Valve — Installation	12-1-5	12-13
Solenoid — Removal/Installation	12-1-6	12-15
Remote Sensor — Removal/Installation	12-1-7	12-16
Remote Sensor — Cleaning/Inspection/Repair	12-1-8	12-18
Heater Control Cable — Removal/Installation	12-1-9	12-20
Heater Control Cable — Cleaning/Inspection	12-1-10	12-22
Heating and Ventilation System Ducts — Cleaning/Inspection/Repair	12-1-11	12-23
Heating and Ventilation System Ducts — Removal/Installation	12-1-12	12-26
Bleed Air Tube Firesleeves — Removal/Installation	12-1-13	12-35
Bleed Air Tube Firesleeves — Cleaning/Inspection	12-1-14	12-37

12-1-1. MIXING VALVE — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

Personnel Required:
67S Scout Helicopter Repairer

Applicable Configurations:
All

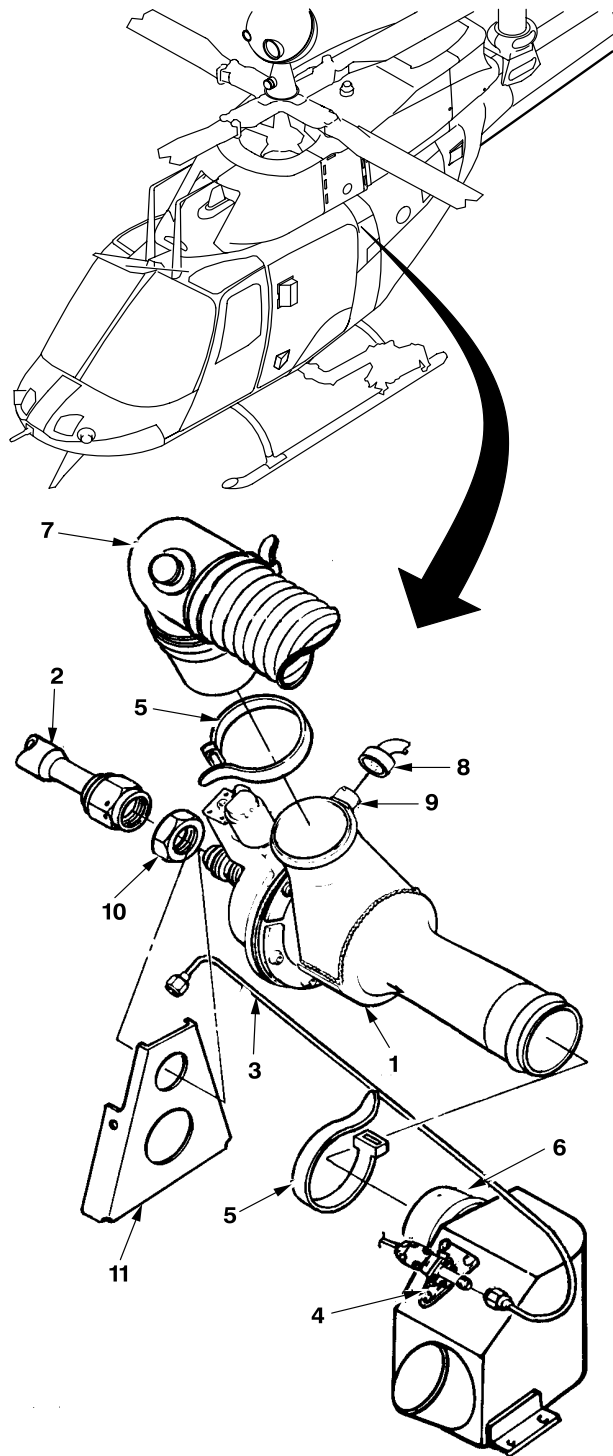
Equipment Condition:
Helicopter Safed (Task 1-6-7)

Tools:
General Mechanic Tool Kit (B178)
Wrench (B216) (2 each)

GO TO NEXT PAGE

12-1-1. MIXING VALVE — REMOVAL (CONT)

1. Gain access to mixing valve (1) located on shelf above aft electrical compartment.
2. Remove lockwire from nut on tube (2).
3. Loosen nut on tube (2). Disconnect tube.
4. Disconnect tube (3) at mixing valve (1) and remote sensor (4).
5. Cut tiedown straps (5) on ducts (6 and 7) attached to mixing valve (1). Push duct (6) away from mixing valve (1).
6. Disconnect electrical connector (8) from receptacle (9) of mixing valve (1).
7. Remove mounting nut (10) attaching mixing valve (1) to bracket (11) and remove mixing valve (1).



406961-86-2
J1829

END OF TASK

12-1-2. MIXING VALVE — DISASSEMBLY

This task covers: Disassembly (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Airframe Repairer Tool Kit (B176)

Personnel Required:

67S Scout Helicopter Repairer

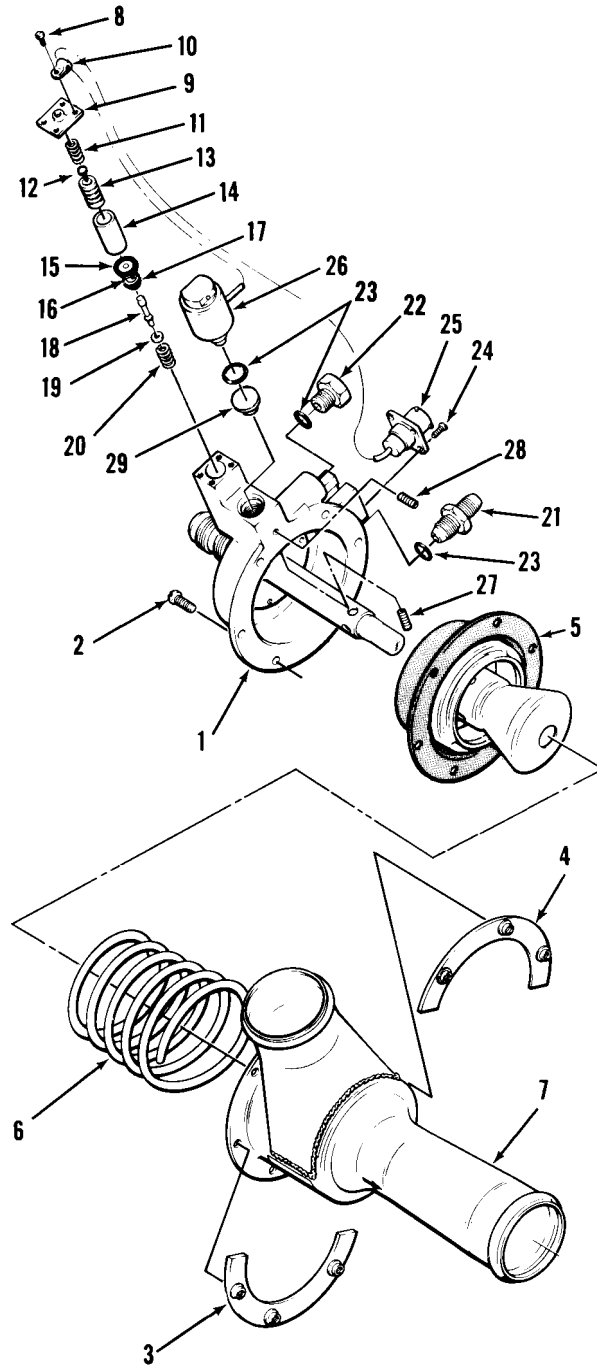
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12-1-2. MIXING VALVE — DISASSEMBLY (CONT)

WARNING

Mixing valve assembly is spring-loaded. Exercise caution when removing screws.

1. Remove control valve (1) by removing six screws (2) from ring assemblies (3) and (4).
2. Remove diaphragm assembly (5) and spring (6) from body (7).
3. Cut lockwire and remove four screws (8) that secure plate (9) to control valve (1) and remove wire clip (10).
4. Remove plate (9), lift spring (11), shim (12), piston (13), guide (14), packing (15), seat (16), packing (17), stem (18), washers (19), and spring (20) from control valve (1).
5. Remove union (21), plug (22), and packings (23) from control valve (1).
6. Cut lockwire and remove four screws (24) that secure connector (25) and remove connector (25) from control valve (1).
7. Remove solenoid (26), packing (23), setscrew (27), pin-plug (28), and seat (29) from control valve (1).



406072-1-1
J0564

END OF TASK

12-1-3. MIXING VALVE — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Rubber Gloves (D111)
Paint Brush (D54)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Tools:
General Mechanic Tool Kit (B178)

References:
TM 1-1500-344-23

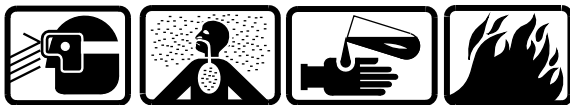
Material:
Drycleaning Solvent (D199)
Sandpaper (D175)
Epoxy Primer Coating (D98)
Wiping Rag (D164)

Equipment Condition:
Mixing Valve Disassembled (Task 12-1-2)

CLEAN

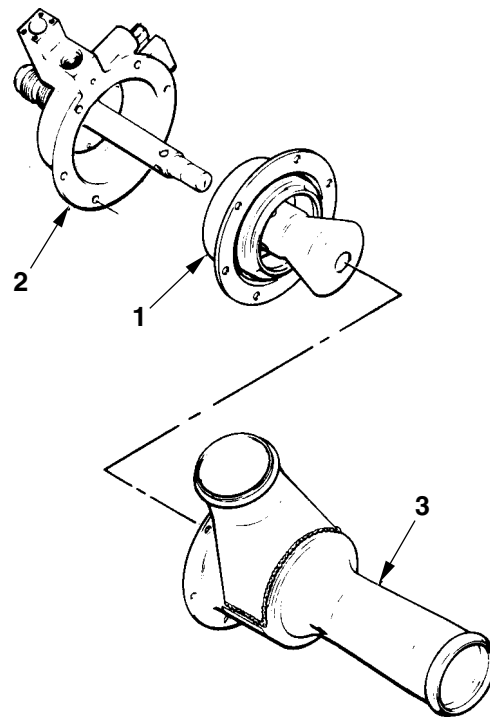
WARNING

Perform task in a well-ventilated area.



Drycleaning Solvent

1. Clean all metal parts using drycleaning solvent (D199) and paint brush (D54). Dry with wiping rag (D164).



406961-747
H1907

INSPECT

NOTE

This inspection is to determine if any part of heater mixing valve is damaged or worn to the extent that it should be replaced.

2. Inspect all parts for damage and corrosion (TM 1-1500-344-23).
3. Inspect all ports and orifices for blockage and corrosion (TM 1-1500-344-23).
4. Discard diaphragm assembly (1).
5. Inspect mixing valve body (2 and 3) for dents, breaks, and deformation.
6. Inspect solenoid for discoloration from overheating.

REPAIR

NOTE

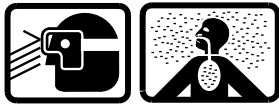
Repairs consist of replacement of worn or damaged parts.

7. Replace all parts that are cracked.

GO TO NEXT PAGE

12-1-3. MIXING VALVE — CLEANING/INSPECTION/REPAIR (CONT)

8. Replace packings (4, 5, 6, 7, and 8).
9. Replace diaphragm assembly (1).
10. Replace spring (9).
11. Replace broken or distorted springs (10 and 11).
12. Replace plug (12) and union (13) having damaged threads or eroded interior.
13. Replace solenoid (14) having damaged connector (15) or evidence of overheating.



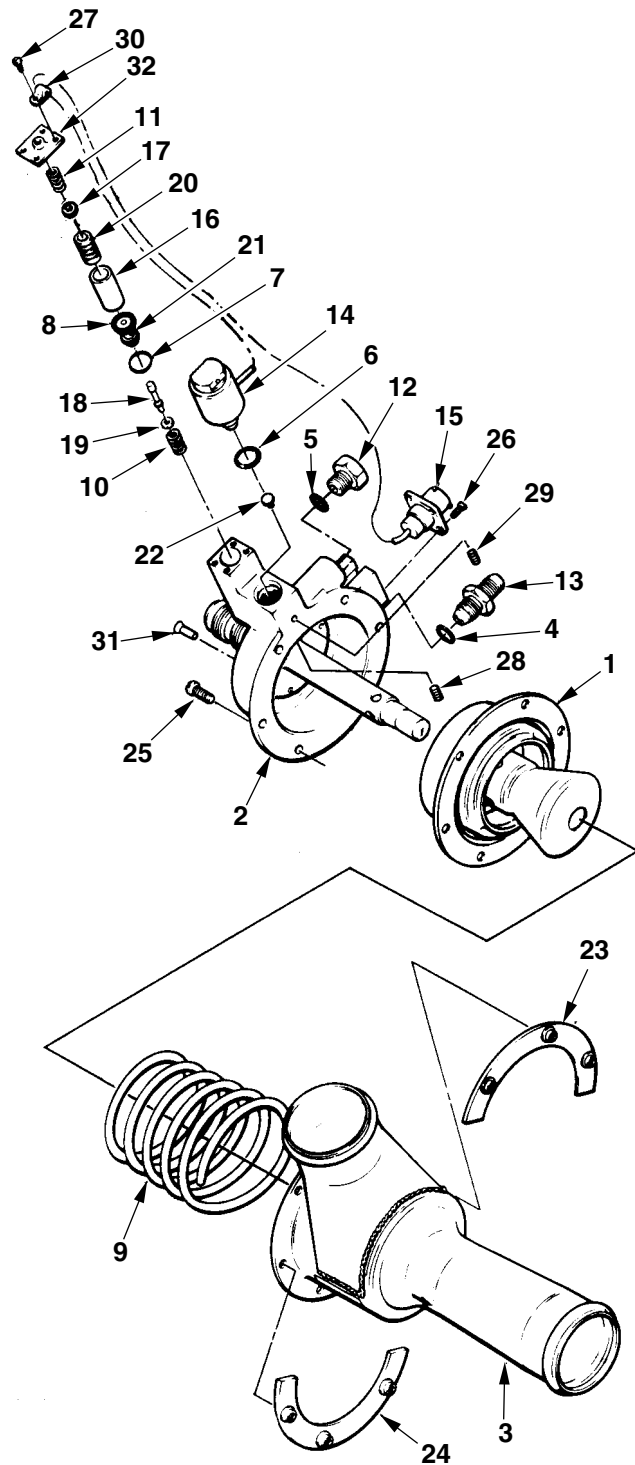
Sanding Operations

14. Polish out scratches in guide (16) using 400 grit sandpaper (D175).
15. Replace damaged shim (17).
16. Replace stem (18) and washer (19) if any wear is evident.
17. Replace piston (20) and seats (21 and 22) if scratched or pitted.
18. Replace broken or bent ring assemblies (23 and 24).
19. Replace screws (25, 26, and 27) and setscrew (28) having damaged threads.
20. Replace pin-plug (29) and wire clamp (30).
21. Replace cracked or broken rivets (31).



Sanding Operations

22. Polish out scratches and dents in plate (32) and mixing valve body (2 and 3) using 400 grit sandpaper (D175).



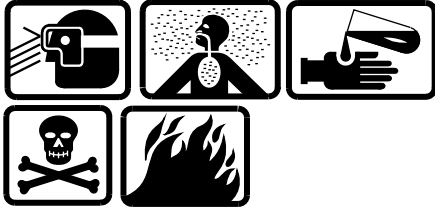
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12-1-3. MIXING VALVE — CLEANING/INSPECTION/REPAIR (CONT)

**Drycleaning Solvent**

23. Remove sanding residue with drycleaning solvent (D199) and dry with wiping rags (D164).

**Epoxy Primer Coating**

24. Apply one coat of epoxy primer coating (D98) to all repaired areas of parts which were previously painted.

INSPECT

END OF TASK

12-1-4. MIXING VALVE — ASSEMBLY

This task covers: Assembly (Off Helicopter)

INITIAL SETUP

Material:

Dry Lubricant (D135)
Lockwire (D131)

Applicable Configurations:
All

Personnel Required:

67S Scout Helicopter Repairer

Tools:

General Mechanic Tool Kit (B178)
Torque Wrench (B238)

GO TO NEXT PAGE

12-1-4. MIXING VALVE — ASSEMBLY (CONT)

NOTE

Replace all packings upon assembly and ensure all parts are clean.

ASSEMBLE

1. On control valve (1) install seat (2), pin-plug (3), setscrew (4), packing (5), and solenoid (6).

2. Install connector (7) on control valve (1) with four screws (8). Install lockwire (D131).

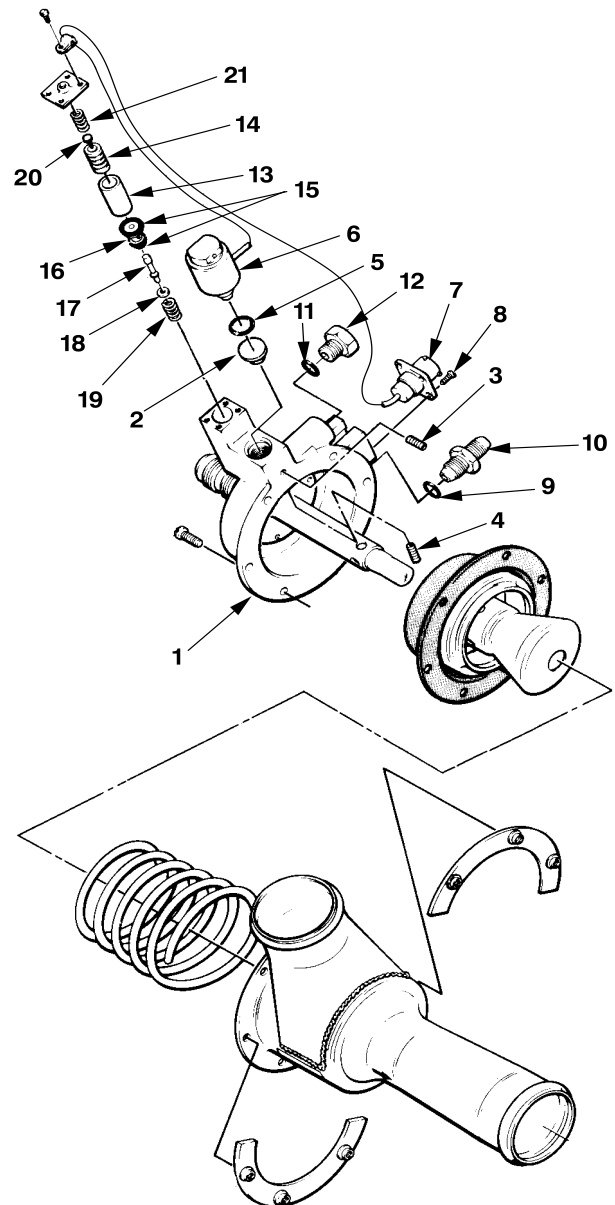
3. Install packing (9) and union (10) on control valve (1). Torque union (10) **95 TO 105 INCH-POUNDS**.

4. Install packing (11) and plug (12) on control valve (1). Torque plug (12) **95 TO 105 INCH-POUNDS**.

**Film Lubricant**

5. Apply dry lubricant (D135) to inside of guide (13). Pass piston (14) through guide (13) several times and remove excess lubricant.

6. Install packings (15) on seat (16) and place stem (17) into seat (16). Place washer (18) and spring (19) on stem (17). Install this group of parts onto control valve (1). Insert guide (13), piston (14), shim (20), and spring (21) in control valve (1).



406072-2-4
J1831

GO TO NEXT PAGE

12-1-4. MIXING VALVE — ASSEMBLY (CONT)

7. Position wire clip (22) on electrical wire, install plate (23) and wire clip (22) with four screws (24). Secure screws with lockwire (D131).

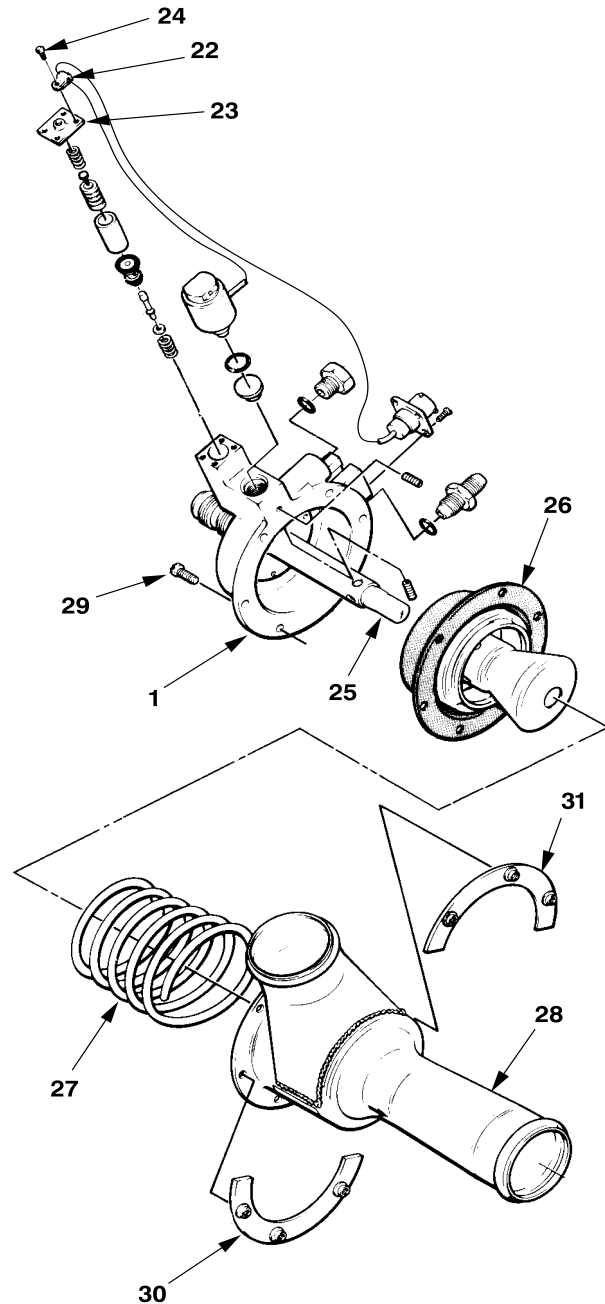
8. Lubricate stem of nozzle (25) on control valve (1) with dry lubricant (D135).

9. Install diaphragm assembly (26) on control valve (1). Position spring (27) and housing (28) onto diaphragm assembly (26).

WARNING

Diaphragm assembly is spring-loaded. Exercise caution when compressing spring between diaphragm and mixing valve body.

10. Compress spring (27) with caution to avoid cutting or deforming diaphragm (26). Secure housing (28) to control valve (1) with six screws (29) and ring assemblies (30) and (31).



406072-2-3
J1831

END OF TASK

12-1-5. MIXING VALVE — INSTALLATION

This task covers: Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

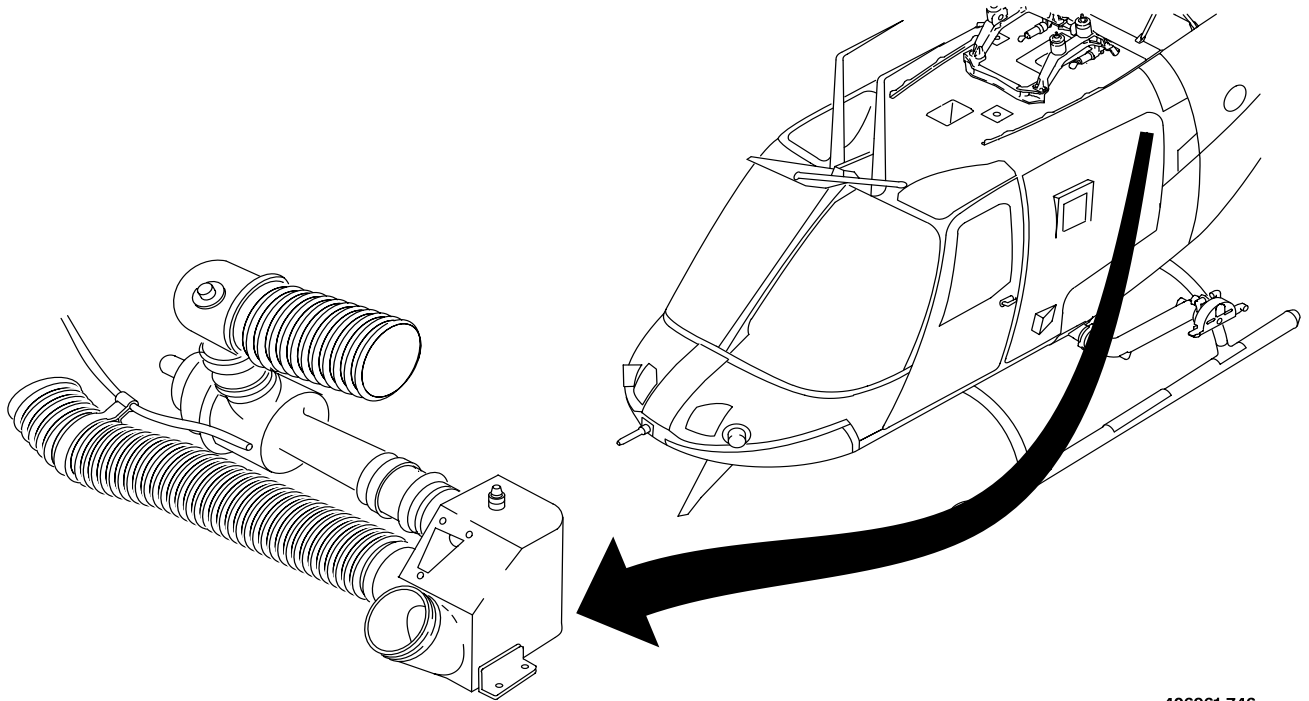
Tools:
General Mechanic Tool Kit (B178)
Panduit Tie Gun (B62)
Open End Wrench (B216)
Torque Wrench (B237)
Torque Wrench (B240)
Torque Wrench (B241)

Material:
Lockwire (D131)
Tiedown Strap (D206)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
Maintenance Test Pilot

References:
TM 1-1520-248-MTF

Equipment Condition:
Helicopter Safed (Task 1-6-7)



406961-746
J1831

GO TO NEXT PAGE

12-1-5. MIXING VALVE — INSTALLATION (CONT)

INSTALL

1. Prepare surfaces of mixing valve (1) to provide Class R-1 electrical bond. Refer to appendix M for electrical bonding instructions.

2. Install mixing valve (1) through mounting hole of bracket (2) and install nut (3) fingertight on threaded end.

3. Align mixing valve (1) to ducts (4 and 5) and press ducts onto mixing valve (1).

4. Install tube (6) on mixing valve (1). Torque fitting **430 TO 470 INCH-POUNDS**.

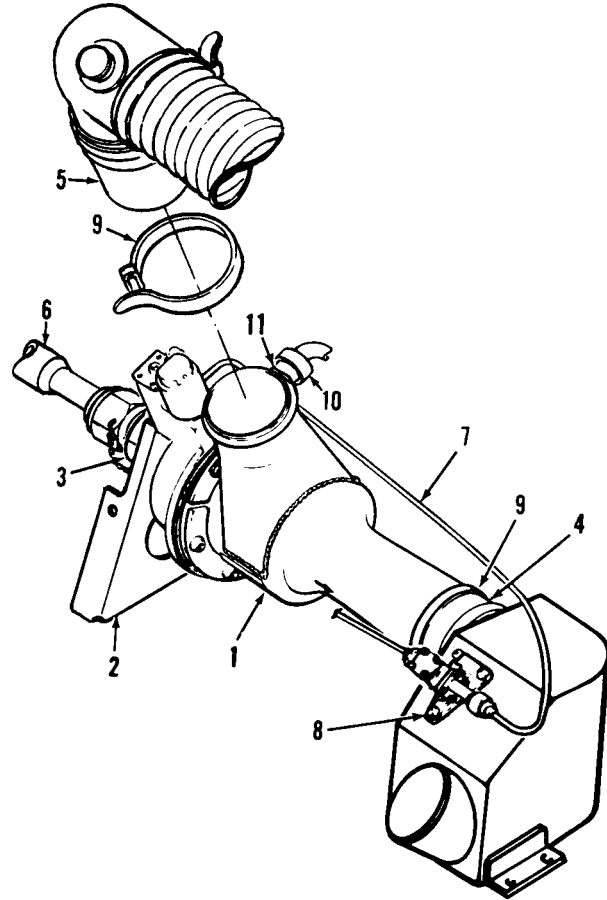
5. Tighten nut (3) to secure mixing valve (1). Torque nut (3) **230 TO 260 INCH-POUNDS**.

6. Install lockwire (D131) on nut of tube (6).

7. Install tube (7) on mixing valve (1) and remote sensor (8). Torque fittings **50 TO 65 INCH-POUNDS**.

8. Secure ducts (4 and 5) with tiedown straps (D206) (9). Cut off excess tiedown straps.

9. Connect electrical connector (10) to receptacle (11) of mixing valve (1).



406961-85-2
J0564

INSPECT

FOLLOW-ON MAINTENANCE

Maintenance test pilot perform MOC/MTF (TM 1-1520-248-MTF).

END OF TASK

12-1-6. SOLENOID — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit (B177)
Digital Multimeter (B98)

Material:
Lockwire (D131)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
68F Aircraft Electrician

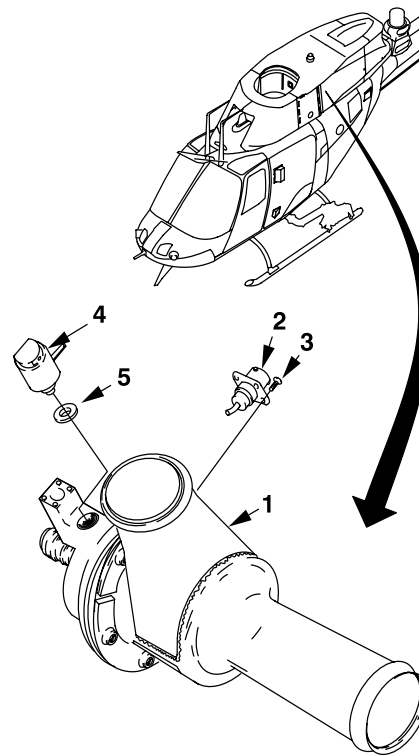
Equipment Condition:
Helicopter Safed (Task 1-6-7)
Electrical Power Removed (Tasks 1-6-5 and 1-6-6)

REMOVE

1. Gain access to mixing valve (1) through avionics compartment.
2. Disconnect electrical connector (not shown) from connector (2) on mixing valve (1).
3. Cut lockwire and remove four screws (3) and remove connector (2).
4. Cut lockwire and remove solenoid (4) and packing (5) from mixing valve (1).

INSTALL

5. Install serviceable solenoid (4) and packing (5) on mixing valve (1) and secure with lockwire (D131).
6. Install electrical connector (2) on mixing valve (1) with four screws (3) and install lockwire (D131).
7. Check solenoid coil continuity (slight resistance) at connector (2) pins A and D with digital multimeter (B98).
8. Connect electrical connector (not shown) to connector (2).

INSPECT

406072-3-2
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END OF TASK

12-1-7. REMOTE SENSOR — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Personnel Required:

67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Applicable Configurations:

All

Equipment Condition:

Helicopter Safed (Task 1-6-7)

Tools:

General Mechanic Tool Kit (B178)
■ Torque Wrench (B237)

GO TO NEXT PAGE

 12-1-7. REMOTE SENSOR — REMOVAL/INSTALLATION (CONT)

REMOVE

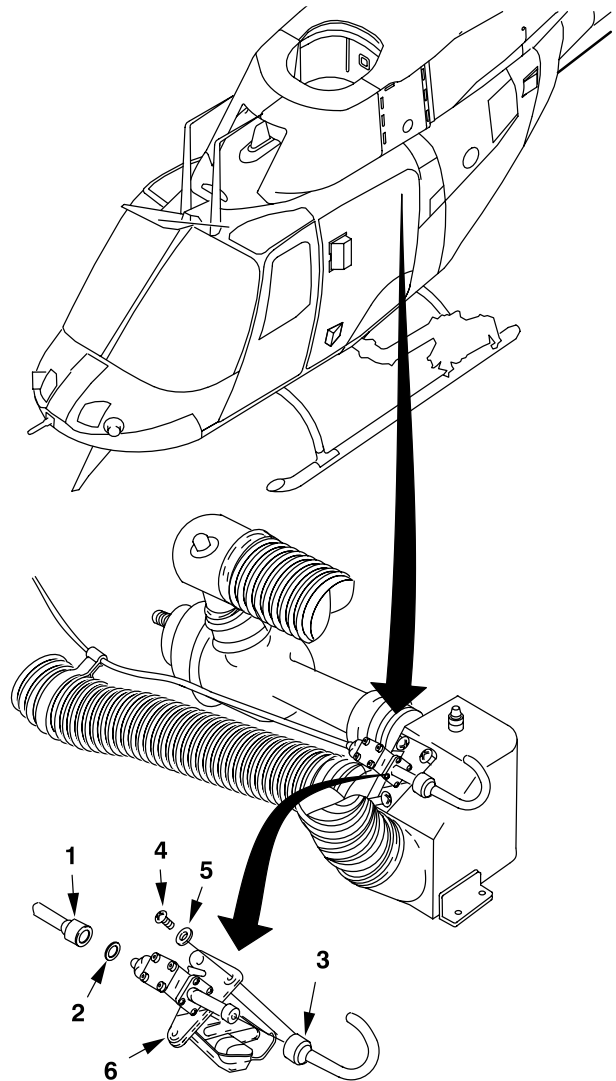
1. Open left access door.
2. Remove soundproofing blanket.
3. Disconnect control cable (1). Remove spacer (2).
4. Disconnect tube assembly (3).
5. Remove three screws (4) and washers (5).
6. Remove remote sensor (6).

INSTALL

7. Place remote sensor (6) in position.
8. Install three screws (4) and washers (5).
9. Install spacer (2). Connect control cable (1).
10. Connect tube assembly (3). Torque fitting **50 TO 65 INCH-POUNDS.**

INSPECT

11. Install soundproofing blanket.
12. Close left access door.


 406961-527
 J1803

END OF TASK

12-1-8. REMOTE SENSOR — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

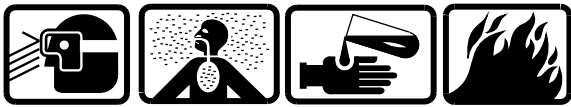
Material:
Drycleaning Solvent (D199)
Wiping Rags (D164)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

References:
TM 1-1500-344-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)

CLEAN

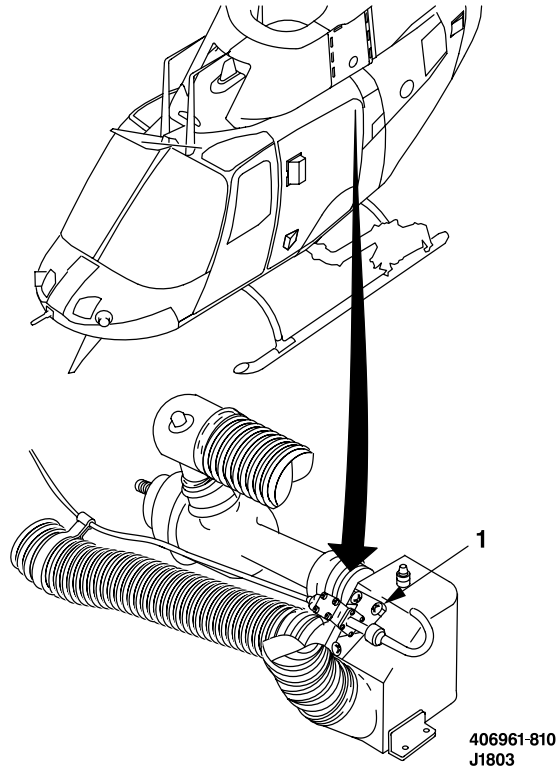


Drycleaning Solvent

1. Use drycleaning solvent (D199) and wiping rags (D164) to clean remote sensor (1) for inspection.
2. Use wiping rags (D164) to dry remote sensor (1).

INSPECT

3. Inspect remote sensor (1) for the following:
 - a. Cracks — none allowed
 - b. Breakage — none allowed
 - c. Corrosion — repair.



406961-810
J1803

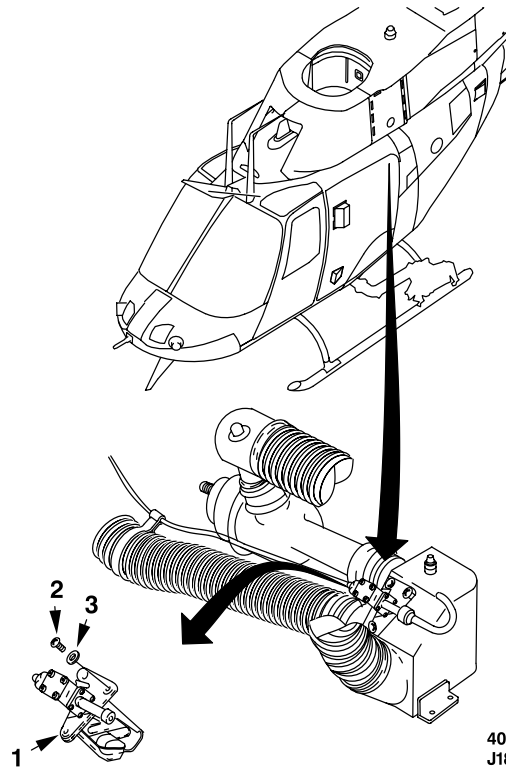
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12-1-8. REMOTE SENSOR — CLEANING/INSPECTION/REPAIR (CONT)

4. Inspect three screws (2) for the following:
 - a. Presence
 - b. Stripped threads
 - c. Crosspoint.
5. Inspect three washers (3) for the following:
 - a. Presence
 - b. Cracks.

REPAIR

6. Treat remote sensor (1) for corrosion in accordance with TM 1-1500-344-23.
7. Replace missing or damaged screws (2) and washers (3).

INSPECT406961-811
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END OF TASK

12-1-9. HEATER CONTROL CABLE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Material:
Sealing Compound (D184)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Tools:
General Mechanic Tool Kit (B178)

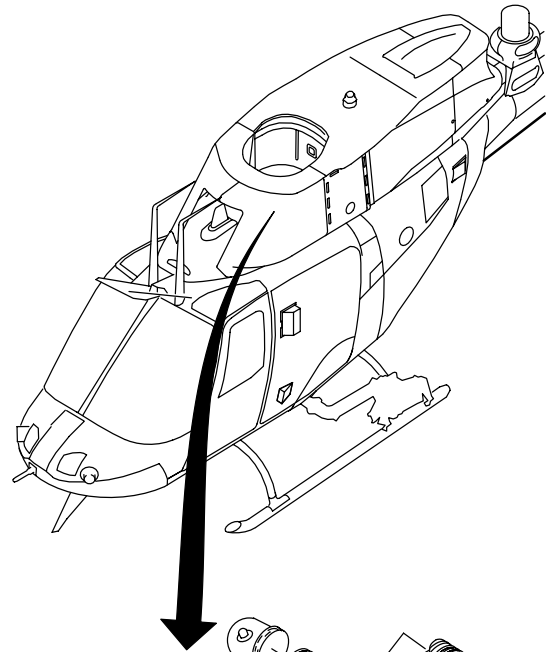
Equipment Condition:
Helicopter Safed (Task 1-6-7)

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12-1-9. HEATER CONTROL CABLE — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Open left access door.
2. Remove soundproofing blanket.
3. Detach heater control cable (1) from ducting, drain line, and structure at locations shown by removing nuts (2), washers (3), screws (4), and clamps (5).
4. Disconnect heater control cable (1) from remote sensor (6).
5. Open right access door.
6. Remove grommets (7 and 8).
7. Remove nuts (9), screws (10), and washers (11).
8. Remove heater control cable (1) with bracket.



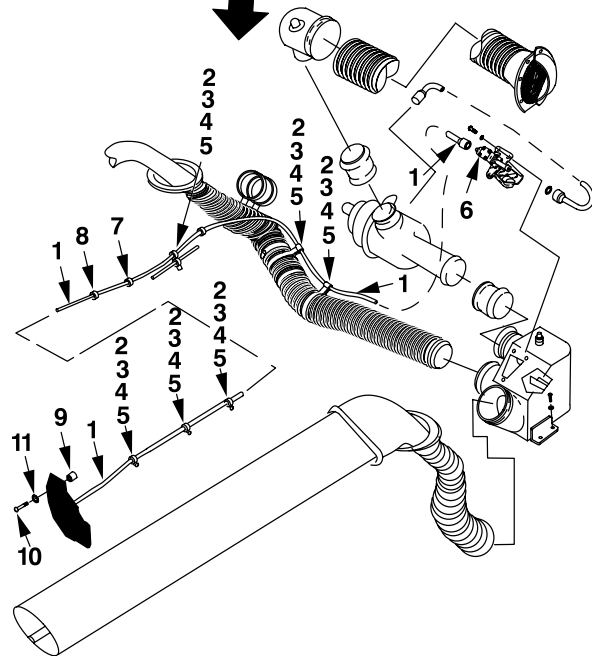
INSTALL

9. Position bracket with heater control cable (1) in place and secure by installing screws (10), washers (11), and nuts (9). Route heater control cable (1) aft along ducting to remote sensor (6).



Sealing Compound

10. Install grommets (7 and 8). Apply sealing compound (D184) at grommet locations.
11. Connect heater control cable (1) to remote sensor (6).
12. Clamp heater control cable (1) at locations shown by installing clamps (5), screws (4), washers (3), and nuts (2).



406070-17
J1803

INSPECT

13. Install soundproofing blanket.
14. Close left and right access door.

END OF TASK

12-1-10. HEATER CONTROL CABLE — CLEANING/INSPECTION

This task covers: Cleaning and Inspection (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

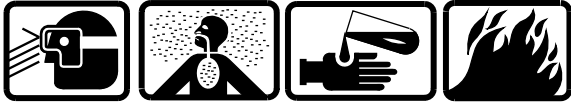
Tools:
General Mechanic Tool Kit (B178)

Material:
Drycleaning Solvent (D199)
Wiping Rags (D164)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)

CLEAN

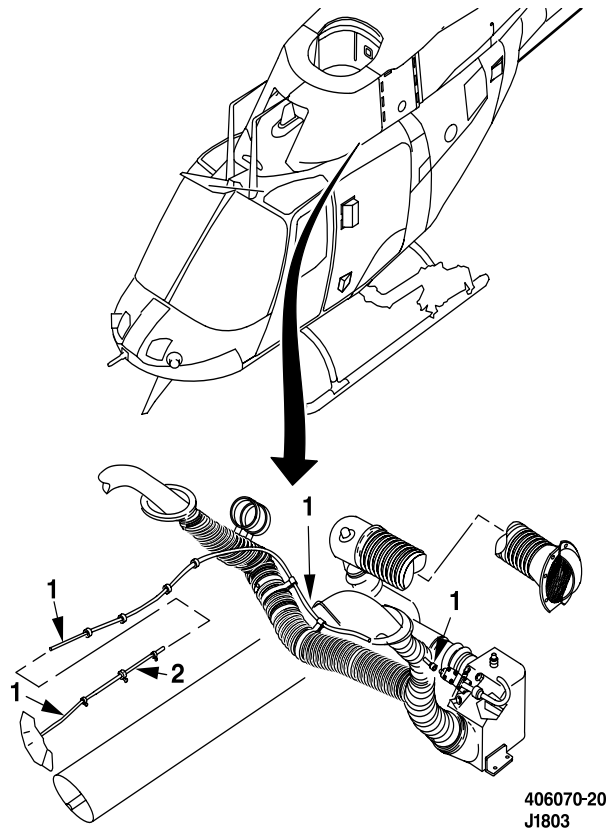


Drycleaning Solvent

1. Clean heater control cable (1) with drycleaning solvent (D199). Dry with wiping rags (D164).

INSPECT

2. Inspect heater control cable (1) for damage and/or deterioration.
3. Inspect heater control cable (1) for proper operation.
4. Inspect insulation tubing (2) for damage.



END OF TASK

12-1-11. HEATING AND VENTILATION SYSTEM DUCTS — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Airframe Repairer Tool Kit (B176)

Material:

Wiping Rag (D164)
Soap (D192)
Fiberglass Cloth (D101)
Sandpaper (D175)

White Cotton Gloves (D112)
Low-Lint Cleaning Cloth (D67)
Adhesive Brush (D52)
Adhesive (D21)
Polycarbonate (D155)
Rubber Gloves (D111)

Personnel Required:

67S Scout Helicopter Repairer
68G Aircraft Structural Repairer

Equipment Condition:

Helicopter Safed (Task 1-6-7)

CLEAN

CAUTION

Do not use any solvents on polycarbonate surface.



Cleaning Compound

1. Clean polycarbonate (rigid) ducts with mild soap (D192) and warm water. Rinse with clear water.
2. Dry ducts with clean wiping rag (D164).

INSPECT

3. Inspect polycarbonate (rigid) ducts for holes, tears, cracks, and deep scratches.
4. Inspect internal spacers in ducts for looseness.
5. Inspect ducts for damaged gaskets, seals, and couplings.
6. Inspect flexible ducts for holes, tears, and deterioration. Replace duct if defects are found.

GO TO NEXT PAGE

REPAIR

NOTE

Gloves (D112) shall be worn while repairing ducts.

7. Cracks or deep scratches in ducts less than **0.50 inch** in length:



Drilling Operations

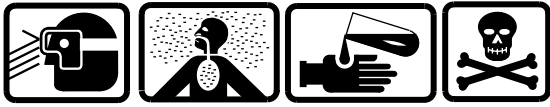
- a. Stop drill crack or deep scratch at each end with number 40 drill.



Sanding Operations

- b. Lightly abrade damaged area with 400 grit sandpaper (D175).
- c. Wipe area with clean low-lint cloth (D67) to remove all residue.

12-1-11. HEATING AND VENTILATION SYSTEM DUCTS — CLEANING/INSPECTION/REPAIR
(CONT)

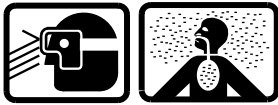


Adhesive

d. Apply adhesive (D21) to repair area using adhesive brush (D52) or spatula.

e. Allow adhesive to cure at room temperature, 70 to 80 °F (21 to 26 °C) for 48 hours.

8. Cracks or deep scratches in ducts longer than **0.50 inch**.



Drilling Operations

a. Stop drill crack or deep scratch at each end with number 40 drill bit.



Sanding Operations

b. Lightly abrade damage area with 400 grit sandpaper (D175).

c. Wipe area with clean low-lint cloth (D67) to remove residue.

d. Cut a section of 120 to 127 weave fiberglass cloth (D101) to extend a minimum of **0.50 inch** around periphery of repair area.



Adhesive

e. Apply adhesive (D21) to repair area using adhesive brush (D52) or spatula.

f. To repair, lay previously cut fiberglass cloth section from step d., over repair area and rub adhesive lightly on fiberglass cloth.



Adhesive

g. Apply brush coat of adhesive (D21) over fiberglass repair area.

h. Allow adhesive to cure at room temperature, 70 to 80 °F (21 to 26 °C) for 48 hours.

9. Holes or tears larger than **0.50 inch**.

a. Clean up hole or torn area for patch insertion repair.

GO TO NEXT PAGE

12-1-11. HEATING AND VENTILATION SYSTEM DUCTS — CLEANING/INSPECTION/REPAIR
(CONT)

b. Fabricate an insert (1) from polycarbonate (D155) the same size as hole cleanup.

or use heat lamp, minimum 160 °F (71 °C) for 2 hours minimum.

c. Fabricate two overlay patches (2) **0.50 inch** larger than insert (1).

d. Taper outer edge of overlay patches (2) as shown.



Sanding Operations

e. Lightly abrade insert (1), duct (3), and both patches (2) with 400 grit sandpaper (D175).



Adhesive

f. Using adhesive brush (D52), apply a coat of adhesive (D21) to nontapered surface of inner patch (2) and duct (3). Place patch (2) to inner surface of duct (3) and press firmly.

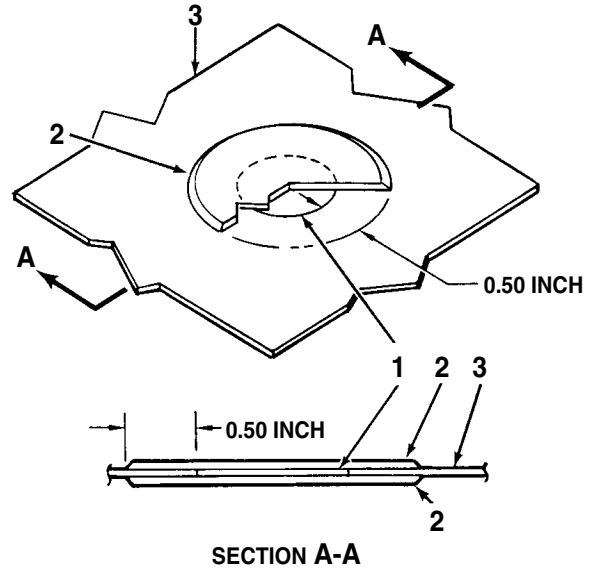
g. Apply adhesive (D21) to one surface of insert (1). While supporting inner patch (2), place insert (1) in hole.

h. Apply pencil mark **0.50 inch** (four locations) on duct (3) from edge of hole.

i. Apply a coat of adhesive (D21) to duct (3), insert (1), and nontapered surface of patch (2). Place patch between pencil mark and press firmly against duct.

j. Allow adhesive to cure at room temperature, 70 to 80 °F (21 to 26 °C) for 48 hours.

10. Apply a bead of adhesive (D21) around loose spacers. Allow adhesive to cure at room temperature, 70 to 80 °F (21 to 26 °C) for 2 days,



406961-711
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END OF TASK

12-1-12. HEATING AND VENTILATION SYSTEM DUCTS — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Airframe Repairer Tool Kit (B176)
Electronic Equipment Tool Kit (B244)
Panduit Tie Gun (B62)

Material:

Rubber Gloves (D111)
Tape (D217)
Silicone Adhesive (D36)
Tiedown Strap (D206)
Sandpaper (D175)
Low-Lint Cleaning Cloth (D67)
Adhesive Brush (D52)

Personnel Required:

68N Avionic Mechanic
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68G Aircraft Structural Repairer

References:

TM 11-1520-248-23

Equipment Condition:

Helicopter Safed (Task 1-6-7)
Back Cushion Removed (Task 2-2-20) or
Backrest Removed (Task 2-2-29)
Crew Seat and Armor Seat Panel Removed
(Task 2-2-33) or Seat Pan Assembly
Removed (Task 2-2-34)
Avionic Equipment Removed As Required
(TM 11-1520-248-23)

GO TO NEXT PAGE

12-1-12. HEATING AND VENTILATION SYSTEM DUCTS — REMOVAL/INSTALLATION (CONT)

REMOVE FORWARD SECTION DUCTS

1. Remove left or right side forward heating and ventilation system ducts.

NOTE

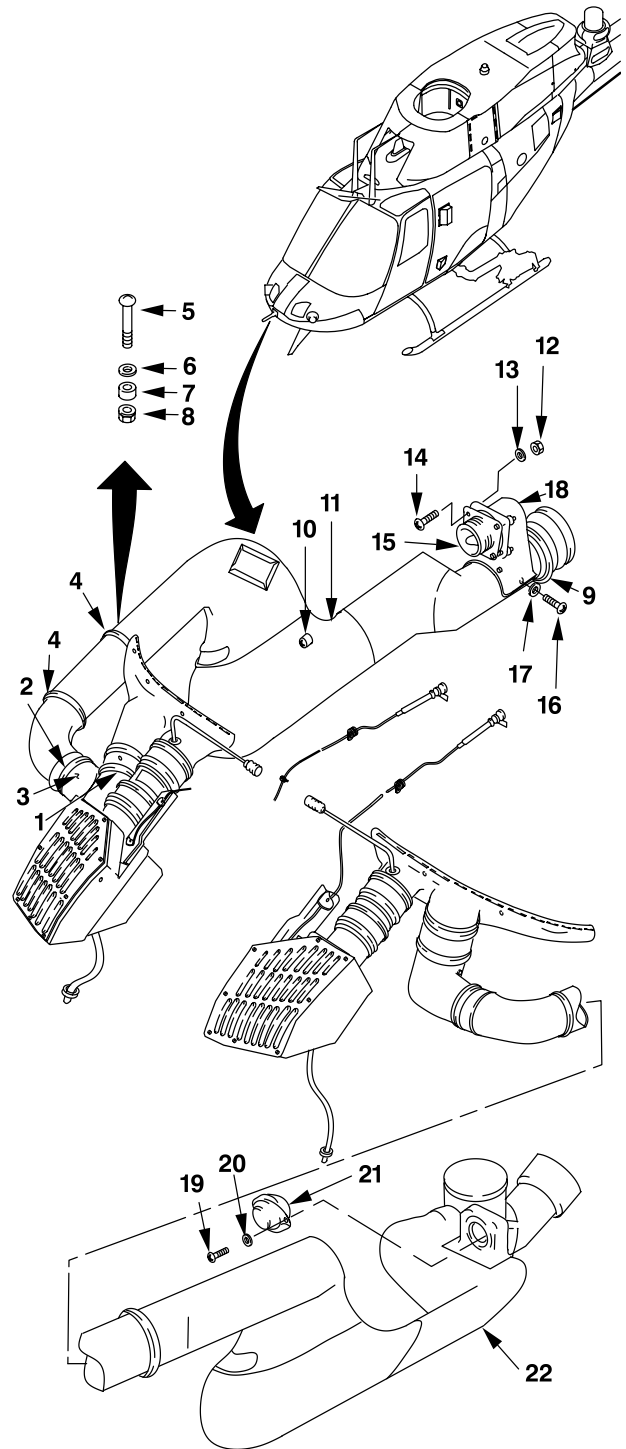
Procedures for left or right side forward ducts are identical unless noted otherwise.

- a. Open left or right side crew door, as required.
- b. Cut tiedown straps (1 and 2) and remove ducts (3).
- c. Remove two clamps (4) by removing screw (5), washer (6), spacer (7), and nut (8) at each clamp location.
- d. Cut tiedown strap (9).



Drilling Operations

- e. Drill out head of rivet (10) securing duct assembly (11).
- f. For right side ducting, remove four nuts (12), four washers (13), and four screws (14). Remove valve (15). Remove six screws (16), six washers (17), and remove duct (18).
- g. For left side ducting, remove two screws (19), two washers (20), and valve (21).
- h. Remove right side duct assembly (11) or left side duct assembly (22), as required.



406961-708
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12-1-12. HEATING AND VENTILATION SYSTEM DUCTS — REMOVAL/INSTALLATION (CONT)

REMOVE CENTER SECTION DUCTS

NOTE

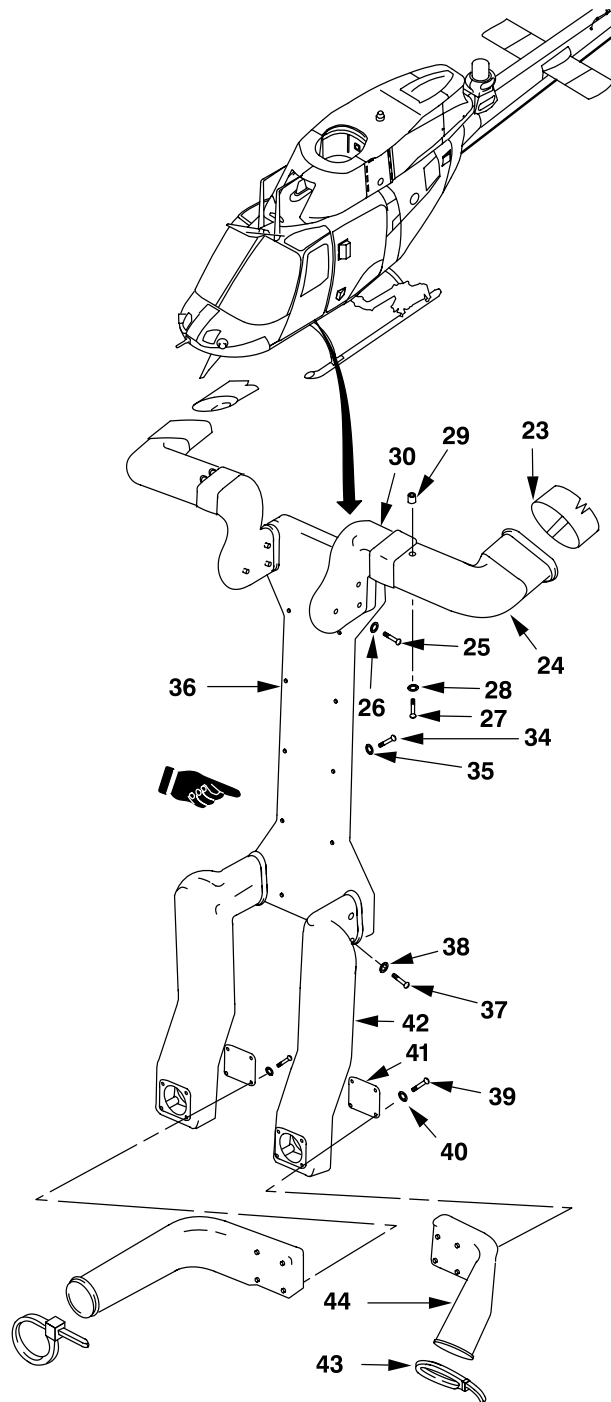
Removal procedure is the same for right ducting.

2. Remove tape from ducts (23 and 24).
3. Remove three screws (25) and three washers (26).
4. Remove screw (27), washer (28), and spacer (29). Remove ducts (24 and 30).

NOTE

Duct (24) is bonded to duct (30) with adhesive (D36).

5. Remove duct (30) from duct (24).
6. Deleted.
7. Remove 11 screws (34) and 11 washers (35) and duct (36).
8. Remove two screws (37) and two washers (38).
9. Remove four screws (39), four washers (40), and cover (41) from duct (42). Remove duct (42).
10. Cut and remove tiedown strap (43). Remove duct (44).



406961-709-1
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GO TO NEXT PAGE

12-1-12. HEATING AND VENTILATION SYSTEM DUCTS — REMOVAL/INSTALLATION (CONT)

REMOVE AFT SECTION DUCTS

11. Remove right duct (45) as follows:

NOTE

These procedures may be used for removing duct from either side of cabin.

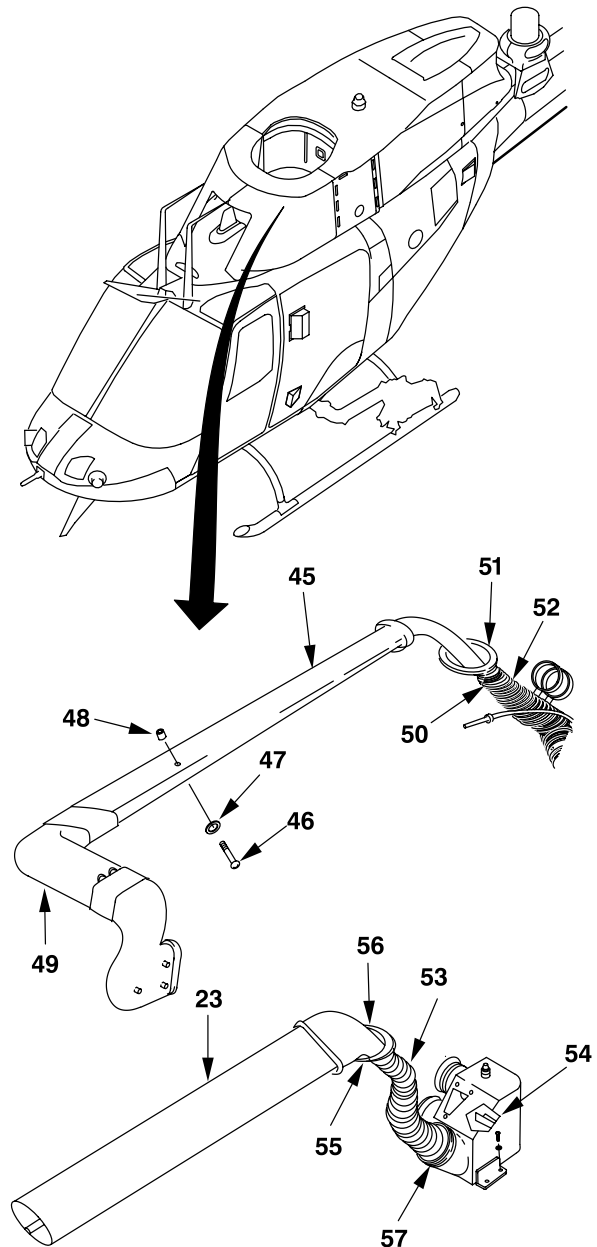
- a. Remove screw (46), washer (47), and spacer (48).
- b. Remove tape between duct (45) and duct (49).
- c. Remove tiedown strap (50) securing boot (51) and flexible duct (52) to duct (45).
- d. Remove duct (45) from helicopter.

12. Remove flexible duct (53) between left rigid duct (23) and plenum (54) as follows:

NOTE

Strap (55) will already be removed if duct (23) has been removed.

- a. Remove tiedown strap (55) securing boot (56) and duct (23) to duct (53).
- b. Remove tiedown strap (57) securing duct (53) to plenum (54).
- c. Remove duct (53).



406961-857
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GO TO NEXT PAGE

12-1-12. HEATING AND VENTILATION SYSTEM DUCTS — REMOVAL/INSTALLATION (CONT)

13. Remove flexible duct (52) between right rigid duct (45) and plenum (54) as follows:

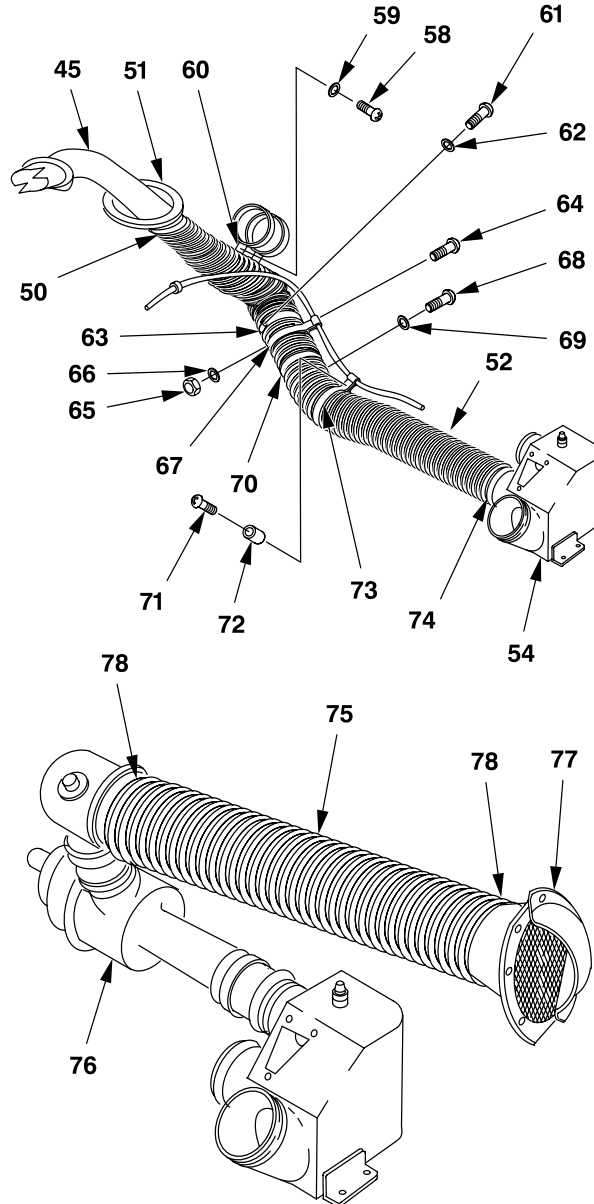
NOTE

Strap (50) will already be removed if duct (45) has been removed.

- a. Remove tiedown strap (50) securing boot (51) and duct (45) to duct (52).
- b. Remove screw (58), washer (59), and clamp (60).
- c. Remove screw (61), washer (62), and clamp (63).
- d. Remove screw (64), nut (65), washer (66), and clamp (67).
- e. Remove screw (68), washer (69), and clamp (70).
- f. Remove screw (71), spacer (72), and clamp (73).
- g. Remove tiedown strap (74) securing duct (52) to plenum (54).
- h. Remove duct (52) from helicopter.

14. Remove flexible duct (75) between mixing valve (76) and fresh air scoop (77) as follows:

- a. Remove tiedown straps (78) securing duct (75) to mixing valve (76) and fresh air scoop (77).
- b. Remove duct (75) from helicopter.



406961-709
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GO TO NEXT PAGE

12-1-12. HEATING AND VENTILATION SYSTEM DUCTS — REMOVAL/INSTALLATION (CONT)

INSTALL FORWARD SECTION DUCTS

15. Install left or right side forward heating and ventilation system ducts.

NOTE

Installation procedures for left or right side ducting are the same unless noted otherwise. All tiedown straps (D206) will be installed using Panduit tie gun (B62).

a. Install forward duct (3) in place and secure to nozzle with tiedown strap (D206) (1).

b. Install duct assembly (11) in place and install two clamps (4) using screw (5), washer (6), spacer (7), and nut (8) at each clamp location.

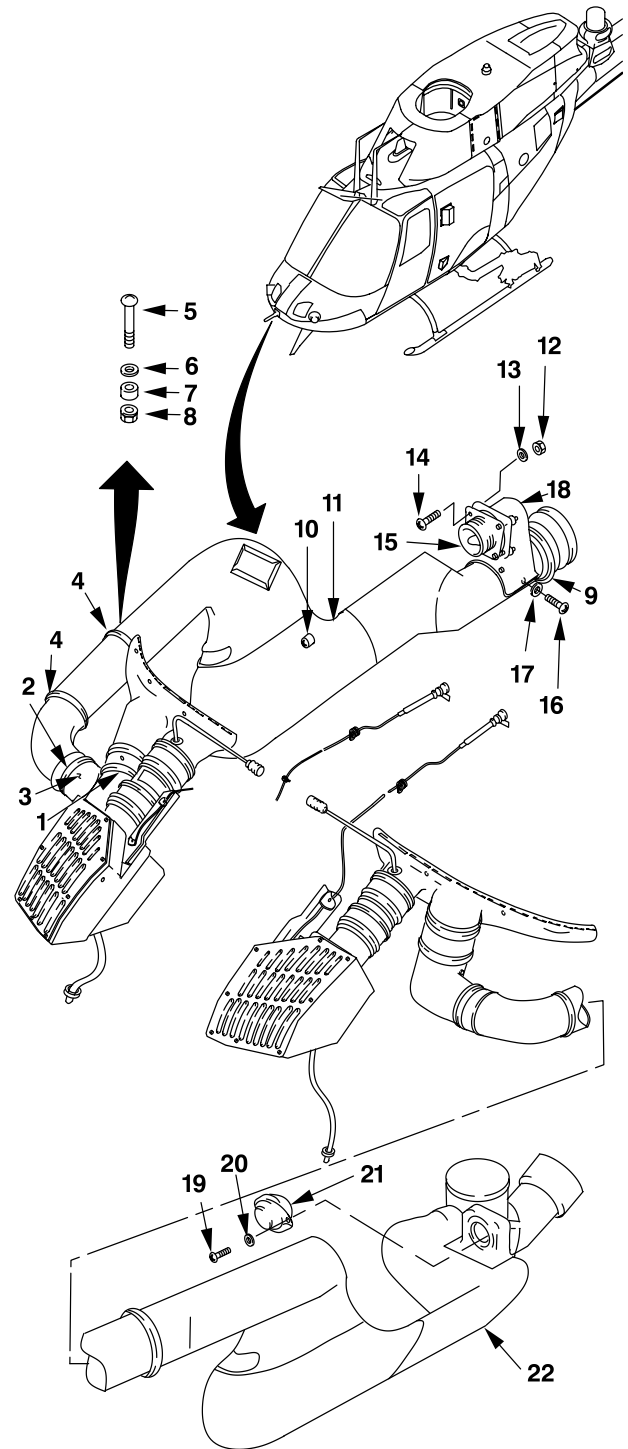
c. Secure duct assembly (11) to structure using rivet (10).

d. Secure duct assembly (11) to duct (3) using tiedown strap (D206) (2).

e. For right side duct assembly (11), install duct (18) using six screws (16) and six washers (17). Install valve (15) on forward side of seat bulkhead using four screws (14), four washers (13), and four nuts (12).

f. For left side duct assembly (22), install valve (21) using two screws (19) and two washers (20).

g. Connect duct assembly (11) to center section ducting using tiedown strap (D206) (9).



406961-708
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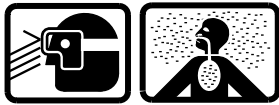
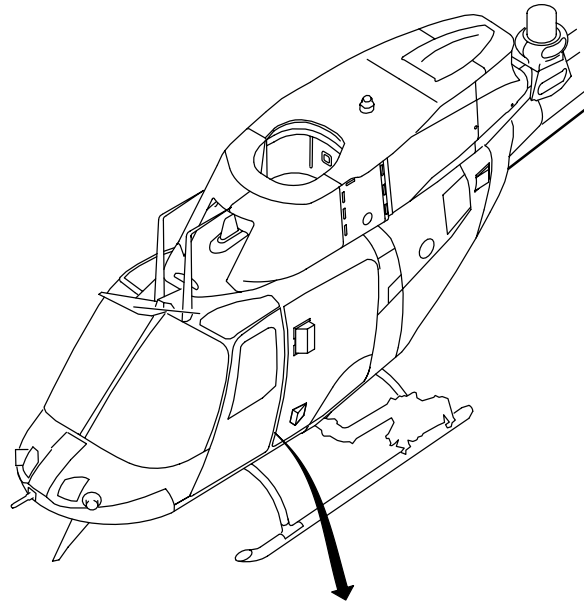
12-1-12. HEATING AND VENTILATION SYSTEM DUCTS — REMOVAL/INSTALLATION (CONT)

INSTALL CENTER SECTION DUCTS

NOTE

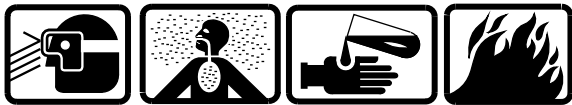
Installation procedures are the same for right ducting.

16. Position duct (36) to center post and install 11 screws (34) and 11 washers (35).
17. Deleted.
18. Install duct (42) to center post with two screws (37) and two washers (38).
19. Install lower end of duct (42), cover (41), and duct (44) to airframe with four screws (39) and four washers (40).
20. Install and secure forward end of duct (44) with tiedown strap (D206) (43).



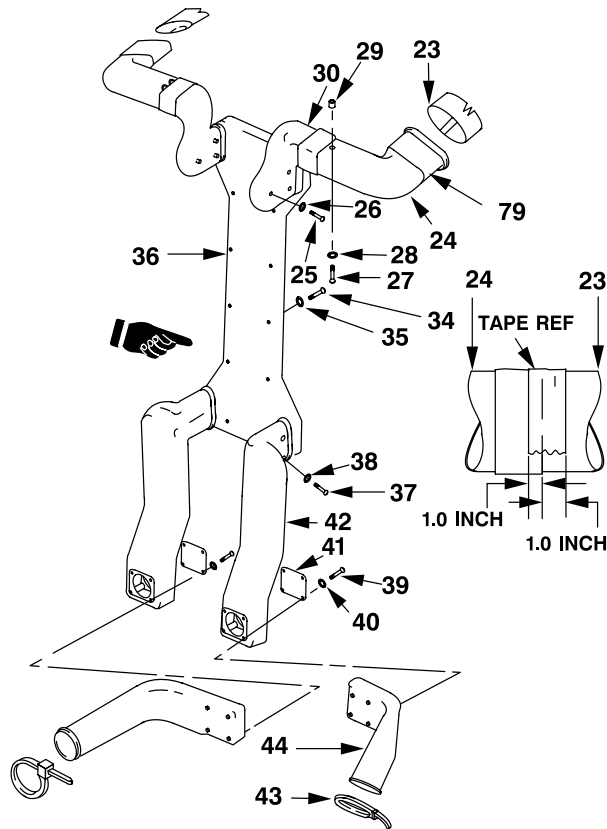
Sanding Operations

21. Lightly abrade outboard end of duct (30) with 400 grit sandpaper (D175). Wipe residue with low-lint cleaning cloth (D67).



Adhesive

22. Using adhesive brush (D52), apply a coat of silicone adhesive (D36) to area previously sanded and slide duct (24) onto duct (30). Allow adhesive to cure at room temperature 75 °F (23.9 °C), minimum 5 days.
23. Slide duct (24) onto duct (23) and install screw (27), washer (28), and spacer (29).
24. Install three screws (25) and three washers (26).
25. Place a pencil mark **1.00 inch** each direction from edge of collar (79). Apply tape (D217) around duct (23) and collar (79). Ensure tape is applied between pencil marks.



406961-710-2
J2745

INSPECT

GO TO NEXT PAGE

12-1-12. HEATING AND VENTILATION SYSTEM DUCTS — REMOVAL/INSTALLATION (CONT)

INSTALL AFT SECTION DUCTS

26. Install rigid duct (23 and 45) as follows:

NOTE

These procedures may be used to install duct on either side of cabin.

a. Install duct (45) between boot (51) and duct (49).

b. Wrap joint between duct (49) and duct (45) with tape (D217). Tape should overlap equally on each side of joint.

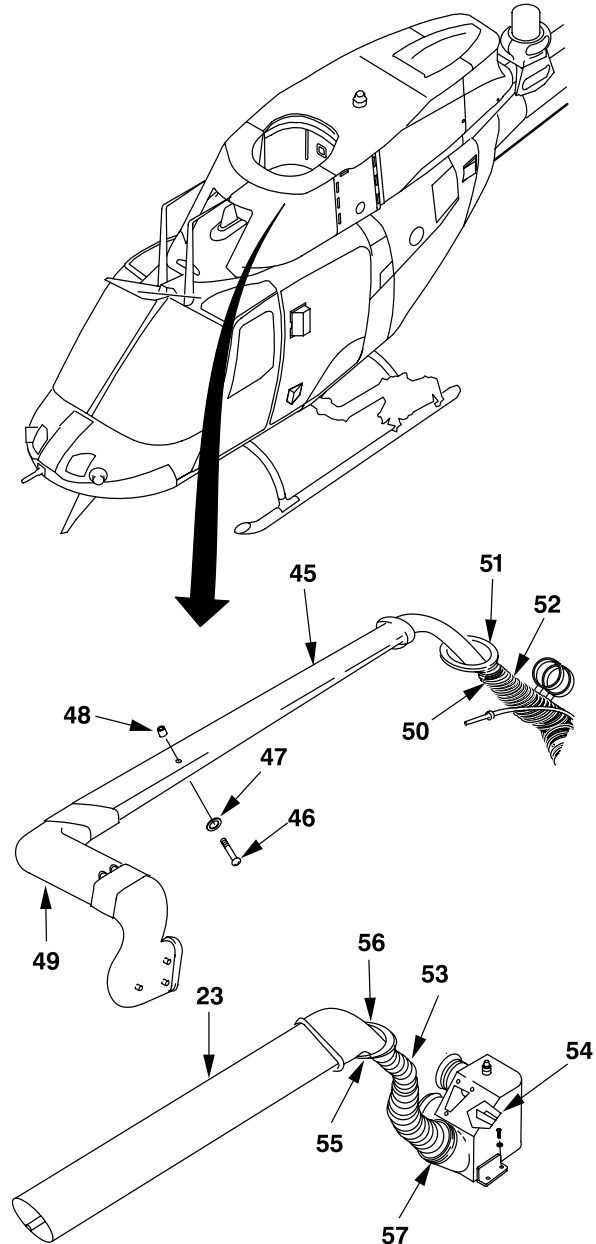
c. Install screw (46), washer (47), and spacer (48).

27. Install flexible duct (53) between left rigid duct (23) and plenum (54) as follows:

a. Install duct (53) between plenum (54) and duct (23).

b. Secure duct (53) to plenum (54) with tiedown strap (D206) (57).

c. Secure duct (53) to boot (56) to duct (23) with tiedown strap (D206) (55).



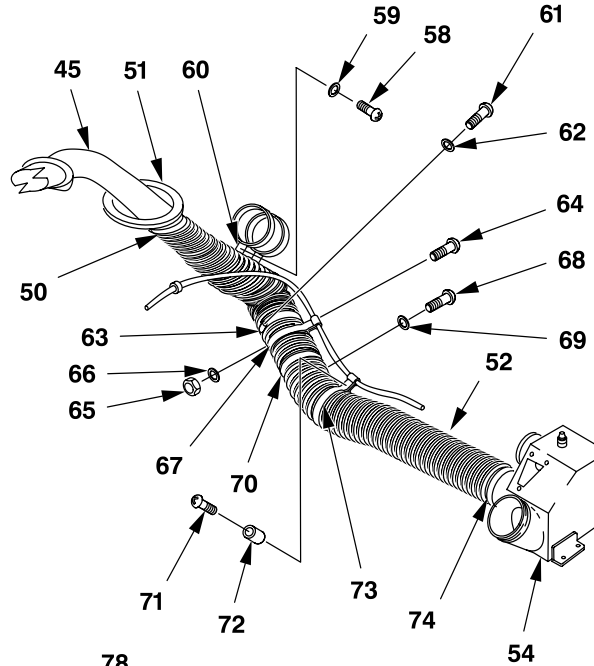
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12-1-12. HEATING AND VENTILATION SYSTEM DUCTS — REMOVAL/INSTALLATION (CONT)

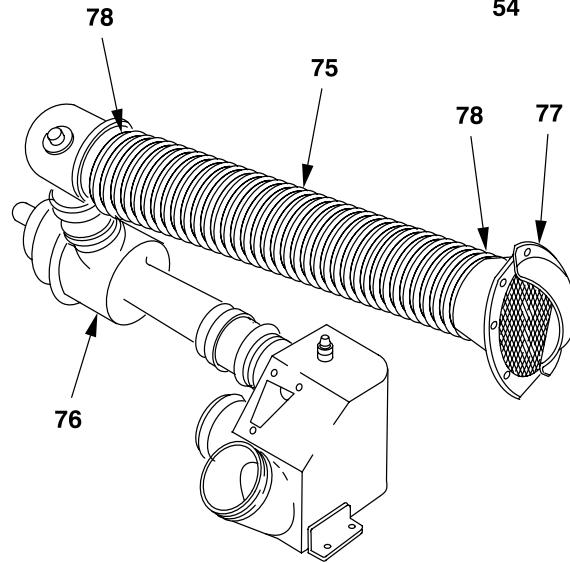
28. Install flexible duct (52) between right rigid duct (45) and plenum (54) as follows:

- a. Install duct (52) between plenum (54) and duct (45).
- b. Secure duct (52) to plenum (54) with tiedown strap (D206) (74).
- c. Secure duct (52) and boot (51) to duct (45) with tiedown strap (D206) (50).
- d. Install clamp (60) with screw (58) and washer (59).
- e. Install clamp (63) with screw (61) and washer (62).
- f. Install clamp (67) with screw (64), nut (65), and washer (66).
- g. Install clamp (70) with screw (68) and washer (69).
- h. Install clamp (73) with screw (71) and spacer (72).



29. Install flexible duct (75) between mixing valve (76) and fresh air scoop (77) as follows:

- a. Install duct (75) between mixing valve (76) and fresh air scoop (77).
- b. Secure duct (75) to fresh air scoop (77) with tiedown strap (D206) (78).
- c. Secure duct (75) to mixing valve (76) with tiedown strap (D206) (78).



INSPECT

FOLLOW-ON MAINTENANCE

Install crew seat and armor seat panel (Task 2-2-33) or seat pan assembly (Task 2-2-34).

Install back cushion (Task 2-2-20) or backrest (Task 2-2-29).

Install removed avionic equipment (TM 11-1520-248-23).

406961-709
J1803

END OF TASK

12-1-13. BLEED AIR TUBE FIRESLEEVES — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Lockwire (D131)
Torque Wrench (B240)
Torque Wrench (B241)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

12-1-13. BLEED AIR TUBE FIRESLEEVES — REMOVAL/INSTALLATION (CONT)

REMOVE

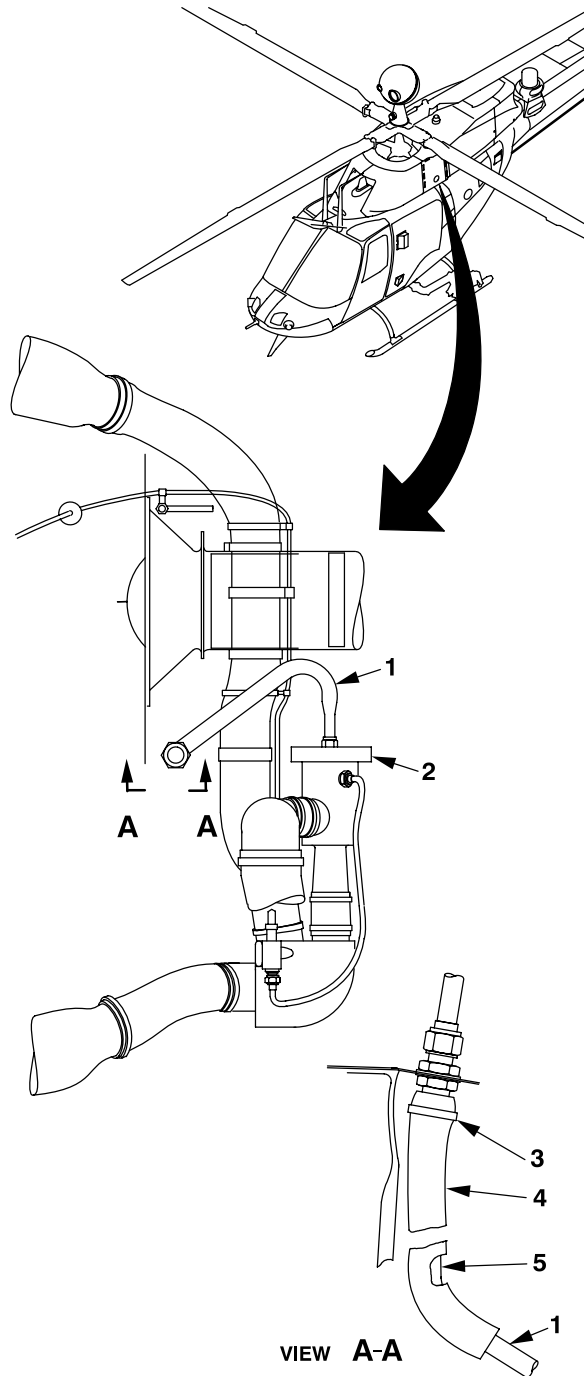
1. Gain access and remove soundproofing.
2. Remove lockwire from nut on tube (1), at mixing valve (2).
3. Loosen nut on tube (1) and disconnect.
4. Remove clamp (3) from tube (1) and slide firesleeves (4 and 5) back from nut.
5. Loosen nut on tube (1), disconnect and remove tube (1).
6. Remove firesleeves (4 and 5) from tube (1).

INSTALL

7. Install firesleeves (4 and 5) on tube (1).
8. Install clamp (3) over firesleeves (4 and 5), do not tighten clamp at this time.
9. Install tube (1) at mixing valve (2), torque nut **430 TO 470 INCH-POUNDS** and install lockwire (D131) on nut of tube.
10. Torque nut on opposite end of tube (1) **230 TO 260 INCH-POUNDS**, pull firesleeves (4 and 5) over nut, and tighten clamp (3).

INSPECT

11. Install soundproofing.



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J1803

END OF TASK

12-1-14. BLEED AIR TUBE FIRESLEEVES — CLEANING/INSPECTION

This task covers: Cleaning and Inspection (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)

CLEAN

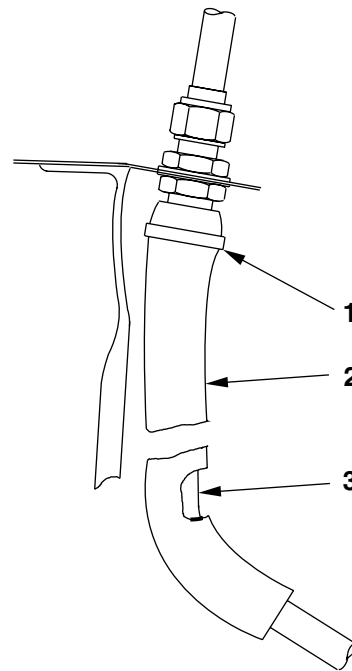
1. Clean bleed air tube firesleeves (2 and 3) as follows:

a. Remove clamp (1) and pull back firesleeve (2). Clean firesleeve (3) with a clean wiping rag (D164).

b. Slide firesleeve (2) into place and install clamp (1). Clean firesleeve (2) with a clean wiping rag (D163).

INSPECT

2. Inspect bleed air tube firesleeves (2 and 3) for damage and/or deterioration.



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G5739

END OF TASK

Section II. VENTILATING SYSTEM

12-5. VENTILATING SYSTEM

helicopters. Standard torque tables are provided in Appendix P and TM 1-1500-204-23.

12-6. INTRODUCTION

This section contains maintenance procedures for: removal, cleaning, inspection, repair, and installation of plenum assembly; removal, cleaning, inspection, and installation of vent control cable; and replacement of defogging blower for the OH-58D and OH-58D(R)

12-7. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Plenum Assembly — Removal	12-2-1	12-39
Plenum Assembly — Cleaning/Inspection/Repair	12-2-2	12-40
Plenum Assembly — Installation	12-2-3	12-41
Defogging Blower — Removal/Installation	12-2-4	12-43
Vent Control Cable — Removal/Installation	12-2-5	12-45
Vent Control Cable — Cleaning/Inspection	12-2-6	12-48

 12-2-1. PLENUM ASSEMBLY — REMOVAL

This task covers: Removal (On Helicopter)

INITIAL SETUP

Personnel Required:
67S Scout Helicopter Repairer (2)

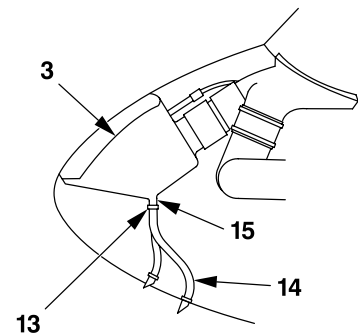
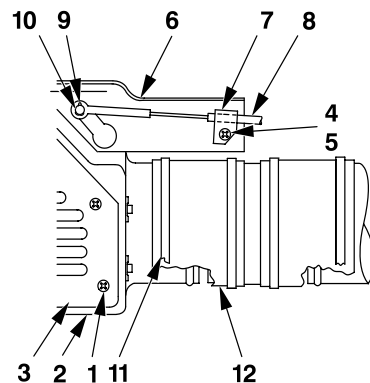
Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)

Tools:
General Mechanic Tool Kit (B178)

REMOVE

1. Remove eight screws (1) from grill (2) outside helicopter.
2. Remove grill (2).
3. Push down on plenum assembly (3) until plenum assembly is detached from nose of aircraft.
4. Working through grill opening from outside helicopter, remove screw (4) and washer (5) from bracket assembly (6) holding clamp (7) around vent control cable (8).
5. Remove cotter pin (9) and flapper arm pin (10) from clevis and move vent control cable (8) away from plenum assembly (3).
6. Cut tiedown strap (11) and pull coupling (12) from plenum assembly (3).
7. Cut tiedown strap (13) on drain hose (14) and pull drain hose off plenum nipple (15).
8. Remove plenum assembly (3) from helicopter.



406961-89
J1803

END OF TASK

12-2-2. PLENUM ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Rubber Gloves (D111)
Silicone Rubber (D188)
Seal (H-145)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Repairer
67S Scout Helicopter Technical Inspector (TI)

Tools:
General Mechanic Tool Kit (B178)

References:
TM 1-1500-344-23

Material:
Soap (D192)
Adhesive (D25)
Wiping Rags (D164)

CLEAN



Cleaning Compound

1. Clean plenum assembly with mild soap (D192) and warm water. Rinse with clear water and dry with wiping rag (D164).

INSPECT

2. Inspect plenum assembly for cracks, breaks, or corrosion (TM 1-1500-344-23).

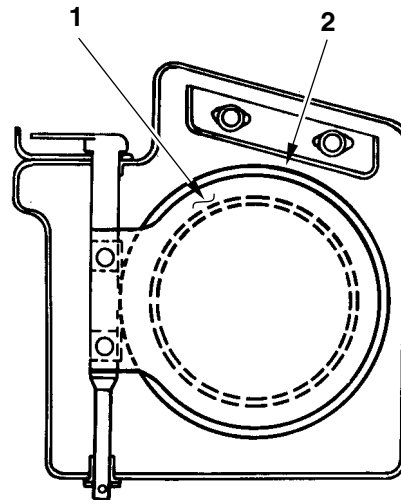
REPAIR

3. Replace plenum assembly if cracked or broken.

4. Open flapper valve (1) and scrape seal (2) off plenum assembly with knife.

5. Remove adhesive from mating surface of plenum assembly.

6. Using silicone rubber (D188), fabricate new seal (2). Refer to figure H-145 in Appendix H.



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H1911

7. Apply adhesive (D25) to seal (2) and faying surface of plenum assembly. Install seal (2) on plenum assembly.

INSPECT



Adhesive

END OF TASK

12-2-3. PLENUM ASSEMBLY — INSTALLATION

This task covers: Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Panduit Tie Gun (B62)

Material:
Silicone Adhesive (D36)
Tiedown Strap (D206)
Adhesive Brush (D52)

Personnel Required:
67S Scout Helicopter Repairer (2)
67S Scout Helicopter Technical Inspector (TI)

Equipment Condition:
Helicopter Safed (Task 1-6-7)

INSTALL

1. Working through grille (1) opening from outside the helicopter, place vent control cable (2) in clamp (3) and start screw (4) and washer (5) into bracket assembly (6).

2. Position vent control cable (2) in clamp (3) so that **0.60 inch** in cable sheathing extends beyond clamp.

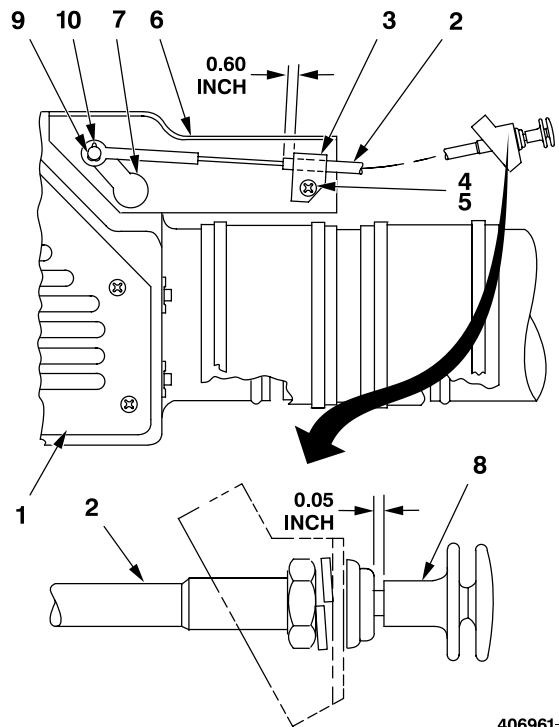
3. Tighten screw (4) on clamp (3).

4. Using flapper arm (7), place flapper in closed position.

5. Position control knob (8) until clearance of **0.05 inch** is obtained between control knob and vent control cable (2).

6. Secure clevis of vent control cable (2) to flapper arm (7) with flapper arm pin (9) (head towards bracket).

7. Install cotter pin (10) through flapper arm pin (9).



406961-1306
J0562

GO TO NEXT PAGE

12-2-3. PLENUM ASSEMBLY — INSTALLATION (CONT)



Adhesive

8. Apply silicone adhesive (D36) to mating surface of plenum assembly (11) using adhesive brush (D52) or spatula.

9. Install plenum assembly (11) from inside helicopter. Align holes in plenum assembly to mounting holes in helicopter.

10. Install eight screws (12) to secure grill (1) and plenum assembly (11) to helicopter.

11. Push drain hose (13) **1.20 inches** over drain nipple (14) on bottom of plenum assembly (11).

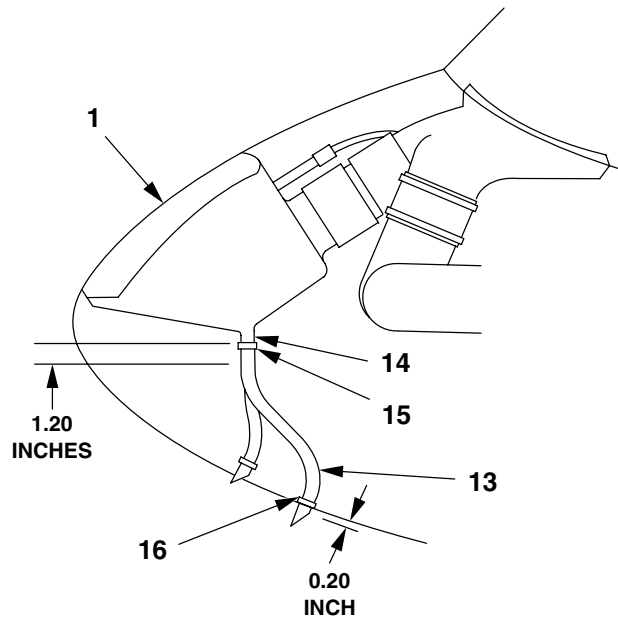
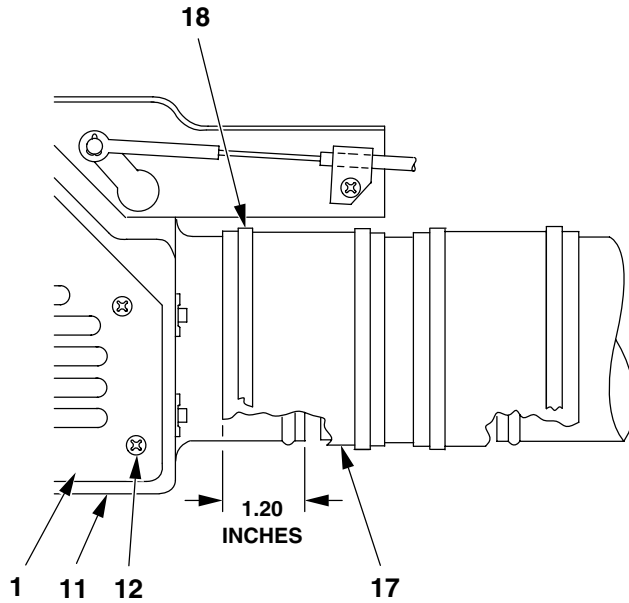
12. Install tiedown strap (D206) (15) using Panduit tie gun (B62).

13. Position drain hose (13) where scarfed end protrudes **0.20 inch** through grommet (16).

14. Push vent hose coupling (17) **1.20 inches** onto plenum assembly (11).

15. Secure with tiedown strap (D206) (18) using Panduit tie gun (B62).

INSPECT



406961-88
J0562

END OF TASK

12-2-4. DEFOGGING BLOWER — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Electrical Repairer Tool Kit (B177)
Panduit Tie Gun (B62)

Material:
Tiedown Strap (D206)
Solder (D196)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer
68F Aircraft Electrician

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Plenum Assembly Removed (Task 12-2-1)

GO TO NEXT PAGE

12-2-4. DEFOGGING BLOWER — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Unsolder wire (1) from terminal of filter (2).
2. Remove nut (3) with washer (4) from filter (2).
3. Pull filter (2) with washer (5) out of mounting hole.
4. Push grommet (6) with filter (2) through hole in duct (7).
5. Cut tiedown straps (8 and 9) from couplings (10 and 11). Remove blower (12) from couplings.
6. Remove and retain grommet (6) from filter (2) wire.

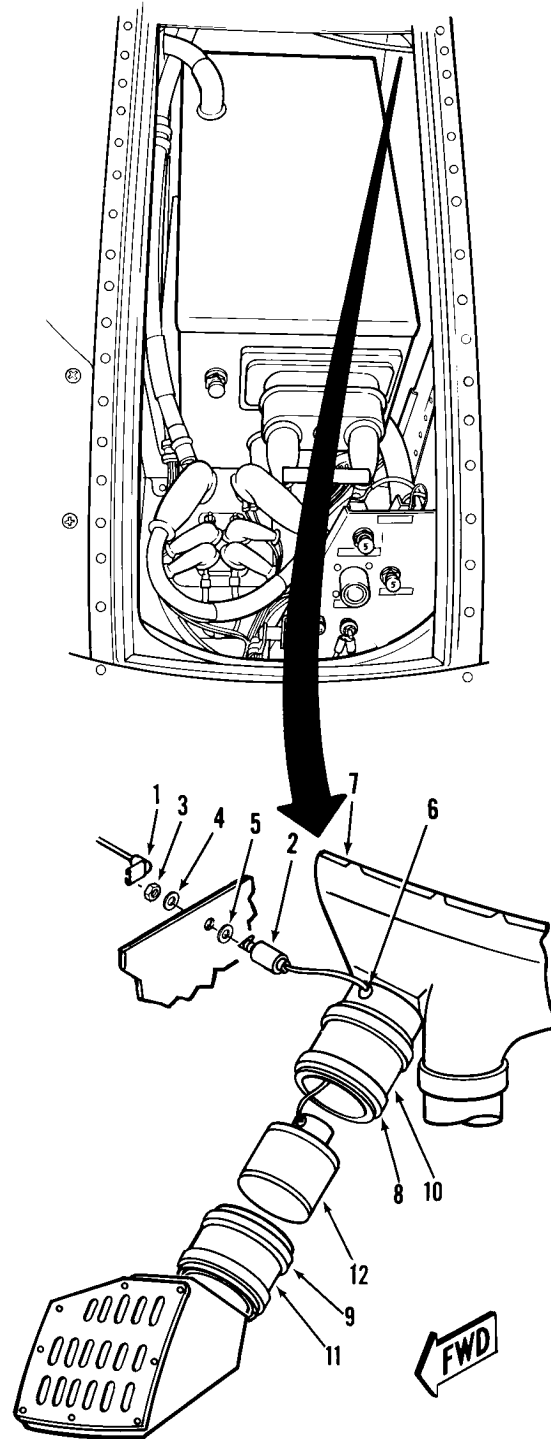
INSTALL

7. Install grommet (6) on filter (2) wire.
8. Hold blower (12) next to couplings (10 and 11) and push filter (2) through hole in duct (7).
9. Install grommet (6) in duct (7) hole.
10. Place blower in couplings (10 and 11) and install with tiedown straps (D206) (8 and 9) using Panduit tie gun (B62).
11. Place filter (2) with washer (5) into mounting hole and install washer (4) with nut (3).
12. Solder (D196) wire (1) to terminal of filter (2).

INSPECT

FOLLOW-ON MAINTENANCE

Install plenum assembly (Task 12-2-3).



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END OF TASK

12-2-5. VENT CONTROL CABLE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

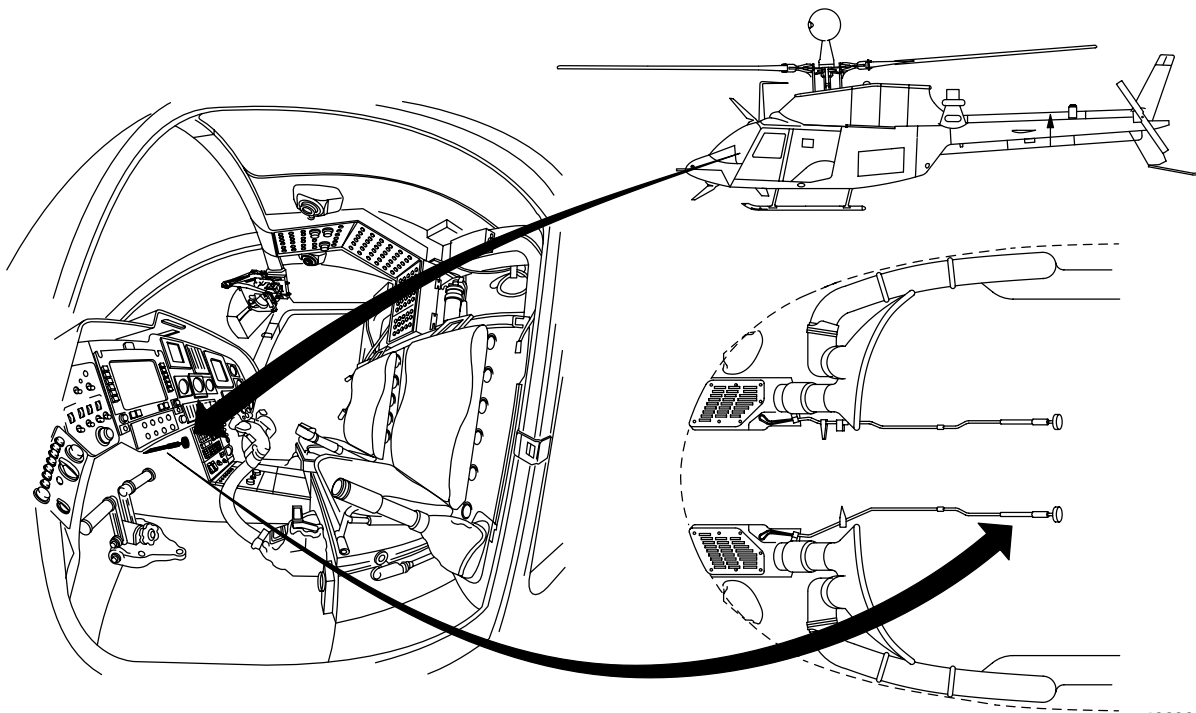
Applicable Configurations:
All

Tools:
 ■ General Mechanic Tool Kit (B178)
 ■ Torque Wrench (B238)

Material:
 Silicone Adhesive (D36)
 Adhesive Brush (D52)

Personnel Required:
 67S Scout Helicopter Repairer

Equipment Condition:
 Helicopter Safed (Task 1-6-7)



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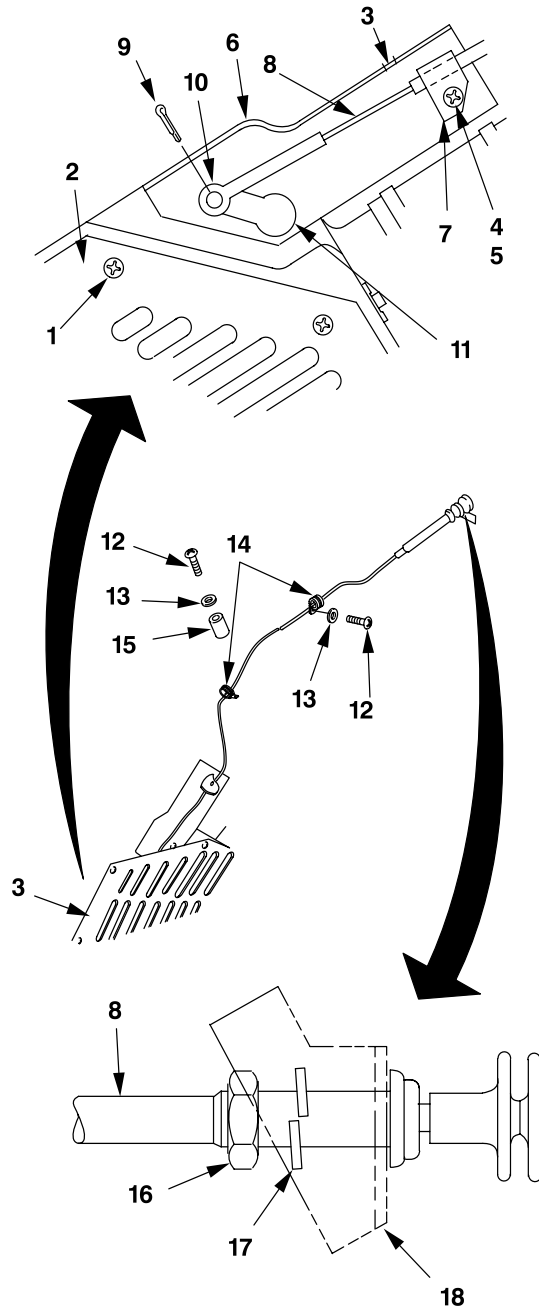
12-2-5. VENT CONTROL CABLE — REMOVAL/INSTALLATION (CONT)

REMOVE

NOTE

Removal procedures for left or right side vent control cables are identical unless otherwise noted.

1. Remove eight screws (1) from grille (2) outside helicopter.
2. Push down on plenum assembly (3) until plenum assembly is detached from nose of aircraft.
3. Working through grille (2) opening from outside helicopter, remove screw (4) and washer (5) from bracket assembly (6) holding clamp (7) around vent control cable (8).
4. Remove cotter pin (9) and flapper arm pin (10) attaching vent control cable (8) to flapper arm (11).
5. Remove two screws (12), washers (13), and clamps (14). If removing right side vent control cable, remove spacer (15).
6. Loosen nut (16). Remove nut (16) and washer (17) while pulling vent control cable (8) through control knob bracket (18).



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GO TO NEXT PAGE

12-2-5. VENT CONTROL CABLE — REMOVAL/INSTALLATION (CONT)

INSTALL

7. Position vent control cable (8) through control knob bracket (18) and secure with washer (17) and nut (16). Torque nut (16) **100 TO 120 INCH-POUNDS**.

8. Working through grille (2) opening from outside the helicopter, place vent control cable (8) in clamp (7) and start screw (4) and washer (5) into bracket assembly (6).

9. Position vent control cable (8) in clamp (7) so that **0.60 inch** in cable sheathing extends beyond clamp.

10. Using plenum flapper arm (11), place plenum flapper in closed position.

11. Position cable knob (19) until a clearance of **0.05 inch** is obtained between control knob and vent control cable (8).

12. Install clevis of vent control cable (8) to flapper arm (11) on plenum assembly (3) with flapper arm pin (10) (head toward bracket assembly) and cotter pin (9).

13. Secure vent control cable (8) at two locations with clamps (14), screws (12), and washers (13). If installing right side vent control cable, install spacer (15) at center clamp location.

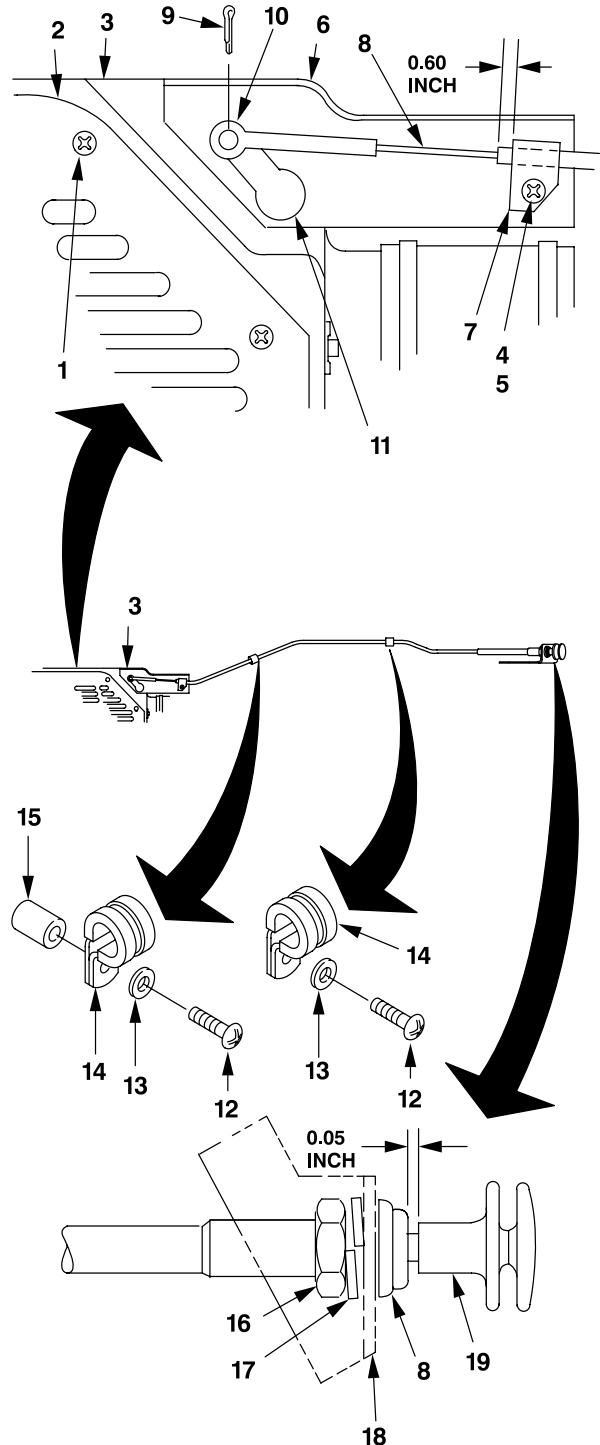


Adhesive

14. Apply silicone adhesive (D36) to mating surface of plenum assembly (3) using adhesive brush (D52) or spatula.

15. Install plenum assembly (3) from inside helicopter and align holes in plenum assembly to mounting holes in helicopter.

16. Install eight screws (1) to secure grille (2) and plenum assembly (3) to helicopter.



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END OF TASK

12-2-6. VENT CONTROL CABLE — CLEANING/INSPECTION

This task covers: Cleaning and Inspection (Off Helicopter)

INITIAL SETUP

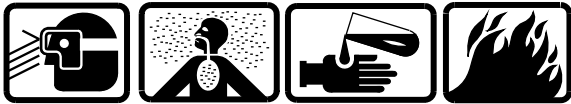
Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Drycleaning Solvent (D199)
Wiping Rags (D164)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Repairer

Equipment Condition:
Vent Control Cable Removed (Task 12-2-5)



Drycleaning Solvent

CLEAN

1. Clean cable with drycleaning solvent (D199) and dry with wiping rags (D164).

INSPECT

2. Inspect cable for fraying and obvious damage.

3. No repair authorized.

END OF TASK

CHAPTER 13

MISSION EQUIPMENT

13-1. MISSION EQUIPMENT

This chapter covers maintenance procedures for cargo hook, procedures for configuring the

helicopter for rapid deployment and flight after rapid deployment, and maintenance procedures for rescue ladder for OH-58D and OH-58D(R) helicopters. This chapter is divided into three sections.

		Page
Section I	Cargo Hook Suspension Assembly	13-2
Section II	Rapid Deployment	13-24
Section III	Rescue Ladder	13-58

Section I. CARGO HOOK SUSPENSION ASSEMBLY

13-2. CARGO HOOK SUSPENSION ASSEMBLY

assembly used on OH-58D and OH-58D(R) helicopters. Standard torque tables are provided in Appendix P and TM 1-1500-204-23.

13-3. INTRODUCTION

This section contains maintenance procedures for removal, cleaning, inspection, repair and installation of the cargo hook suspension

13-4. TASK LIST

A list of tasks is provided to identify those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Cargo Hook Suspension Assembly — Removal/Installation	13-1-1	13-3
Cargo Hook Suspension Assembly — Disassembly/Assembly	13-1-2	13-5
Cargo Hook Emergency Release Cable — Removal/Installation	13-1-3	13-11
Cargo Hook Emergency Release Cable Bracket — Removal/Installation	13-1-4	13-18
Cargo Hook Suspension Assembly — Cleaning/Inspection/Repair	13-1-5	13-21

13-1-1. CARGO HOOK SUSPENSION ASSEMBLY — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Lockwire (D131)

Personnel Required:
67S Scout Helicopter Repairer
67S Scout Helicopter Technical Inspector (TI)

References:
TM 1-1520-248-T

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

13-1-1. CARGO HOOK SUSPENSION ASSEMBLY — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove lockwire and disconnect electrical cable assembly connector (1) from fuselage mounted electrical cable assembly connector.
2. Install protective cap (2) on electrical cable assembly connector (1).
3. Disconnect forward end of connector (3) from fuselage mounted release cable assembly.
4. Stow forward end of connector (3) in bracket (4) as shown.
5. Support suspension assembly (5).
6. Remove pins (6, 7, 8, and 9) securing suspension assembly (5) to fuselage mounted fittings and supports.
7. Remove suspension assembly (5) from helicopter.

INSTALL

NOTE

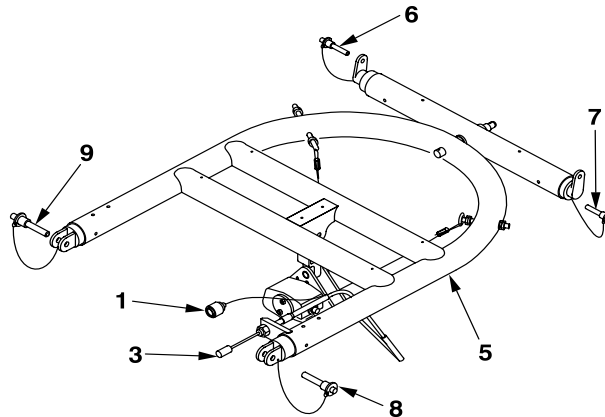
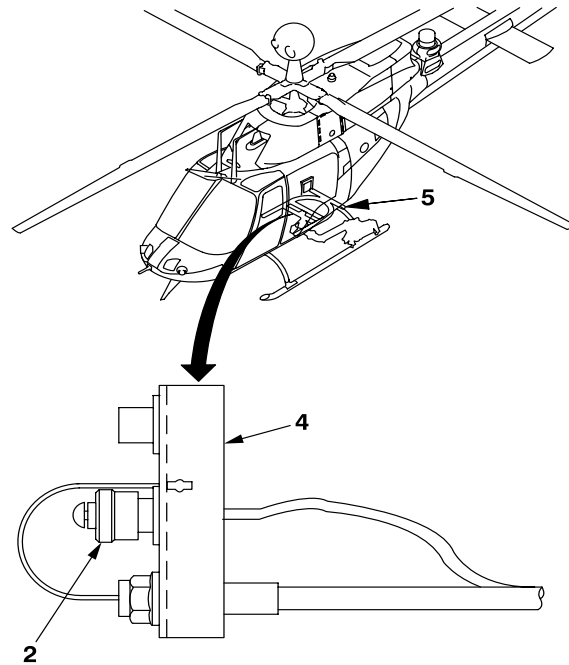
If initial installation of hook, stencil date of installation on hook to track TBO time.

8. Position suspension assembly (5) on helicopter.
9. Install pins (9, 8, 7, and 6) to secure suspension assembly (5) to fuselage mounted fittings and supports.
10. Release forward end of connector (3) from bracket (4).
11. Connect connector (3) to fuselage mounted release cable assembly.
12. Remove protective cap (2) from electrical cable assembly connector (1).
13. Inspect electrical cable assembly connector (1) for corrosion, missing or bent pins, and cracked housing.
14. Connect electrical cable assembly connector (1) to fuselage mounted electrical connector and secure with lockwire (D131).

INSPECT

FOLLOW ON MAINTENANCE

Perform operational check (TM 1-1520-248-T).



406706-34
J1844

END OF TASK

13-1-2. CARGO HOOK SUSPENSION ASSEMBLY — DISASSEMBLY/ASSEMBLY

This task covers: Disassembly/Assembly (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Goggles (B55)

Material:
Corrosion Preventive Compound (D83)
Rubber Gloves (D111)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

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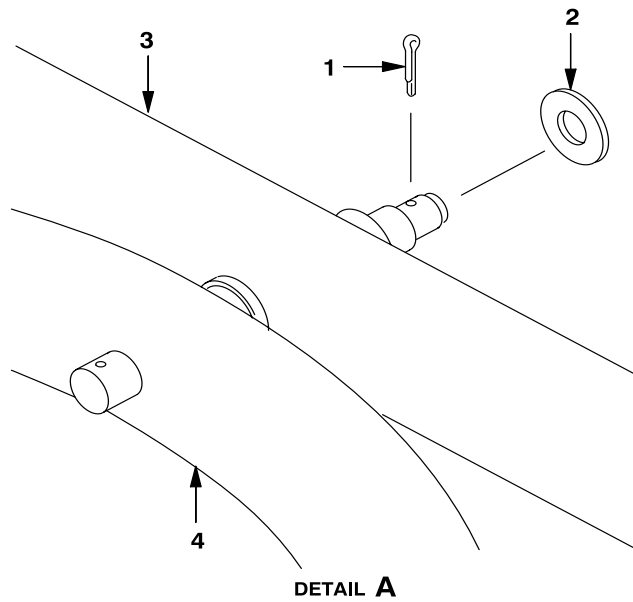
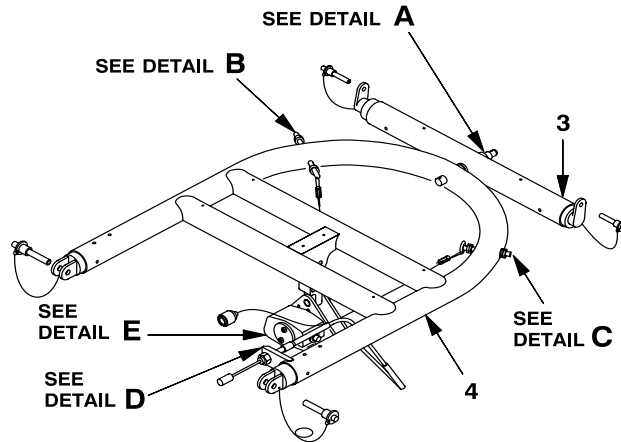
13-1-2. CARGO HOOK SUSPENSION ASSEMBLY — DISASSEMBLY/ASSEMBLY (CONT)

DISASSEMBLE

WARNING

Goggles (B55) shall be worn during this task to prevent eye injury

1. Remove cotter pin (1), washer (2), and separate cargo spreader assembly (3) from frame assembly (4).



406070-48-1
J1831

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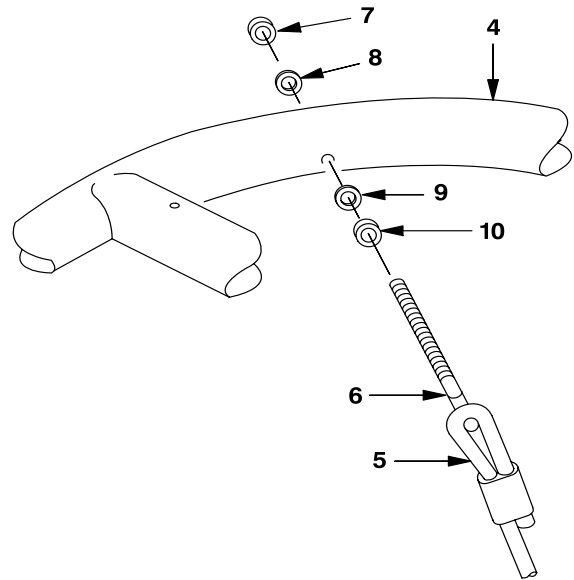
13-1-2. CARGO HOOK SUSPENSION ASSEMBLY — DISASSEMBLY/ASSEMBLY (CONT)

2. Unhook shock cord (5) from eyebolt (6) on both sides of frame assembly (4).

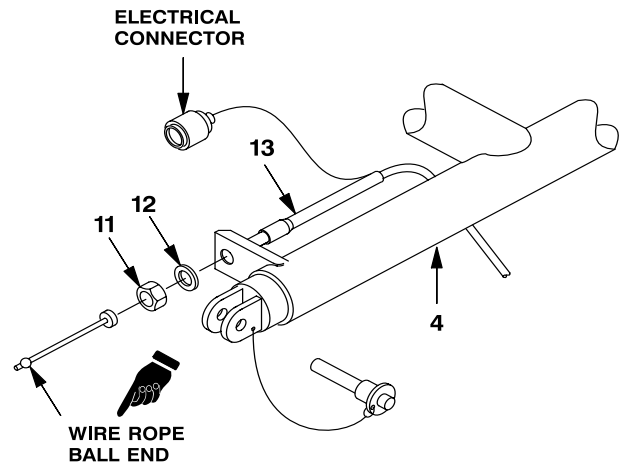
3. Remove nut (7) and washer (8), and remove eyebolt (6) from frame assembly (4).

4. Remove washer (9) and nut (10) from eyebolt (6).

5. Remove nut (11), washer (12), and remove cable assembly (13) from frame assembly (4).



DETAIL B
AND
DETAIL C



DETAIL D

406070-48-2
J2465

GO TO NEXT PAGE

13-1-2. CARGO HOOK SUSPENSION ASSEMBLY — DISASSEMBLY/ASSEMBLY (CONT)

6. Remove cotter pin (14), nut (15), washers (16, 17, 18, and 19), and bolt (20).

7. Remove universal assembly (21) from frame assembly (4).

8. Remove cotter pin (22), nut (23), washer (24), bushing (25), washer (26), and bolt (27).

9. Separate universal assembly (21) from clevis assembly (28).

10. Remove cotter pin (29), nut (30), washer (31), two washers (32), washer (33), and bolt (34).

11. Separate cargo hook (35) from clevis assembly (28).

ASSEMBLE

12. Position clevis assembly (28) on cargo hook (35).

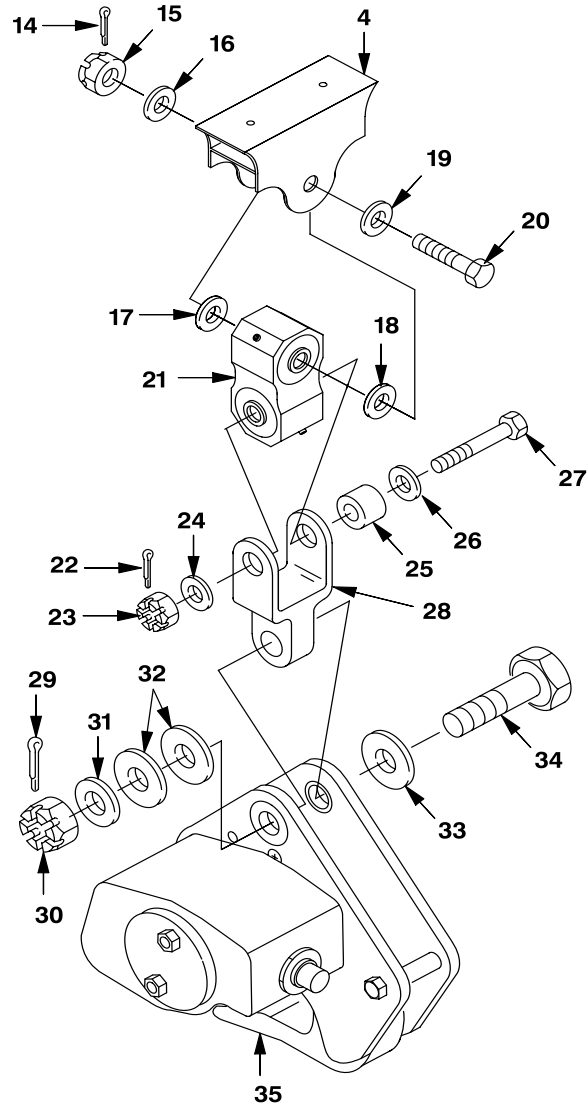
13. Install bolt (34), washer (33), two washers (32), washer (31), nut (30), and cotter pin (29).

14. Position clevis assembly (28) on universal assembly (21).

15. Install bolt (27), washer (26), bushing (25), washer (24), nut (23), and cotter pin (22).

16. Position universal assembly (21) on frame assembly (4).

17. Install bolt (20), washers (16, 17, 18, and 19), nut (15), and cotter pin (14).



DETAIL E

406070-48-3
J2465

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13-1-2. CARGO HOOK SUSPENSION ASSEMBLY — DISASSEMBLY/ASSEMBLY (CONT)

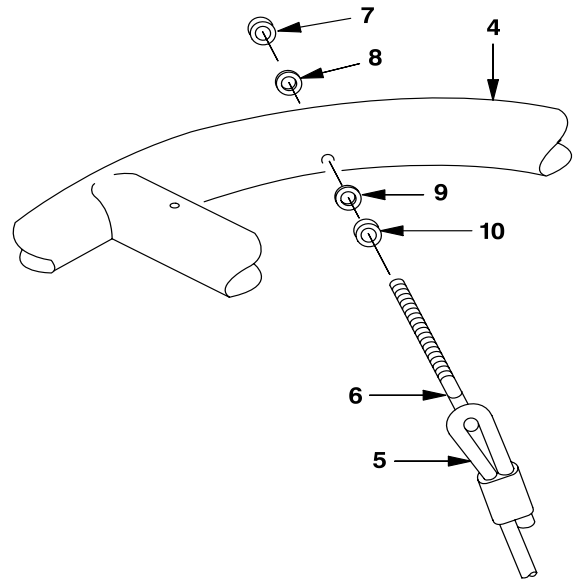
18. Position cable assembly (13) on frame assembly (4).

19. Install washer (12) and nut (11) on cable assembly (13).

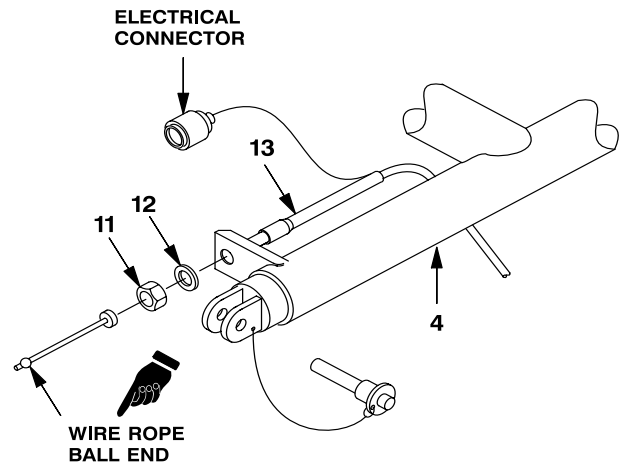
20. Install nut (10) and washer (9) on eyebolt (6).

21. Insert eyebolt (6) through frame assembly (4) with open side of loop pointing up. Install washer (8) and nut (7).

22. Hook shock cord (5) to eyebolt (6) on both sides of frame assembly (4).



DETAIL B
AND
DETAIL C

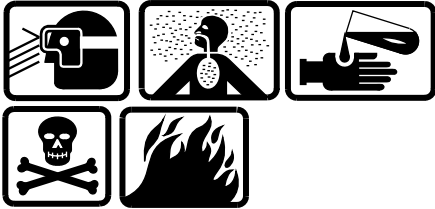


DETAIL D

406070-48-2
J2465

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13-1-2. CARGO HOOK SUSPENSION ASSEMBLY — DISASSEMBLY/ASSEMBLY (CONT)



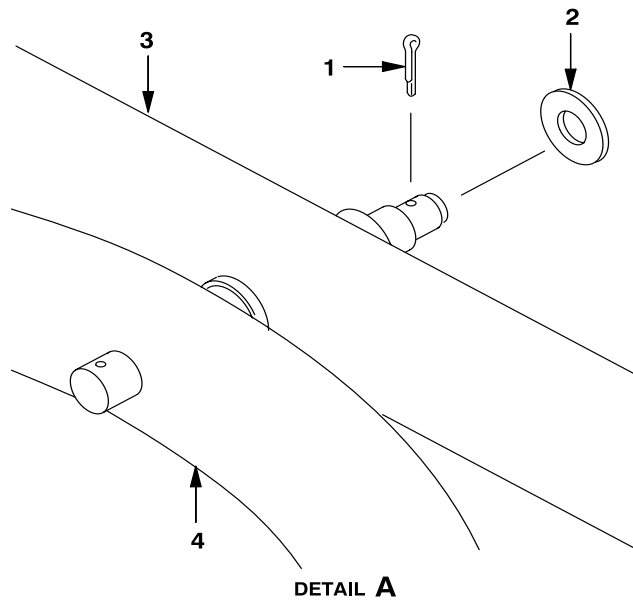
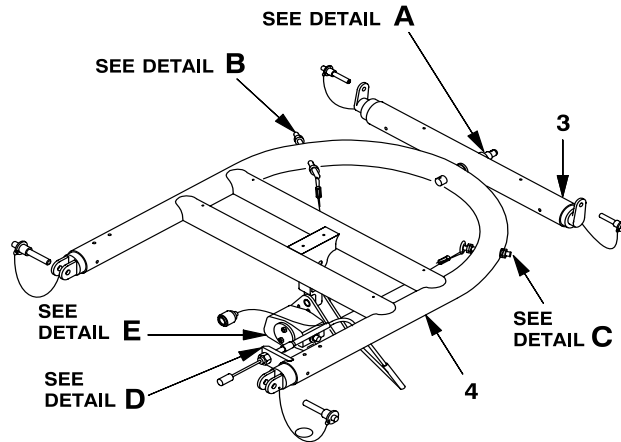
Corrosion Preventive Compound

23. Apply corrosion preventive compound (D83) to inside of spreader assembly (3) and pin on frame assembly (4).

24. Position spreader assembly (3) on frame assembly (4).

25. Install washer (2) and cotter pin (1).

INSPECT



406070-48-1
J1831

END OF TASK

13-1-3. CARGO HOOK EMERGENCY RELEASE CABLE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:

General Mechanic Tool Kit (B178)
Heat Gun (B59)
Goggles (B55)

Material:

Lockwire (D131)
Sealing Compound (D181)
Rubber Gloves (D111)

Personnel Required:

67S Scout Helicopter Repairer (2)
67S Scout Helicopter Technical Inspector (TI)

References:

TM 1-1520-248-T

Equipment Condition:

Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

13-1-3. CARGO HOOK EMERGENCY RELEASE CABLE — REMOVAL/INSTALLATION (CONT)

REMOVE

WARNING

Goggles (B55) shall be worn to prevent eye injury.

1. With cargo hook suspension assembly (1) installed:

a. Ensure that CARGO HOOK circuit breaker/switch (2) located on forward overhead console is in the OFF position.

b. Remove lockwire and disconnect electrical cable assembly connector (3).

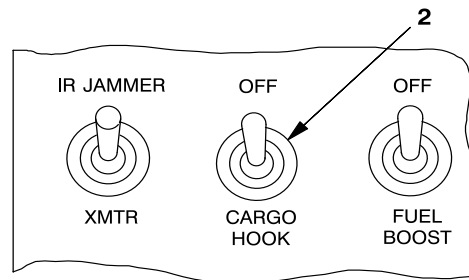
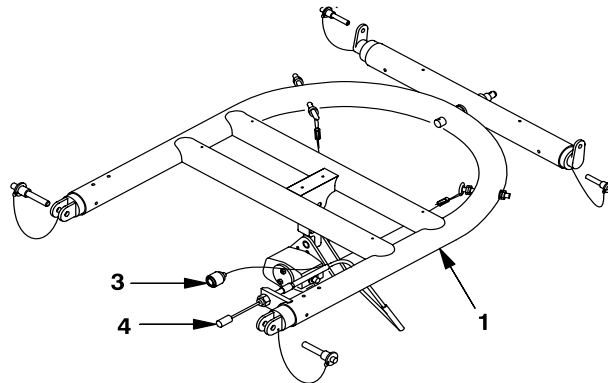
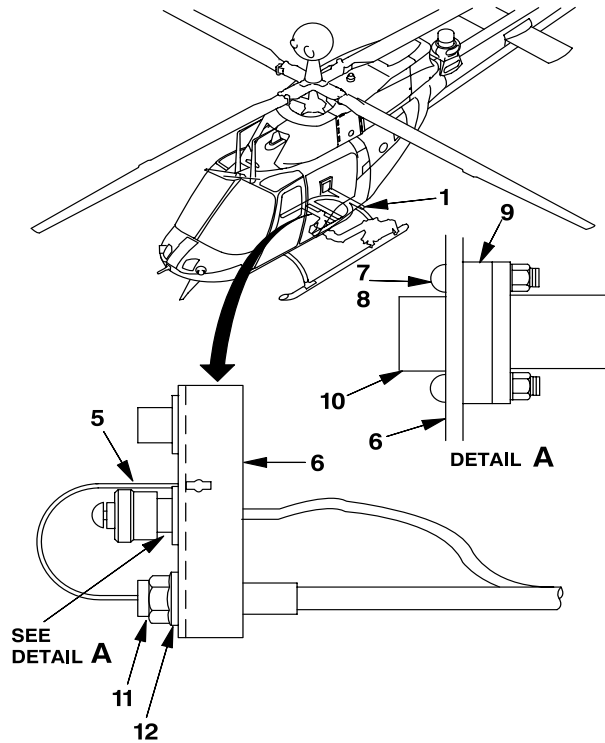
c. Disconnect forward end of connector (4) from fuselage mounted release cable assembly (5).

2. With cargo hook suspension assembly (1) removed from helicopter:

a. Disconnect end of cable assembly (5) from bracket (6).

b. Remove four screws (7), four washers (8), and retainer (9). Remove electrical connector (10) from bracket (6).

3. Remove nut (11) and washer (12). Remove cable assembly (5) from bracket (6).

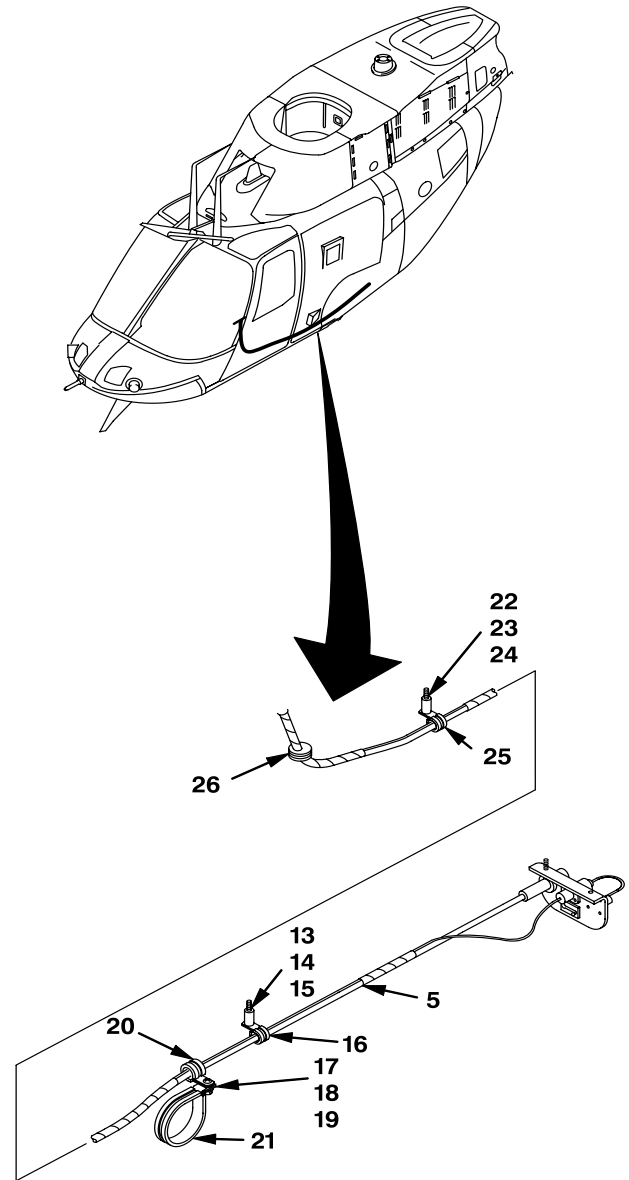


406570-2-1
J1831

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13-1-3. CARGO HOOK EMERGENCY RELEASE CABLE — REMOVAL/INSTALLATION (CONT)

4. Remove screw (13), washer (14), and spacer (15).
5. Remove clamp (16) from cable assembly (5).
6. Remove nut (17), washer (18), and screw (19).
7. Remove clamp (20) from cable assembly (5).
8. Remove clamp (21) from forward crosstube.
9. Remove screw (22), washer (23), and spacer (24).
10. Remove clamp (25) from cable assembly (5).
11. Remove grommet (26) from bottom of fuselage.



406570-2-2
J1831

GO TO NEXT PAGE

13-1-3. CARGO HOOK EMERGENCY RELEASE CABLE — REMOVAL/INSTALLATION (CONT)

12. Hold handle (27) and loosen nut (28).

13. Remove handle (27) and nut (28) from cable assembly (5).

14. Remove three screws (29) and three washers (30) securing mount (31) to console (32).

15. Raise cable assembly (5) and mount (31) up from console (32) until wrench can be put on nut (33). Hold nut (33) and loosen nut (34).

16. Remove nut (34), mount (31), and nut (33) from cable assembly (5).

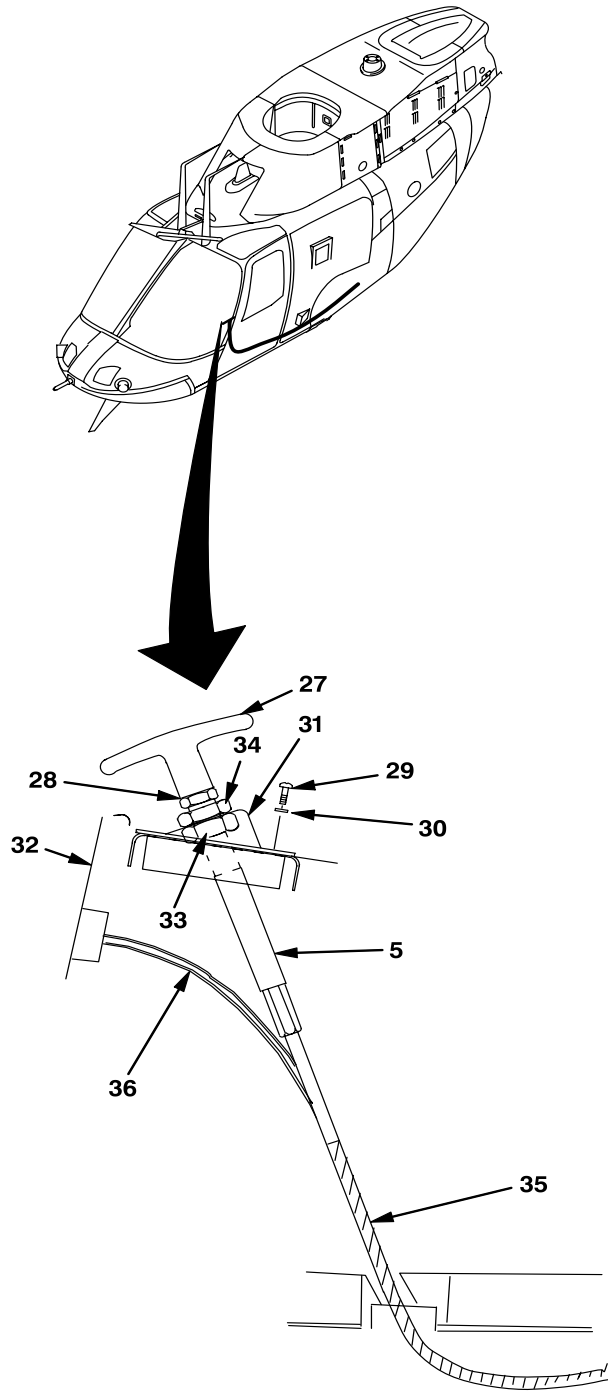
17. Pull cable assembly (5) up through bottom of fuselage until lower end of insulation tubing (35) is accessible.

CAUTION

Ensure cable assemblies are not damaged during removal of insulation tubing.

18. Cut and remove insulation tubing (35) from cable assembly (5) and electrical cable assembly (36) in three places.

19. Work cable assembly (5) down through bottom of fuselage and remove from helicopter.



406570-2-3
J1831

GO TO NEXT PAGE

13-1-3. CARGO HOOK EMERGENCY RELEASE CABLE — REMOVAL/INSTALLATION (CONT)

INSTALL

NOTE

Handle, retaining nuts, and mount must be removed from cable assembly prior to starting installation.

20. Install cable assembly (5) through bottom of fuselage. Hold cable assembly in mounting position and measure minimum **3.5 inches** and maximum **4.5 inches** from bottom of fuselage. Mark cable assembly (5).

21. Pull cable assembly (5) through bottom of fuselage until mark is accessible. Cut **8-inch** piece of shrink insulation tubing (35). Split insulation tubing (35).



Heat

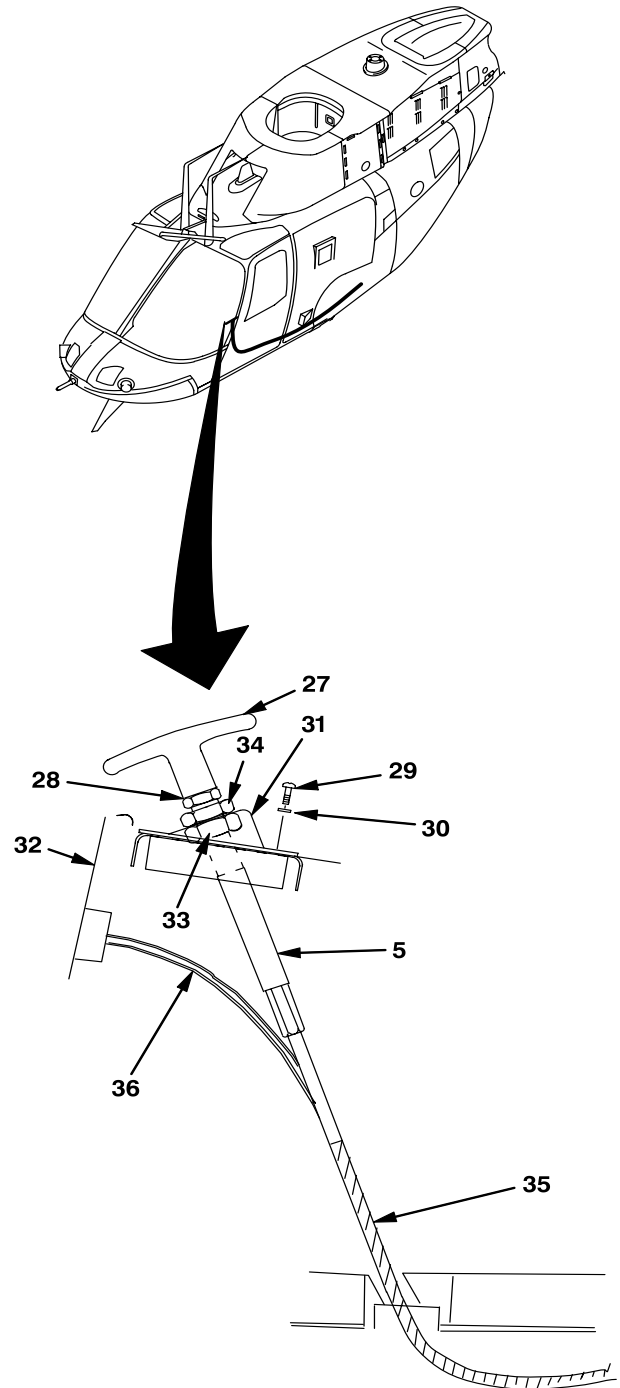
22. Position electrical cable assembly (36) to cable assembly (5) and install insulation tubing around both with lower end of insulation tubing at mark on cable assembly (5). Apply heat to shrink insulation tubing (35).

23. Install nut (33), mount (31), and nut (34) on cable assembly (5). Tighten nut (34).

24. Position mount (31) on console (32) and secure with three washers (30) and three screws (29).

25. Install nut (28) and handle (27) on cable assembly (5).

26. Hold handle (27) and tighten nut (28) against handle (27).



406570-2-3
J1831

GO TO NEXT PAGE

13-1-3. CARGO HOOK EMERGENCY RELEASE CABLE — REMOVAL/INSTALLATION (CONT)



Adhesive

27. Cut grommet (26) and install on cable assembly (5). Install grommet (26) in bottom of fuselage and seal with sealing compound (D181).

28. Route cable assembly (5) over forward cross-tube to bracket (6).



Heat

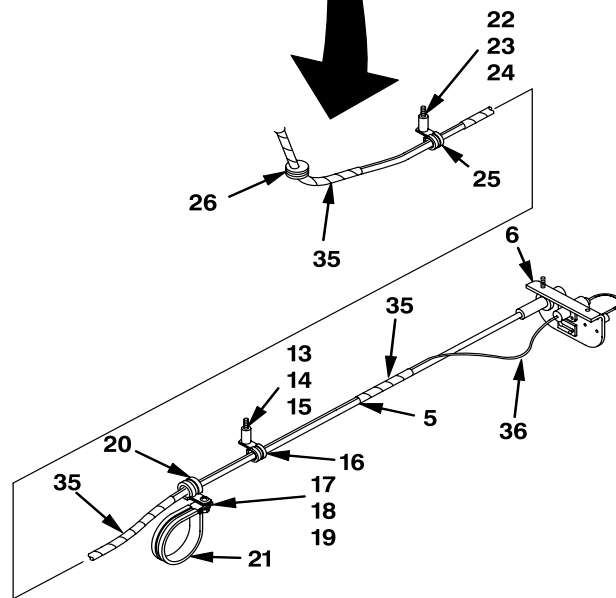
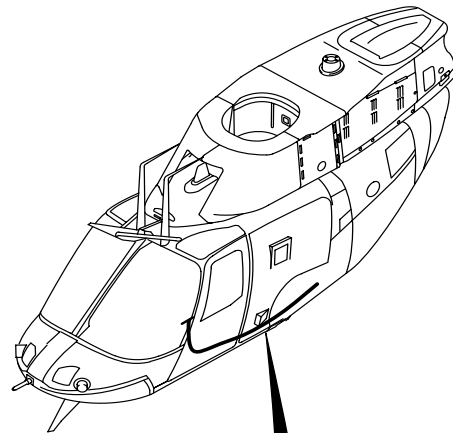
29. Cut piece of shrink insulation tubing (35) **3.5 inches** long. Split and position on cable assembly (5) and electrical cable assembly (36) where the cable assemblies cross over the forward cross-tube. Apply heat to shrink insulation tubing (35).

30. Install clamp (25) on cable assembly (5) and secure with spacer (24), washer (23), and screw (22).

31. Install clamp (21) on forward cross-tube. Install clamp (20) on cable assembly (5).

32. Secure clamp (21) and clamp (20) together with screw (19), washer (18), and nut (17).

33. Install clamp (16) on cable assembly (5) and secure with spacer (15), washer (14), and screw (13).



406570-2-4
J1831

GO TO NEXT PAGE

13-1-3. CARGO HOOK EMERGENCY RELEASE CABLE — REMOVAL/INSTALLATION (CONT)



Heat

34. Cut piece of shrink insulation tubing (35) **1.5 inches** long. Split and position on cable assembly (5) and electrical cable assembly (36) half way between clamp (16) and bracket (6). Apply heat to shrink insulation tubing (35).

35. Position cable assembly (5) through bracket (6) and secure with washer (12) and nut (11).

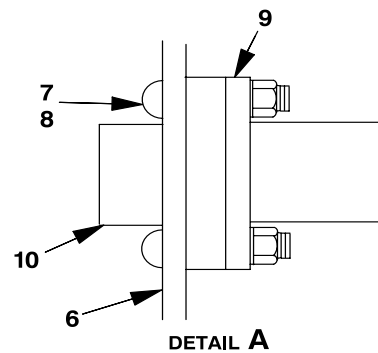
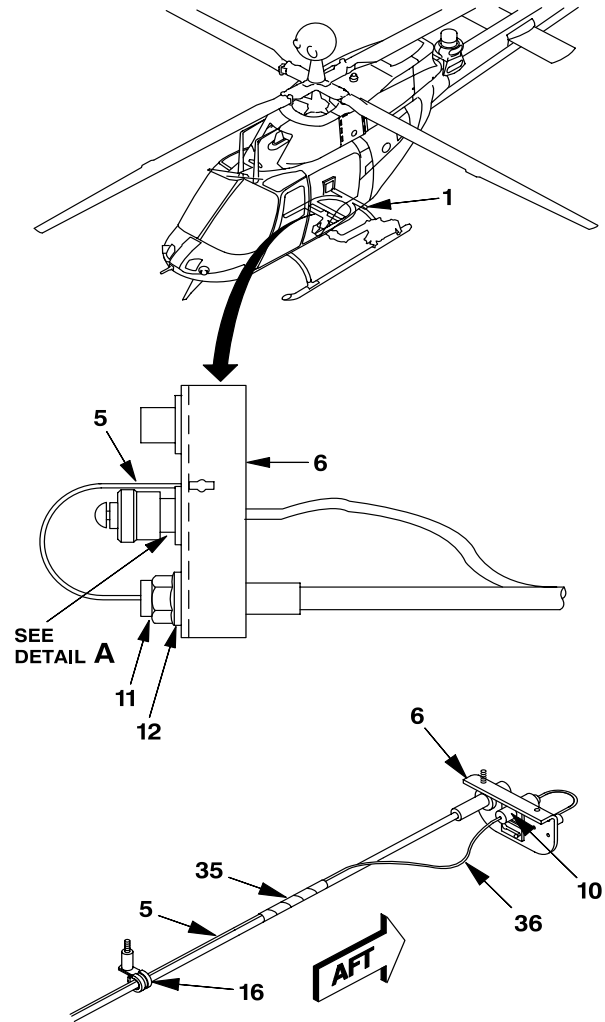
36. Position electrical connector (10) on bracket (6) and secure with retainer (9), four washers (8) and four screws (7).

INSPECT

FOLLOW ON MAINTENANCE

Install cargo hook suspension assembly (Task 13-1-1).

Perform operational check (TM 1-1520-248-T).



406570-2-6
J1831

END OF TASK

13-1-4. CARGO HOOK EMERGENCY RELEASE CABLE BRACKET — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Material:
Lockwire (D131)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Repairer
67S Scout Helicopter Technical Inspector (TI)

Tools:
General Mechanic Tool Kit (B178)

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

13-1-4. CARGO HOOK EMERGENCY RELEASE CABLE BRACKET — REMOVAL/INSTALLATION
(CONT)

REMOVE

1. With cargo hook suspension assembly (1) installed:

a. Ensure that CARGO HOOK circuit breaker/switch (2) located in forward overhead console is in the OFF position.

b. Remove lockwire and disconnect electrical cable assembly connector (3) from electrical cable assembly connector (4).

c. Disconnect forward end of cable assembly connector (5) from fuselage mounted release cable assembly (6).

d. Remove four screws (7), four washers (8), and retainer (9). Remove electrical cable assembly connector (4) from bracket (10).

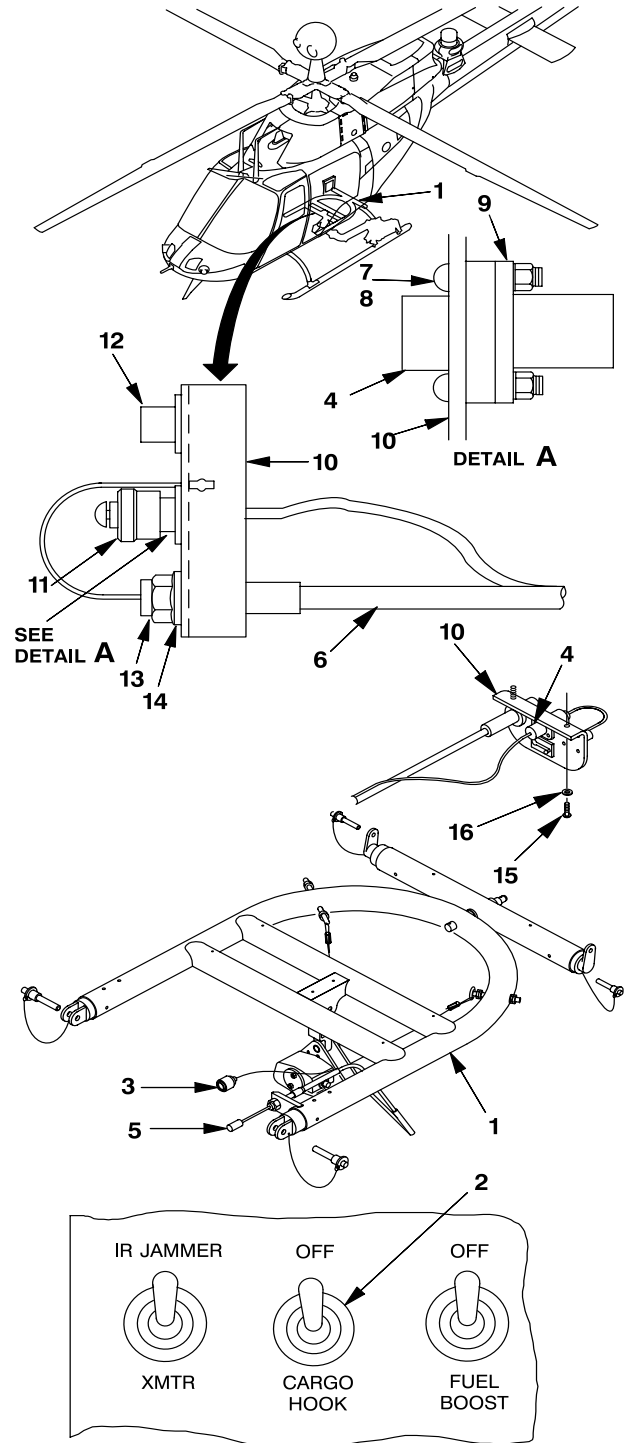
2. With cargo hook suspension assembly (1) removed from helicopter:

a. Disconnect end of cable assembly (6) from bracket (10).

b. Remove protective cap (11) from electrical cable assembly connector (4) and install on dummy receptacle (12).

3. Remove nut (13) and washer (14). Remove cable assembly (6) from bracket (10).

4. Remove two screws (15) and two washers (16). Remove bracket (10) from helicopter.



406570-3
J1831

GO TO NEXT PAGE

13-1-4. CARGO HOOK EMERGENCY RELEASE CABLE BRACKET — REMOVAL/INSTALLATION
(CONT)

INSTALL

5. Position bracket (10) on helicopter and secure with two washers (16) and two screws (15).

6. Position cable assembly (6) through bracket (10) and secure with washer (14) and nut (13).

7. With cargo hook suspension assembly (1) installed:

a. Ensure that CARGO HOOK circuit breaker/switch (2) located on forward overhead console is in the OFF position.

b. Position electrical cable assembly connector (4) on bracket (10) and install retainer (9), four washers (8), and four screws (7).

c. Connect electrical cable assembly connector (3) to electrical cable assembly connector (4) and secure with lockwire (D131).

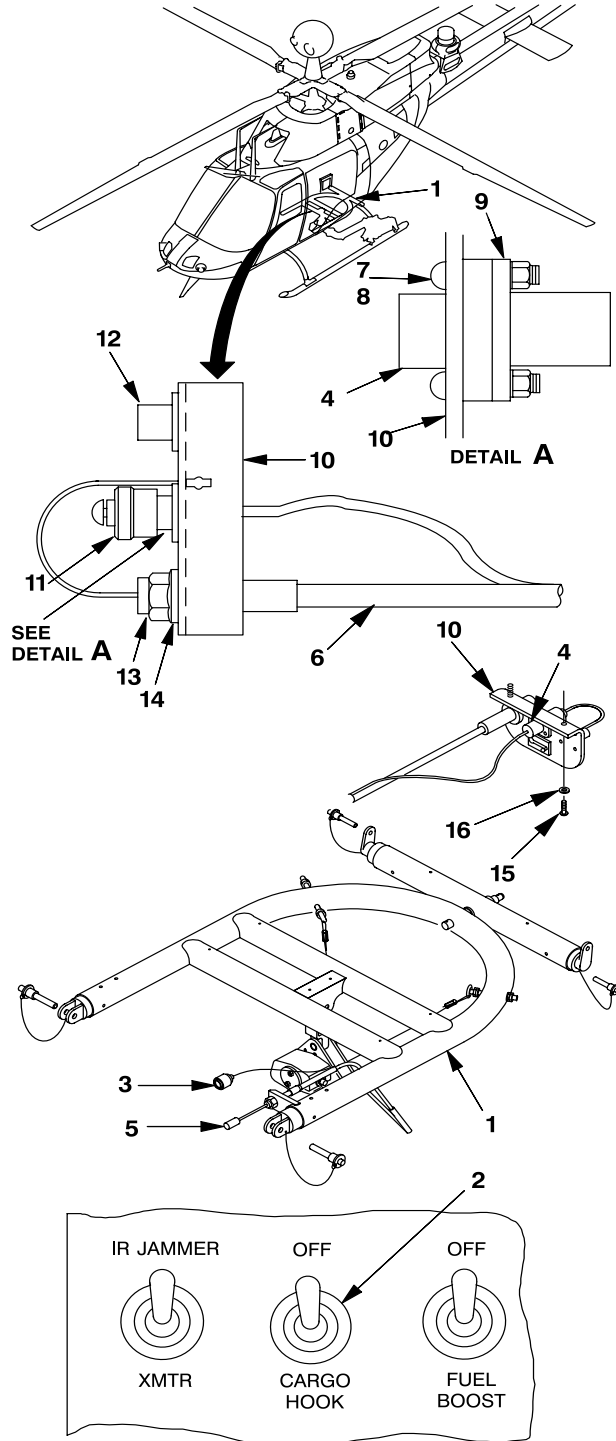
d. Connect forward end of cable assembly connector (5) to cable assembly (6).

8. With cargo hook suspension assembly (1) installed on helicopter:

a. Position electrical cable assembly connector (4) on bracket (10) and install retainer (9), four washers (8), and four screws (7).

b. Remove protective cap (11) from dummy receptacle (12) and install on electrical cable assembly connector (4).

c. Install end of cable assembly (6) in retainer on bracket (10).



INSPECT

406570-3
J1831

END OF TASK

13-1-5. CARGO HOOK SUSPENSION ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Clean/Inspect Repair Cargo Hook Suspension Assembly (Off Helicopter)

INITIAL SETUP

Wiping Rags (D164)
Epoxy Primer Coating (D98)
Paint (D150)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Tools:
General Mechanic Tool Kit (B178)
Goggles (B55)
Utility Apron (B7)

References:
TM 55-1500-345-23

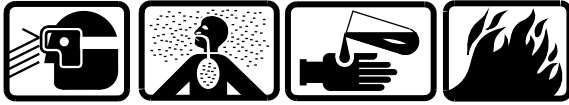
Material:
Drycleaning Solvent (D199)
Rubber Gloves (D111)
Sandpaper (D175)

Equipment Condition:
Cargo Hook Suspension Assembly Removed
(Task 13-1-1)

GO TO NEXT PAGE

13-1-5. CARGO HOOK SUSPENSION ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN



Drycleaning Solvent

1. Clean suspension assembly using wiping rags (D164) dampened with drycleaning solvent (D199).
2. Dry suspension assembly using clean wiping rags (D164).

INSPECT

3. Visually inspect suspension assembly for cracks, scratches, nicks, gouges and corrosion. See figure Cargo Hook Suspension Assembly — Damage Limits.
4. Inspect pins and lanyards for damage and security.
5. Inspect shock cord assembly for fraying and deterioration.
6. Inspect electrical cable assembly for damage and security.
7. Inspect mechanical release cable assembly for damage and security.

REPAIR



Sanding Operations

8. Polish out repairable damage on suspension assembly using 400 grit sandpaper (D175).



Epoxy Primer Coating



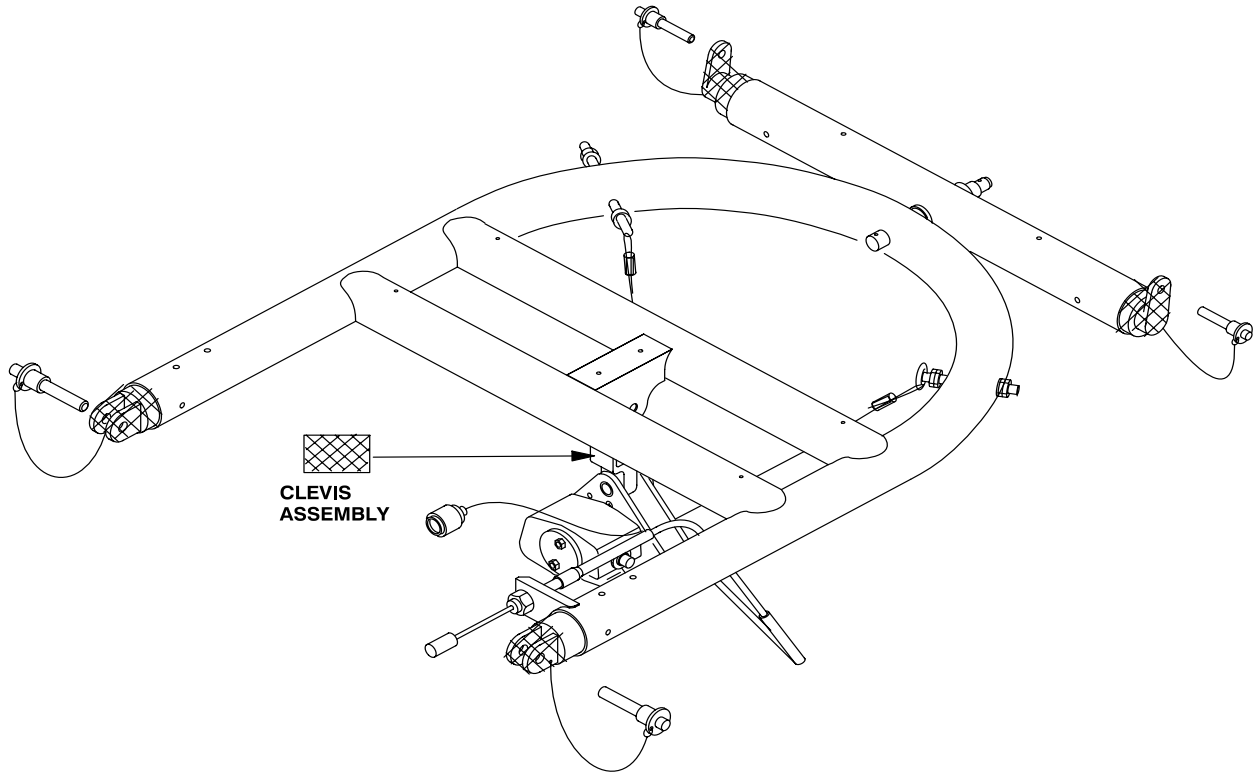
Polyurethane Coating

9. Apply coat of epoxy primer coating (D98) to repaired area followed by coat of paint (D150) (TM 55-1500-345-23).
10. Replace pins and lanyards if damaged.
11. Replace shock cord assembly if frayed or deteriorated.
12. Replace electrical cable assembly if damaged.
13. Replace mechanical release cable assembly if damaged.

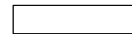
INSPECT

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13-1-5. CARGO HOOK SUSPENSION ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

MECHANICAL

0.005 in. before and after repair

0.020 in. before and after repair

CORROSION

0.002 in. before and 0.005 in. after repair

0.010 in. before and 0.020 in. after repair

MAXIMUM AREA PER FULL REPAIR

0.050 X 1.000 in.

1.00 X 2.000 in.

NUMBER OF REPAIRS

One per area

Not critical

EDGE CHAMFER TO REMOVE DAMAGE

0.030 in. X 45°

0.030 in. X 45°

NOTE: No cracks are permitted.

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J1831

Cargo Hook Suspension Assembly — Damage Limits

END OF TASK

Section II. RAPID DEPLOYMENT

13-5. RAPID DEPLOYMENT

helicopters for rapid deployment and flight after rapid deployment. Standard torque tables are provided in Appendix P and TM 1-1500-204-23.

13-6. INTRODUCTION

This section contains maintenance procedures for removal, cleaning, inspection, repair and installation of the MMS hoist and platform assembly used on the OH-58D and OH-58D(R) helicopters and procedures to configure

13-7. TASK LIST

A list of tasks is provided to identify those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
MMS Hoist Assembly — Installation/Removal	13-2-1	13-25
MMS Hoist Assembly — Cleaning/Inspection/Repair	13-2-2	13-28
MMS Hoist Assembly — Disassembly/Assembly	13-2-3	13-33
MMS Platform Assembly — Installation/Removal	13-2-4	13-37
MMS Platform Assembly — Cleaning/Inspection/Repair	13-2-5	13-40
MMS Platform Assembly — Disassembly/Assembly	13-2-6	13-42
Rapid Deployment Jacks — Cleaning/Inspection/Repair	13-2-7	13-49
MMS Hoist (Alternate Removal of Major Components)	13-2-8	13-56
Configure Helicopter for Rapid Deployment	13-2-9	13-56.2
Configure Helicopter for Flight After Rapid Deployment	13-2-10	13-56.26

13-2-1. MMS HOIST ASSEMBLY — INSTALLATION/REMOVAL

This task covers: Installation and Removal (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Repairer (3)
67S Scout Helicopter Technical Inspector (TI)

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Main Rotor Blades Folded (Standard Method)
(Task 1-7-5)
Main Rotor Blades Folded (Alternate Method)
(Task 1-7-6)
Helicopter Kneeled (Task 13-2-9)

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13-2-1. MMS HOIST ASSEMBLY — INSTALLATION/REMOVAL (CONT)

INSTALL

WARNING

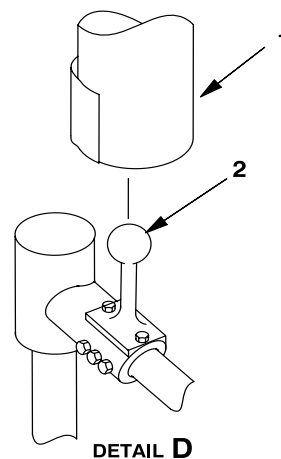
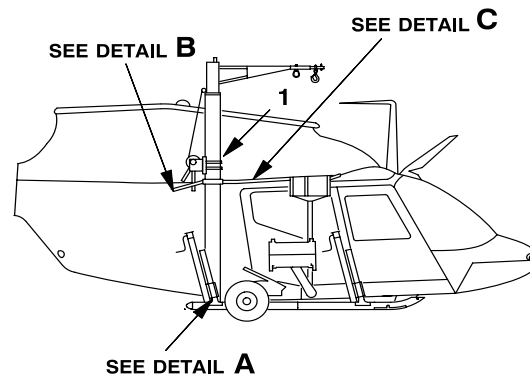
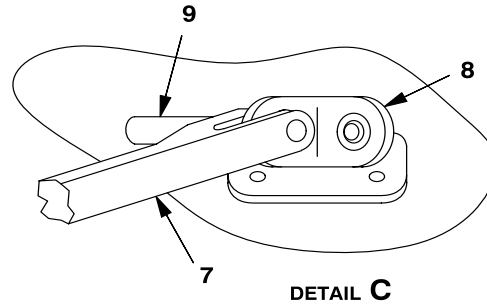
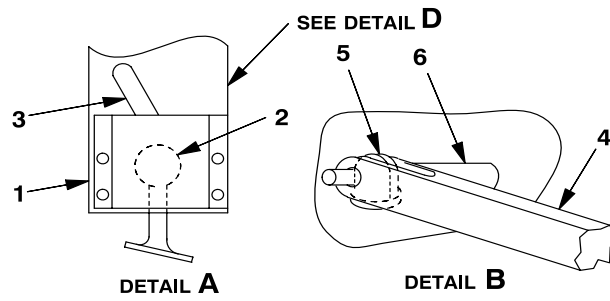
- This task requires a minimum of three people to prevent injury to personnel.
- Helicopter shall remain in kneeled position during all steps to prevent injury to personnel.
- Ensure lower end of hoist assembly locks securely in place on ball to prevent injury to personnel.
- Ensure clearance between MMS hoist and rotor blades during installation to prevent injury to personnel.

NOTE

Hoist assembly support ball and support arm attach fittings are located on pilot (right) side of helicopter.

1. Position lower end of hoist assembly (1) on ball (2) with hoist boom pointing forward parallel with skid.
2. Ensure that hoist assembly (1) is locked on ball (2) by rotating handle (3) and will not move up or down.
3. Align arm assembly (4) with aft attach eyebolt (5) and secure in place with pin (6).
4. Align arm assembly (7) with forward attach fitting (8) and secure in place with pin (9).

INSPECT



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GO TO NEXT PAGE

13-2-1. MMS HOIST ASSEMBLY — INSTALLATION/REMOVAL (CONT)

REMOVE

WARNING

- Hoist assembly shall be supported during removal to prevent injury to personnel.
- Ensure clearance between MMS and rotor blades during removal to prevent injury to personnel.

5. Support hoist assembly (1) and release pins (6 and 9).

6. Release hoist assembly (1) from ball (2) by rotating handle (3).

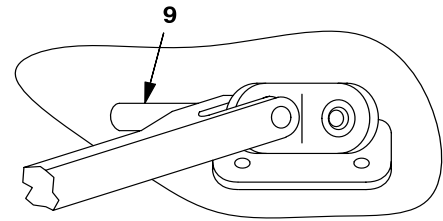
7. Remove hoist assembly (1).

INSPECT

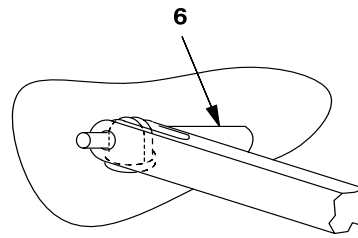
FOLLOW-ON MAINTENANCE

Unfold main rotor blades (Task 1-7-5 or 1-7-6).

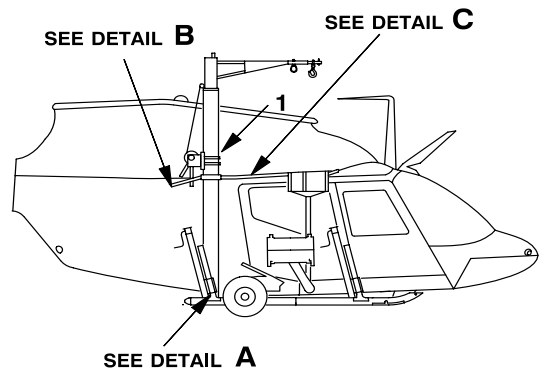
Raise helicopter (Task 13-2-9).



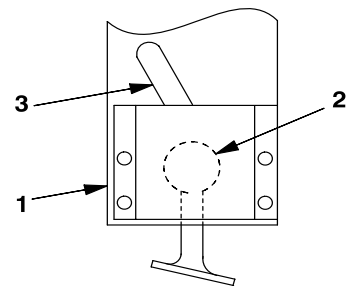
DETAIL C



DETAIL B



SEE DETAIL A



DETAIL A

406270-9
J1969

END OF TASK

13-2-2. MMS HOIST ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Goggles (B55)
Respirator (B116)
Apron (B7)

Material:

Drycleaning Solvent (D199)
Rubber Gloves (D111)
Wiping Rags (D164)
400-Grit Sandpaper (D175)
Epoxy Primer Coating (D98)
Paint (D150)

Personnel Required:

67S Scout Helicopter Repairer
67S Scout Helicopter Technical Inspector (TI)

References:

TM 55-1500-345-23

CAUTION

To prevent accumulation of dust and dirt, lubrication or grease of any kind shall not be applied to MMS hoist assembly.

GO TO NEXT PAGE

13-2-2. MMS HOIST ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN



Drycleaning Solvent

1. Clean hoist assembly (1) using wiping rags (D164) dampened with drycleaning solvent (D199).
2. Dry hoist assembly (1) using clean wiping rags (D164).
3. Clean cable assembly (2), hook (3), ring (4), ratchet and pawl (5), brake assembly (6), and eyebolts (7) with dry wiping rag (D164). Do not lubricate.

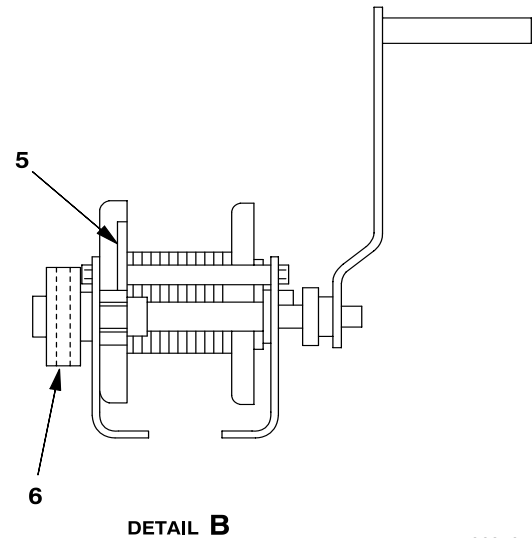
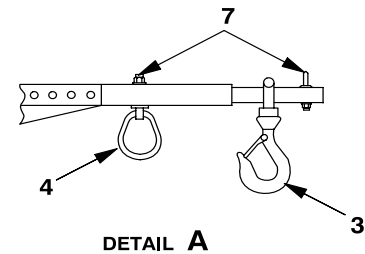
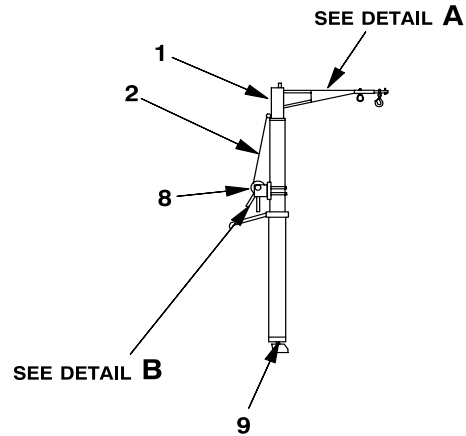


Compressed Air

4. Remove dust or sand from winch assembly (8) using shop air.

INSPECT

5. Inspect hoist assembly (1) as follows:
 - a. Inspect cable assembly (2) for kinks, frays, broken strands, and correct spooling on drum.
 - b. Inspect hook (3), eyebolts (7) and ring (4) for damage.
 - c. Inspect winch assembly (8) for broken or chipped gears and correct operation of ratchet and pawl (5).
 - d. Inspect brake assembly (6) for correct operation.
 - e. Inspect ball locking mechanism (9) for damage and correct operation.
 - f. Check hoist assembly (1) for smoothness and binding during extension.
 - g. Check hoist assembly (1) for structural damage.
6. Inspect outer tube assembly for nicks, dents, scratches and corrosion to limits shown.
7. Inspect inner tube assembly for nicks, dents, scratches and corrosion to limits shown.

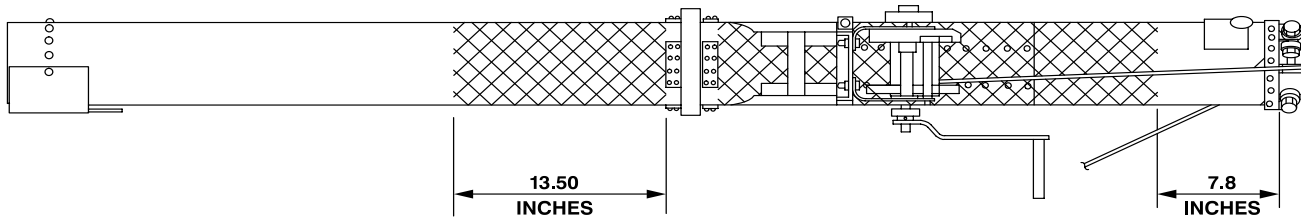


406270-5
J2465

See figure MMS Hoist Assembly — Damage Limits.

GO TO NEXT PAGE

13-2-2. MMS HOIST ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



OUTER TUBE ASSEMBLY

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE

MAXIMUM DAMAGE AND REPAIR DEPTH

TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
MECHANICAL	0.015 in. before and after repair	0.030 in. before and after repair
CORROSION	0.008 in. before and 0.015 in. after repair	0.015 in. before and 0.030 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.400 sq. in.	1.500 sq. in.
NUMBER OF REPAIRS	10 per area	Not critical
MINIMUM DISTANCE BETWEEN REPAIRS	6.000 inches	5.000 inches
EDGE CHAMFER TO REMOVE DAMAGE	N/A	0.060 in. x 45°

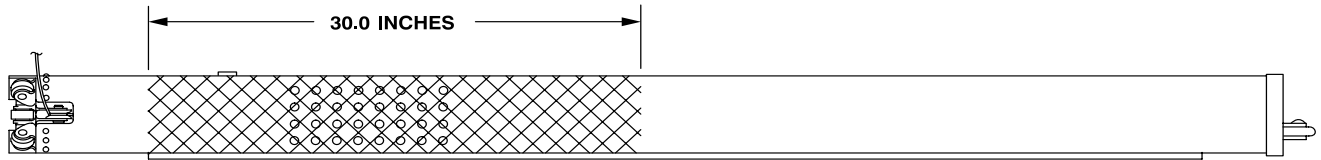
- NOTES: 1. No cracks are permitted.
2. No dents are permitted.

406270-10-1
J1829

MMS Hoist Assembly — Damage Limits (Sheet 1 of 2)

GO TO NEXT PAGE

13-2-2. MMS HOIST ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)



INNER TUBE ASSEMBLY

DAMAGE LOCATION SYMBOLS



TYPE OF DAMAGE	MAXIMUM DAMAGE AND REPAIR DEPTH	
	Symbol 1 (Cross-hatch)	Symbol 2 (Empty)
MECHANICAL	0.012 in. before and after repair	0.025 in. before and after repair
CORROSION	0.006 in. before and 0.012 in. after repair	0.012 in. before and 0.025 in. after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.250 sq. in.	1.000 sq. in.
NUMBER OF REPAIRS	5 per area	Not critical
MINIMUM DISTANCE BETWEEN REPAIRS	6.000 inches	5.000 inches
EDGE CHAMFER TO REMOVE DAMAGE	N/A	0.050 in. x 45°

- NOTES: 1. No cracks are permitted.
 2. No dents are permitted.

406270-10-2
 J1829

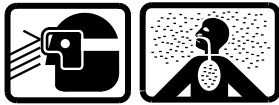
MMS Hoist Assembly — Damage Limits (Sheet 2 of 2)

GO TO NEXT PAGE

13-2-2. MMS HOIST ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)

REPAIR

8. Replace cable assembly (2) if damaged or worn.
9. Replace hook (3), eyebolts (7) and ring (4) if damaged.
10. Replace brake assembly (6) if damaged or worn.
11. Replace ball locking mechanism (9) if damaged or worn.
12. Replace winch assembly (8) and ratchet and pawl (5) if damaged or worn.
13. Replace hoist assembly (1) if structural damage is not repairable.
14. Repair inner and outer tube assemblies as follows:



Sanding Operations

- a. Polish out reparable damage using 400-grit sandpaper (D175).



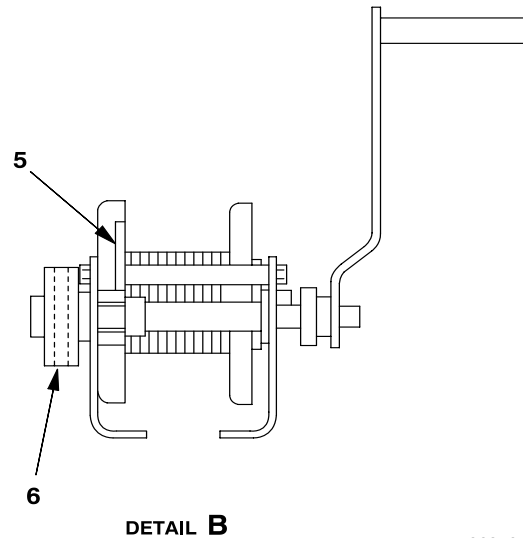
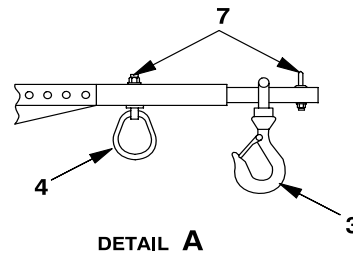
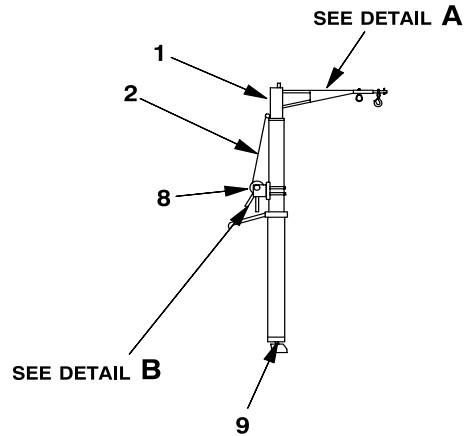
Epoxy Primer Coating



Polyurethane Coating

- b. Apply coat of epoxy primer coating (D98) to repair area followed by coat of paint (D150) (TM 55-1500-345-23).

INSPECT



406270-5
J2465

END OF TASK

13-2-3. MMS HOIST ASSEMBLY — DISASSEMBLY/ASSEMBLY

This task covers: Disassembly and Assembly (Off Helicopter)

INITIAL SETUP

Torque Wrench (B238)
Torque Wrench (B239)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Repairer
68G Airframe Repairer
67S Scout Helicopter Technical Inspector (TI)

Tools:

General Mechanic Tool Kit (B178)
Airframe Repairer Tool Kit (B176)
Goggles (B55)
Torque Wrench (B236)

References:
TM 1-1500-204-23

GO TO NEXT PAGE

13-2-3. MMS HOIST ASSEMBLY — DISASSEMBLY/ASSEMBLY (CONT)

DISASSEMBLE

NOTE

Mark position of arm assemblies to ensure correct position on assembly.

1. Remove arm assemblies (1 and 2) from outer post assembly (3) by removing two nuts (4), two washers (5), two bolts (6), two spacers (7), two nuts (7.1), two washers (7.2), and two screws (7.3).

NOTE

An alternate method of attaching the upper arm of boom (8) to inner post (9) on some MMS hoist assemblies is with a quick-release pin.

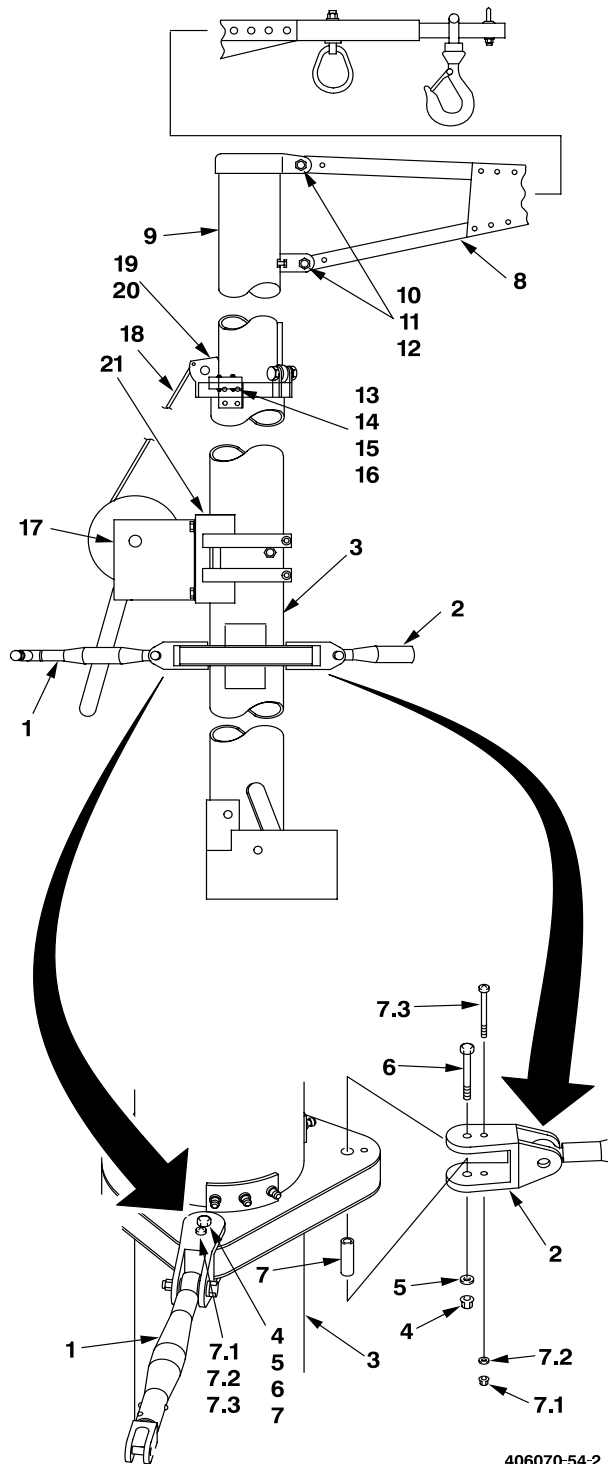
2. Remove boom assembly (8) from inner post assembly (9) by removing two nuts (10), four washers (11), and two bolts (12).

3. Remove stop (13) from outer post assembly (3) by removing two nuts (14), two washers (15), and two bolts (16).

4. Operate winch assembly (17) to retract cable assembly (18) until lower end of inner post assembly (9) is within **2 inches** of top of outer post assembly (3).

5. Remove two cotter pins (19) and pins (20) from outer post assembly (3).

6. Enter outer post assembly (3) from lower access hole and remove cotter pin (21) on lower end of inner post assembly (9).



406070-54-2
J2767

GO TO NEXT PAGE

13-2-3. MMS HOIST ASSEMBLY — DISASSEMBLY/ASSEMBLY (CONT)

7. Remove cable assembly (18) from lower end of inner post assembly (9) by pushing down on cable assembly (18) to release ball from slot. Pull cable assembly (18) out from top of outer post assembly (3).

8. Unwind cable assembly (18) from winch assembly (17). Remove nut (22) and clamp (23). Remove cable assembly (18) from winch assembly (17).

9. Remove winch assembly (17) from outer post assembly (3) by removing four nuts (24), four washers (25), and four bolts (26).

10. Remove bolt (27) and washer (28) from guard (29) and outer post assembly (3).

11. Remove guard (29) from outer post assembly (3) by removing eight rivets (30).

12. Remove lock (31), spring (32), shaft (33), and handle (34) from outer post assembly (3) by removing two pins (35).

13. Remove handle (34) from shaft (33) by removing nut (36), washer (37), and screw (38).

ASSEMBLE

14. Install handle (34) on shaft (33) using screw (38), washer (37), and nut (36).

15. Install lock (31), spring (32), shaft (33), and handle (34) on outer post assembly (3) using two pins (35).

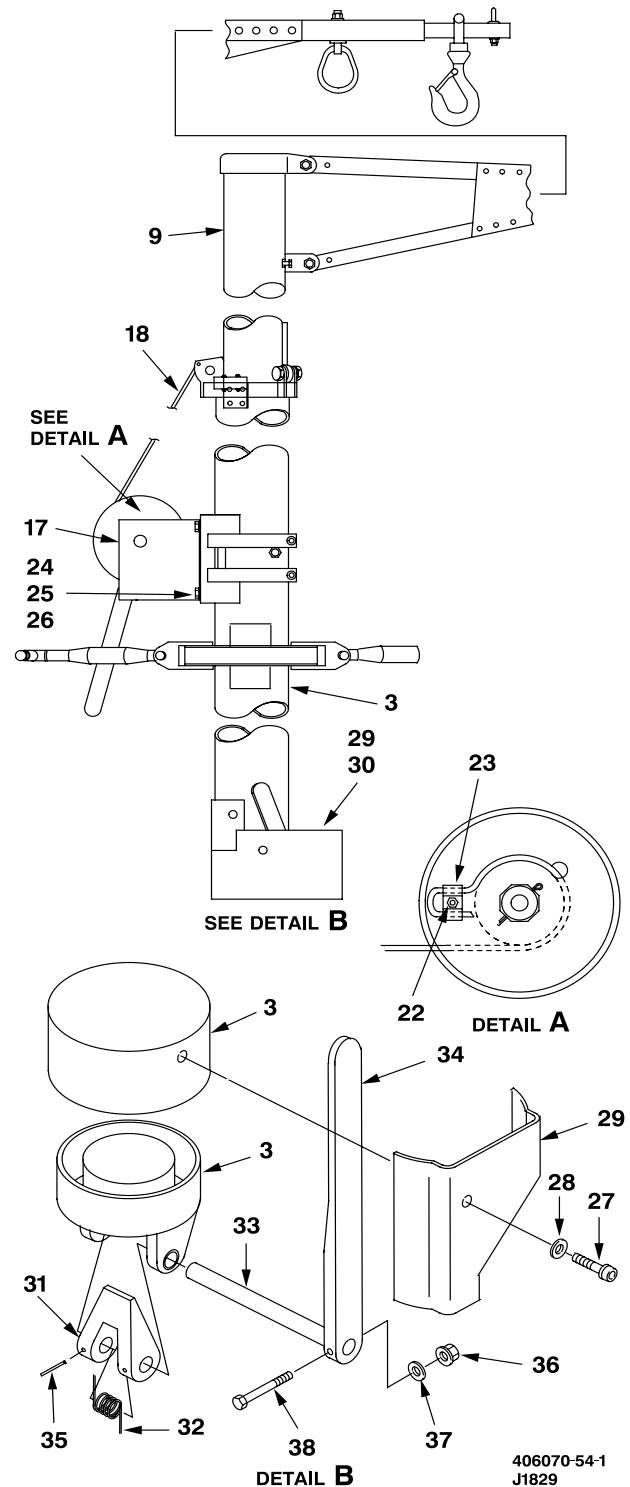
16. Install guard (29) on outer post assembly (3) using eight rivets (30) (TM 1-1500-204-23).

17. Install bolt (27) and washer (28) into guard (29) and outer post assembly (3).

18. Install winch assembly (17) on outer post assembly (3) using four bolts (26), four washers (25), and four nuts (24). Torque nuts (24) **120 TO 160 INCH-POUNDS**.

19. Feed cable assembly (18) through hole in drum of winch assembly (17). Position cable assembly (18) under clamp (23) as shown in Detail A. Install nut (22).

20. Slide cable assembly (18) down between inner post assembly (9) and outer post assembly (3) to lower access hole.



GO TO NEXT PAGE

13-2-3. MMS HOIST ASSEMBLY — DISASSEMBLY/ASSEMBLY (CONT)

21. Install cable assembly (18) on lower end of inner post assembly (9) using cotter pin (21).

22. Place cable assembly (18) in pulley at top of outer post assembly (3). Operate winch assembly (17) to remove the slack in cable assembly (18).

23. Install two cotter pins (19) and two pins (20) on outer post assembly (3).

24. Operate winch assembly (17) to lower inner post assembly (9) to bottom of outer post assembly (3).

25. Install stop (13) in the maximum inboard position on outer post assembly (3) using two bolts (16), two washers (15), and two nuts (14).

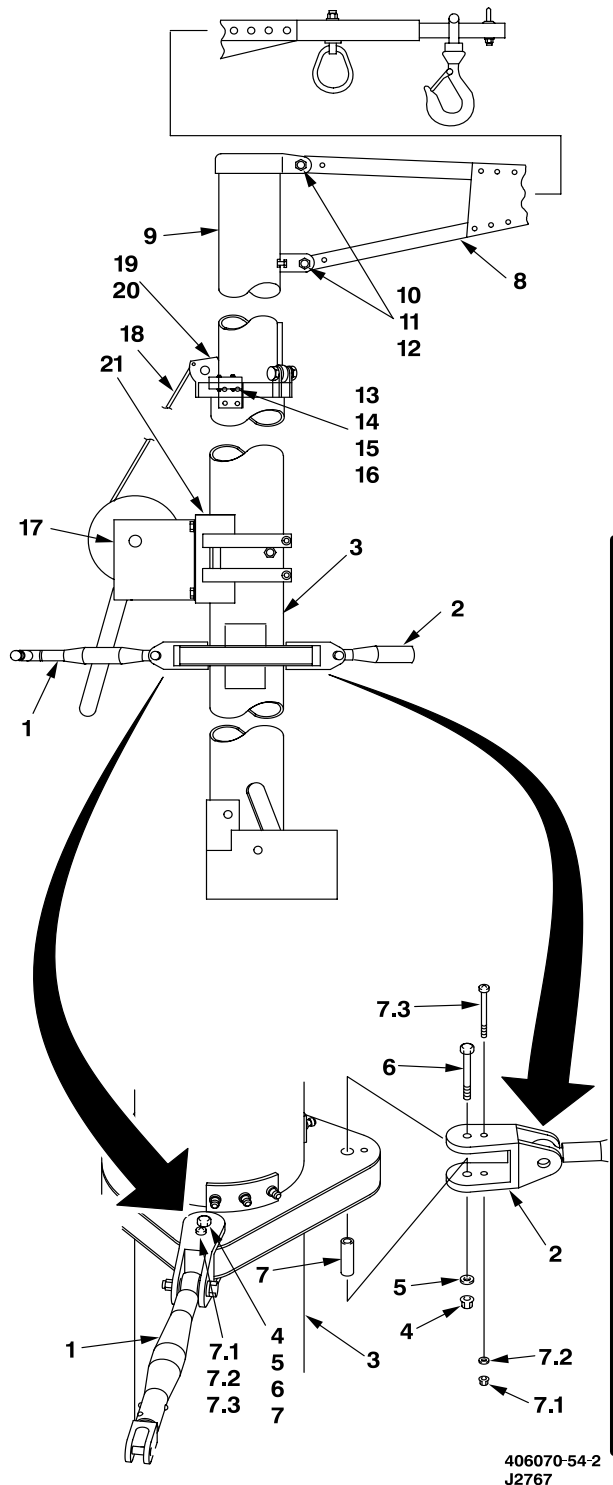
NOTE

An alternate method of attaching the upper arm of boom (8) to inner post (9) on some MMS hoist assemblies is with a quick-release pin.

26. Install boom assembly (8) on inner post assembly (9) using two bolts (12), four washers (11), and two nuts (10). Torque nuts (10) **120 TO 160 INCH-POUNDS**.

27. Install arm assemblies (1 and 2) on outer post assembly (3) using bolt (6), washer (5), spacer (7), nut (4), nut (7.1), washer (7.2), and screw (7.3) per each assembly. Torque nuts (4) **75 TO 95 INCH-POUNDS** and torque nuts (7.1) **20 TO 25 INCH-POUNDS**.

INSPECT



END OF TASK

13-2-4. MMS PLATFORM ASSEMBLY — INSTALLATION/REMOVAL

This task covers: Installation and Removal (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Repairer
67S Scout Helicopter Technical Inspector (TI)

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Helicopter Kneeled (Task 13-2-9)

GO TO NEXT PAGE

13-2-4. MMS PLATFORM ASSEMBLY — INSTALLATION/REMOVAL (CONT)

INSTALL

WARNING

- Helicopter shall remain in kneeled position while accomplishing all steps to prevent injury to personnel.
- Ensure lower end of platform assembly locks securely in place on ball to prevent injury to personnel.

NOTE

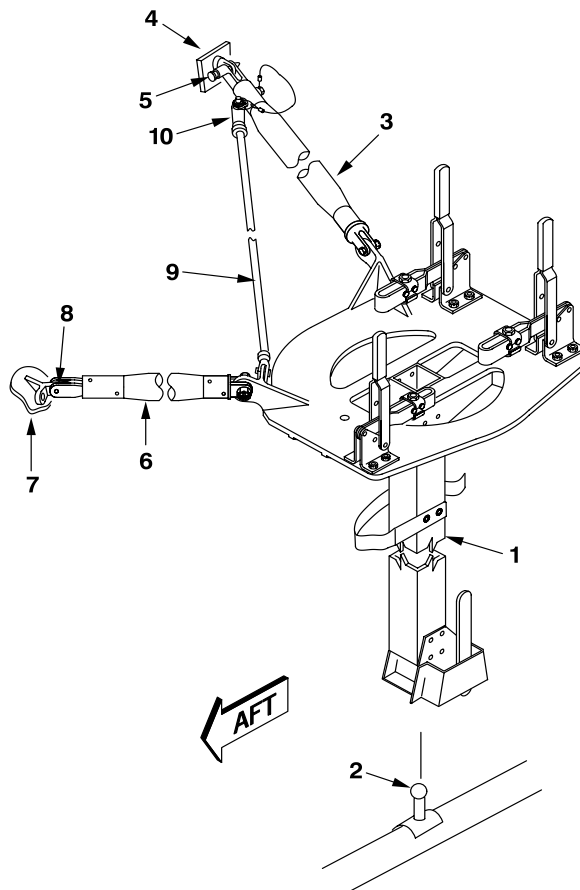
- MMS platform assembly installation is located on pilot (right) side of helicopter only.
- During installation it is possible to trap rod in a position that it can not be hooked up. Keep rod in proper position during installation.
- If HELLFIRE rack is installed on UWP, UWP locking clevis may need to be adjusted to facilitate installation of MMS platform assembly.

1. Position lower end of platform assembly (1) on ball (2). Ensure spring-loaded lock snaps into place.

2. Align forward support arm assembly (3) with fuselage mounted eyebolt (4) and secure in place with pin (5). Ensure pin (5) is on aft side of bracket.

3. Align aft support arm assembly (6) with forward portion of fuselage fitting (7) and secure in place with pin (8). Ensure pin (8) is on forward side of bracket.

4. Position clevis of rod (9) on forward support arm assembly (3). Adjust clevis as required to install pin (10).



406270-6-1
J2465

INSPECT

GO TO NEXT PAGE

13-2-4. MMS PLATFORM ASSEMBLY — INSTALLATION/REMOVAL (CONT)

REMOVE

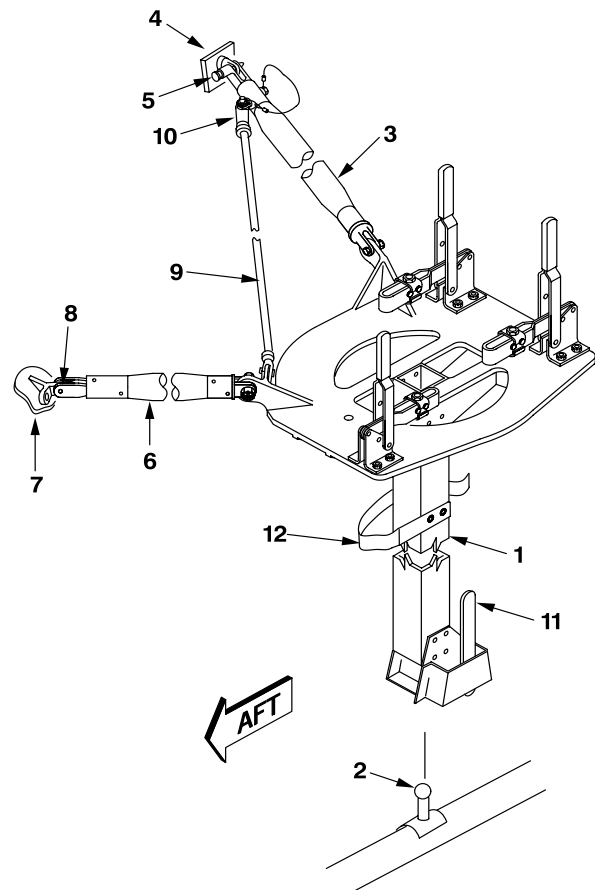
WARNING

Platform assembly shall be supported during removal to prevent injury to personnel.

5. Support platform assembly (1).
6. Remove pin (10) and leave rod (9) attached at other end.
7. Remove pin (5) from fuselage mounted eyebolt (4) and pin (8) from fuselage fitting (7).
8. Release platform assembly (1) from ball (2) by rotating handle (11).
9. Remove platform assembly (1).
10. Secure arm assemblies (3 and 6) and rod (9) to platform assembly (1) with strap (12).

FOLLOW-ON MAINTENANCE

- Raise helicopter (Task 13-2-9).



406270-6-2
J2465

END OF TASK

13-2-5. MMS PLATFORM ASSEMBLY — CLEANING/INSPECTION/REPAIR

This task covers: Clean/Inspect/Repair MMS Platform Assembly (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Apron (B7)
Goggles (B55)

Material:

Drycleaning Solvent (D199)
Rubber Gloves (D111)
Sandpaper (D175)
Wiping Rags (D164)

Personnel Required:

67S Scout Helicopter Repairer
67S Scout Helicopter Technical Inspector (TI)

GO TO NEXT PAGE

13-2-5. MMS PLATFORM ASSEMBLY — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN

**Drycleaning Solvent**

1. Clean platform assembly (1) using wiping rags (D164) dampened with drycleaning solvent (D199).

2. Dry platform assembly (1) using clean wiping rags (D164).

INSPECT

3. Visually inspect platform assembly (1) for cracks, scratches, nicks, gouges, and corrosion. No cracks allowed.

4. Visually inspect platform support assembly (2) for cracks, scratches, nicks, gouges, and corrosion. No cracks allowed.

5. Visually inspect platform forward and aft support arm assemblies (3 and 4) for cracks, scratches, nicks, gouges, and corrosion. No cracks allowed.

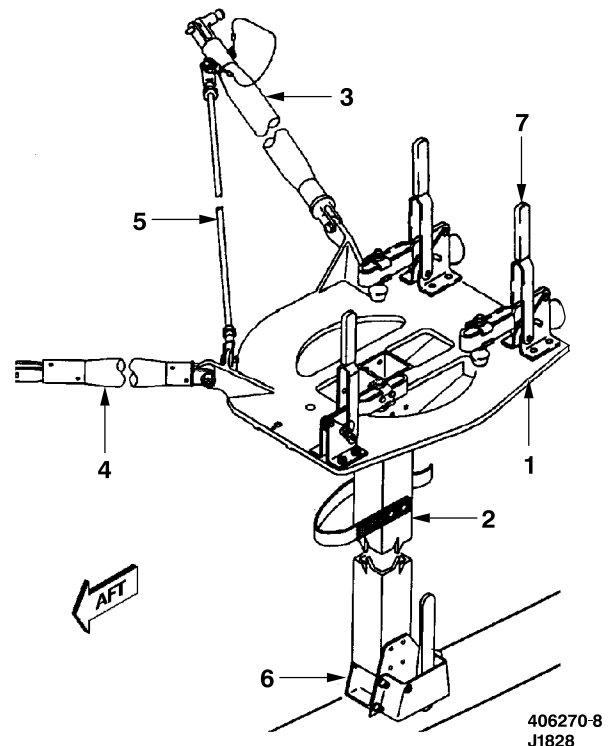
6. Visually inspect rod assembly (5) for cracks, scratches, nicks, gouges, and corrosion. No cracks allowed.

7. Visually inspect ball locking mechanism (6) for cracks, scratches, nicks, gouges, and corrosion. No cracks allowed.

8. Inspect toggle clamp assemblies (7) for damage and correct operation.

REPAIR

9. Repair of platform assembly (1), platform support assembly (2), platform forward and aft support arm assemblies (3 and 4), and rod assembly (5) is limited to cleanup of minor damage or component replacement.

**Sanding Operations**

10. Burnish nicks, scratches, and gouges using 400 grit sandpaper (D175).

11. Remove corrosion using 400-grit sandpaper (D175).

12. Replace toggle clamp assemblies (7) if damaged or worn (Task 13-2-6).

13. Replace ball locking mechanism (6) if damaged or worn (Task 13-2-6).

INSPECT

END OF TASK

13-2-6. MMS PLATFORM ASSEMBLY — DISASSEMBLY/ASSEMBLY

This task covers: Disassembly and Assembly (Off Helicopter)

INITIAL SETUP

Material:
Goggles (B55)

Applicable Configurations:
All

Personnel Required:
67S Scout Helicopter Repairer
67S Scout Helicopter Technical Inspector (TI)
68G Aircraft Structural Repairer

Tools:
General Mechanic Tool Kit (B178)
Airframe Repairer Tool Kit (B176)
Torque Wrench (B236)
Torque Wrench (B239)

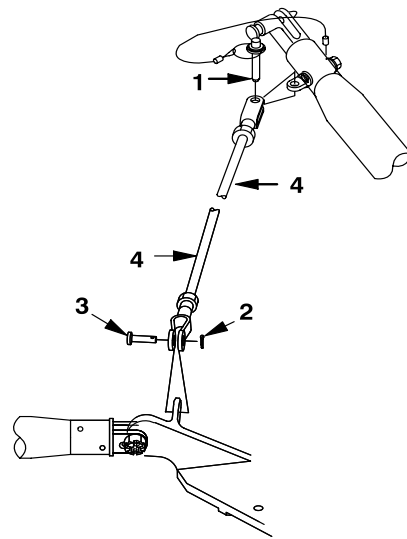
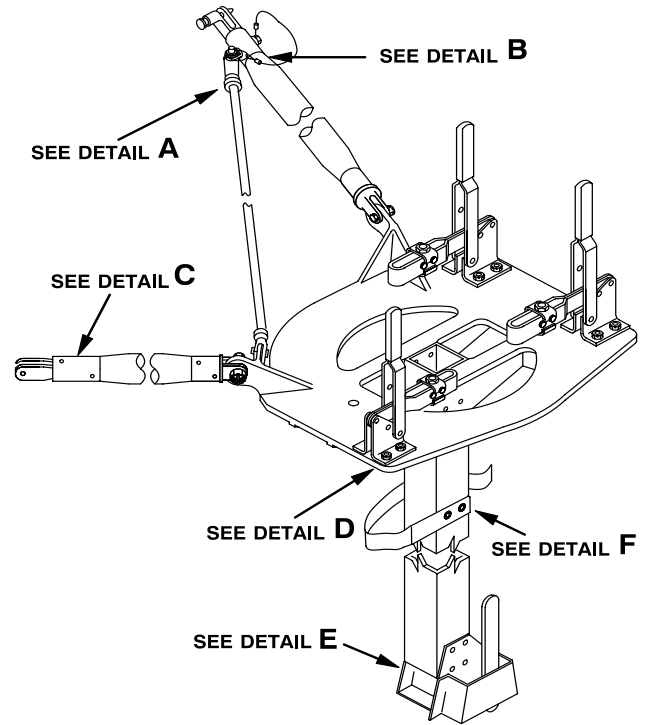
References:
TM 1-1500-204-23

GO TO NEXT PAGE

13-2-6. MMS PLATFORM ASSEMBLY — DISASSEMBLY/ASSEMBLY (CONT)

DISASSEMBLE

1. Remove quick-release pin (1).
2. Remove cotter pin (2) and pin (3) and remove rod assembly (4).



DETAIL A

406070-47-1
J2465

GO TO NEXT PAGE

13-2-6. MMS PLATFORM ASSEMBLY — DISASSEMBLY/ASSEMBLY (CONT)

3. Remove nut (5), two washers (6), lanyard assembly (7), and eyebolt (8).

4. Remove cotter pin (9), nut (10), two washers (11), and shear bolt (12) and remove forward support arm assembly (13).

5. Remove cotter pin (14), nut (15), two washers (16), and shear bolt (17) and remove support arm assembly (18).

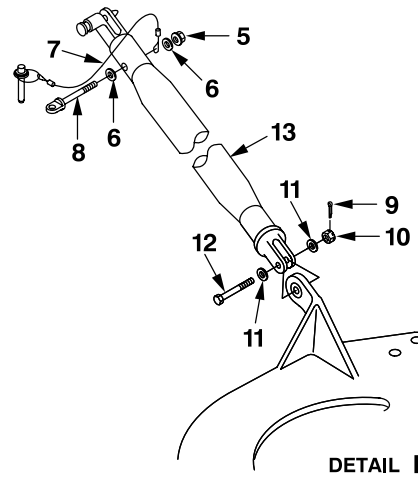
6. Remove 12 nuts (19), 12 washers (20), and 12 shear bolts (21) and remove 3 toggle clamps (22).

7. Remove nut (23), washer (24), screw (25), and lanyard assembly (26) with quick-release pin attached.

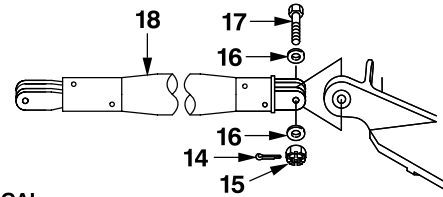
8. Remove nut (27), washer (28), screw (29), and lanyard assembly (30) with quick-release pin attached.

9. Remove collar (31) and remove guide pin (32), two places.

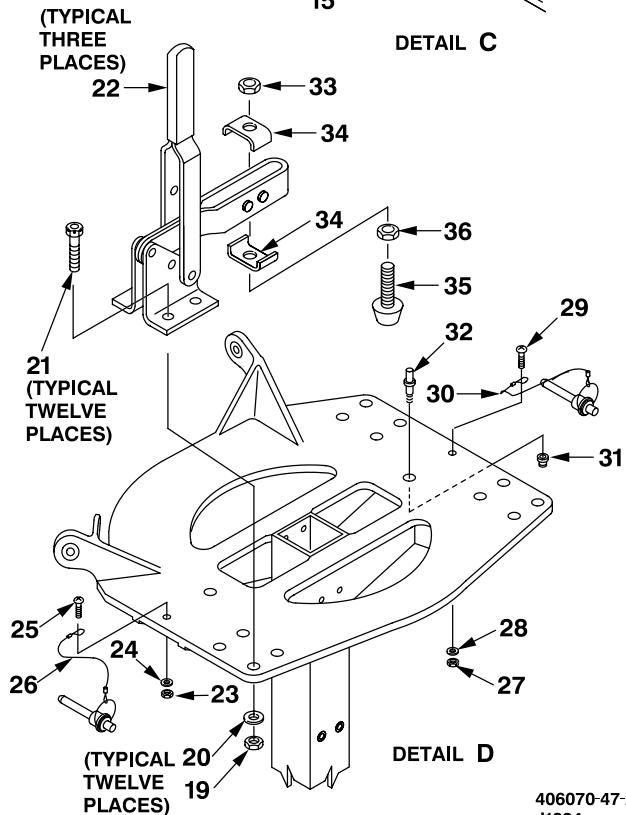
10. Remove nut (33) and one clamp (34). Remove spindle (35), one clamp (34), and nut (36).



DETAIL B



DETAIL C



DETAIL D

406070-47-2
J1834

GO TO NEXT PAGE

13-2-6. MMS PLATFORM ASSEMBLY — DISASSEMBLY/ASSEMBLY (CONT)

11. Remove eight collars (37), eight pins (38), and shim (39).

12. Separate MMS platform assembly (40) from support assembly (41).

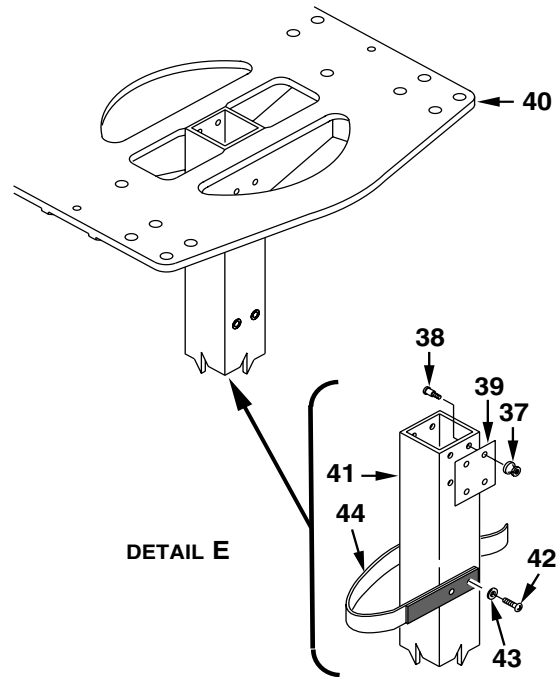
13. Remove two screws (42), and two washers (43) and remove strap assembly (44).

14. Remove nut (45), two washers (46), screw (47), and spacer (48).

15. Remove four collars (49) and four pins (50) and remove guard (51).

16. Remove nut (52), washer (53), and screw (54) and remove handle (55).

17. Remove two rivets (56) (TM 1-1500-204-23).



WARNING

When disassembling any component under spring tension, goggles (B55) shall be worn to avoid injury to eyes.

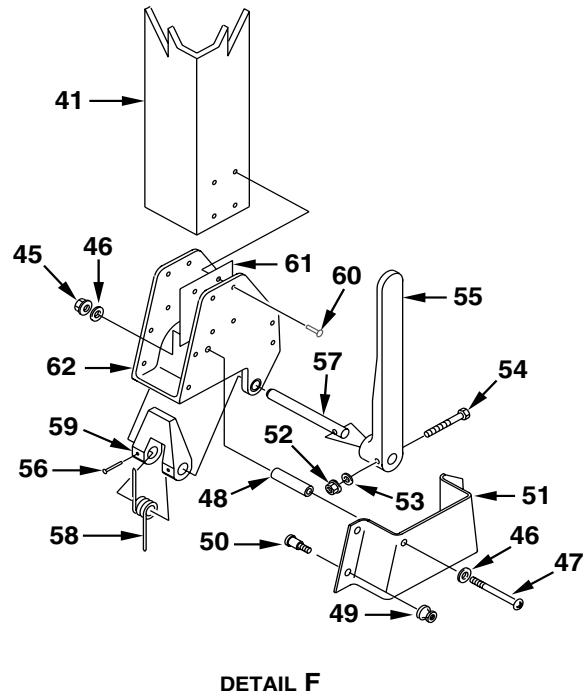
CAUTION

When disassembling any component under spring tension, care must be used to avoid loss of parts.

18. Remove shaft (57), spring (58), and lock (59).

19. Remove eight rivets (60) and shim (61) (TM 1-1500-204-23).

20. Remove support assembly (62) from support assembly (41).



406070-47-3
H4437

GO TO NEXT PAGE

13-2-6. MMS PLATFORM ASSEMBLY — DISASSEMBLY/ASSEMBLY (CONT)

ASSEMBLE

21. Position support assembly (62) on support assembly (41).

22. Install shim (61) and eight rivets (60) (TM 1-1500-204-23).

WARNING

When assembling any component under spring tension, goggles (B55) shall be worn to avoid injury to the eyes.

CAUTION

When assembling any component under spring tension, care must be used to avoid loss of parts.

23. Install lock (59), spring (58), and shaft (57).

24. Install two rivets (56) (TM 1-1500-204-23).

25. Install handle (55), screw (54), washer (53), and nut (52).

26. Position guard (51) and install four pins (50) and four collars (49).

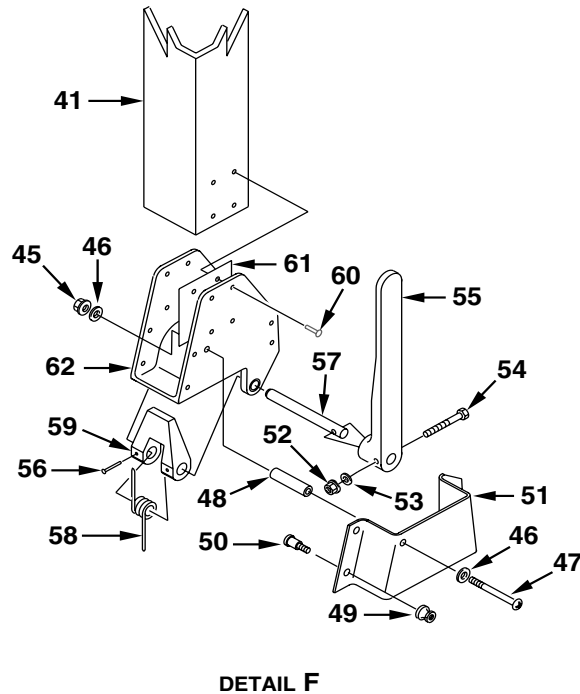
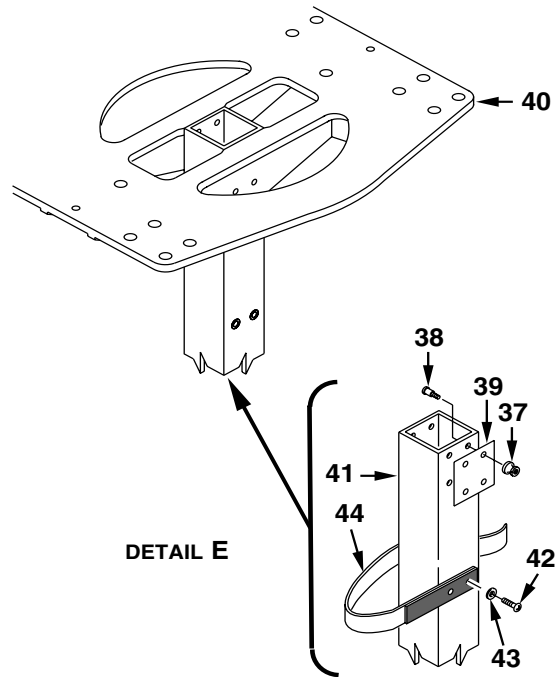
27. Install spacer (48), screw (47), two washers (46), and nut (45).

28. Position strap assembly (44) on support assembly (41).

29. Install two washers (43) and two screws (42).

30. Position MMS platform assembly (40) on support assembly (41).

31. Install shim (39), eight pins (38), and eight collars (37).



406070-47-3
H4437

GO TO NEXT PAGE

13-2-6. MMS PLATFORM ASSEMBLY — DISASSEMBLY/ASSEMBLY (CONT)

32. Install nut (36) and one clamp (34) on spindle (35).

33. Position spindle (35) in toggle clamp (22). Install one clamp (34) and nut (33). Adjust spindle (35) to middle of adjustment range.

34. Install guide pin (32) and collar (31).

35. Install lanyard assembly (30) with quick-release pin attached, screw (29), washer (28), and nut (27).

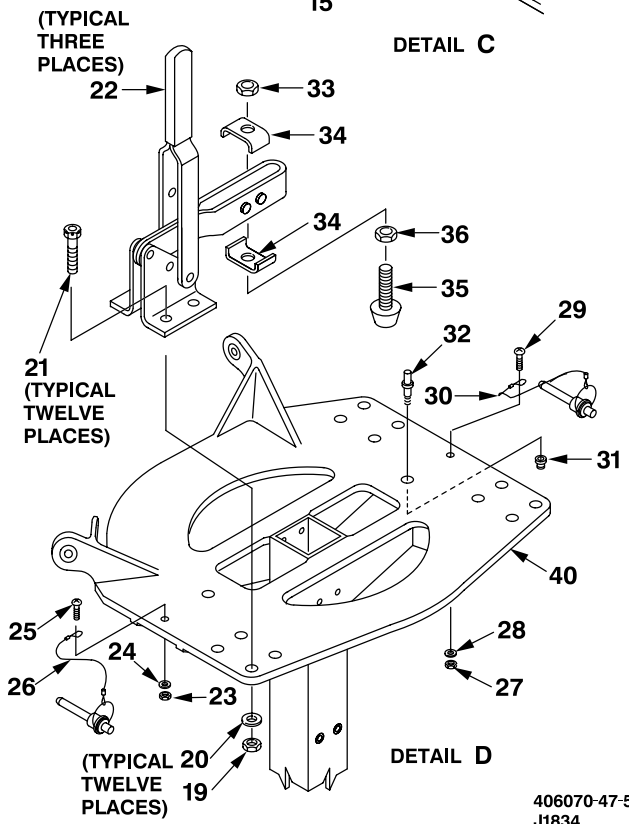
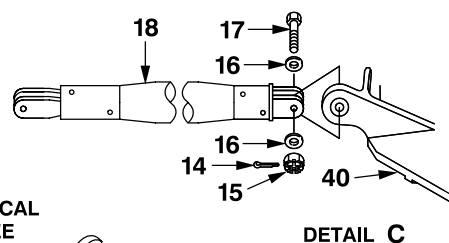
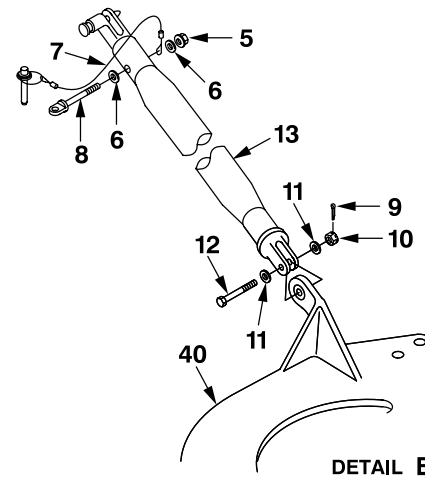
36. Install lanyard assembly (26) with quick-release pin attached, screw (25), washer (24), and nut (23).

37. Position 3 toggle clamps (22) and install 12 shear bolts (21), 12 washers (20), and 12 nuts (19). Torque nuts (19) **100 TO 140 INCH-POUNDS**.

38. Position aft support arm assembly (18) on MMS platform assembly (40) and install shear bolt (17), two washers (16), and nut (15). Torque nut (15) **30 TO 40 INCH-POUNDS** and secure with cotter pin (14).

39. Position forward support arm assembly (13) on MMS platform assembly (40) and install shear bolt (12), two washers (11), and nut (10). Torque nut (10) **30 TO 40 INCH-POUNDS** and secure with cotter pin (9).

40. Install eyebolt (8), lanyard assembly (7) with quick-release pin attached, two washers (6), and nut (5). Torque nut (5) **20 TO 25 INCH-POUNDS**.



406070-47-5
J1834

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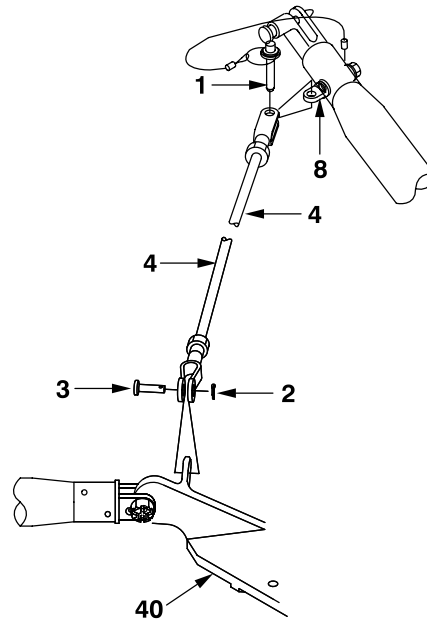
13-2-6. MMS PLATFORM ASSEMBLY — DISASSEMBLY/ASSEMBLY (CONT)

41. Position rod assembly (4) on attach point of MMS platform assembly (40).

42. Install cotter pin (2) through pin (3).

43. Position opposite end of rod assembly (4) to eyebolt (8) and install quick-release pin (1).

INSPECT



406070-47-4
J1834

END OF TASK

13-2-7. RAPID DEPLOYMENT JACKS — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair of Rapid Deployment Jacks (Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Material:
Solvent (D199)
Wiping Rags (D164)
Grease (D113)

Personnel Required:
67S Scout Helicopter Repairer

GO TO NEXT PAGE

13-2-7. RAPID DEPLOYMENT JACKS — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN



Drycleaning Solvent

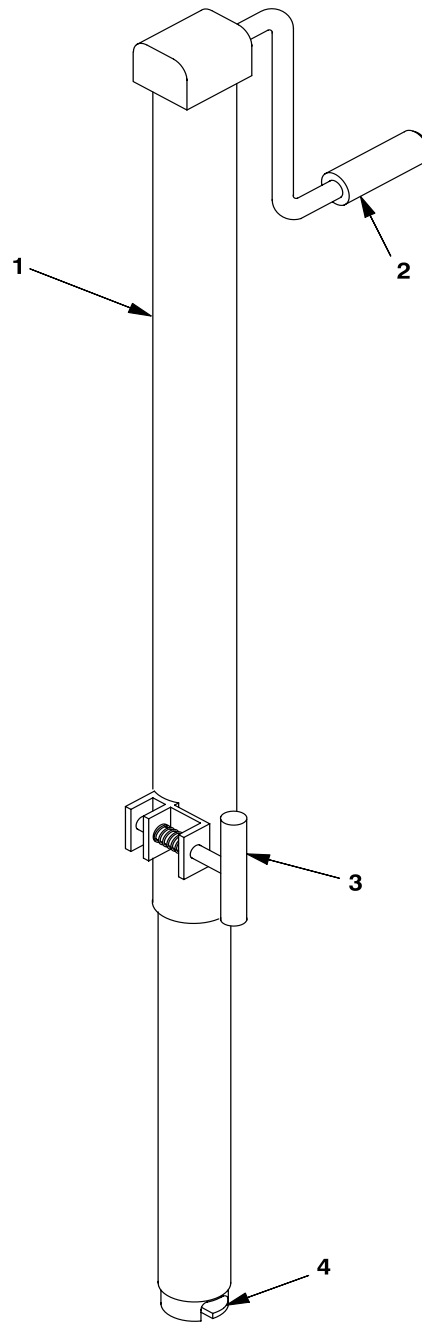
1. Clean exterior surfaces of jack assembly (1) with a wiping rag (D164) dampened with solvent (D199).
2. Dry with clean, dry wiping rag (D164).

INSPECT

3. Inspect jack crank (2) for distortion, cracks, and general condition.
4. Inspect retained assembly (3) for bent or broken pin, worn or broken spring, and smoothness of operation.
5. Inspect attachment lugs (4) for wear, cracks, and distortion.
6. Inspect outer housing for any damage affecting jack operation.
7. Extend jack assembly (1) to its maximum length, checking for smooth operation.
8. Retract jack and check for smooth operation and maximum reaction.

REPAIR

9. Replace jack if any damage is present which affects rated capacity of jack or safe operation.
10. Repairs are limited to general cleaning, exterior refinishing, and lubrication of threads.



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J1449

13-2-8. MMS HOIST (ALTERNATE REMOVAL OF MAJOR COMPONENTS)

This task covers: Alternate Removal of MMS Hoist Major Components (On Helicopter)

INITIAL SETUP

Applicable Configurations:

All

Tools:

General Mechanic Tool Kit (B178)

Personnel Required:

67S Scout Helicopter Repairer

67S Scout Helicopter Technical Inspector (TI)

Equipment Condition:

Helicopter Safed (Task 1-6-7)

Engine Assembly Disconnected (As required)
(Task 4-1-1)

Transmission Assembly Disconnected
(As required) (Task 6-3-2)

Main Rotor Hub Assembly Disconnected
(As required) (Task 5-1-1)

MMS Hoist Assembly Installed On Helicopter
(Task 13-2-1)

GO TO NEXT PAGE

13-2-8. MMS HOIST (ALTERNATE REMOVAL OF MAJOR COMPONENTS) (CONT)

DISASSEMBLE

NOTE

Rigging of the MMS hoist assembly for use as a maintenance hoist is for emergency use only in removal and installation of the engine, transmission, and main rotor hub assemblies, as required.

1. Raise hoist until **1-inch** gray band (1) painted on movable section of hoist assembly is visible.
2. Remove nut (2) and bolt (3) from stowed position in winch support.
3. Align holes (4) in fixed and movable sections of hoist assembly.
4. Install bolt (3) through holes aligned in step 3. and secure with nut (2).
5. Remove hook (5) from anchor (6).
6. Remove nut (7), bolt (8), pulley (9), and guide (10).

ASSEMBLE

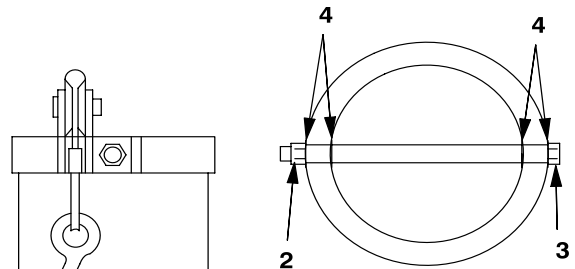
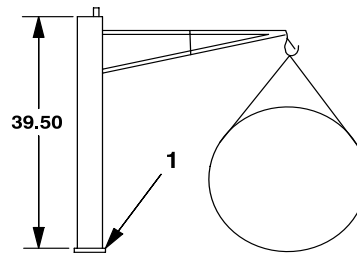
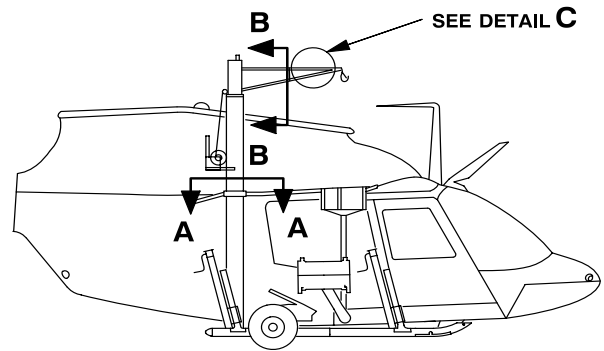
7. Position cable in pulley (9) and install guide (10) over pulley (9).

NOTE

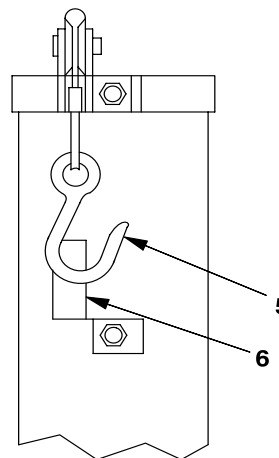
Ensure guide (10) is positioned over top of pulley (9) before installing bolt (8) and nut (7).

8. Install pulley (9), guide (10), bolt (8), and nut (7).
9. Attach hook (5) to component to be removed as required.

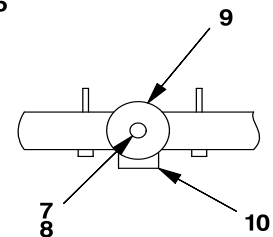
INSPECT



SECTION A-A



VIEW B-B



DETAIL C

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END OF TASK

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT

This task covers: Configuring Helicopter for Rapid Deployment

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Aft Crosstube Support Strap (B165)
Main Rotor Blade Folding Kit (B94)

Material:
Tape (D212)
Cushioning Material (D91)
Plastic Bag (D153)
Barrier Material (D48)
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer (4)

Equipment Condition:
Electrical Power Removed (Tasks 1-6-5 and 1-6-6)
Helicopter Safed (Task 1-6-7)
Searchlight Retracted to Stowed Position (TM 1-1520-248-T)
Helicopter Cleaned (Task 1-4-11)
Cargo Hook Suspension Assembly Removed (Task 13-1-1) (If installed)
Rescue Ladders Removed (Task 13-3-1) (If installed)
Tiedown Rings Installed (Task 1-7-2)

SERVICE FUEL

1. Service fuel (Task 1-4-1 or Task 1-4-2) to 3/4 full or approximately 75 gallons.

COVER SEARCHLIGHT

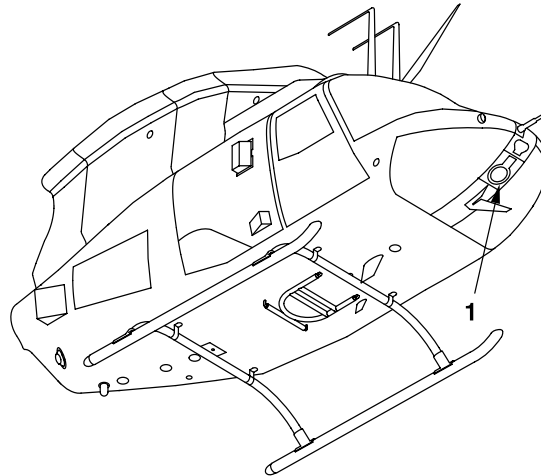
2. Cover searchlight (1) with cushioning material (D91) and secure with tape (D212).

COVER EXTERIOR VENTS AND DRAIN HOLES

3. Cover exterior vent and drain holes with barrier material (D48) and secure with tape (D212).

COVER BATTERY RECEPTACLES

4. Cover battery receptacle(s) with barrier material (D48) and secure with tape (D212).



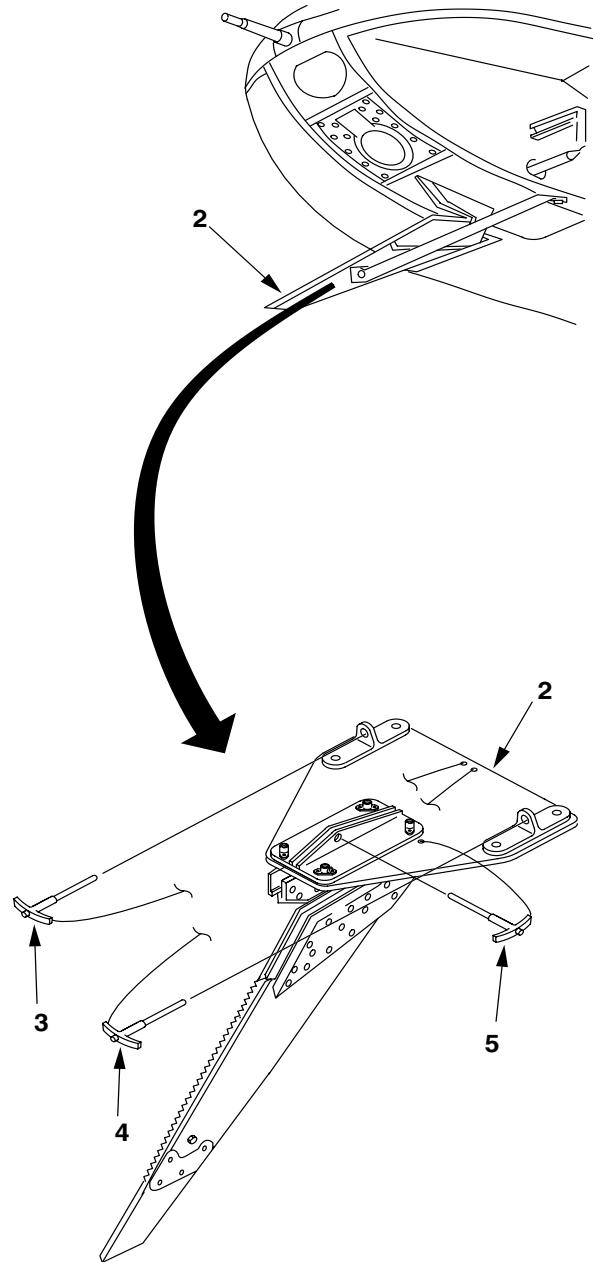
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13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

REMOVE LOWER WIRE CUTTER ASSEMBLY

5. Support lower wire cutter assembly (2).
6. Remove quick-disconnect pins (3, 4, and 5).
7. Remove lower wire cutter assembly (2) from helicopter.

406010-543-2
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

REMOVE UHF BLADE ANTENNA

8. Support UHF blade antenna (6).
9. Disconnect three turnlock fasteners (7) securing antenna (6) to underside of helicopter.

CAUTION

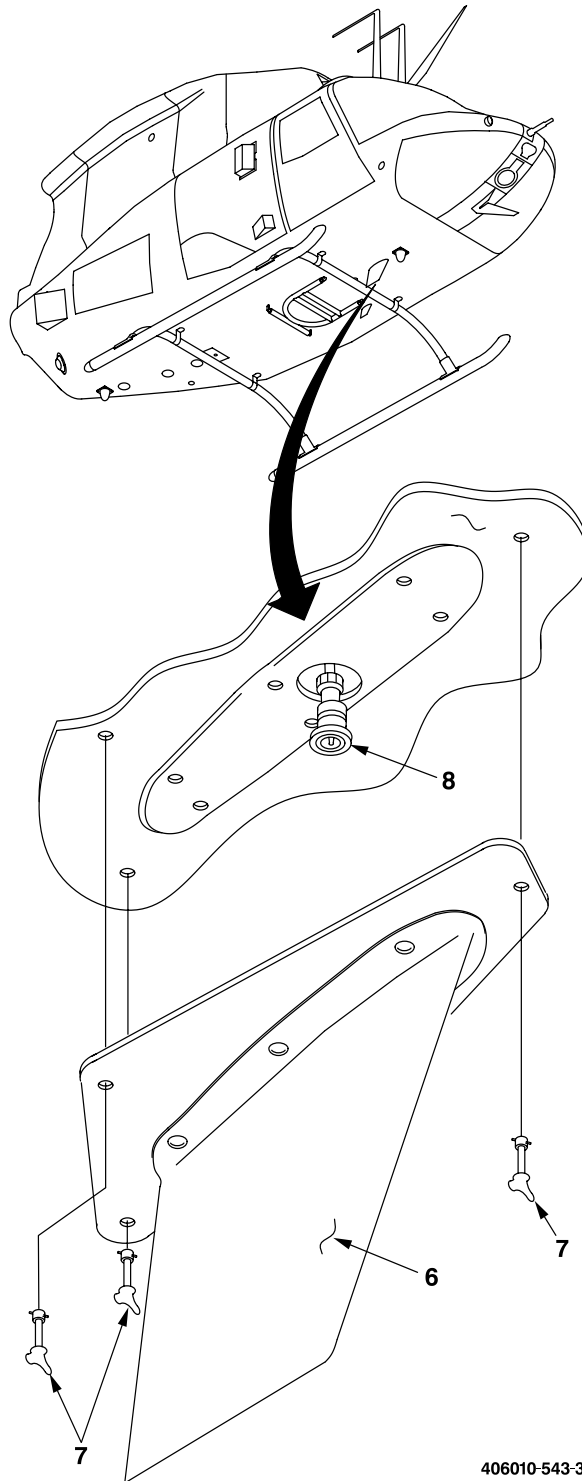
Antenna electrical cable and connector may be damaged if antenna is pulled down too far during removal.

10. Lower antenna (6) until clearance allows disconnection of coax cable connector (8).

NOTE

Installation of antenna will be difficult if antenna cable retracts into airframe.

11. Remove antenna (6) by disconnecting coax cable connector (8).



406010-543-3
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

REMOVE RDS BLADE ANTENNA

12. Support RDS blade antenna (9).

13. Disconnect four turnlock fasteners (10) securing antenna (9) to underside of helicopter.

CAUTION

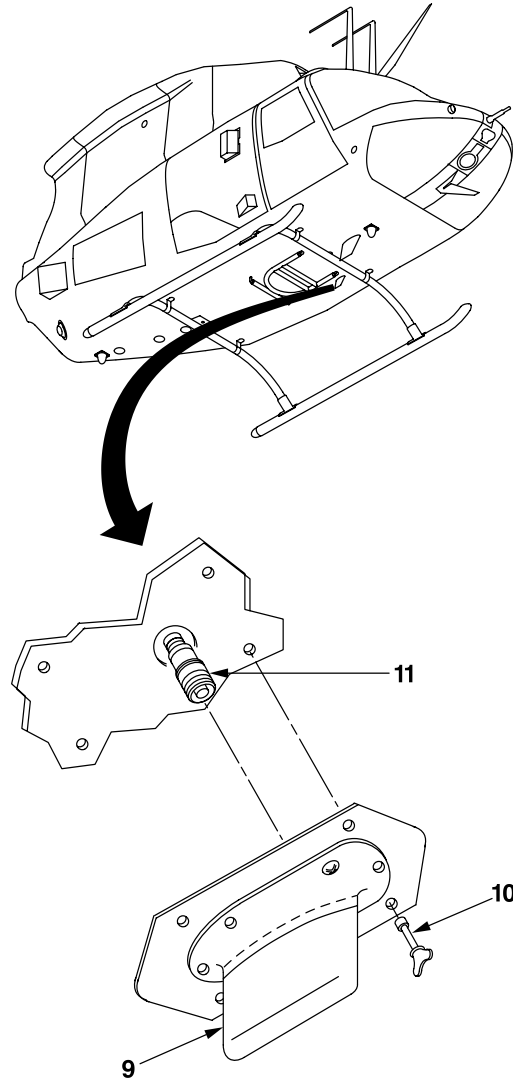
Antenna electrical cable and connector may be damaged if antenna is pulled down too far during removal.

14. Lower antenna (9) until clearance allows disconnection of coax cable connector (11).

NOTE

Installation of antenna will be difficult if antenna cable retracts into airframe.

15. Remove antenna (9) by disconnecting coax cable connector (11).



406010-543-4
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

SECURE LOOSE EQUIPMENT

16. Secure lower cutter assembly and both blade antennas in CPG seat.

SET COLLECTIVE POSITION

17. Place pilot collective stick (12) at mid-position point. Collective stick should not be frictioned unless it is absolutely necessary to hold collective in place and then only with light friction.

CAUTION

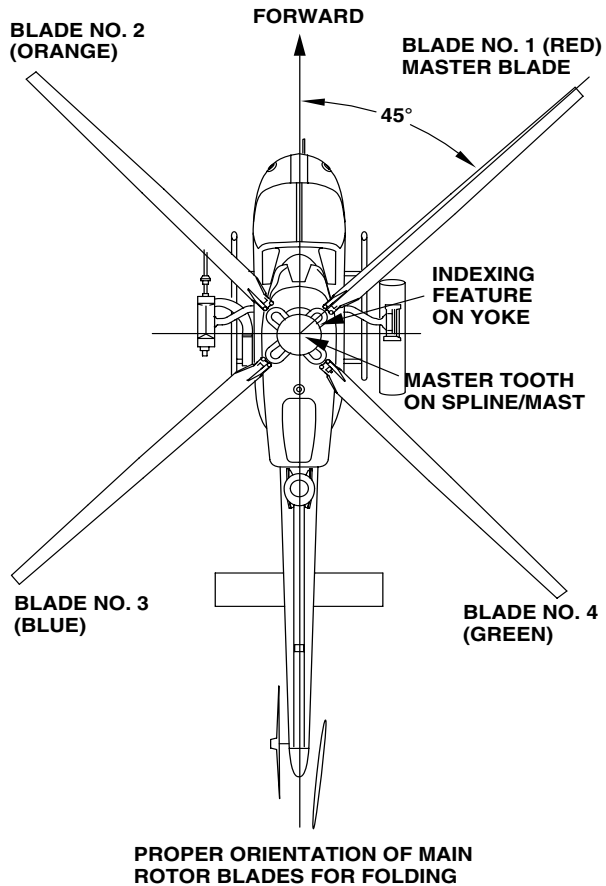
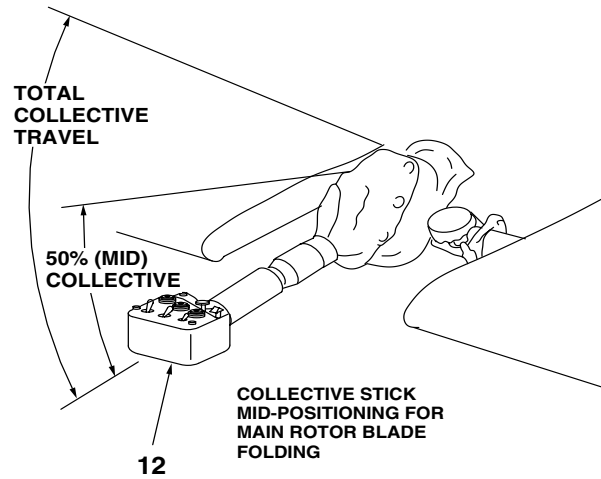
To prevent damage to tail rotor assembly during loading/unloading of helicopter, tail rotor blades shall be positioned as stated.

NOTE

Several rotations may be required to position both main and tail rotor blades properly.

ROTATE MAIN ROTOR BLADES

18. Rotate main rotor blades to allow the red (master) blade No. 1 to be positioned 45 degrees to right of helicopter centerline and the tail rotor blades parallel to tailboom (horizontal).



406010-543-5
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

INSTALL BLADE FOLDING RACK

19. Remove three screws (13) from each side of tailboom.

20. Install blade folding mounting brackets (14) on each side of tailboom.

WARNING

To avoid hand injury, care shall be exercised while handling blade folding rack.

CAUTION

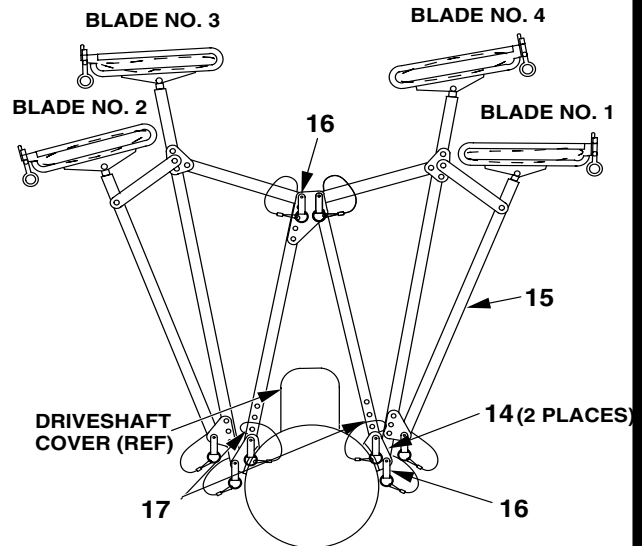
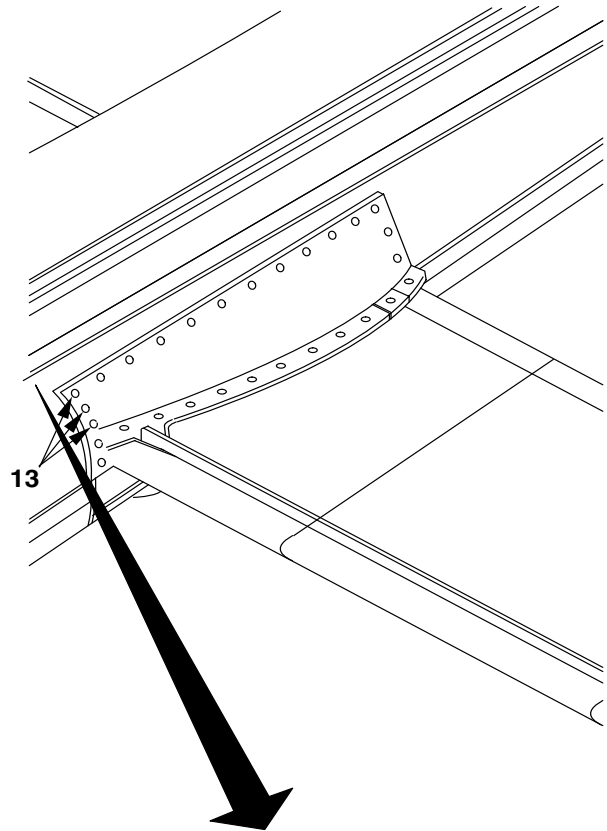
Blade folding rack shall not be allowed to contact or damage tailboom or horizontal stabilizer during installation.

NOTE

The left side of the blade folding rack is identified with black stencil lettering.

21. Install blade folding rack (15) on mounting brackets (14) using quick-disconnect pins (16).

22. Stow removed screws (13) in six rivnuts (17) on blade rack.



INSTALLATION OF
BLADE FOLDING RACK
VIEW LOOKING FORWARD

406010-543-6
J2779

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13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

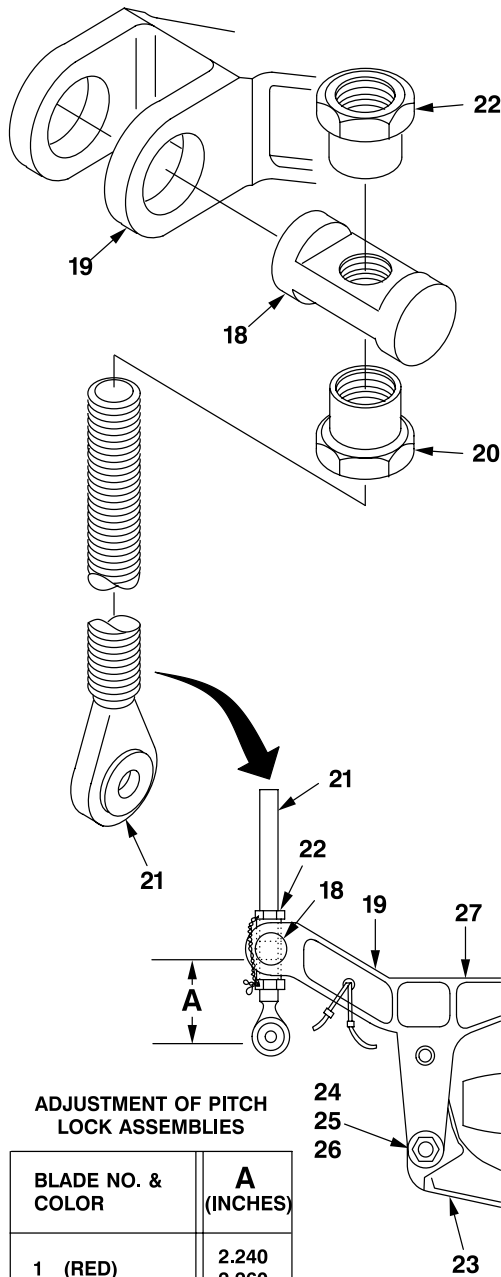
ADJUST PITCH LOCK ASSEMBLIES

23. Install pin (18) in scissor (19).
24. Screw nut (20) onto rod end assembly (21).
25. Insert rod end assembly (21) through pin (18).
26. Screw nut (22) onto rod end assembly (21).
27. Position scissor (23) onto scissor (19) and secure with bolt (24), washer (25), and nut (26). Tighten nut (26) to allow **0.010 to 0.020 inch** between bolt (24) and scissor (23).
28. Adjust pitch lock assemblies (p/o B94) (27) per color code to applicable blade.
29. After adjustment of pitch lock assemblies (p/o B94) (27), secure nuts (20 and 22) with lockwire (D132).

NOTE

If P/N T101828-105 blade rack assembly is being used, pitch lock assemblies shall be set at the following dimensions (in inches):

BLADE NO. & COLOR	A
1 (RED)	1.660 - 1.680
2 (ORANGE)	3.830 - 3.850
3 (BLUE)	3.990 - 4.010
4 (GREEN)	1.860 - 1.880



ADJUSTMENT OF PITCH LOCK ASSEMBLIES

BLADE NO. & COLOR	A (INCHES)
1 (RED)	2.240 2.260
2 (ORANGE)	3.690 3.710
3 (BLUE)	3.990 4.010
4 (GREEN)	2.420 2.440

406010-543-7
J2779

GO TO NEXT PAGE

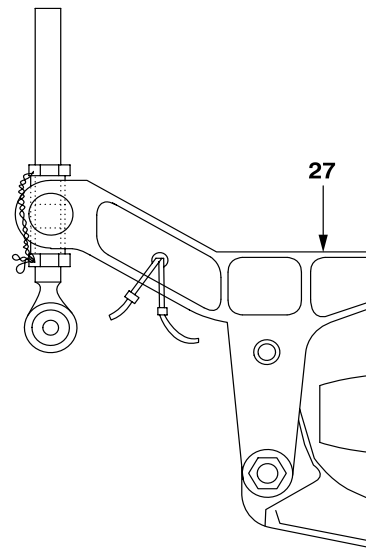
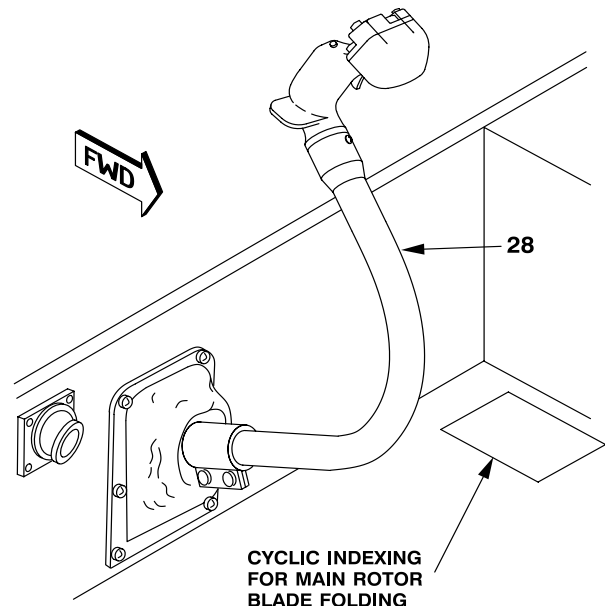
13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

FOLD MAIN ROTOR BLADES

CAUTION

- To prevent damage to the main rotor blades and yoke assembly during blade folding procedure, blades, in particular the orange blade, shall not come in contact with the main rotor yoke assembly.
- To prevent damage to the flight controls, unnecessary force shall not be applied to pilot cyclic or collective stick during blade folding procedure.
- To prevent damage to flight controls, CPG cyclic or collective stick shall not be used to make adjustments during blade folding operations.
- To prevent overloading swashplate arms during blade folding, pitch locks shall be engaged as specified.
- After rotors have been aligned and the blade folding rack is installed, the rotors should not be rotated from this position, since interference between blade and yoke will occur during folding of blades No. 1 and 2.

30. Place pilot cyclic control stick (28) as required to engage pitch lock assemblies (p/o B94) (27) to main rotor pitch change horn.



406010-543-8
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

CAUTION

To prevent damage to pitch links, pitch links shall not be adjusted while installing pitch lock assemblies (p/o B94). Pitch lock assembly color shall match color of corresponding blade.

NOTE

It may be necessary to move the cockpit controls (pilot cyclic and collective) slightly to connect the pitch lock assemblies (p/o B94).

31. Install pitch lock assemblies (p/o B94) (27) per applicable color between yoke support plates (29 and 30) and blade pitch horns (31) as follows:

a. Place scissor (19) in position on upper support plate (29) and connect rod end (21) to pitch horn (31).

NOTE

Slot allows freedom to install over pin in plate.

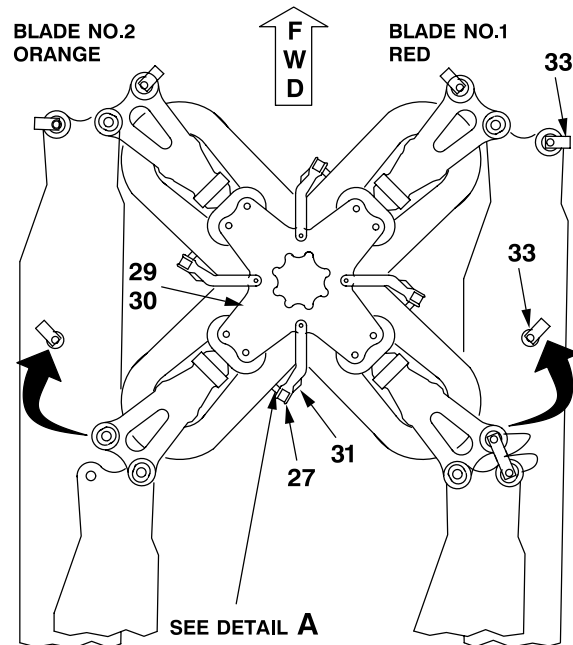
b. Place scissor (23) on lower support plate (30) and connect to scissor (19) using pip pin (32). Tighten nut (26) to allow **0.010 to 0.020 inch** between bolt (24) and scissor (23).

32. Remove expandable bolt (33) on blade No. 4.

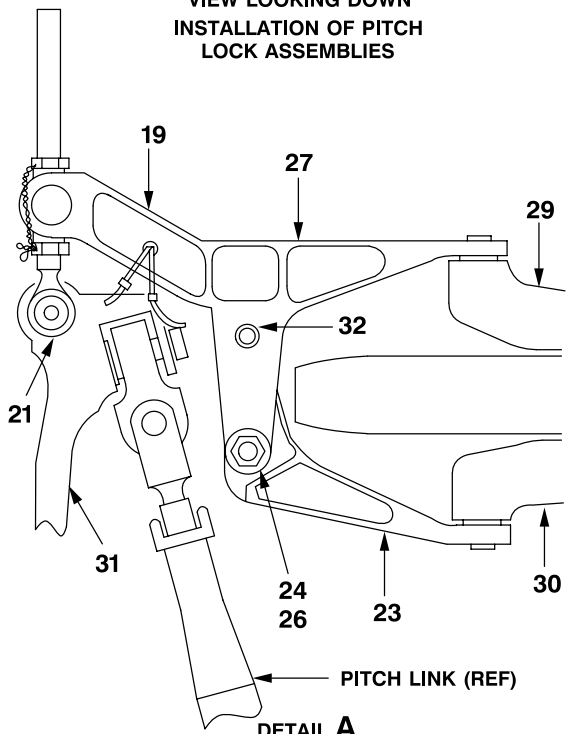
CAUTION

To prevent excessive loading of blade grips and pitch horns, blades shall not be allowed to fall below or rise above blade rack height during blade folding.

33. Using wand assembly, move blade aft. Stow and secure blade in uppermost rack on right side. Expandable bolt (33) that was removed will be stowed in blade hole of No. 1 blade.



SEE DETAIL A
VIEW LOOKING DOWN
INSTALLATION OF PITCH
LOCK ASSEMBLIES



DETAIL A
INSTALLATION OF PITCH
LOCK ASSEMBLIES

406010-543-9
J2779

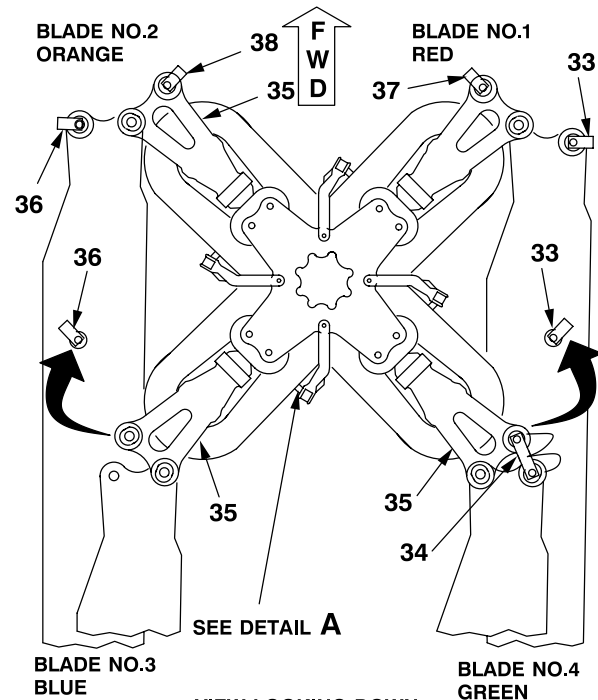
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13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

CAUTION

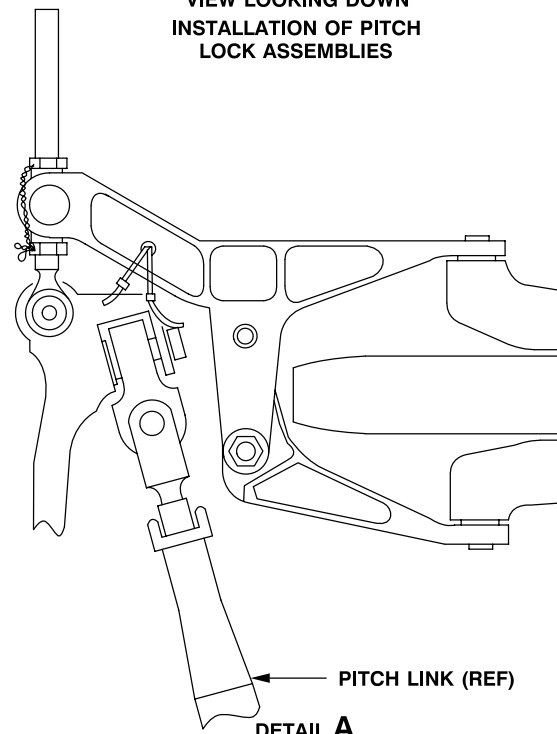
As each blade is positioned to the aft position and stowed in the blade rack, it should be secured in the rack. This will keep the rotor from rotating during folding of the remaining blades.

34. Install link (p/o B94) (34) connecting blade No. 4 to grip (35).
35. Remove expandable bolt (36) on blade No. 3.
36. Rotate blade aft, stow and secure in upper rack on left side. Expandable bolt (36) that was removed will be stowed in blade hole of blade No. 2.
37. Remove expandable bolt (37) on blade No. 1 and fold blade toward tail.
38. As blade is swung aft ensure blade No. 1 passes under and clears grip (35) on blade No. 4 (leading edge up). Stow and secure blade in lower rack on right side. Expandable bolt (37) that was removed will be stowed in grip hole of blade No. 1.
39. Fold blade No. 2 similar to blade No. 1.
40. As blade is swung aft ensure blade No. 2 passes under and clears grip (35) on blade No. 3 (leading edge down). Stow expandable bolt (38) in grip hole of blade No. 2.
41. Ensure all blades are secured to tailboom rack and main rotor blade expandable bolts (33, 36, 37, and 38) are secured in two forward blade holes and grips (35).



BLADE NO.3 BLUE BLADE NO.4 GREEN

VIEW LOOKING DOWN
INSTALLATION OF PITCH
LOCK ASSEMBLIES



DETAIL A
INSTALLATION OF PITCH
LOCK ASSEMBLIES

406010-543-10
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

FOLD VERTICAL FIN

WARNING

To prevent injury to personnel, fin shall be supported during stowing/unstowing operations.

CAUTION

- To prevent damage to blades and/or fin, main rotor blades shall not be rotated while fin is in stowed position.
- To prevent damage to antenna leads, antenna leads (ref) from fin connectors shall be disconnected prior to rotating fin to stowed position.

42. Disconnect antenna leads (ref) from fin connectors.

NOTE

Bolts (39) and washers (40) removed during stowing procedures should be retained to complete fin installation prior to flight.

43. Remove four bolts (39) with washers (40).

NOTE

Loosening pivot bolt (41) and travel stop bolt (42) is not required for fin rotation.

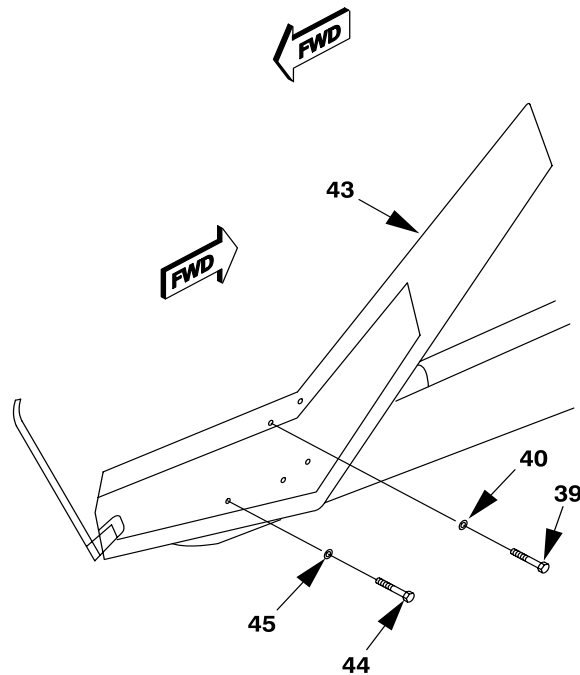
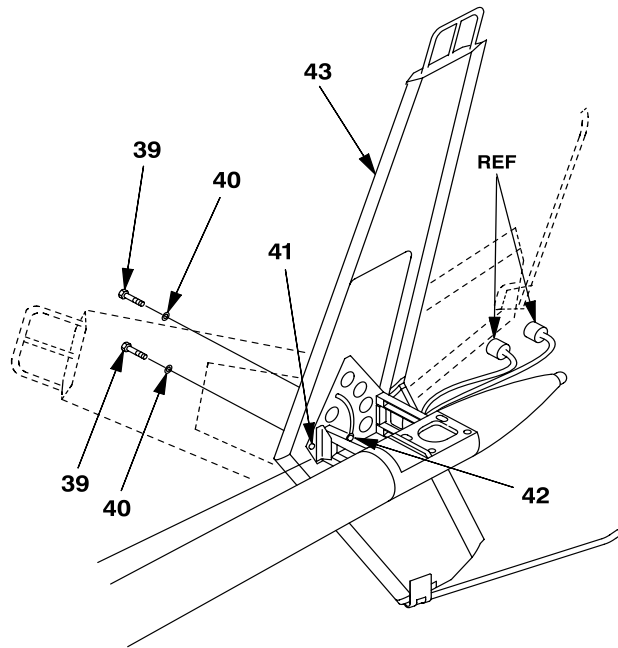
44. Rotate fin (43) forward to maximum position and align stowage hole in fin (43) with aft mount bolt hole.

NOTE

Bolt (44) (NAS6604-28) and washer (45) (140-007-17-17C3) used to secure fin in folded position are loose equipment items. If bolt (44) and washer (45) are not available, bolt (39) and washer (40) may be used.

45. Install bolts (39 and 44) with washers (40 and 45).

46. Use cushioning material (D91) secured with tape (D212) to pad potential contact points between main rotor blades and vertical fin (43).



406010-543-11
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

FOLD HORIZONTAL STABILIZER

47. Release pins (46 and 47) on lower side of fittings (48).

48. Remove pins (46 and 47) from fittings (48).

NOTE

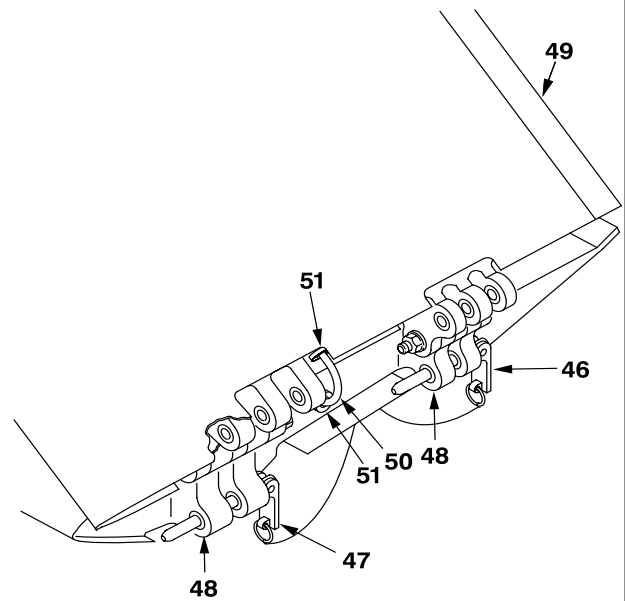
When raising outboard portion of stabilizer (49), observation shall be made for strain on electrical wire (50) passing through grommets (51) in stabilizer.

49. Raise outboard portion of stabilizer (49).

50. Repeat steps 47. through 49. for stabilizer on opposite side of tailboom.

51. Pad and secure outboard portions of stabilizer (49) in raised position.

52. Insert pins (46 and 47) in fittings (48) for storage.



406010-543-12
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

INSTALL CROSSTUBE SUPPORT STRAPS

CAUTION

Visually inspect landing gear tiedown fittings for damage or cracks before use.

NOTE

Crosstube support straps should be checked for serviceability prior to installation.

53. Attach aft crosstube support strap (52) as follows:

- a. Attach hook (53) end with locking gate (54) to tiedown fitting (55) on skid tube (56).
- b. Attach ratchet (57) end to tiedown fitting (55) on opposite skid tube (56).

CAUTION

To prevent damage to crosstube assembly, use of excessive force while tightening ratchet shall be avoided.

54. Tighten ratchet (57) until crosstube support strap (52) is tight.

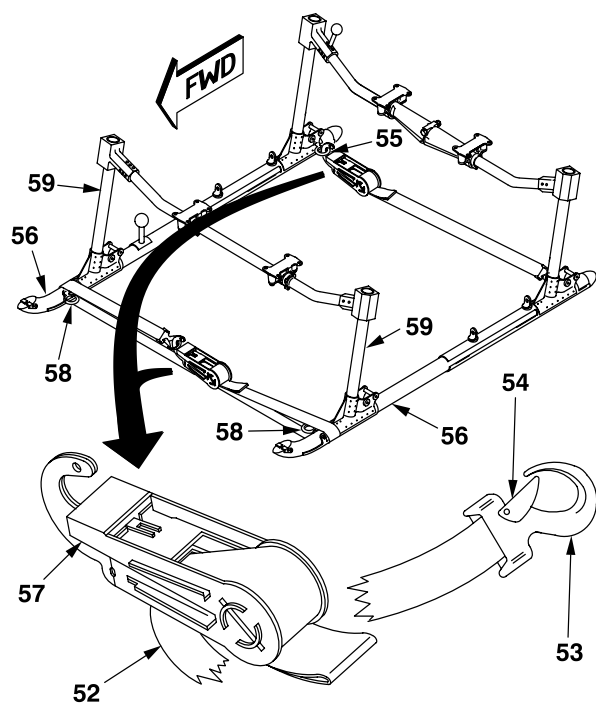
55. Install forward crosstube support strap (52) around skid tubes (56) between tow fittings (58) and legs (59) with ratchet (57) end on top.

56. Attach hook (53) end with locking gate (54) of forward crosstube support strap (52) to ratchet (57) of forward crosstube support strap.

CAUTION

To prevent damage to crosstube assembly, use of excessive force while tightening ratchet shall be avoided.

57. Tighten ratchet (57) until crosstube support strap (52) is tight.



406010-543-13
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

FOLD UNIVERSAL WEAPONS PYLON (UWP)
ASSEMBLY**CAUTION**

To avoid damage to ammunition chute and gun pod umbilical cable connector bracket, disconnect both prior to folding weapons pylon if gun is installed.

NOTE

Boresighting of UWP, gun pod, missile, and rocket launchers is not required when UWP is folded and unfolded.

58. Disconnect armament cable connector (60) from weapons store and secure cable with tape (D212).

59. Disconnect jettison cable connector (61) from ejector rack disconnect and secure cable with tape (D212).

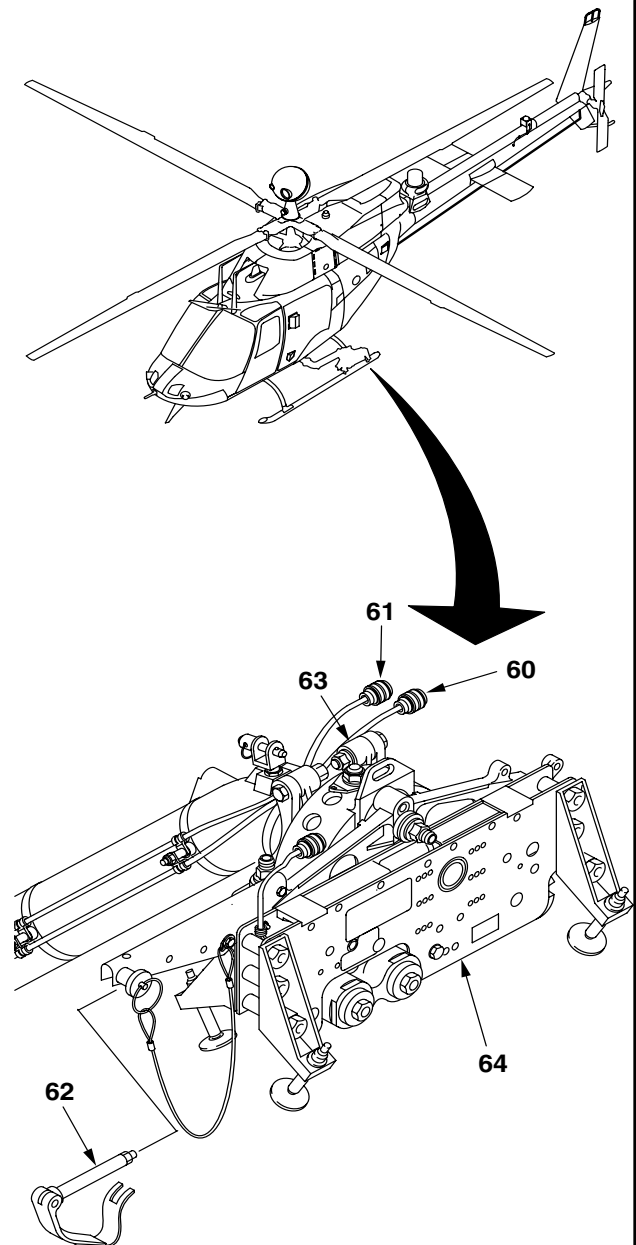
60. Remove expandable bolt (62) from hinge assembly (63).

61. Lift, rotate, and hold stores/ejector rack assembly (64) up and outboard until tangs on stores/ejector rack assembly clear expandable bolt hole in pylon assembly.

62. Reinstall expandable bolt (62) in pylon assembly.

63. Place a piece of **0.50 inch** thick plywood between pylon assembly and tangs of stores/ejector rack assembly (64) and lower stores/ejector rack assembly to rest on plywood.

64. Repeat steps 58. through 63. for opposite UWP.

INSPECT

406010-543-14
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

LOWER HELICOPTER

CAUTION

To prevent damage to searchlight, it shall be in stowed position prior to lowering helicopter.

65. Position one person at each jack. Position jacks (65) onto rear pins (66) on skid tube saddles (67). Turn jacks (65) one-quarter turn to position upper latch pins (68) in line with brackets (69) on knuckle assemblies (70). This latches jacks (65) to skid tubes.

66. Turn jack handles (71) to align upper latch pins (68) with holes in brackets (69).

67. Retract upper latch pins (68) and position jacks (65) onto brackets (69). Release latch pins (68). Verify that latch pins (68) have fully extended and are through holes in brackets (69).

CAUTION

To prevent jamming knuckle assemblies against caps, jack handles should not be turned more than one turn counterclockwise.

68. With one person at each jack, turn each jack handle (71) approximately one turn counterclockwise to release pressure on locks (72) on knuckle assemblies (70).

CAUTION

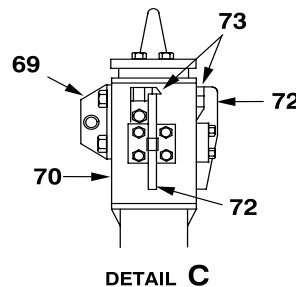
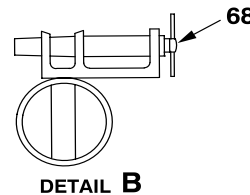
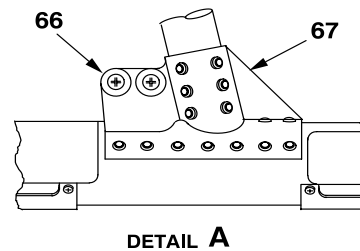
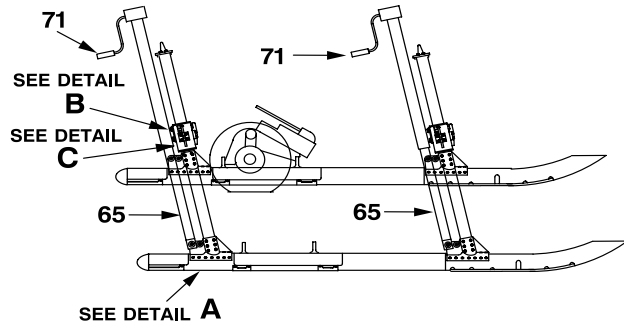
To prevent knuckle assemblies from binding and damaging landing gear legs, all four jacks shall be lowered at the same time and rate.

NOTE

Approximately 90 percent of weight of helicopter will be on the aft jacks. Handles of aft jacks will be easier to turn than handles on forward jacks.

69. Open hooks (73), depress top of locks (72), and turn jack handles (71) approximately one turn clockwise to lower knuckle assemblies (70) past locking point.

70. Turn forward jack handles (71) two or three turns clockwise to even out loads on jacks.



406010-543-15
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

NOTE

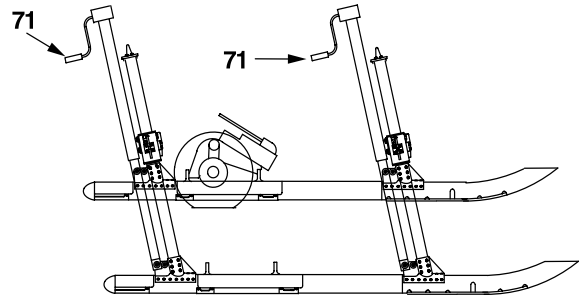
Ground handling wheels jack handle shall be held in up position while lowering helicopter.

71. Place a piece of **0.250 inch** thick plywood under each rear crosstube support.

NOTE

Due to jack and skid tube leg assembly interference, access to the cockpit will be restricted once helicopter is kneeled.

72. Position one person in front of helicopter to observe that helicopter is lowered evenly. Turn jack handles (71) clockwise until all weight is removed from jacks.

INSPECT

406010-543-16
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

INSTALL MMS HOIST ASSEMBLY

WARNING

- This task requires a minimum of three people to prevent injury to personnel.
- Helicopter shall remain in kneeled position during all steps to prevent injury to personnel.
- Ensure lower end of hoist assembly locks securely in place on ball to prevent injury personnel.
- Ensure clearance between MMS hoist and rotor blades during installation to prevent injury to personnel.

NOTE

Hoist assembly support ball and support arm attach fittings are located on pilot (right) side of helicopter.

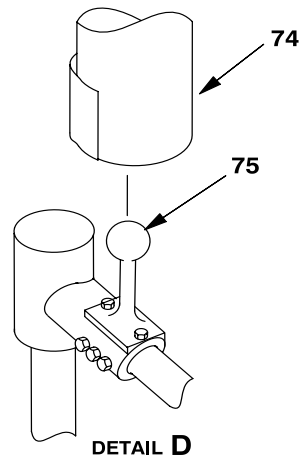
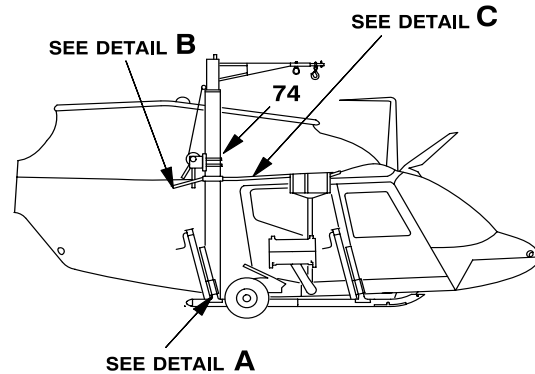
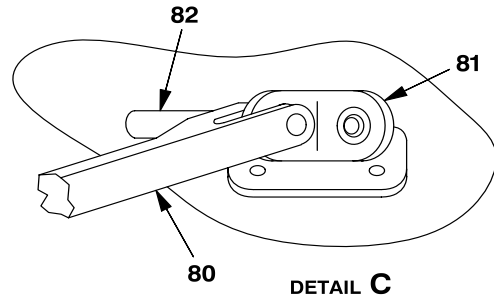
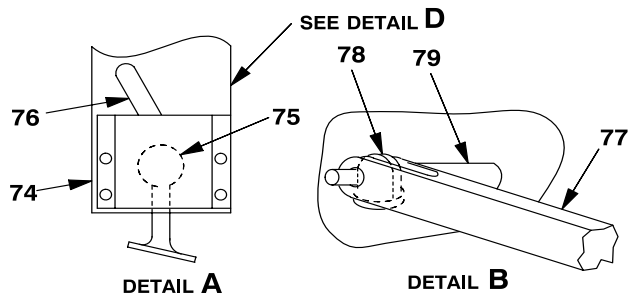
73. Position lower end of hoist assembly (74) onto ball (75) with hoist boom pointing forward parallel with skid.

74. Ensure that hoist assembly (74) is locked on ball (75) by rotating handle (76) and that hoist assembly will not move up or down.

75. Align arm assembly (77) with aft attach eyebolt (78) and secure in place with pin (79).

76. Align arm assembly (80) with forward attach eyebolt (81) and secure in place with pin (82).

INSPECT



406010-543-17
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

INSTALL MMS PLATFORM ASSEMBLY

WARNING

- Helicopter shall remain in kneeled position while accomplishing all steps to prevent injury to personnel.
- Ensure lower end of platform assembly locks securely in place on ball to prevent injury to personnel.

NOTE

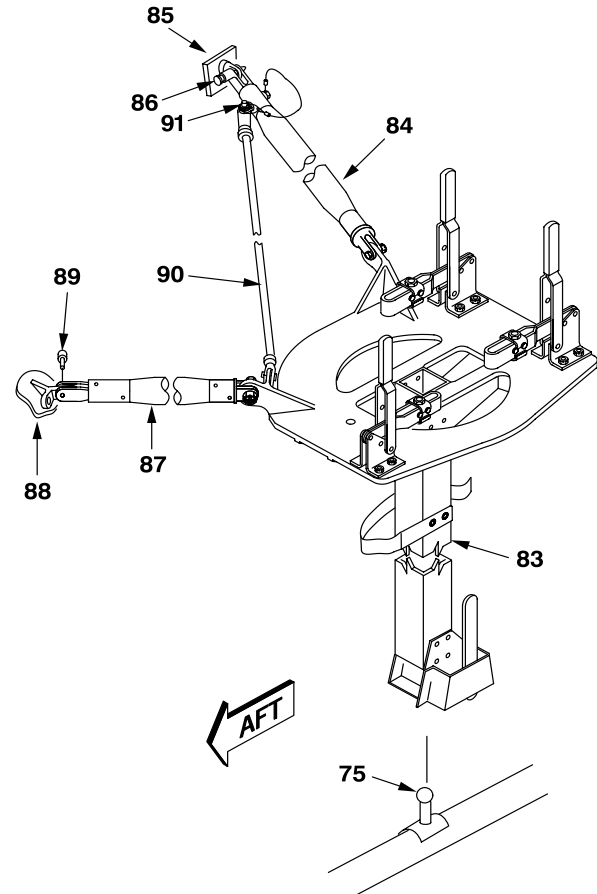
- MMS platform assembly installation is located on pilot (right) side of helicopter only.
- During installation it is possible to trap rod in a position in which it cannot be hooked up. Keep rod in proper position during installation.

77. Position lower end of MMS platform assembly (83) onto ball (75). Ensure spring-loaded lock snaps into place.

78. Align forward support arm assembly (84) with fuselage mounted eyebolt (85) and secure in place with pin (86). Ensure pin (86) is on aft side of bracket.

79. Align aft support arm assembly (87) with forward portion of fuselage fitting (88) and secure in place with pin (89). Ensure pin (89) is on forward side of bracket.

80. Position clevis of rod (90) onto forward support arm assembly (84). Adjust clevis as required to install pin (91).



406010-543-18
J2779

INSPECT

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

REMOVE MMS ASSEMBLY

WARNING

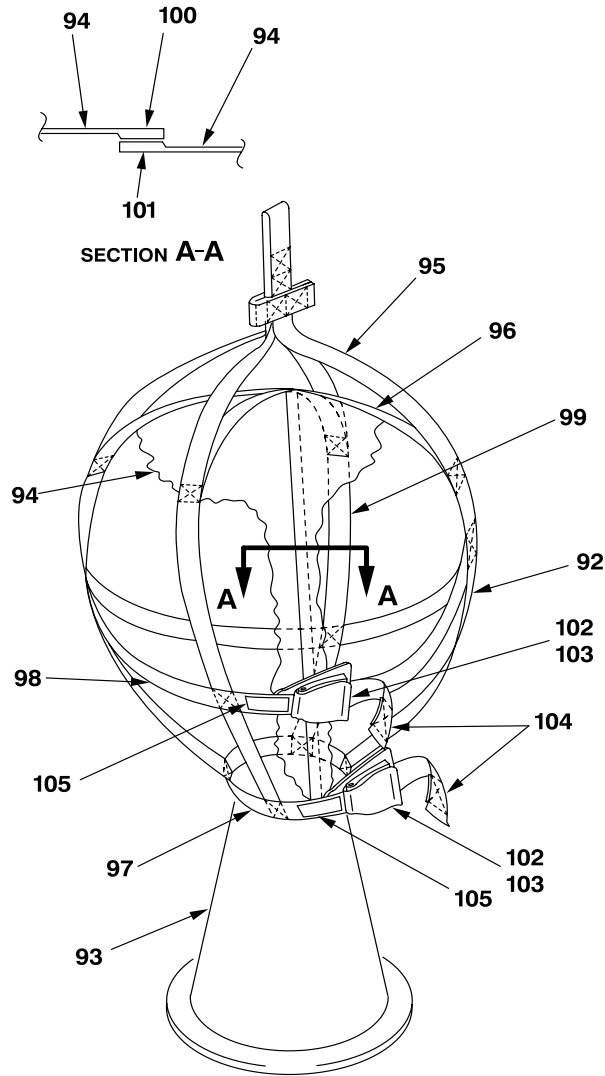
Helicopter shall remain in kneeled position while accomplishing all steps to prevent injury to personnel.

CAUTION

- Helicopter shall remain in kneeled position while accomplishing all steps to prevent damage to equipment.
- Stencil “THIS STRAP MUST BE INSTALLED BETWEEN THE EYES OF SIGHT” must be installed between the eyes of the MMS assembly.

81. Install MMS sling assembly (eye sling) (92) on MMS assembly (93) as follows:

- a. Slide MMS sling assembly (92) over MMS assembly (93).
- b. Ensure MMS cover (94), straps (95 and 96), and strap assemblies (97 and 98) are not damaged or twisted.
- c. Ensure that stencil (99) is installed in the proper position.
- d. Secure fastener-hook (100) to fastener-pile (101) for the full length of the fastener.
- e. Insert connector (102) into buckle (103) on strap assemblies (97 and 98) and tighten straps until snug.
- f. Fold ends of strap assemblies (97 and 98) and secure fastener-piles (104) to fastener-hooks (105).



406010-543-19
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

82. Attach MMS sling assembly (92) to MMS hoist assembly (74) as follows:

- a. Extend MMS hoist assembly (74) to MMS sling assembly (92) level.
- b. Verify that swivel hook (106) on boom (107) is centered over top of MMS sling assembly (92).
- c. Position eye (108) of MMS sling assembly (92) on swivel hook (106).

WARNING

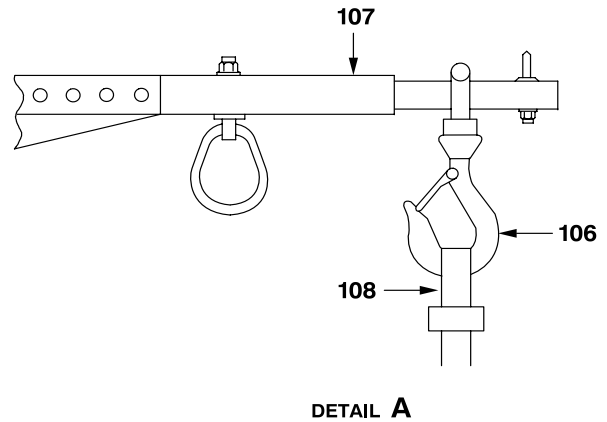
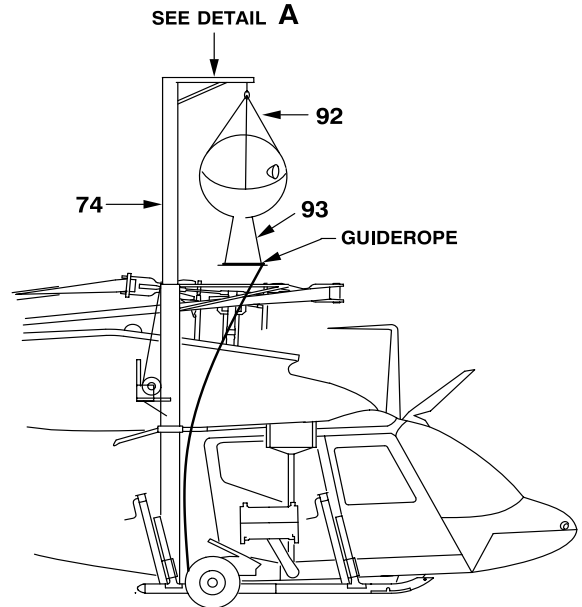
Use of a guiderope is essential to prevention of injury or damage to equipment.

- d. Attach guiderope to MMS assembly (93).

CAUTION

To prevent damage to equipment, do not extend hoist past external stops.

- e. Extend MMS hoist assembly (74) until MMS sling assembly (92) is snug.



406010-543-20
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

83. Remove 12 mounting bolts (109) and washers (110).

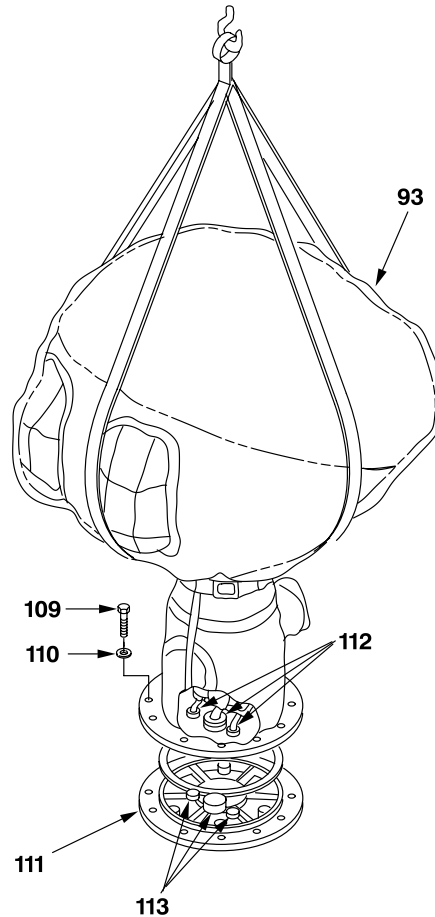
CAUTION

Lifting the MMS assembly higher than **7 inches** above torquemeter support may damage interface electrical connectors.

84. Slowly raise MMS assembly (93) about **5 inches** above torquemeter support (111) and disconnect three electrical connectors (112) from electrical connectors (113) on torquemeter support by rotating connectors (112) counterclockwise.

85. Install protective caps on three torquemeter support electrical connectors (113).

86. Install sight support cover on torquemeter support (111).



406010-543-21
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

87. Mount MMS assembly (93) on MMS platform assembly (83) as follows:

- a. Remove three lock pins (114) and open three toggle clamps (115).
- b. Rotate boom (107) on MMS hoist assembly (74) and align MMS assembly (93) with MMS platform assembly (83).

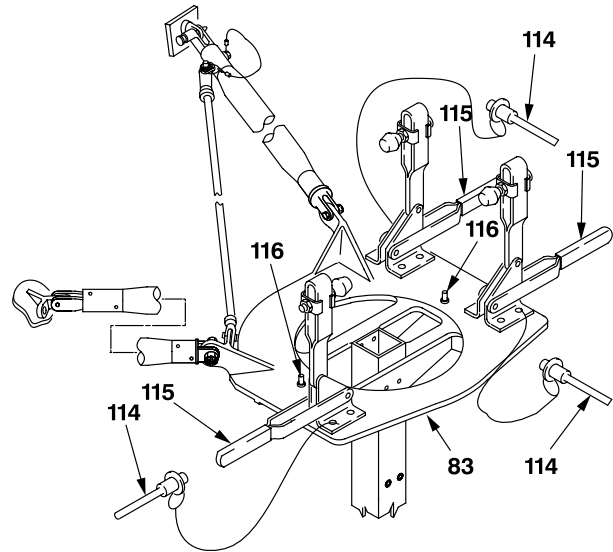
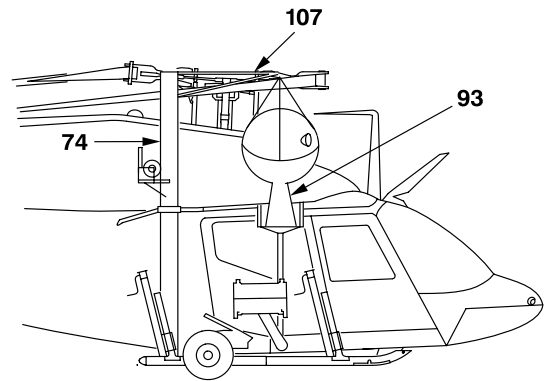
WARNING

To prevent injury to personnel, ensure brake on hoist is engaged prior to releasing latch on winch.

CAUTION

- To prevent damage to equipment, ensure brake on hoist is engaged prior to releasing latch on winch.
- Ensure electrical plugs on MMS assembly are not positioned between base of MMS assembly and MMS platform assembly.
- Ensure fan shroud is at nine o'clock position.

c. With MMS hoist assembly (74), lower MMS assembly (93) to MMS platform assembly (83), aligning MMS assembly alignment holes with two alignment pins (116) on MMS platform assembly (83).



406010-543-22
J2779

GO TO NEXT PAGE

13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

d. If first time use of MMS platform assembly (83), adjust toggle clamps (115) as follows:

(1) Loosen three top pad/bolt nuts (117) on toggle clamps (115) and slide pad/bolt (118) to outboard end of slot in toggle clamp (115).

(2) Lock handles on toggle clamps (115) to engage pad/bolt (118) to MMS assembly (93) ring.

(3) Adjust lower pad/bolt nut (119) until pad compresses firmly on MMS assembly (93) ring.

(4) Tighten top pad/bolt nut (117) to lock pad/bolt (118) in place.

e. Close three toggle (115) to secure MMS assembly (93) to MMS platform assembly (83).

f. Install three lock pins (114) in toggle clamps (115).

g. Secure MMS cables (120) to base of MMS platform assembly (83) with strap (121).

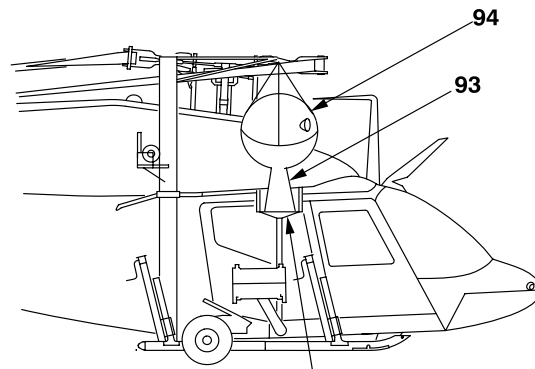
NOTE

MMS sling assembly will remain attached to MMS hoist assembly during rapid deployment transportation.

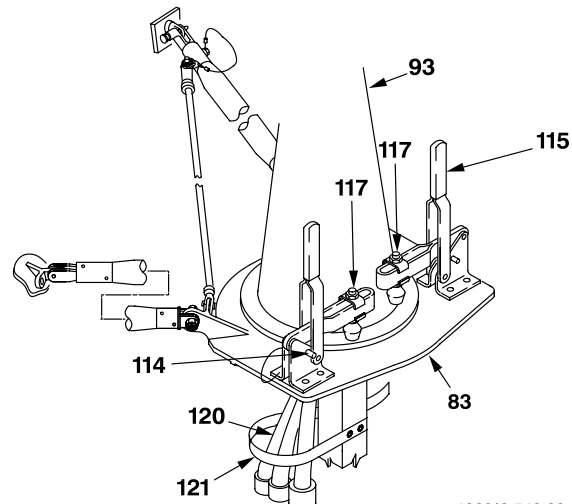
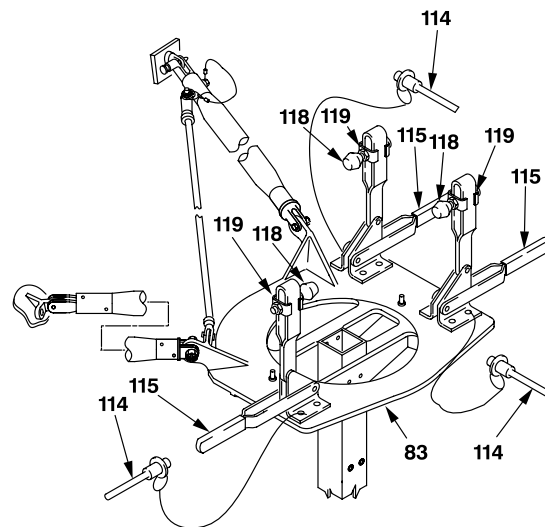
h. Place MMS attaching hardware in plastic bag (D153) and secure under MMS cover (94).

i. Secure MMS cover (94) to MMS assembly (93) with tape (D212).

INSPECT



SEE DETAIL B



DETAIL B

406010-543-23
J2779

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13-2-9. CONFIGURE HELICOPTER FOR RAPID DEPLOYMENT (CONT)

88. Remove latch pin (122) from clevis fitting (123).

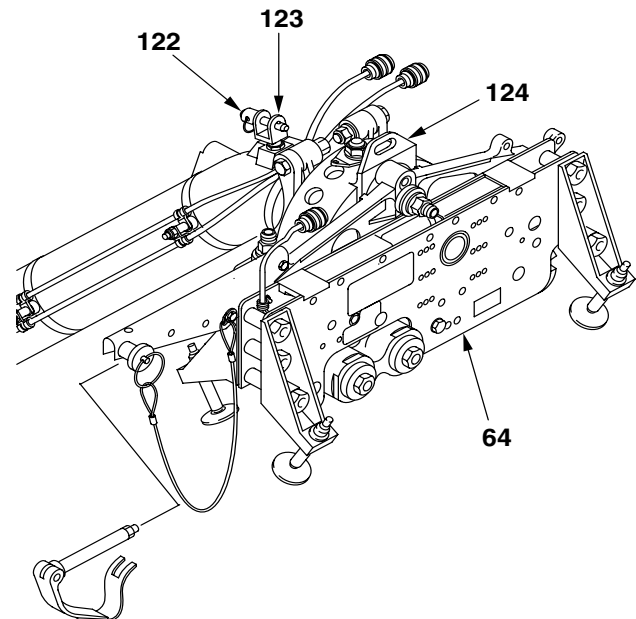
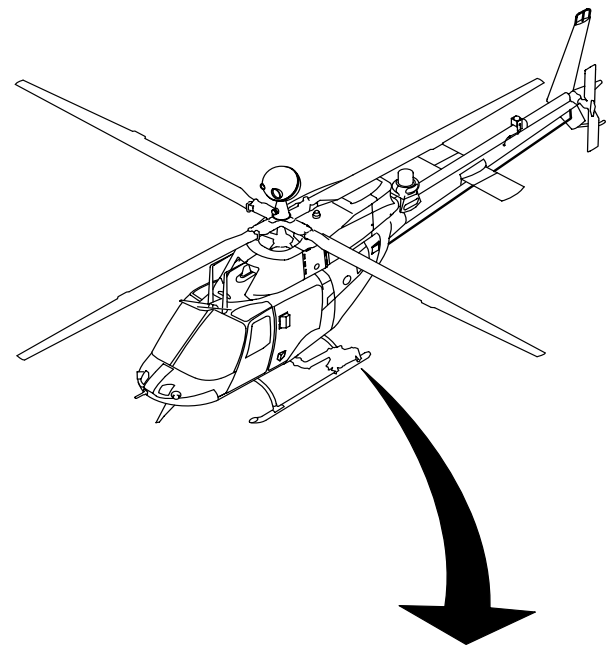
NOTE

Right UWP clevis fitting may have to be adjusted for adequate clearance between weapons/weapon racks and MMS hoist/platform assemblies.

89. Remove plywood from between pylon assembly and tangs of stores/ejector rack assembly (64) and rotate stores/ejector rack assembly up and inboard until support assembly (124) tang rests in clevis fitting (123).

90. Secure support assembly (124) tang in clevis fitting (123) with latch pin (122).

91. Repeat steps 88. through 90. for opposite UWP.



406010-543-24
J2779

END OF TASK

13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT

This task covers: Configuring Helicopter for Flight After Rapid Deployment

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B237)
Torque Wrench (B239)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer (4)

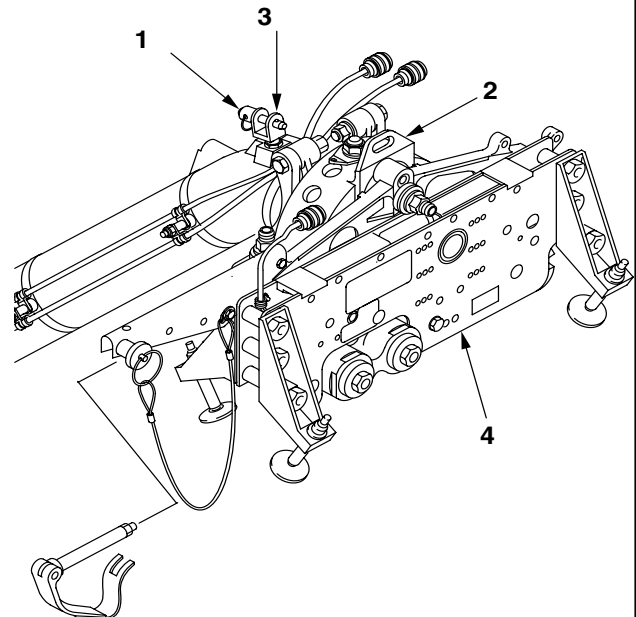
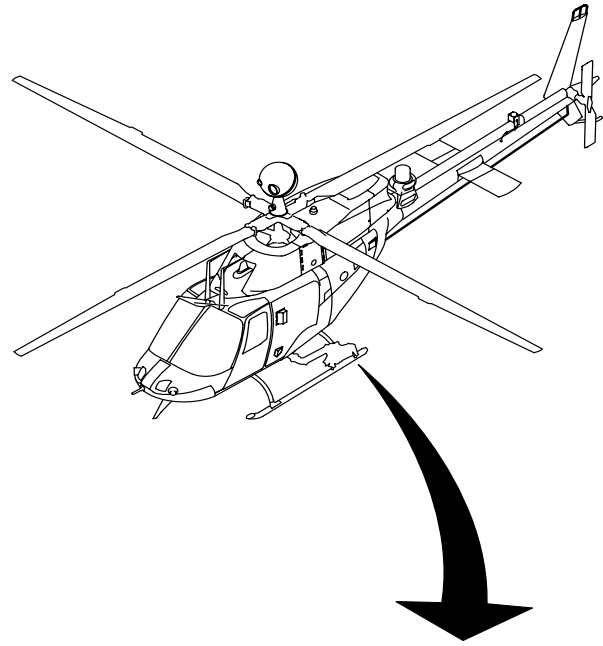
Equipment Condition:
Electrical Power Removed (Tasks 1-6-5 and 1-6-6)
Helicopter Configured For Rapid Deployment (Task 13-2-9)

GO TO NEXT PAGE

13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT (CONT)

PREPARE UNIVERSAL WEAPONS PYLON (UWP) ASSEMBLY TO UNFOLD

1. Remove latch pin (1) securing support assembly (2) tang in clevis fitting (3).
2. Position piece of **0.50 inch** plywood between pylon assembly and tangs of stores/ejector rack assembly (4).
3. Rotate stores/ejector rack assembly (4) down and outboard until tangs of stores/ejector rack assembly rest on plywood.
4. Install latch pin (1) in clevis fitting (3).
5. Repeat steps 1. through 4. for opposite UWP.

406070-55-1
J2785

GO TO NEXT PAGE

13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT (CONT)

INSTALL MMS ASSEMBLY

6. Remove MMS assembly hardware from MMS cover (5).

CAUTION

To prevent damage to equipment, ensure cables are clear of platform while raising MMS assembly from platform.

7. Remove three lock pins (6) in toggle clamps (7). Open toggle clamps.

WARNING

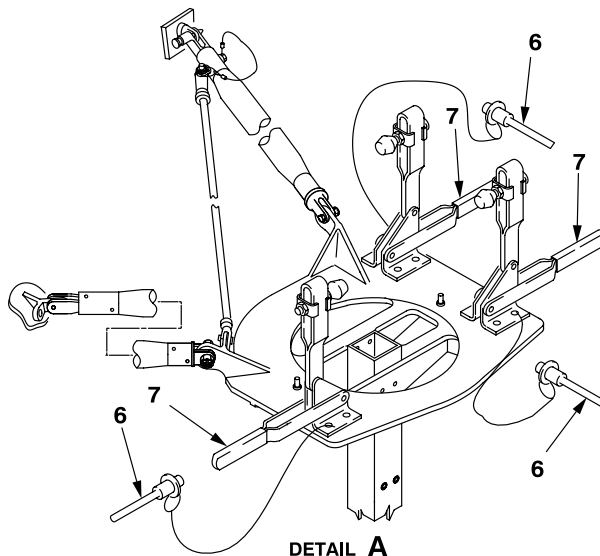
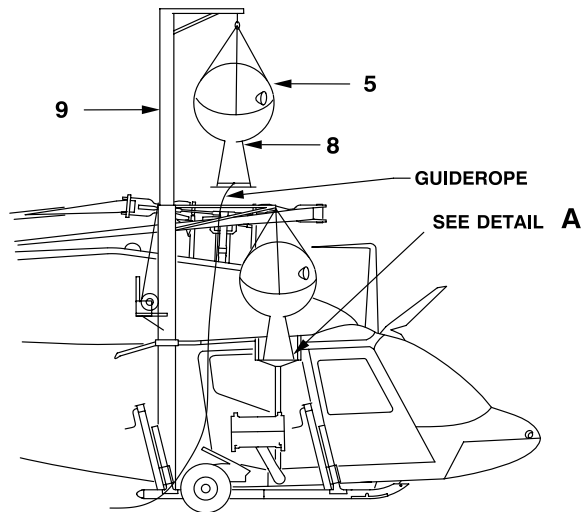
Use of a guiderope is essential to prevention of injury or damage to equipment.

CAUTION

To prevent damage to equipment, do not extend hoist past external stops.

8. Attach guiderope to MMS assembly (8).

9. Raise MMS assembly (8) with MMS hoist assembly (9) to position above main rotor leaving sufficient clearance to connect electrical connectors.



406070-55-2
J2785

GO TO NEXT PAGE

13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT (CONT)

10. Rotate boom (10) on MMS hoist assembly (9) to align MMS assembly (8) over torquemeter support assembly (11).

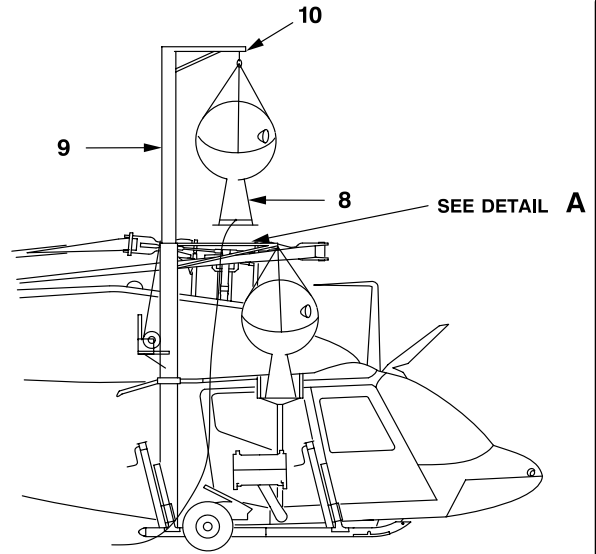
WARNING

When MMS assembly is being lowered, keep hands out of way or bodily injury could result.

11. Slowly lower MMS assembly (8) until it is about **5 inches** above torquemeter support assembly (11).

12. Remove sight support cover from torquemeter support assembly (11).

13. Remove protective caps from three torquemeter support assembly electrical connectors (12).



CAUTION

Connectors may be damaged if they are not properly aligned.

14. Connect three electrical connectors (13) to torquemeter support assembly electrical connectors (12) by aligning receptacle index grooves with plug indicators and polarizing stripes and rotating plug locking rings clockwise.

INSPECT

NOTE

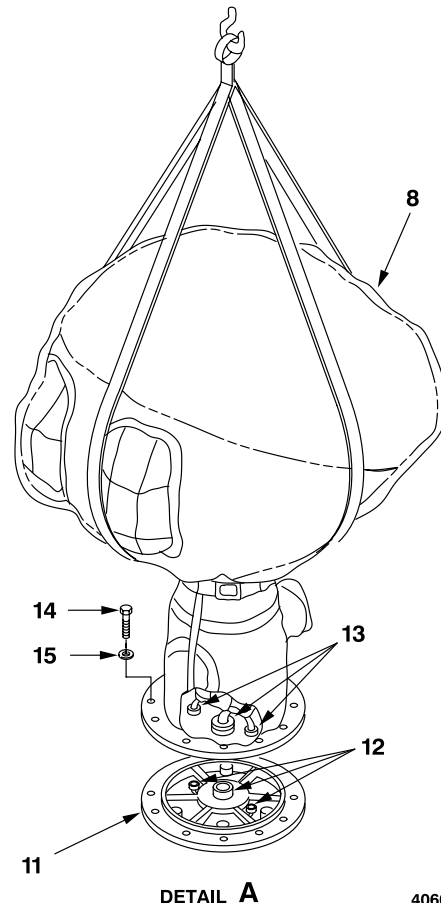
TCU inlet air fan assembly faces the nose of the helicopter when MMS is properly installed.

15. Lower MMS assembly (8) onto torquemeter support assembly (11) and align mating pins and mounting hardware holes.

16. Secure MMS assembly (8) onto torquemeter support assembly (11) with 12 mounting bolts (14) and washers (15).

17. Torque bolts (14) **120 TO 140 INCH-POUNDS**.

INSPECT



406070-55-3
J2785

GO TO NEXT PAGE

13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT (CONT)

18. Remove sling assembly eye (16) from swivel hook (17).

19. Remove MMS sling assembly (eye sling) (18) from MMS assembly (8) as follows:

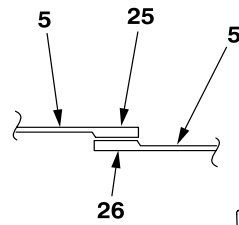
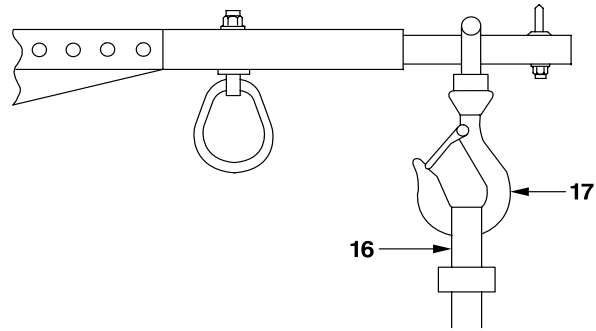
a. Remove ends of straps (19 and 20) from fastener-piles (21) and fastener-hooks (22).

b. Disconnect connectors (23) from buckles (24).

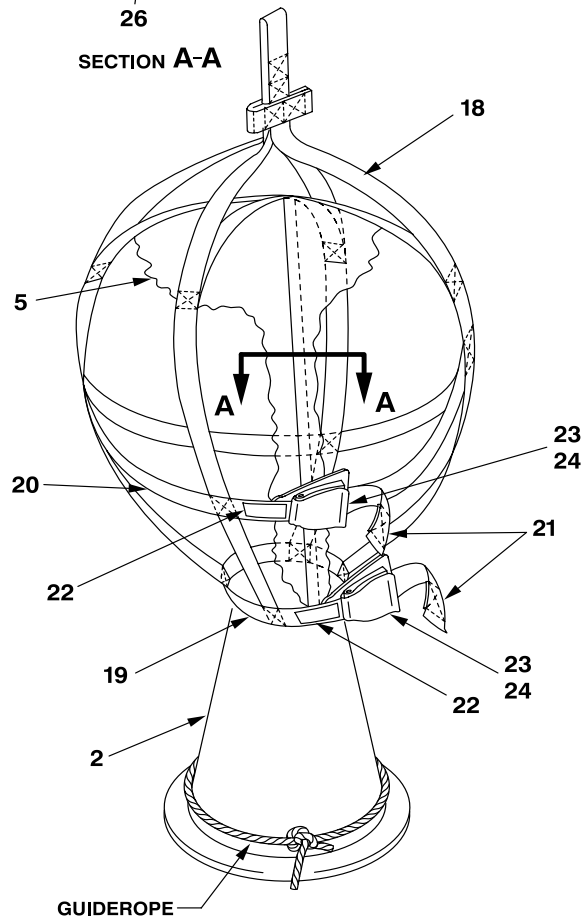
c. On MMS cover (5), disconnect fastener-hook (25) from fastener-pile (26) for the full length of the fastener.

d. Remove MMS sling assembly (18) from MMS assembly (8).

20. Remove guiderope.



SECTION A-A



406070-55-4
J2785

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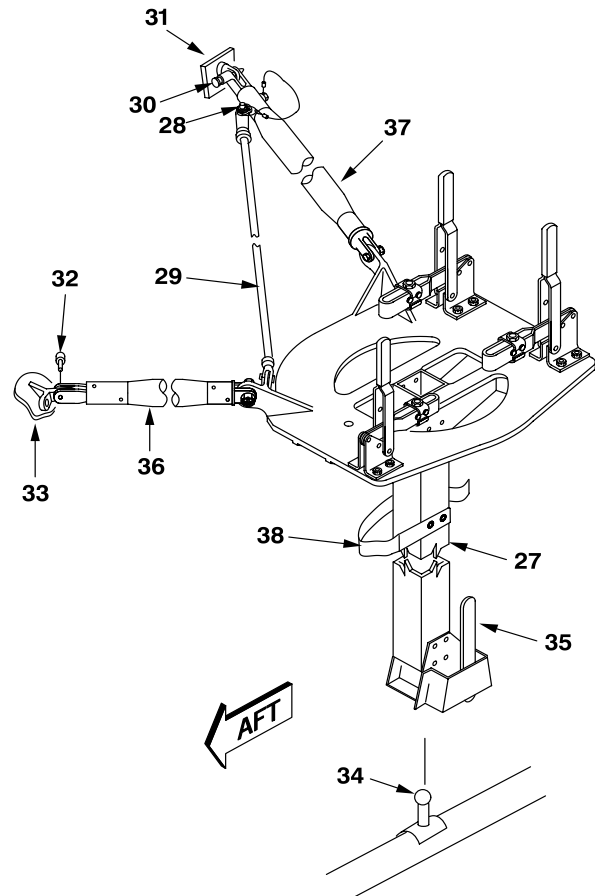
13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT (CONT)

REMOVE MMS PLATFORM ASSEMBLY

WARNING

To prevent injury to personnel, platform assembly shall be supported during removal.

21. Support platform assembly (27).
22. Remove pin (28) and leave rod (29) attached at other end.
23. Remove pin (30) from fuselage mounted eyebolt (31) and pin (32) from fuselage fitting (33).
24. Release platform assembly (27) from ball (34) by rotating handle (35).
25. Remove platform assembly (27).
26. Secure rod (29) and arm assemblies (36 and 37) to platform assembly (27) with strap (38).



406070-55-5
J2785

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13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT (CONT)

REMOVE MMS HOIST ASSEMBLY

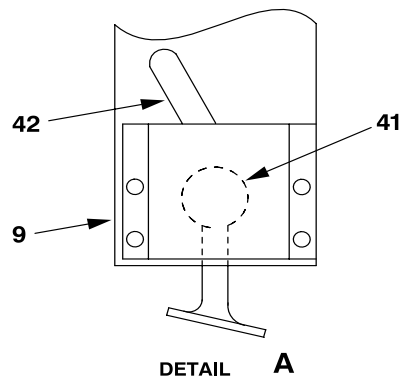
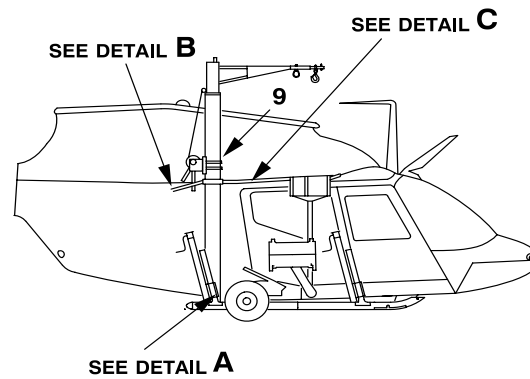
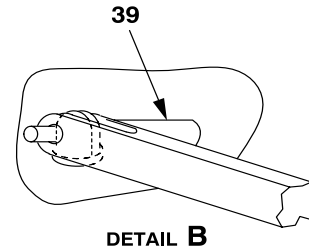
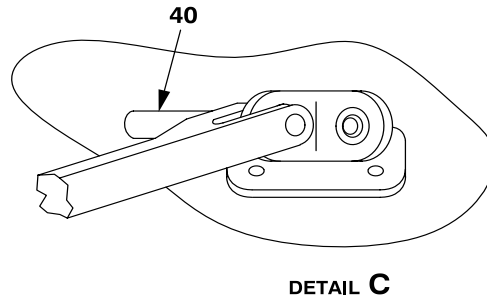
WARNING

- To prevent injury to personnel, hoist assembly shall be supported during removal.
- To prevent injury to personnel, ensure clearance between MMS hoist and rotor blades during removal.

27. Support MMS hoist assembly (9) and release pins (39 and 40).

28. Release MMS hoist assembly (9) from ball (41) by rotating handle (42).

29. Remove MMS hoist assembly (9).



406070-55-6
J2785

GO TO NEXT PAGE

13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT (CONT)

RAISE HELICOPTER

CAUTION

To prevent knuckle assemblies from binding and damaging landing gear legs, all four jacks shall be raised at the same time and rate.

NOTE

Approximately 90 percent of weight of helicopter will be on the aft jacks. Handles of aft jacks will be harder to turn than handles on forward jacks.

30. Position one person at each jack (43). Position one person in front of helicopter to observe that helicopter is raised evenly.

31. Turn aft jack handles (44) two or three turns counterclockwise to even out loads on jacks (43).

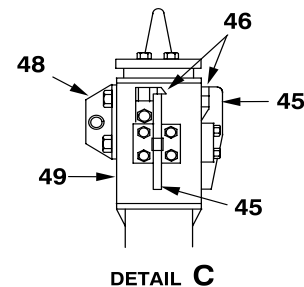
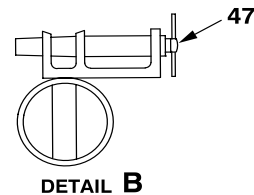
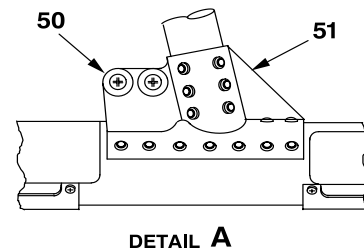
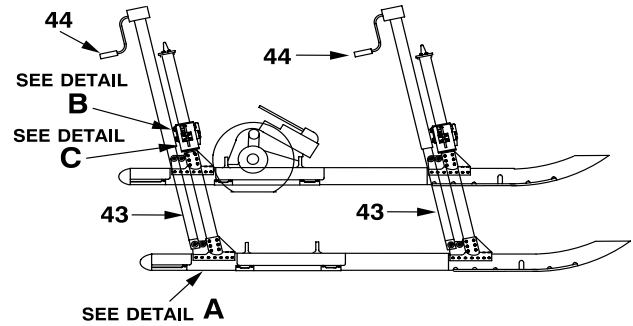
32. Turn jack handles (44) counterclockwise until locks (45) click into place. Verify that hooks (46) are closed.

33. Turn jack handles (44) clockwise until latch pin (47) can be retracted from brackets (48) on knuckle assemblies (49).

34. Rotate jacks (43) one-quarter turn to release pin (50) on skid saddle (51).

35. Remove jacks (43).

INSPECT



406070-55-7
J2785

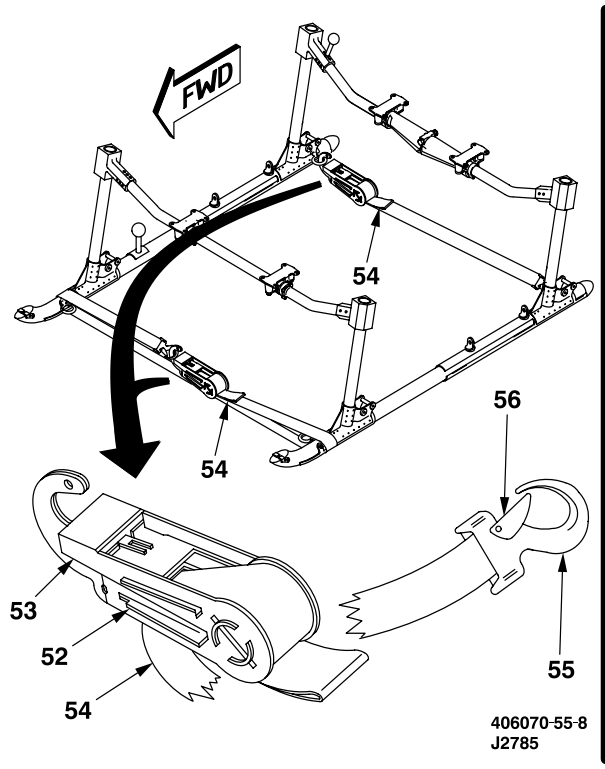
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13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT (CONT)

REMOVE AFT CROSSTUBE SUPPORT STRAPS

36. Release catches (52) of ratchet (53) end of crosstube support straps (54) and operate ratchets until enough slack exists to free hooks (55).

37. Release locking gates (56) of hook (55) end of crosstube support straps (54) from ratchet (53) end of crosstube support straps and remove crosstube support straps.



GO TO NEXT PAGE

13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT (CONT)

UNFOLD UNIVERSAL WEAPONS PYLON (UWP) ASSEMBLY

38. Remove expandable bolt (57) from pylon assembly.

39. Remove plywood from between pylon assembly and tangs of stores/ejector rack assembly (4) and rotate stores/ejector rack assembly down and inboard.

NOTE

Head of expandable bolt shall face forward.

40. Secure stores/ejector rack assembly (4) in launch position by installing expandable bolt (57) through tangs of stores/ejector rack assembly and pylon assembly.

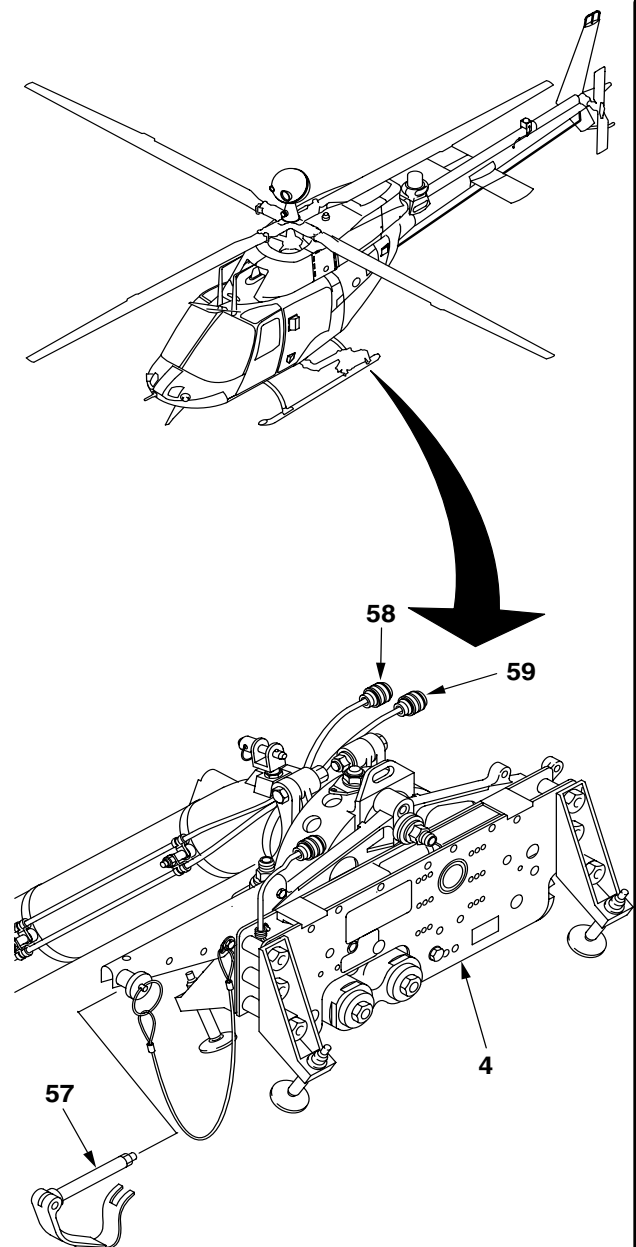
41. Remove tape from jettison cable (58) and connect jettison cable connector to ejector rack.

42. Remove tape from armament cable (59) and connect armament cable to weapons store.

NOTE

Boresighting of UWP, gun pod, missile, and rocket launchers is not required when UWP is folded and unfolded.

43. Repeat steps 38. through 42. for opposite UWP.

INSPECT

406070-55-9
J2785

GO TO NEXT PAGE

13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT (CONT)

UNFOLD HORIZONTAL STABILIZER

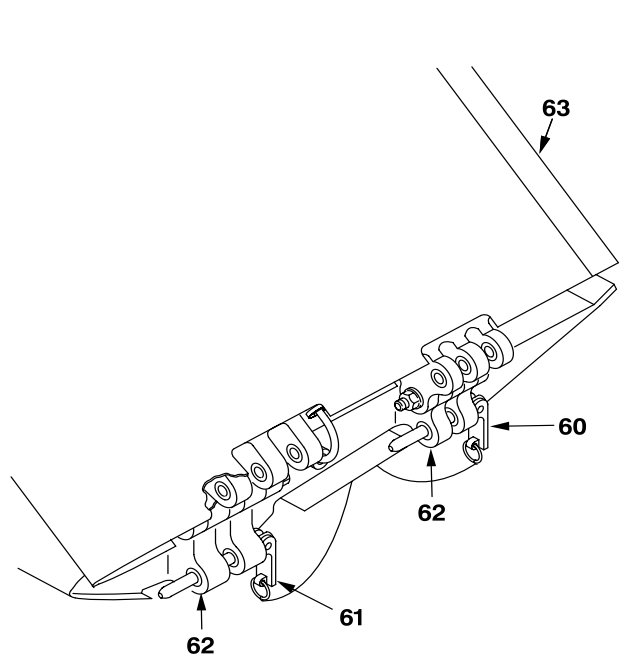
44. Remove expandable pins (60 and 61) from fittings (62) in horizontal stabilizer (63).

45. Unsecure and remove padding from outboard portions of horizontal stabilizer (63).

46. Align pin holes in fittings (62) and insert pins (60 and 61).

47. Close latch on pins (60 and 61) to secure in place.

INSPECT



406070-55-10
J2785

GO TO NEXT PAGE

13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT (CONT)

UNFOLD VERTICAL FIN

48. Remove padding between vertical fin (64) and folded main rotor blades.

49. Remove bolt (65) with washer (66).

50. Remove bolt (67) with washer (68) from stowed vertical fin (64).

NOTE

Loosening pivot bolt (69) and travel stop bolt (70) is not required for vertical fin (64) rotation.

51. Rotate vertical fin (64) to aft maximum position.

NOTE

Bolts (67) and washers (68) that were retained during stowing procedures are required to complete fin installation prior to flight.

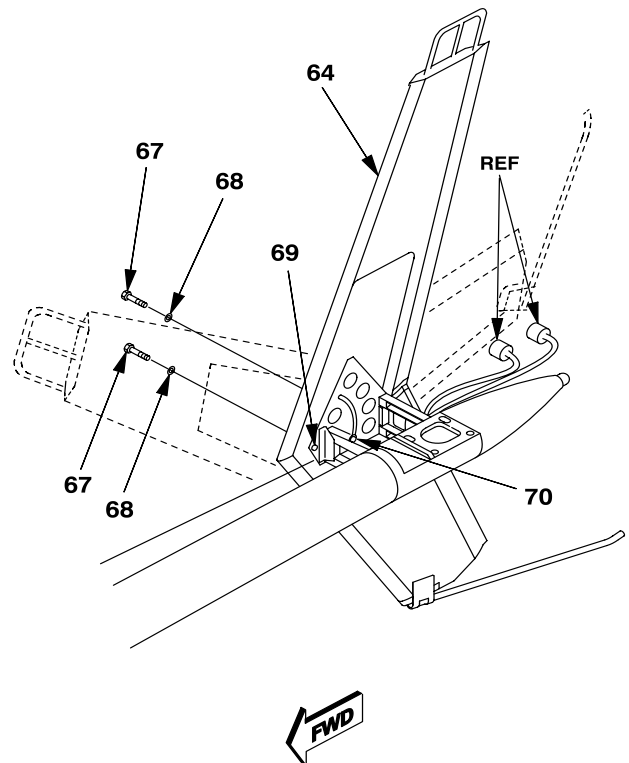
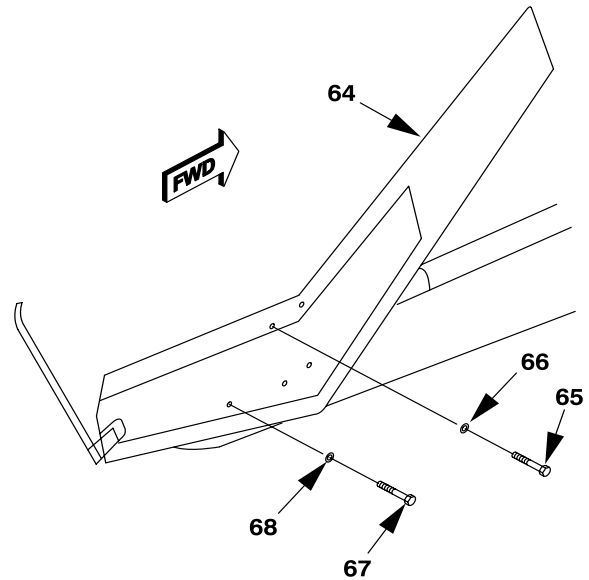
52. Install four bolts (67) with washers (68) to secure vertical fin (64) to support assembly. Torque bolts (67) **60 TO 80 INCH-POUNDS**.

NOTE

Antenna leads to vertical fin (64) connectors shall be reconnected after rotating fin to flight position or antenna will be inoperative.

53. Reconnect antenna leads (ref) to vertical fin (64) connectors.

INSPECT



406070-55-11
J2785

GO TO NEXT PAGE

13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT (CONT)

UNFOLD MAIN ROTOR BLADES

CAUTION

To prevent damage to pitch change links, do not move flight controls during blade unfolding.

54. Remove pitch lock assemblies (71) and stow.

55. Remove expandable bolts (72, 73, 74, and 75) from grips (76) and blades.

56. Remove blade No. 1 from blade folding rack (77) and rotate and install in grip (76) with proper color-coded expandable bolt (72). Ensure blade clears grip (76) on blade No. 4 during unfolding.

57. Remove blade No. 2 from blade folding rack (77) and rotate and install in grip (76) with proper color-coded expandable bolt (73). Ensure blade clears grip (76) on blade No. 4 during unfolding.

58. Unfold blade No. 3 and install in grip (76) with proper color-coded expandable bolt (74).

59. Remove link (78) connecting blade No. 4 to grip (76). Unfold blade No. 4 and install in grip (76) with proper color-coded expandable bolt (75).

WARNING

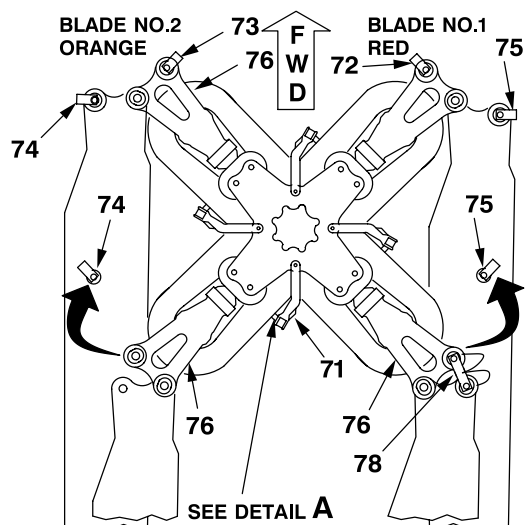
To avoid hand injury, care shall be exercised while handling blade folding rack.

CAUTION

Blade folding rack shall not be allowed to contact or damage tailboom or horizontal stabilizer during removal.

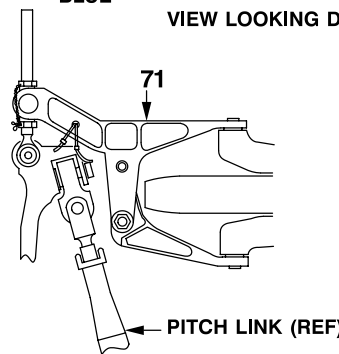
60. Remove blade folding rack (77) from mounting brackets (79) by releasing quick-disconnect pins (80).

INSPECT

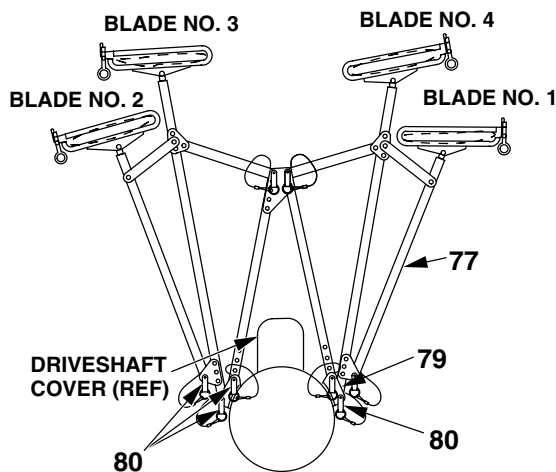


BLADE NO.3 BLUE BLADE NO.4 GREEN

VIEW LOOKING DOWN



DETAIL A
PITCH LOCK ASSEMBLY



BLADE FOLDING RACK
VIEW LOOKING FORWARD

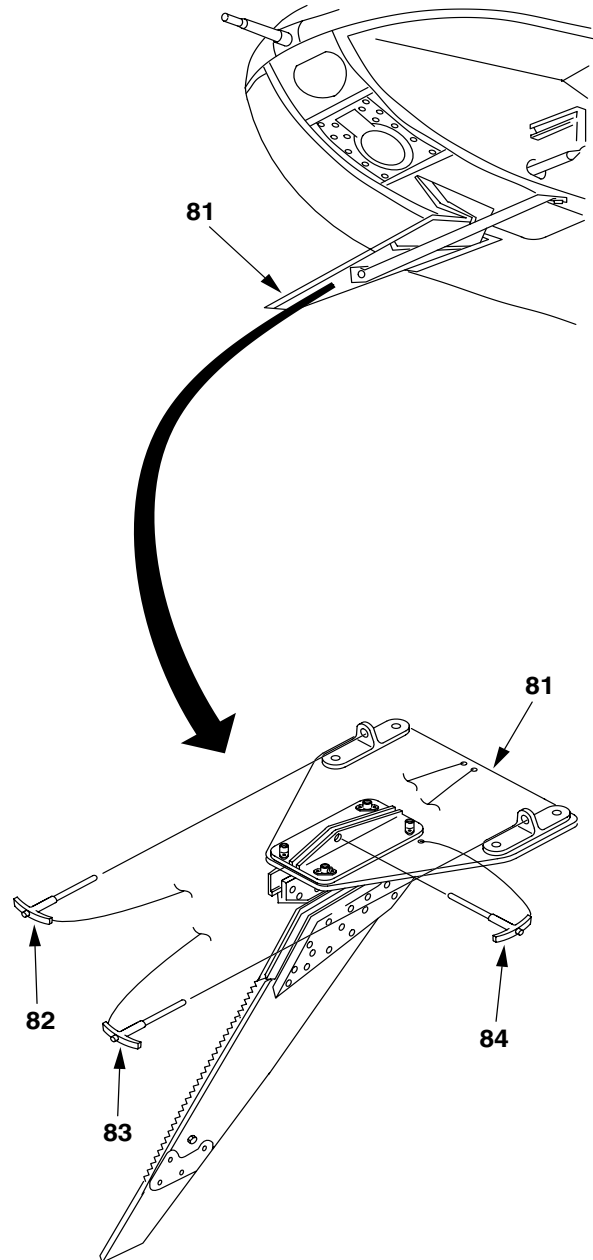
406070-55-12
J2785

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13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT (CONT)

INSTALL LOWER WIRE CUTTER ASSEMBLY

61. Retrieve lower wire cutter assembly (81) from CPG seat.
62. Support lower wire cutter assembly (81) in place on helicopter.
63. Install quick-disconnect pins (82, 83, and 84) with handle facing forward.

INSPECT406070-55-13
J2785

GO TO NEXT PAGE

13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT (CONT)

INSTALL UHF BLADE ANTENNA

64. Retrieve UHF blade antenna (85) from CPG seat.

NOTE

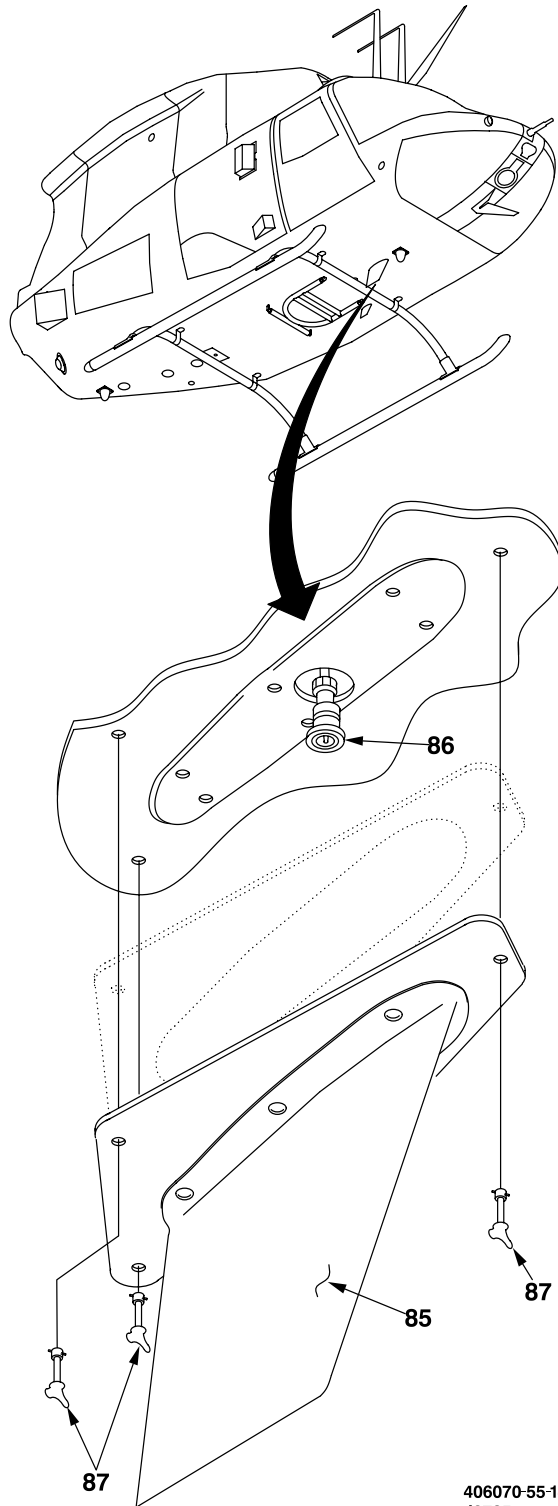
Ensure gasket is secured and aligned on antenna.

65. Position UHF blade antenna (85) near mounting point and connect coax cable connector (86) to antenna.

66. Carefully feed exposed length of coax cable back into airframe while positioning UHF blade antenna (85) onto mounting surface.

67. Install UHF blade antenna (85) on underside of helicopter by connecting three turnlock fasteners (87).

INSPECT



406070-55-14
J2785

GO TO NEXT PAGE

13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT (CONT)

INSTALL RDS BLADE ANTENNA

68. Retrieve RDS blade antenna (88) from CPG seat.

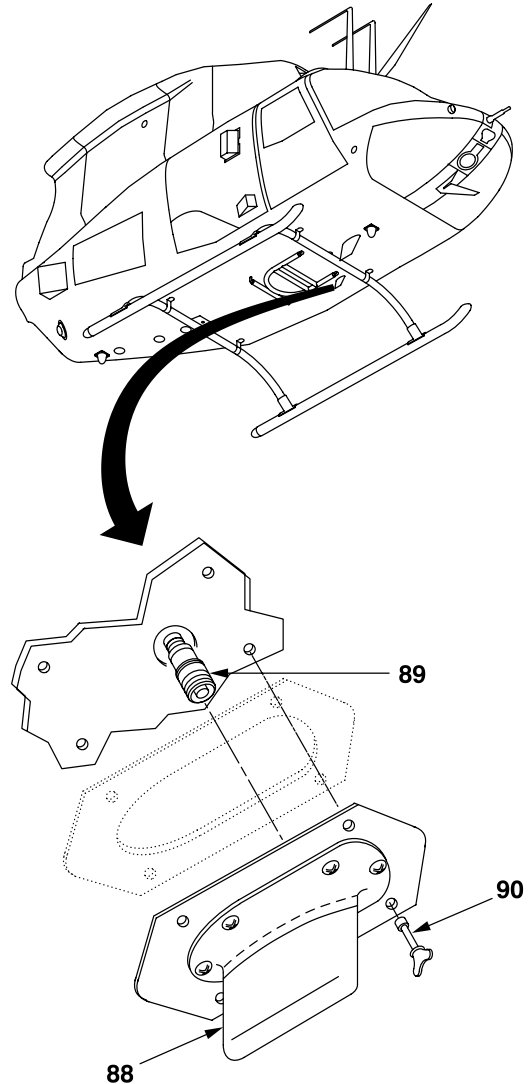
NOTE

Ensure gasket is secured and aligned on antenna.

69. Position RDS blade antenna (88) near mounting point and connect coax cable connector (89) to antenna.

70. Carefully feed exposed length of coax cable back into airframe while positioning RDS blade antenna (88) onto mounting surface.

71. Install RDS blade antenna (88) on underside of helicopter by connecting four turnlock fasteners (90).

INSPECT

406070-55-15
J2785

GO TO NEXT PAGE

13-2-10. CONFIGURE HELICOPTER FOR FLIGHT AFTER RAPID DEPLOYMENT (CONT)

72. Remove cushioning material and tape from landing light (91).

73. Remove barrier material and tape from all vent and drain holes.

74. Remove barrier material and tape from battery receptacle(s).

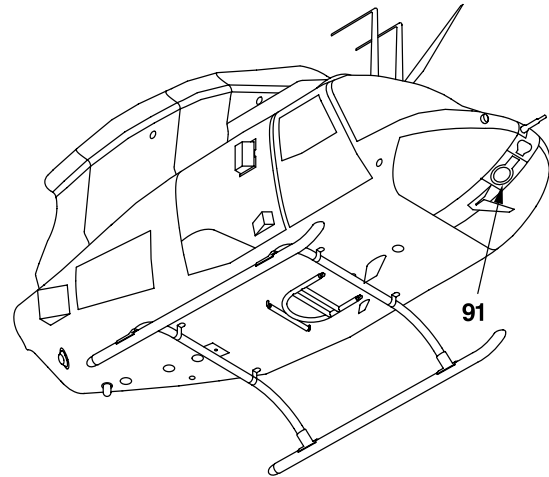
75. Connect battery(ies) (TM 11-1520-248-23).

INSPECT

FOLLOW-ON MAINTENANCE

Install cargo hook suspension assembly, if required (Task 13-1-1).

Install rescue ladders, if required (Task 13-3-1).



406070-55-16
J2785

END OF TASK

Section III. RESCUE LADDER

13-8. RESCUE LADDER

are provided in Appendix P and TM 1-1500-204-23.

13-9. INTRODUCTION

This section contains maintenance procedures for removal, cleaning, inspection, repair and installation of the rescue ladder used on the OH-58D and OH-58D(R) helicopters. Standard torques

13-10. TASK LIST

A list of tasks is provided to identify those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Rescue Ladder — Removal/Installation	13-3-1	13-59
Rescue Ladder — Cleaning/Inspection/Repair	13-3-2	13-61
Left Rescue Ladder Release Cable — Removal/Installation	13-3-3	13-64
Right Rescue Ladder Release Cable — Removal/Installation	13-3-4	13-66
Rescue Ladder Release Cable — Cleaning/Inspection/Repair	13-3-5	13-69

13-3-1. RESCUE LADDER — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

13-3-1. RESCUE LADDER — REMOVAL/INSTALLATION (CONT)

REMOVE

NOTE

Removal procedures for left and right ladders are the same.

1. Remove two screws (1), two clamps (2), and two spacers (3) securing release cable (4) to ladder housing (5).

NOTE

Ladder will deploy when release cable pin (6) is removed.

2. Remove release cable pin (6) while holding lower shell of ladder housing (5) to prevent deployment.
3. Remove release cable pin (6) from release cable (4) and reinstall in ladder housing (5).
4. Remove four screws (7) securing ladder housing (5) to pylon support arm (8).
5. Remove ladder housing (5) from helicopter.

INSTALL

NOTE

Installation procedures for left and right ladders are the same.

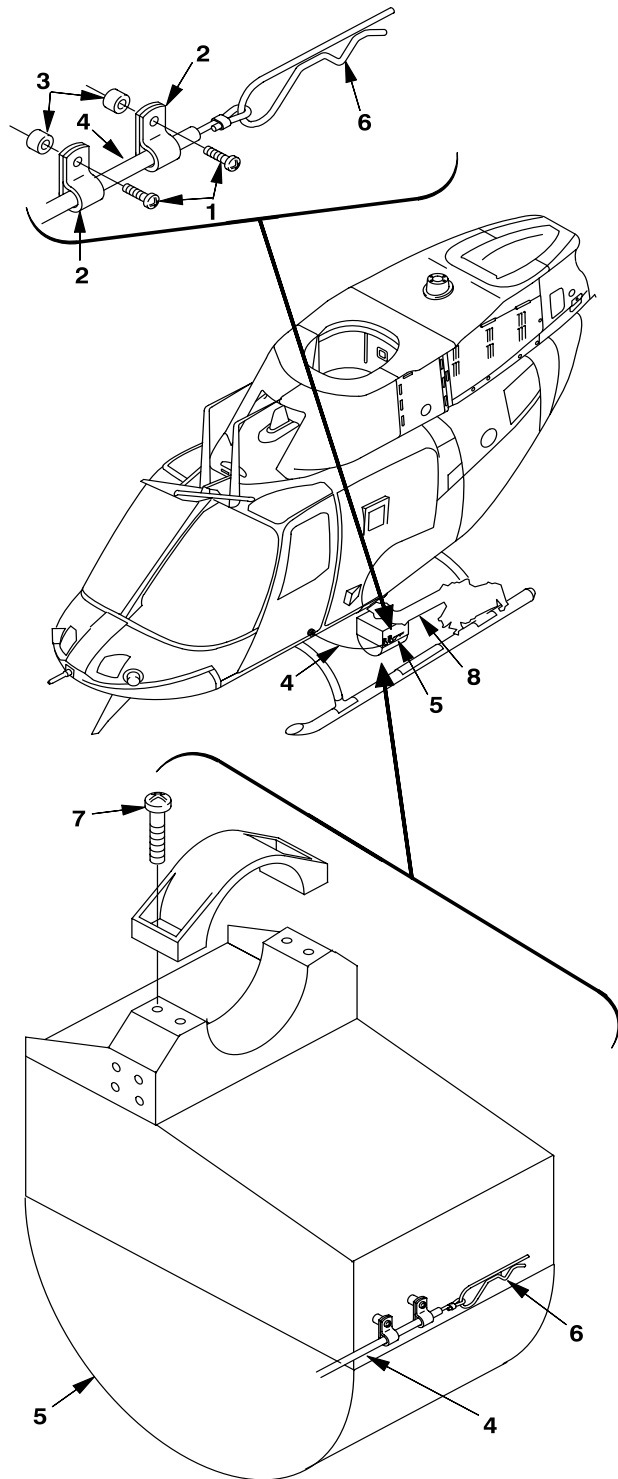
6. Position ladder housing (5) onto helicopter.
7. Install four screws (7) to secure ladder housing (5) to pylon support arm (8).

NOTE

Ladder will deploy when release cable pin (6) is removed.

8. While holding lower shell of ladder housing (5) to prevent deployment, remove release cable pins (6) from ladder housing (5) and reinstall in release cable (4).
9. Install release cable pin (6) in ladder housing (5).
10. Install two spacers (3), two clamps (2), and two screws (1) to secure release cable (4) to ladder housing (5).

INSPECT



406830-49-3
J1825

END OF TASK

13-3-2. RESCUE LADDER — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On/Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Corrosion Preventive Compound (D85)
Drycleaning Solvent (D199)
Epoxy Primer Coating (D98)

Paint (D150)
Rubber Gloves (D111)
Sandpaper (D175)
Wiping Rags (D164)

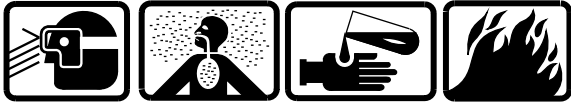
Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Equipment Condition:
Helicopter Safed (Task 1-6-7)

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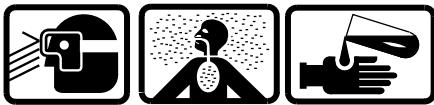
13-3-2. RESCUE LADDER — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN



Drycleaning Solvent

1. Clean ladder housing (1) with drycleaning solvent (D199).
2. Dry ladder housing (1) with a wiping rag (D164).

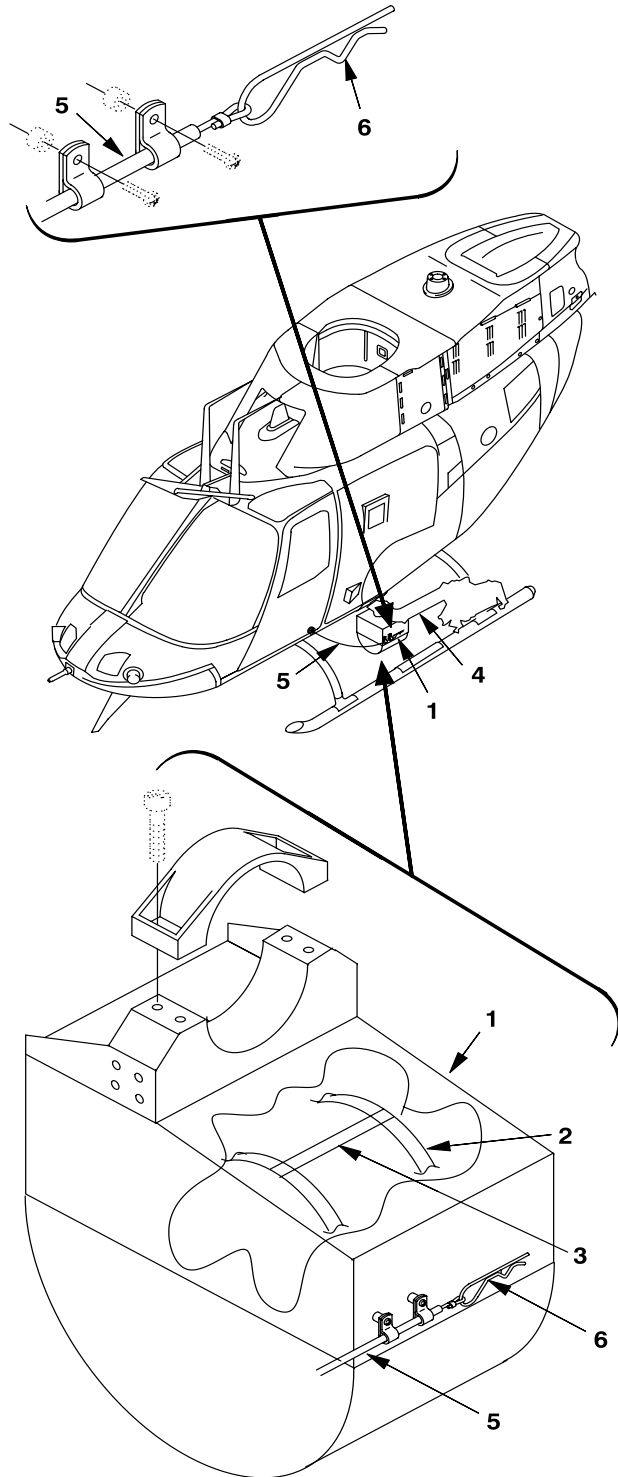


Corrosion Preventive Compound

3. Wipe down ladder cables (2) (sidepieces) and rungs (3) (crosspieces) using wiping rags (D164) and corrosion preventive compound (D85).

INSPECT

4. Visually inspect ladder housing (1) for cracks, scratches, nicks, and dents and security to pylon support arm (4).
5. Visually inspect release cable (5) for security to ladder housing (1) and release cable pin (6).
6. Visually inspect release cable pin (6) for condition and engagement in ladder housing (1).
7. Visually inspect ladder cables (2) (sidepieces) and rungs (3) (crosspieces) for condition and security.

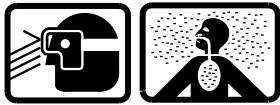


406830-49-1
J1825

GO TO NEXT PAGE

13-3-2. RESCUE LADDER — CLEANING/INSPECTION/REPAIR (CONT)

REPAIR



Sanding Operations

8. Polish out ladder housing (1) repairable damage using 400 grit sandpaper (D175).



Epoxy Primer Coating



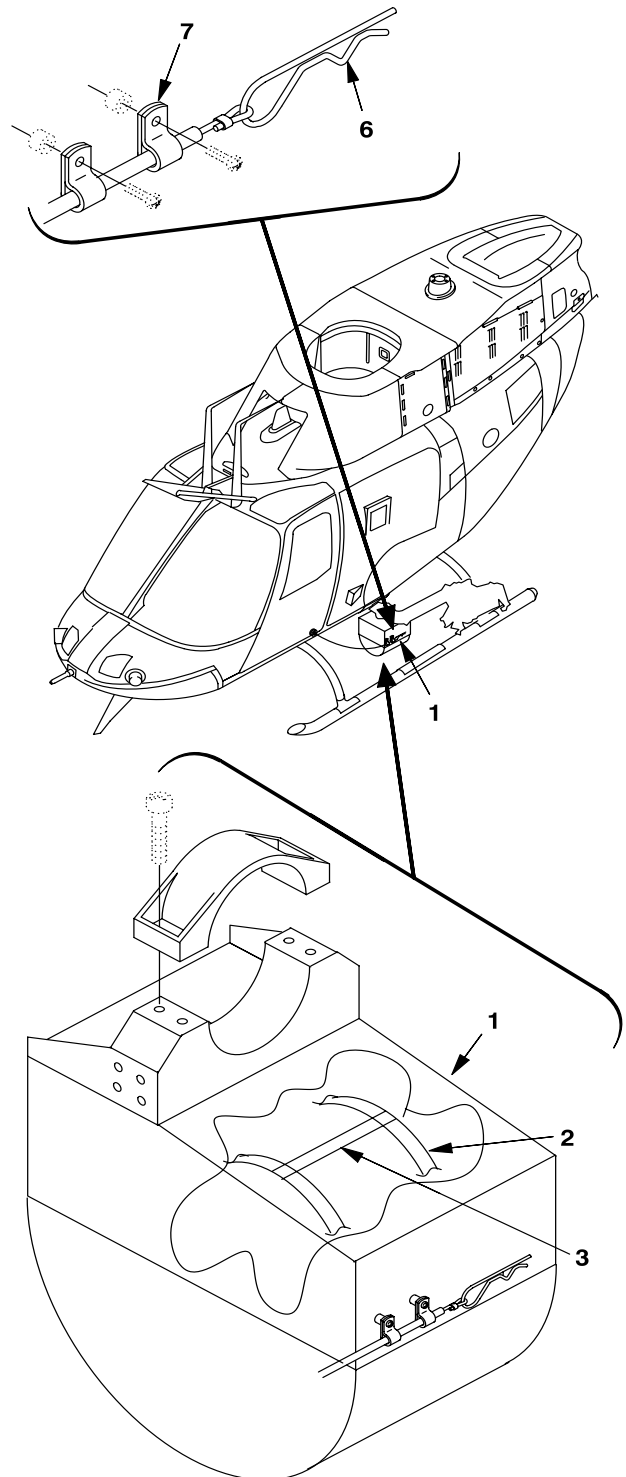
Polyurethane Coating

9. Apply coat of epoxy primer (D98) and a coat of matching paint (D150) to ladder housing (1) repair areas.

10. Replace damaged release cable pin (6) and clamps (7).

11. Repair or replace damaged ladder cables (2) (sidepieces) and rungs (3) (crosspieces).

INSPECT



406830-49-2
J1825

END OF TASK

13-3-3. LEFT RESCUE LADDER RELEASE CABLE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)

Tools:
General Mechanic Tool Kit (B178)

GO TO NEXT PAGE

13-3-3. LEFT RESCUE LADDER RELEASE CABLE — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove two screws (1), two clamps (2), and two spacers (3) securing release cable (4) to ladder housing (5).

NOTE

Ladder will deploy when release cable pin (6) is removed.

2. Remove release cable pin (6) while holding lower shell of ladder housing (5) to prevent deployment.

3. Remove release cable pin (6) from release cable (4) and reinstall in ladder housing (5).

4. Remove screw (7) and clamp (8) securing release cable (4) to copilot floor.

5. Remove nut (9) from threaded portion of release cable (4) securing release cable to instrument panel (10).

6. Remove release cable (4) from grommet (11), nut (9), and instrument panel (10).

INSTALL

7. Route release cable (4) through instrument panel (10), nut (9), and grommet (11) as shown, in between structure parts to secure it in position.

8. Install nut (9) on threaded portion of release cable (4) to secure release cable to instrument panel (10).

NOTE

Ladder will deploy when release cable pin (6) is removed.

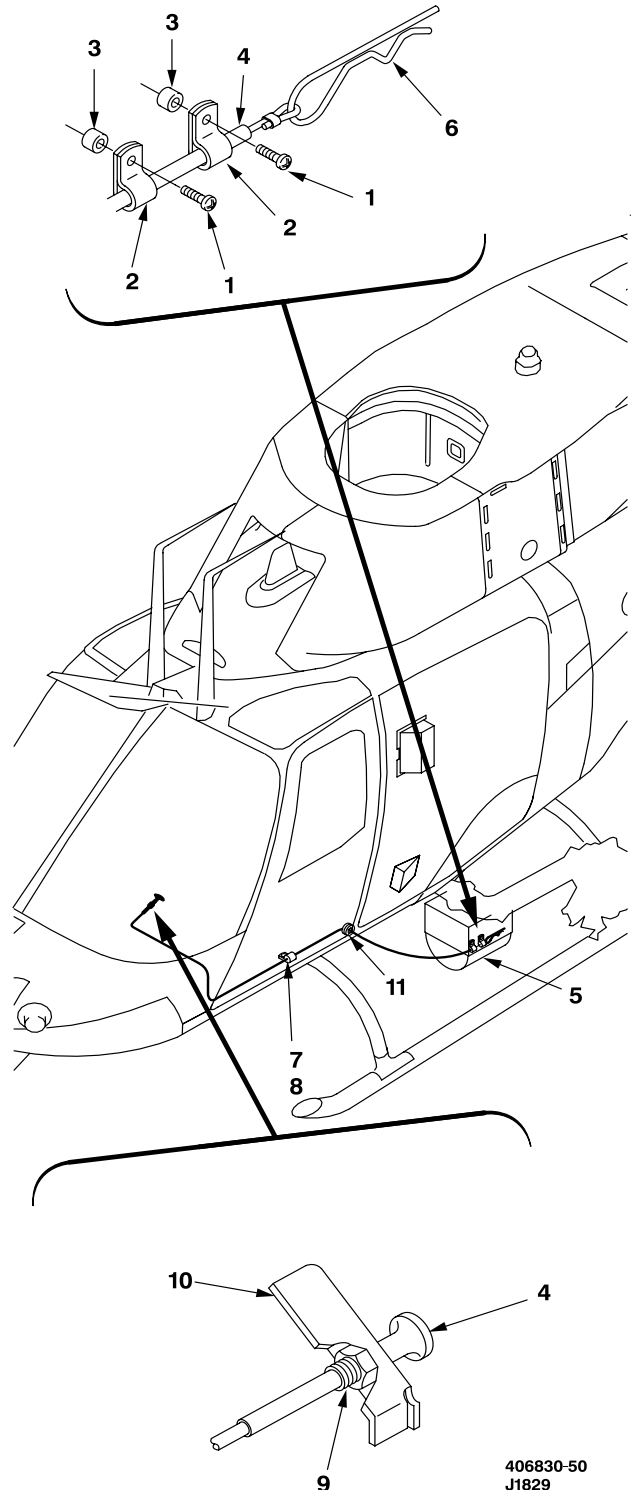
9. While holding lower shell of ladder housing (5) to prevent deployment, remove release cable pin (6).

10. Install release cable pin (6) on release cable (4) and ladder housing (5).

11. Install two screws (1), two clamps (2), and two spacers (3) securing release cable (4) to ladder housing (5).

12. Install screw (7) and clamp (8) to secure release cable (4) to copilot floor.

INSPECT



406830-50
J1829

END OF TASK

13-3-4. RIGHT RESCUE LADDER RELEASE CABLE — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Personnel Required:
67S Scout Helicopter Technical Inspector (TI)
67S Scout Helicopter Repairer

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)

Tools:
General Mechanic Tool Kit (B178)

GO TO NEXT PAGE

13-3-4. RIGHT RESCUE LADDER RELEASE CABLE — REMOVAL/INSTALLATION (CONT)

REMOVE

1. Remove two screws (1), two clamps (2), and two spacers (3) securing release cable (4) to ladder housing (5).

NOTE

Ladder will deploy when release cable pin (6) is removed.

2. Remove release cable pin (6) while holding lower shell of ladder housing (5) to prevent deployment.

3. Remove release cable pin (6) from release cable (4) and reinstall in ladder housing (5).

4. Remove screw (7) and clamp (8) securing release cable (4) to pilot floor.

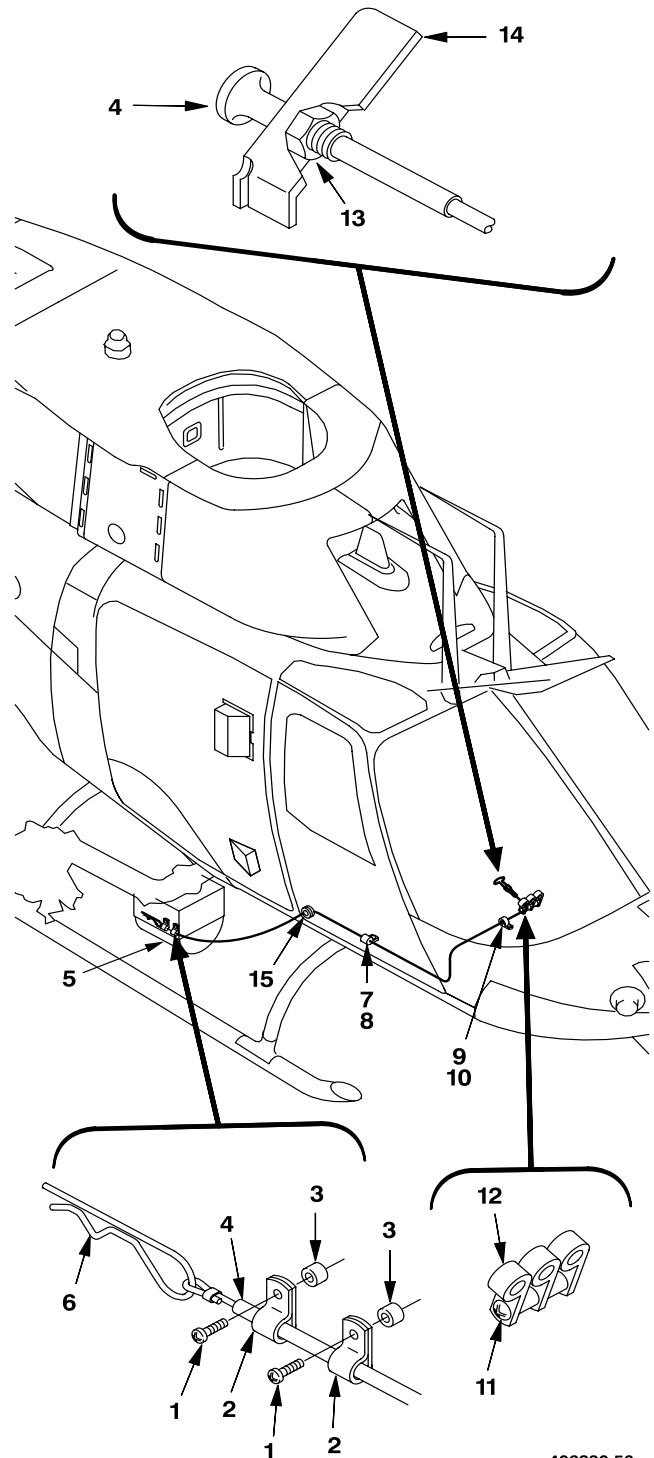
5. Remove screw (9) and clamp (10) securing release cable (4) to pilot outboard structure.

6. Remove screw (11) and clamp (12) securing release cable (4) to harness bundle.

7. Install screw (11) and clamp (12) without release cable (4) to secure harness bundle to structure.

8. Remove nut (13) from threaded portion of release cable (4) securing release cable to instrument panel (14).

9. Remove release cable (4) from grommet (15), nut (13), and instrument panel (14).



406830-56
J2465

GO TO NEXT PAGE

13-3-4. RIGHT RESCUE LADDER RELEASE CABLE — REMOVAL/INSTALLATION (CONT)

INSTALL

NOTE

Ladder will deploy when release cable pin (6) is removed.

10. While holding lower shell of ladder housing (5) to prevent deployment, remove release cable pin (6).

11. Route release cable (4) through instrument panel (14), nut (13), and grommet (15), as shown, in between structure parts to secure it in position.

12. Install nut (13) on threaded portion of release cable (4) to secure release cable to instrument panel (14).

13. Install release cable pin (6) on release cable (4) and in ladder housing (5).

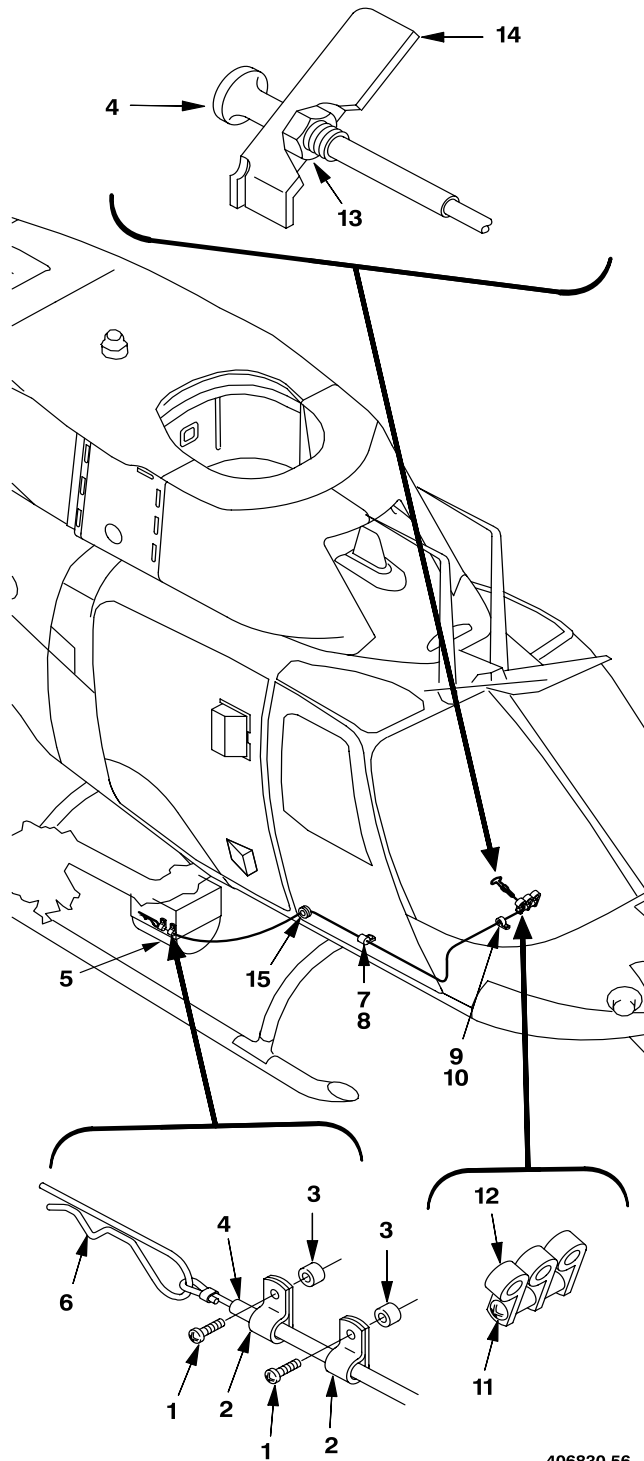
14. Install two screws (1), to clamps (2), and two spacers (3) to secure release cable (4) to ladder housing (5).

15. Remove screw (11) and clamp (12) securing harness bundle to structure.

16. Install screw (11) and clamp (12) to secure release cable (4) to harness bundle.

17. Install screw (9) and clamp (10) to secure release cable (4) to pilot outboard structure.

18. Install screw (7) and clamp (8) to secure release cable (4) to pilot floor.



406830-56
J2465

END OF TASK

13-3-5. RESCUE LADDER RELEASE CABLE — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Material:
Drycleaning Solvent (D199)
Rubber Gloves (D111)
Wiping Rags (D164)

Personnel Required:
67S Scout Helicopter Repairer
67S Scout Helicopter Technical Inspector (TI)

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

13-3-5. RESCUE LADDER RELEASE CABLE — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN



Drycleaning Solvent

1. Clean release cable housing (1) with drycleaning solvent (D199).
2. Dry cable with a wiping rag (D164).

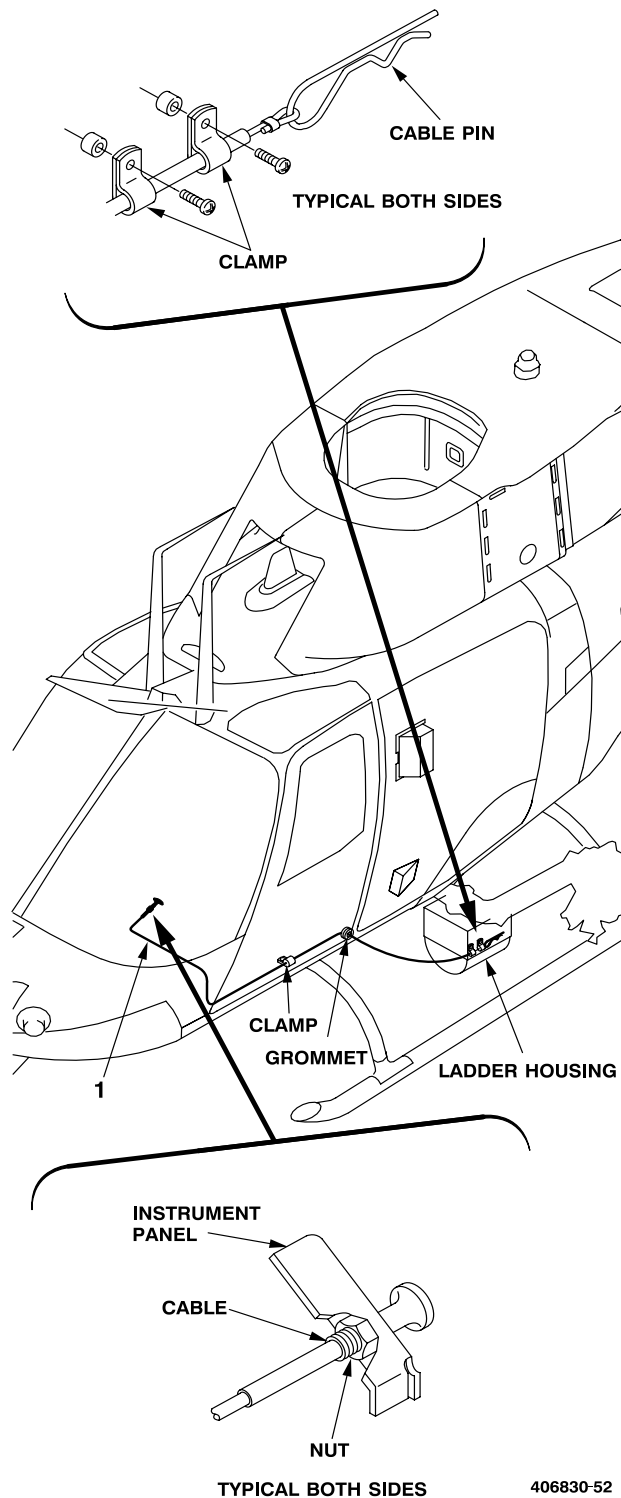
INSPECT

3. Inspect release cable housing (1) for dents and sharp bends that would bind the cable.
4. Inspect release cable housing (1) for security to the instrument panel, structure, and ladder housing.
5. Inspect release cable for security to the handle and release cable pin.
6. Inspect release cable pin for condition and security to the ladder housing.

REPAIR

7. Tighten unsecured parts.
8. Repair or replace damaged parts.

INSPECT



406830-52
J1829

END OF TASK

CHAPTER 14

EMERGENCY EQUIPMENT

14-1. **EMERGENCY EQUIPMENT**

This chapter contains maintenance procedures of the fire extinguisher, first aid kit, and underwater acoustic beacon.

	Page
Section I Miscellaneous Emergency Equipment	14-2

Section I. MISCELLANEOUS EMERGENCY EQUIPMENT

14-2. MISCELLANEOUS EMERGENCY EQUIPMENT

extinguisher, first aid kit, and underwater acoustic beacon. Standard torques are provided in Appendix P and TM 1-1500-204-23.

14-3. INTRODUCTION

This section contains maintenance procedures for: removal, inspection, and installation of the fire

14-4. TASK LIST

The task list lists those tasks required to support unit and intermediate level maintenance.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Fire Extinguisher — Removal/Inspection/Installation	14-1-1	14-3
First Aid Kit — Removal/Inspection/Installation	14-1-2	14-4
Underwater Acoustic Beacon — Removal/Installation	14-1-3	14-5
Underwater Acoustic Beacon — Cleaning/Inspection/Repair	14-1-4	14-8

 14-1-1. FIRE EXTINGUISHER — REMOVAL/INSPECTION/INSTALLATION

This task covers: Removal, Inspection, and Installation (On Helicopter)

INITIAL SETUP

References:
TB 5-4200-200-10

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)

Personnel Required:
67S Scout Helicopter Repairer
67S Scout Helicopter Technical Inspector (TI)

REMOVE

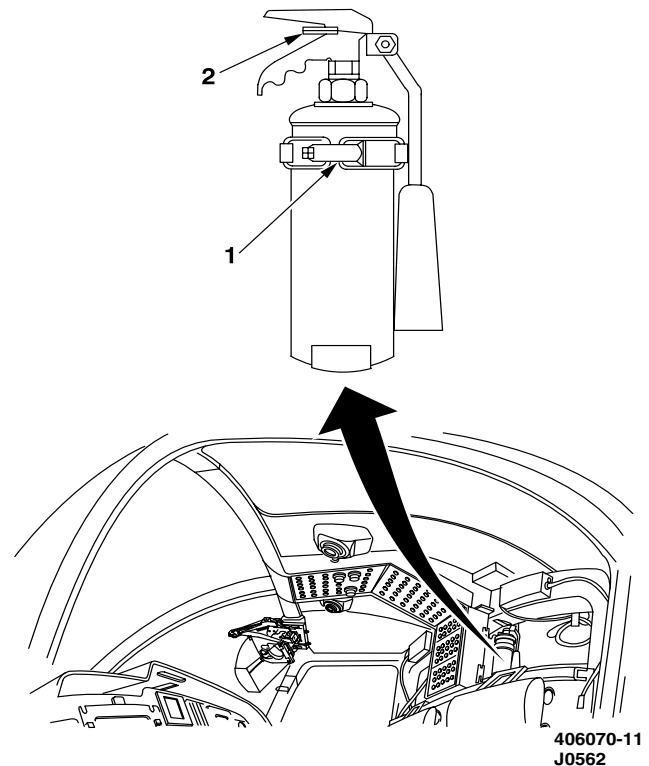
1. Release spring clip (1) on fire extinguisher mount bracket.
2. Remove fire extinguisher (2) from bracket on left side of center post.

INSPECT

3. Fire extinguishers will be inspected in accordance with TB 5-4200-200-10.

INSTALL

4. Position fire extinguisher (2) in mount bracket on left side of center post.
5. Attach spring clip (1) and secure spring clip handle.

INSPECT

END OF TASK

14-1-2. FIRST AID KIT — REMOVAL/INSPECTION/INSTALLATION

This task covers: Removal, Inspection, and Installation (On Helicopter)

INITIAL SETUP

References:
TM 1-1500-204-23

Applicable Configurations:
All

Equipment Condition:
Helicopter Safed (Task 1-6-7)

Personnel Required:
67S Scout Helicopter Repairer
67S Scout Helicopter Technical Inspector (TI)

REMOVE

1. Release four quick-release fasteners (1).
2. Remove first aid kit (2) from right side of center post.

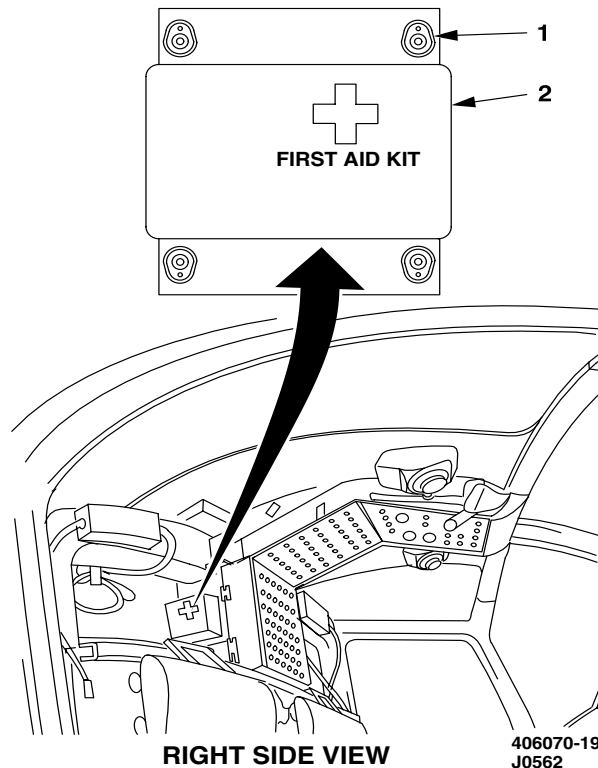
INSPECT

3. Inspect first aid kit (2) (TM 1-1500-204-23).

INSTALL

4. Position first aid kit (2) on right side of center post.
5. Secure with four quick-release fasteners (1).

INSPECT



END OF TASK

14-1-3. UNDERWATER ACOUSTIC BEACON — REMOVAL/INSTALLATION

This task covers: Removal and Installation (On Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)
Torque Wrench (B235)

Material:
Lockwire (D132)

Personnel Required:
67S Scout Helicopter Repairer
67S Scout Helicopter Technical Inspector (TI)
68N Avionics Repairer

References:
NAVAIR 16-45-2453

Equipment Condition:
Helicopter Safed (Task 1-6-7)
Beacon Tested Prior to Installation (NAVAIR
16-45-2453)

GO TO NEXT PAGE

14-1-3. UNDERWATER ACOUSTIC BEACON — REMOVAL/INSTALLATION (CONT)

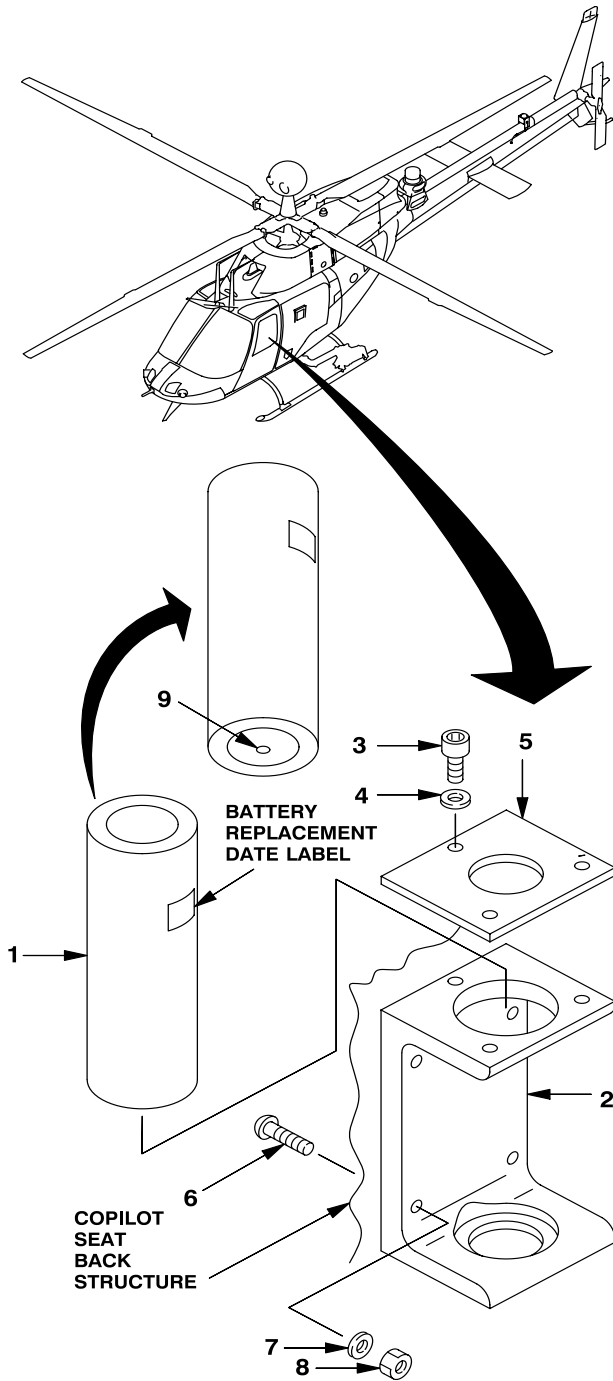
REMOVE

1. Remove beacon (1) from cradle (2) as follows:

- a. Remove lockwire from three capscrews (3).
- b. Remove three capscrews (3), three lockwashers (4), and plate (5) from cradle (2).
- c. Remove beacon (1) from cradle (2).

2. Remove cradle (2) from helicopter as follows:

- a. Remove beacon (1) from cradle (2) (step 1. above).
- b. Remove four screws (6), washers (7), and nuts (8) securing cradle (2) to structure.
- c. Remove cradle (2) from helicopter.
- d. Protect switch (9) from damage, dirt, etc., until switch is installed.



406875-202
J1460

GO TO NEXT PAGE

14-1-3. UNDERWATER ACOUSTIC BEACON — REMOVAL/INSTALLATION (CONT)

INSTALL

3. Install cradle (2) in helicopter as follows:

- a. Position cradle (2) in helicopter with three mounting screw holes of plate (5) to the top.
- b. Install four screws (6), four washers (7), and four nuts (8) securing cradle (2) to structure.

4. Install beacon (1) in cradle (2) as follows:

NOTE

An improperly positioned switch (9) can cause the beacon (1) to malfunction.

a. Position beacon (1) in cradle (2) with switch (9) facing downward and battery replacement date label visible.

b. Install plate (5), three lockwashers (4), and three capscrews (3) to secure beacon (1) to cradle (2).

c. Torque three capscrews (3) **15 TO 20 INCH-POUNDS.**

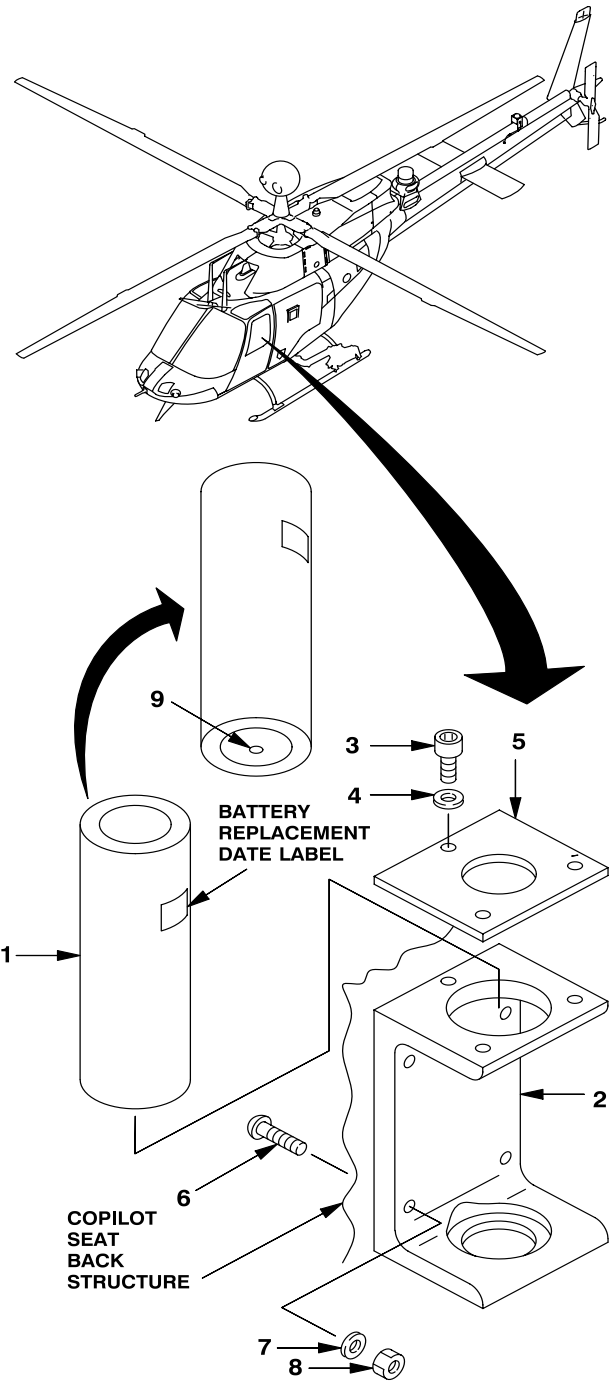
d. Secure capscrews (3) with lockwire (D132).

e. Clean switch (9) (NAVAIR 16-45-2453).

INSPECT

FOLLOW-ON MAINTENANCE

Perform 'after installation' beacon testing (NAVAIR 16-45-2453).



406875-202
J1460

END OF TASK

14-1-4. UNDERWATER ACOUSTIC BEACON — CLEANING/INSPECTION/REPAIR

This task covers: Cleaning, Inspection, and Repair (On/Off Helicopter)

INITIAL SETUP

Applicable Configurations:
All

Tools:
General Mechanic Tool Kit (B178)

Personnel Required:
67S Scout Helicopter Repairer
67S Scout Helicopter Technical Inspector (TI)

References:
NAVAIR 16-45-2453
TM 1-1500-204-23

Equipment Condition:
Helicopter Safed (Task 1-6-7)

GO TO NEXT PAGE

14-1-4. UNDERWATER ACOUSTIC BEACON — CLEANING/INSPECTION/REPAIR (CONT)

CLEAN

NOTE

A dirty switch (1) can cause the beacon (2) to malfunction.

1. Clean beacon (2) every 90 days (NAVAIR 16-45-2453).

NOTE

To prevent malfunction, beacon (2) must be properly installed (Task 14-1-3).

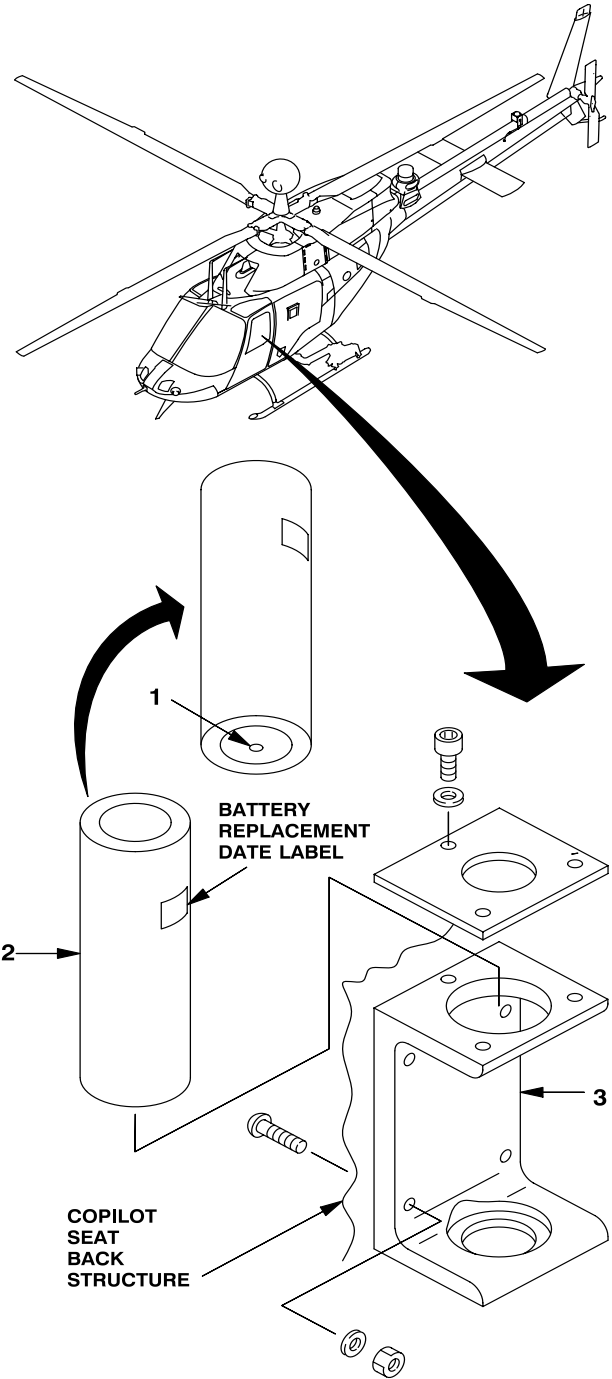
2. Inspect beacon (2) (NAVAIR 16-45-2453). Switch (1) shall be facing downward and battery replacement date label visible.

3. Inspect cradle (3) for damage, corrosion, and security (TM 1-1500-204-23).

4. Repair beacon (2) (NAVAIR 16-45-2453).

5. Repair cradle (3) (TM 1-1500-204-23).

INSPECT



406875-203
J1460

END OF TASK

GLOSSARY

<u>Abbreviation/ Acronym</u>	<u>Definition</u>
AC	Alternating Current
ACK	Acknowledge
ADF	Automatic Direction Finder
ADS	Air Data System
ADSS	ANVIS Display Symbology System
ADU	Audio Distribution Unit
ADV	Advisory
AEU	Armament Electronic Unit
AI	Airborne Intercept
AJ	Antijamming
ALSE	Aviation Life Support Equipment
ALT	Altitude
AM	Amplitude Modulation
AMP	Ampere
AMP	Amplifier
ANVIS	Aviators Night Vision Imaging System
AOAP	Army Oil Analysis Program
APU	Aircraft Power Unit
AR	Army Regulation
ARMT	Armament
ASE	Aircraft Survivability Equipment
ATAS	Air-to-Air Stinger
ATHS	Airborne Target Handover System
ATTD	Attitude
AUTO	Automatic
AUX	Auxiliary
AVIM	Aviation Intermediate Maintenance
AVTR	Airborne Video Tape Recorder
AVUM	Aviation Unit Maintenance
AWG	American Wire Gauge
BATT	Battery
B HOT	Black Hot
BIT	Built-In Test
BITE	Built-In Test Equipment
BKUP	Backup

Glossary (Cont)

<u>Abbreviation/ Acronym</u>	<u>Definition</u>
BL	Butt Line
BLWR	Blower
BNR	Burner
BRSIT	Boresight
BRT	Bright
CAGE	Commercial and Government Entity Code
CARC	Chemical Agent Resistant Coating
CB	Circuit Breaker
CDS	Control Display System
CFT	Captive Flight Trainer
CG	Center of Gravity
CHGR	Charger
CIPH	Cipher
CIT	Compressor Inlet Temperature Sensor
CKPT	Cockpit
CKPT LT	Cockpit Light
CL	Center Line
CLR	Clear
COLL	Collision
COMSEC	Communication Security
CPC	Corrosion Preventive Compound
CPG	Copilot/Gunner
CRES	Corrosion Resistant Steel
CTRL	Control
DA PAM	Department of the Army Pamphlet
DC	Direct Current
DEFOG	Windshield Defogger System
DES	Designation
DETR	Detector
DIGT	Digital
DIR	Directional
DISENG	Disengage
DN	Down
DOD	Department of Defense
DRA	Data Rate Adapter
DSC	Digital Scan Converter

Glossary (Cont)

<u>Abbreviation/ Acronym</u>	<u>Definition</u>
DSPL	Display
DTS	Data Transfer System
DX	Direct Exchange
ECU	Electronic Control Unit
ECUIC	Electronic Control Unit Interface Computer
EGI	Embedded Global Position/Inertial Navigation
ELEV	Elevation
EMI	Electromagnetic Interference
ENG	Engine
ENGA	Engage
ESC	Electronic Supervisory Control
ESNTL	Essential
EU	Electronics Unit
EXT	External
FADEC	Full Authority Digital Electronic Control
FCU	Fuel Control Unit
FDLS	Fault Detection and Locating System
FFAR	Folding Fin Aerial Rocket
FM	Frequency Modulation
FOC	Focus
FOV	Field-of-View
FR	Frame
FREQ	Frequency
FRZ	Freeze
FS	Fuselage Station
FWD	Forward
FXD	Fixed
GEN	Generator
GRBX	Gearbox
GSE	Ground Support Equipment
HDG	Heading
HF	High Frequency
HHM	Heading Hold Mode
HLFR	Hellfire
HMS	HELLFIRE Missile System
HMU	Hydromechanical Unit

Glossary (Cont)

<u>Abbreviation/ Acronym</u>	<u>Definition</u>
HOM	Homing (FM)
HSD	Horizontal Situation Display
HSF	Hot Section Factor
HTR	Heater
HYD	Hydraulic
ICS	Internal Communication System
ID	Inside Diameter
IDM	Improved Data Modem
IEU	Interface Electronics Unit
IFF	Identification Friend or Foe
IFM	Improved Frequency Modulation
IGN	Ignition
INIT	Initiate
INST	Instrument
INST LT	Instrument Light
INTCOM	Intercommunication
INV	Inverter
IR	Infrared
ISP	Integrated Systems Processor
JETT	Jettison
KM	Kilometer
KPH	Kilometers Per Hour
KTS	Knots
KYBD	Keyboard
LAT	Latitude
LCF	Low Cycle Fatigue
LDS	Laser Detecting System
LOAL	Lock On After Launch
LOBL	Lock On Before Launch
LRF/D	Laser Rangefinder/Designator
LRU	Line Replaceable Unit
LT	Light
L/H	Left Hand
LVDT	Linear Variable Differential Transformer
MAC	Maintenance Allocation Chart
MAINT	Maintenance

Glossary (Cont)

<u>Abbreviation/ Acronym</u>	<u>Definition</u>
MAPS	Maintenance Action Precise Symptom
MCPS	MMS Central Power Supply
MCPU	Master Controller Processor Unit
MFD	Multifunction Display
MFK	Multifunction Keyboard
MLM	Multipurpose Lightweight Missile
MMS	Mast Mounted Sight
MMSS	Mast Mounted Sight Subsystem
MNL	Manual
MOC	Maintenance Operational Check
MOM	Moment
MPD	Multiparameter Display
MPLH	Multi Purpose Light Helicopter
M/R	Main Rotor
MOS	Military Occupational Specialty
MSDS	Material Safety Data Sheets
MSP	MMS System Processor
MSS	Missile Sight System
MSSEU	Missile Sight System Electronics Unit
MTA	Mast Turret Assembly
MTF	Maintenance Test Flight
MWO	Modification Work Order
MUX	Multiplex
NAV	Navigation
NBC	Nuclear Biological and Chemical
NG	Gas Generator Speed
NICAD	Nickel-Cadmium Battery
NOE	Nap-of-the-Earth
NP	Power Turbine RPM
NR	Main Rotor RPM
NSN	National Stock Number
NVG	Night Vision Goggles
OAT	Outside Air Temperature
OD	Outside Diameter
ODA	Optical Display Assembly
OPR	Operate

Glossary (Cont)

<u>Abbreviation/ Acronym</u>	<u>Definition</u>
OS	Overspeed
OSET	Offset
OSHA	Occupational Safety and Health Administration
PART SEP	Particle Separator
PDU	Pilot Display Unit
PLT	Pilot
PMA	Permanent Magnet Alternator
POS	Position
POS LT	Position Light
PPM	Progressive Phase Maintenance
PSI	Pounds Per Square Inch
PSID	Pounds Per Square Inch Differential
PSIG	Pounds Per Square Inch Gauge
PWR	Power
QAD	Quick Attach-Detach
QE	Engine Torque
QM	Mast Torque
QTY	Quantity
RALT	Radar Altimeter
RAST	Raster
RCCB	Remote Control Circuit Breaker
RCPT	Receptacle
RDS	Radar Detecting System
REC	Receive
RECT	Rectifier
REL	Release
RET	Retract
RFD	Remote Frequency Display
RHE	Remote HELLFIRE Electronics Unit
RKT	Rocket
RPM	Revolutions Per Minute
RPSTL	Repair Parts and Special Tools List
RST	Reset
RT	Receiver/Transmitter
R/H	Right Hand
SAM	Surface-To-Air Missile

Glossary (Cont)

<u>Abbreviation/ Acronym</u>	<u>Definition</u>
SCAS	Stability and Control Augmentation System
SCTY	Security
SEL	Select
SEU	Sight Electronics Unit
SINCGARS	Single Channel Ground/Air Radio System
SMR	Source, Maintenance, and Recoverability
SRCH	Search
STA	Station
STBY	Standby
SYMB	Symbology
TACFIRE	Tactical Fire Direction
TAMS	Transmission Attitude Measurement System
TB	Technical Bulletin
TBD	To Be Designated
TBO	Time Between Overhaul
TCU	Thermal Control Unit
TEMP	Temperature
TGT	Turbine Gas Temperature
TGT/TRQ	Turbine Gas Temperature/Torque
TI	Technical Inspector
TIS	Thermal Imaging Sensor
TM	Technical Manual
TMDE	Test, Measurement, and Diagnostic Equipment
TMOPS	Torquemeter Oil Pressure Sensor
T/R	Tail Rotor
TRK	Track
TRQ	Torque
TRU	Transformer Rectifier Unit
TVS	Television System
UHF	Ultra High Frequency
U/M	Unit of Measure
UTM	Universal Transverse Mercator
UUT	Unit Under Test
UWP	Universal Weapons Pylon
VAC	Volts Alternating Current
VAR	Variation

Glossary (Cont)

<u>Abbreviation/ Acronym</u>	<u>Definition</u>
VDC	Volts Direct Current
■ VDU	Video Downlink/Uplink
VHF	Very High Frequency
VID	Video
VSD	Vertical Situation Display
VSI	Vertical Scale Instrument
VTR	Video Tape Recorder
VTS	Video Tracker System
VTVM	Vacuum Tube Voltmeter
WDC	Water Displacing Compound
WL	Water Line
WRN	Warning
WSPS	Wire Strike Protection System
XDCR	Transducer (Sensor)
XFMR	Transformer
XMSN	Transmission

ALPHABETICAL INDEX

<u>Subject</u>	<u>Para/Task</u>	<u>Subject</u>	<u>Para/Task</u>
26V Auto Transformer — Cleaning/Inspection/Repair	9-4-12		
26V Auto Transformer — Removal/Installation	9-4-13		
28 VDC AUX RCPT, Circuit Breaker — Removal/Installation	9-6-79		
A			
AC External Power Door Switch — Cleaning/Inspection/Repair	9-4-1		
AC External Power Door Switch — Removal/Installation	9-4-2		
AC External Power Receptacle — Cleaning/Inspection/Repair	9-4-3		
AC External Power Receptacle — Removal/Installation	9-4-4		
AC External Power Reset Switch — Cleaning/Inspection/Repair	9-4-5		
AC External Power Reset Switch — Removal/Installation	9-4-6		
AC Generator — Cleaning/ Inspection/Repair	9-4-7		
AC Generator — Installation	9-4-9		
AC Generator — Removal	9-4-8		
AC Power (External) — Application/Removal	1-6-6		
AC Power Monitor Unit — Cleaning/Inspection/Repair	9-4-14		
AC Power Monitor Unit — Removal/Installation	9-4-15		
AN/ALQ-144 IR Jammer Mount (Replacement Tailboom), Countermeasures Set — Installation	2-3-14		
AN/ALQ-144 IR Jammer Mount, Countermeasures Set — Cleaning/Inspection/Repair	2-3-15		
AN/ALQ-144 IR Jammer Mount, Countermeasures Set — Removal/Installation	2-3-13		
Abbreviations (Appendix F)	F-3		
Access Door — Cleaning/ Inspection/Repair	2-2-1		
Access Door, Air Induction Cowl — Cleaning/Inspection/Repair	4-2-7		
Access Door, Air Induction Cowl — Removal/Installation	4-2-6		
Access Door, Air Inlet in — Removal/Installation	2-2-2		
Access Door Bonding Jumper (Typical) — Inspection/Repair/ Replacement	2-2-7		
Access Door Chafing Strip — Cleaning/Inspection/Repair	2-2-5		
		A (Cont)	
		Access Door Hinge Halves/Quick- Disconnect Pin/Lanyard — Cleaning/Inspection/Repair	2-2-4
		Access Door Latch Assembly — Cleaning/Inspection/Repair	2-2-3
		Access Door Turnlock Receptacles — Inspection/ Repair/Replacement	2-2-8
		Access Doors — Removal/ Installation	2-2-6
		Access Panel (Typical), Right or Left — Cleaning/Inspection/ Repair	2-2-84
		Access Panel (Typical), Right or Left — Removal/Installation	2-2-83
		Access Panels and Doors Cowlings Fairings	2-2
		Accessory Gearbox Seal, Engine — Removal/Installation	4-1-10
		Accident, Components Involved in an	E-1
		Acoustic Beacon, Underwater — Cleaning/Inspection/Repair	14-1-4
		Acoustic Beacon, Underwater — Removal/Installation	14-1-3
		Actuator, Collective Hydraulic — Removal/Installation	7-1-9
		Actuator, Cyclic Hydraulic — Removal/Installation	7-1-10
		Actuator, Directional Control Rotary — Cleaning/Inspection/ Repair	11-4-38
		Actuator, Directional Control Rotary — Removal/Installation	11-4-37
		Actuator Idler Bearing (AVIM) — Removal/Installation	11-4-29
		Actuator Input Idler Assembly, Directional Control — Removal/ Installation	11-4-28
		Actuator Mount Bushings, Collective/Cyclic — Removal/ Installation	11-2-55
		Actuator Support Assembly — Removal/Installation	11-2-62
		Actuator Support Assembly (AVIM) — Cleaning/Inspection/ Repair	11-2-63
		Actuator Support Bushing (AVIM) — Removal/Installation	11-4-31
		Actuators	7-2
		Actuators, Introduction to	7-3
		Actuators, Task List for	7-4

<u>Subject</u>	<u>Para/Task</u>
A (Cont)	
Adapter Assembly (AVIM), Main Rotor Grip and — Removal/Installation	5-1-38
Adapter Assembly, Main Rotor Yoke — Cleaning/Inspection/Repair.....	5-1-26
Adapter Assembly, Torquemeter System Antibacklash — Installation	6-4-14
Adapter Assembly, Torquemeter System Antibacklash — Removal	6-4-12
Adapter Assembly Components, Antibacklash — Cleaning/Inspection/Repair.....	6-4-13
Adapter Mount Bushings (AVIM), Main Rotor Yoke — Removal/Installation	5-1-27
Adapter Nut/Input Duplex Bearing Nut, Input — Cleaning/Inspection/Repair.....	6-7-7
Adapter, Clevis — Cleaning/Inspection/Repair.....	7-1-8
Adapter, Clevis — Removal/Installation	7-1-7
Adapter/Bearing Hanger/Segmented Shaft (Typical) — Removal/Installation	6-6-9
Adhesive and Structural Bonding (AVIM), Heat Resistant — Use	2-2-66
Adjustable Tube Assembly — Disassembly/Assembly	11-2-61
Adjustable Tube Assembly — Removal/Installation	11-2-60
Adjustable Tube Assembly, Collective — Removal/Installation	11-2-50
Adjustable Tube Assembly (Typical), Cyclic — Removal/Installation	11-3-32
Adjustable Tube Assembly Controls — Removal/Installation	11-3-37
Adjustable Tube Assembly Rod End Bearing (Typical), Cyclic — Removal/Installation	11-3-33
Adjustable Tube Bearing (Typical), Directional Control — Removal/Installation	11-4-27
Adjustment and Support Assembly, Directional Control Pedal — Removal/Installation.....	11-4-1
Adjustment and Support Assembly, Pedal — Cleaning/Inspection/Repair.....	11-4-3

<u>Subject</u>	<u>Para/Task</u>
A (Cont)	
Adjustment Nut, Collective Jackshaft — Removal/Installation	11-2-18
Aft Crosstube — Cleaning/Inspection/Repair.....	3-1-35
Aft Crosstube — Removal/Installation	3-1-33
Aft Crosstube (Nonstandard) — Cleaning/Inspection/Repair	3-1-38
Aft Crosstube (Rapid Deployment) — Cleaning/Inspection/Repair.....	3-1-37
Aft Crosstube (Rapid Deployment) — Removal/Installation	3-1-34
Aft Crosstube Components — Cleaning/Inspection/Repair	3-1-41
Aft Crosstube Components — Removal/Installation	3-1-39
Aft Crosstube Components (Rapid Deployment) — Removal/Installation	3-1-40
Aft Crosstube Support Assembly — Cleaning/Inspection/Repair	3-1-8
Aft Crosstube Support Assembly (Rapid Deployment) — Cleaning/Inspection/Repair	3-1-9
Aft Crosstube Support Beam Bushing (AVIM) — Removal/Installation	3-1-47
Aft Crosstube Support Beam and Components — Removal/Installation	3-1-43
Aft Crosstube Support Beam and Components (Rapid Deployment) — Cleaning/Inspection/Repair.....	3-1-46
Aft Crosstube Support Beam and Components (Rapid Deployment) — Removal/Installation	3-1-44
Aft Crosstube Support Beam Components — Cleaning/Inspection/Repair.....	3-1-45
Aft Crosstube Support Strap (Rapid Deployment Gear) — Installation/Removal	1-6-4
Aft Crosstube Support Strap (Standard Gear) — Installation/Removal	1-6-3
Aft Crosstube Supports (Rapid Deployment) — Cleaning/Inspection/Repair.....	3-1-42
Aft Electrical/Avionics Door — Cleaning/Inspection/Repair	2-2-90

<u>Subject</u>	<u>Para/Task</u>	<u>Subject</u>	<u>Para/Task</u>
A (Cont)		A (Cont)	
Aft Electrical/Avionics Door — Removal/Installation	2-2-89	Air Induction Cowl (Compressor Inlet Temperature Sensor Installed) — Removal.....	4-2-2
Aft Fairing Assembly — Cleaning/ Inspection/Repair.....	2-2-57	Air Induction Cowl Access Door — Cleaning/Inspection/Repair	4-2-7
Aft Fairing Assembly — Removal/ Installation	2-2-55	Air Induction Cowl Access Door — Removal/Installation	4-2-6
Aft Fairing Assembly Engine Oil Service Door — Removal/ Installation	2-2-59	Air Inlet in Access Door — Removal/Installation	2-2-2
Aft Fairing Extension — Cleaning/ Inspection/Repair.....	2-2-58	Air Thermometer, Outside — Cleaning/Inspection/Removal/ Installation	8-5-5
Aft Fairing Extension — Removal/ Installation	2-2-56	Aircraft Drains (Appendix Q)	Q-10
Aft Firewall	4-24	Aircraft Weighing Record, DD Form 365-2 —.....	G-9
Aft Firewall — Cleaning/ Inspection/Repair.....	4-9-2	Airframe	1-24, 2-1
Aft Firewall Assembly — Removal/Installation	4-9-1	Airframe (Flyable Storage)	E-14
Aft Firewall Pan — Removal/ Installation	4-9-3	Airframe (Intermediate Storage)	E-42
Aft Firewall Seal — Removal/ Installation	4-9-4	Airframe (Short Term Storage)	E-27
Aft Force Gradient, Fore-and- — Cleaning/Inspection/Repair	11-3-2	Airspeed Indicator, Standby — Cleaning/Inspection/Repair	8-2-5
Aft Force Gradient, Fore-and- — Removal/Installation	11-3-1	Airspeed Indicator, Standby — Removal/Installation	8-2-6
Aft Ng Cable Uniball Bearing and Cap — Removal/Cleaning/ Inspection/Installation	4-6-4	Alighting Gear	3-1
Aft Short Shaft Assembly — Cleaning/Inspection/Repair	6-6-5	Aliphatic Polyurethane Top Coatings (AVIM) — Use	2-2-65
Aft Short Shaft Assembly — Removal/Installation	6-6-4	Allocation Chart, Maintenance.....	B-1
Aft Support Bracket, Ng Engine Cable — Removal/Installation	4-6-5	Allocation Chart Remarks, Maintenance	B-12
Aft Transverse Beam — Cleaning/ Inspection/Repair.....	2-4-11	Alternate Skid Shoe — Conversion to	3-1-18
Aft Walking Beam, Directional Control — Removal/Installation	11-4-40	Alternate Skid Shoe — Removal/ Installation/Cleaning/Inspection	3-1-18.1
Aft Walking Beam Bearing (AVIM), Directional Control — Removal/Installation	11-4-41	Alternating Current Power and Distribution System.....	9-11
Aid Kit, First — Removal/ Inspection/Installation	14-1-2	Alternating Current Power and Distribution System, Introduction to	9-12
Air Data Systems, Introduction to Pitot-Static Instrument and	8-9	Alternating Current Power and Distribution System, Task List for	9-13
Air Data Systems, Pitot-Static Instrument and	8-8	Altimeter, Standby — Cleaning/ Inspection/Repair.....	8-2-1
Air Data Systems, Task List for Pitot-Static Instrument and	8-10	Altimeter, Standby — Removal/ Installation	8-2-2
Air Induction	4-5	Amplifier-Coupler Mounting Tray, HF — Removal/Installation	9-2-3
Air Induction Cowl — Cleaning/ Inspection/Repair.....	4-2-3	Anchor Ball Assembly, CPG Cyclic Stick Quick-Disconnect — Cleaning/Inspection/Repair	11-3-90
Air Induction Cowl (Compressor Inlet Temperature Sensor Installed) — Installation	4-2-5	Antibacklash Adapter Assembly, Torquemeter System — Installation	6-4-14
		Antibacklash Adapter Assembly, Torquemeter System — Removal	6-4-12

<u>Subject</u>	<u>Para/Task</u>
A (Cont)	
Antibacklash Adapter Assembly Components — Cleaning/ Inspection/Repair	6-4-13
Anticollision Light (Typical) — Installation	9-5-3
Anticollision Light (Typical) — Removal	9-5-2
Anticollision Light Flasher — Installation	9-5-5
Anticollision Light Flasher — Removal	9-5-4
Antidrive Lever, Main Rotor Controls — Installation	5-2-27
Antidrive Lever, Main Rotor Controls — Removal	5-2-25
Antidrive Lever (AVIM), Main Rotor Controls — Cleaning/ Inspection/Repair	5-2-26
Antidrive Link, Main Rotor Controls — Installation	5-2-30
Antidrive Link, Main Rotor Controls — Removal	5-2-28
Antidrive Link (AVIM), Main Rotor Controls — Cleaning/ Inspection/Repair	5-2-29
Approved Servicing Tables	1-43
Areas (Appendix Q), Engine	Q-9
Arm Rod End, Throttle — Removal/Installation	4-6-7
Arm, Droop Compensator Potentiometer — Cleaning/ Inspection/Repair	11-2-54
Armament, Mission Equipment	1-38
Armament Control Panel — Removal/Installation	9-8-1
Armament Control Panel, Integrally Lit Panel on — Removal/Installation	9-8-2
Armament Electrical Equipment	9-23
Armament Electrical Equipment, Introduction to	9-24
Armament Electrical Equipment, Task List for	9-25
Armament Electronics Unit (AEU) — Cleaning/Inspection/Repair	9-8-3
Armament Electronics Unit (AEU) — Removal/Installation	9-8-4
Armor Panels — Cleaning/ Inspection/Repair	2-2-43
Armor Panels (Typical) — Removal/Installation	2-2-42
Armor Panels, Crew — Cleaning/ Inspection/Repair	2-2-41
Armor Panels (Typical), Crew — Removal/Installation	2-2-40

<u>Subject</u>	<u>Para/Task</u>
A (Cont)	
Armor Seat Panel, Crew Seat and — Removal/Installation	2-2-33
Army Material to Prevent Enemy Use, Destruction of	1-4
Assurance/Quality Control (QA/ QC), Quality	1-6
Attach Bolts, Tailboom — Cleaning/Inspection	2-3-4
Attach Bolts, Tailboom — Cleaning/Inspection/Repair	2-3-5
Attach Fittings, Tailboom and Aft Fuselage — Cleaning/ Inspection/Repair	2-3-3
Attenuating Wire, Energy — Cleaning/Inspection/Repair	2-2-39
Attenuating Wire, Energy — Removal/Installation	2-2-38
Attitude Indicator, Standby — Cleaning/Inspection/Repair	8-2-3
Attitude Indicator, Standby — Removal/Installation	8-2-4
AUTO/MAN switch (FADEC) (OH-58D(R)) — Removal/Installation	9-6-16.1
Auto Transformer, 26V — Cleaning/Inspection/Repair	9-4-12
Auto Transformer, 26V — Removal/Installation	9-4-13
Autorotation RPM, Main Rotor — Adjustment	5-3-1
Auxiliary Circuit Breaker Panel — Lowering	9-6-81
Auxiliary Circuit Breaker Panel — Raising	9-6-82
Auxiliary Circuit Breaker Panel-Typical, Circuit Breaker — Removal/Installation	9-6-83
Auxiliary Control Panel, Integrally Lit Panel CPG — Installation	9-6-69
Auxiliary Control Panel, Integrally Lit Panel CPG — Removal	9-6-68
Auxiliary Control Panel, Integrally Lit Panel Pilot MFD — Installation	9-6-72
Auxiliary Control Panel, Integrally Lit Panel Pilot MFD — Removal	9-6-71
Auxiliary Control Panel-Typical, Switch CPG — Removal/ Installation	9-6-70
Auxiliary Control Panel-Typical, Switch Pilot MFD — Removal/ Installation	9-6-73
Avionic Cooling System Blower — Installation	9-1-3
Avionic Cooling System Blower — Removal	9-1-2

<u>Subject</u>	<u>Para/Task</u>	<u>Subject</u>	<u>Para/Task</u>
A (Cont)		B (Cont)	
Avionic Cooling System Components — Cleaning/ Inspection/Repair	9-1-1	Basic Weight Checklist, DD Form 365-1 —	G-8
Avionic Cooling System Flexible Air Duct Coupling — Removal/ Installation	9-1-6	Basic Weight and Balance Record, DD Form 365-3 —	G-10
Avionic Cooling System Motor Intake Duct Assembly — Removal/Installation	9-1-4	Battery Ballast — Removal/ Cleaning/Inspection/Installation	2-2-100
Avionic Cooling System Thermo Switch (Typical) — Removal/ Installation	9-1-5	Battery Preheat Indicator Light — Removal/Installation	9-3-6
Avionic System Mounts	9-5	Battery Preheat Indicator Lights — Cleaning/Inspection/Repair	9-3-5
Avionic System Mounts, Introduction to	9-6	Beacon, Underwater Acoustic — Cleaning/Inspection/Repair	14-1-4
Avionic System Mounts, Task List for	9-7	Beacon, Underwater Acoustic — Removal/Installation	14-1-3
Avionics, Mission Equipment	1-37	Beam, Aft Transverse — Cleaning/Inspection/Repair	2-4-11
Avionics Cooling System	9-2	Beam, Directional Control Aft Walking — Removal/Installation	11-4-40
Avionics Cooling System, Introduction to	9-3	Beam (AVIM), Forward Transverse — Cleaning/ Inspection/Repair	2-4-10
Avionics Cooling System, Task List for	9-4	Beam Assemblies (AVIM), Transverse — Removal/ Installation	2-4-12
Avionics Equipment (Flyable Storage)	E-10	Beam Assembly — Cleaning/ Inspection/Repair	2-4-7
Avionics Equipment (Intermediate Storage)	E-36	Beam Components, Aft Crosstube Support — Cleaning/Inspection/ Repair	3-1-45
Avionics Equipment (Short Term Storage)	E-21	Bearing, Collective Jackshaft Friction Adjustment — Removal/Installation	11-2-19
Avionics Support — Cleaning/ Inspection/Repair	2-2-82	Bearing, Directional Control Servoactuator Trunnion — Cleaning/Inspection/Repair	7-1-4
B		Bearing, Jackshaft Support Assembly — Cleaning/ Inspection/Repair	11-2-39
BRT Control Knob, Multiparameter Display — Removal/Installation	8-1-2	Bearing, Jackshaft Support Assembly — Removal/ Installation	11-2-38
Back Cushion — Cleaning/ Inspection/Repair	2-2-21	Bearing, Pivot Support — Cleaning/Inspection/Repair	11-3-43
Back Cushion — Removal/ Installation	2-2-20	Bearing (AVIM), Actuator Idler — Removal/Installation	11-4-29
Backrest (Typical) — Cleaning/ Inspection/Repair	2-2-30	Bearing (AVIM), CPG Cyclic Stick Plate Assembly — Removal/ Installation	11-3-72
Backrest (Typical) — Removal/ Installation	2-2-29	Bearing (AVIM), CPG Cyclic Stick Support Assembly — Removal/ Installation	11-3-70
Balance Data, Weight and	G-2	Bearing (AVIM), Directional Control Aft Walking Beam — Removal/Installation	11-4-41
Balancing, Main Rotor Tracking and	5-8		
Balancing, Main Rotor Tracking and Dynamic	5-3-2		
Ball and MMS Hoist Ball (Rapid Deployment), MMS Platform — Cleaning/Inspection/Repair	3-1-54		
Ballast, Battery —Removal/ Cleaning/Inspection/Installation	2-2-100		

<u>Subject</u>	<u>Para/Task</u>
B (Cont)	
Bearing (AVIM), Directional Control Pedal — Removal/ Installation	11-4-5
Bearing (AVIM), Pivot Assembly — Removal/Installation	11-3-49
Bearing (AVIM), Tail Rotor Bellcrank — Removal/ Installation	11-4-44
Bearing (AVIM), Torquemeter Support — Removal/Installation	6-4-7
Bearing (AVIM), Transducer Bellcrank — Removal/ Installation	11-4-16
Bearing (Typical), Cyclic Adjustable Tube Assembly Rod End — Removal/Installation	11-3-33
Bearing (Typical), Directional Control Adjustable Tube — Removal/Installation	11-4-27
Bearing Assembly, Torquemeter Support and — Installation	6-4-11
Bearing Assembly, Torquemeter Support and — Removal	6-4-5
Bearing Assembly, Trunnion — Cleaning/Inspection/Repair	11-2-8
Bearing Assembly, Trunnion — Removal/Installation	11-2-7
Bearing Hanger, Tail Rotor — Alignment	6-6-17
Bearing Hanger Assembly, Components of Shaft and — Cleaning/Inspection/Repair	6-6-10
Bearing Hanger Assembly, Shaft and — Removal/Installation	6-6-8
Bearing Hanger Brackets, Fan Shaft (Forward and Aft) — Removal/Installation	6-6-15
Bearing Hanger Supports, Tailboom — Cleaning/ Inspection/Repair	2-3-9
Bearing Hanger Supports, Tailboom — Removal/ Installation	2-3-10
Bearing Hanger/Segmented Shaft (Typical), Adapter/ — Removal/ Installation	6-6-9
Bearing Hangers/Bearings/ Impeller/Fan Shaft/Blower Housing — Cleaning/ Inspection/Repair	6-6-13
Bearing Hangers/Bearings/ Impeller/Fan Shaft/Blower Housing — Removal/ Installation	6-6-12

<u>Subject</u>	<u>Para/Task</u>
B (Cont)	
Bearing in Force Gradient Cylinder (AVIM) — Removal/ Installation	11-3-3
Bearing Sleeve (AVIM), Combining Bellcrank — Removal/Installation	11-4-12
Bearing and Sleeve (AVIM), Directional Control Force Gradient — Removal/ Installation	11-4-34
Bearings, CPG Cyclic Stick Housing Assembly — Removal/ Installation	11-3-82
Bearings, Pilot Collective Elbow Assembly — Removal/ Installation	11-2-41
Bearings (AVIM), Boosted Bellcrank Assembly — Removal/Installation	11-3-40
Bearings (AVIM), Pilot Cyclic Fitting Assembly — Removal/ Installation	11-3-61
Bellcrank, Directional Control Combining — Removal/ Installation	11-4-11
Bellcrank, Directional Control Lower Tunnel — Removal/ Installation	11-4-20
Bellcrank, Directional Control Pedal — Removal/Installation	11-4-7
Bellcrank, Directional Control Upper Tunnel — Removal/ Installation	11-4-23
Bellcrank, Tail Rotor — Removal/ Installation	11-4-43
Bellcrank Assembly, Boosted — Cleaning/Inspection/Repair	11-3-39
Bellcrank Assembly, Boosted — Removal/Installation	11-3-38
Bellcrank Assembly, Collective Boosted — Removal/ Installation	11-2-56
Bellcrank Assembly, Cyclic Mixer — Removal/Installation	11-3-28
Bellcrank Assembly (AVIM), Collective Boosted — Cleaning/ Inspection/Repair	11-2-57
Bellcrank Assembly (AVIM), Cyclic Mixer — Cleaning/ Inspection/Repair	11-3-31
Bellcrank Assembly Bearings, Input Cyclic Control — Cleaning/Inspection/Repair	11-3-35
Bellcrank Assembly Bearings, Input Cyclic Control — Removal/Installation	11-3-34

<u>Subject</u>	<u>Para/Task</u>
B (Cont)	
Bellcrank Assembly Bearings (AVIM), Boosted — Removal/ Installation	11-3-40
Bellcrank Assembly Bearings (AVIM), Input Cyclic Control — Repair.....	11-3-36
Bellcrank Assembly Clevis, Cyclic Mixer — Cleaning/Inspection/ Repair.....	11-3-29
Bellcrank Assembly Rod End Bearing, Cyclic Mixer — Cleaning/Inspection/Repair	11-3-30
Bellcrank Bearing (AVIM), Tail Rotor — Removal/Installation	11-4-44
Bellcrank Bearing (AVIM), Transducer — Removal/ Installation	11-4-16
Bellcrank Bearing Sleeve (AVIM), Combining — Removal/ Installation	11-4-12
Bellcrank and Support, Directional Control Transducer — Removal/Installation	11-4-15
Bellcrank Support Bushing (AVIM), Transducer — Removal/Installation	11-4-17
Bellcranks Idlers and Walking Beams, Flight Control — Cleaning/Inspection/Repair	11-5-2
Bellmouth — Removal/Installation	4-8-3
Bellows Assembly, Engine Control Cable — Removal/ Installation	4-6-6
Blade (AVIM), Main Rotor — Refinishing	5-1-41
Blade Assembly, Main Rotor and Hub	5-2
Blade Assembly, Main Rotor Hub and — Removal	5-1-1
Blade Inboard Erosion Strip, Main Rotor — Repair	5-1-47
Blade Inboard Erosion Strip (AVIM), Main Rotor — Repair/ Replacement	5-1-49
Blade Outboard Erosion Strip, Main Rotor — Repair.....	5-1-46
Blade Skin by Patching (AVIM), Main Rotor — Repair.....	5-1-40
Blade Trailing Edge, Main Rotor — Repair.....	5-1-45
Blade Trim Tab, Main Rotor — Repair.....	5-1-43
Blade Trim Tab (AVIM), Main Rotor — Removal/Installation	5-1-42
Blades, Main Rotor — De-Icing	1-4-12

<u>Subject</u>	<u>Para/Task</u>
B (Cont)	
Blades, Main Rotor — Folding/ Unfolding (Alternate Method)	1-7-6
Blades, Main Rotor — Folding/ Unfolding (Standard Method)	1-7-5
Blades, Main Rotor — Inspection	5-1-39
Blades, Main Rotor — Removal/ Cleaning/Inspection/Installation	5-1-5
Blades, Tail Rotor Hub and	5-11
Blades (AVIM), Tail Rotor — Cleaning/Inspection/Repair/ Refinishing	5-4-27
Blanket, Soundproofing Insulation — Removal/Installation	2-2-26
Bleed Air Heater Tube and Gasket — Removal/Installation	4-1-9
Bleed Air Tube Firesleeves — Cleaning/Inspection	12-1-14
Bleed Air Tube Firesleeves — Removal/Installation	12-1-13
Bleeding, Hydraulic System	7-5
Bleeding, Introduction to Hydraulic System.....	7-6
Bleeding, Task List for Hydraulic System.....	7-7
Block (Typical), Junction — Removal/Installation	9-6-51
Blower, Avionic Cooling System — Installation	9-1-3
Blower, Avionic Cooling System- Removal	9-1-2
Blower, Defogging — Removal/ Installation	12-2-4
Board (Typical), Terminal — Removal/Installation	9-6-49
Bolt, Main Rotor Blade — Cleaning/Inspection/Repair	5-1-9
Bolt, Mount — Cleaning/ Inspection/Repair.....	2-4-8
Bolts, Tailboom Attach — Cleaning/Inspection	2-3-4
Bolts, Tailboom Attach — Cleaning/Inspection/Repair	2-3-5
Bond (Appendix M), Test of	M-11
Bond Resistance (Appendix M).....	M-10
Bonding Classes (Appendix M), Electrical	M-3
Bonding Jumper (Typical), Access Door — Inspection/Repair/ Replacement	2-2-7
Bonding Methods (Appendix M), Electrical	M-7
Bonding (Appendix M), Intended Use of	M-1
Bonding (AVIM), Heat Resistant Adhesive and Structural — Use	2-2-66

<u>Subject</u>	<u>Para/Task</u>
B (Cont)	
Bonds (Appendix M), Resistance of Electrical	M-5
Boost Pump — Cleaning/ Inspection	10-1-18
Boost Pump — Installation	10-1-19
Boost Pump — Removal	10-1-17
Boosted Bellcrank Assembly — Cleaning/Inspection/Repair	11-3-39
Boosted Bellcrank Assembly — Removal/Installation	11-3-38
Boosted Bellcrank Assembly, Collective — Removal/ Installation	11-2-56
Boosted Bellcrank Assembly (AVIM), Collective — Cleaning/ Inspection/Repair	11-2-57
Boosted Bellcrank Assembly Bearings (AVIM) — Removal/ Installation	11-3-40
Boosted Tube, Directional Control — Removal/Installation	11-4-39
Boosted Tube Assembly — Removal/Installation	11-3-41
Boot, Main Rotor Controls — Removal/Installation	5-2-17
Boot, Tail Rotor Gearbox — Removal/Installation	5-5-16
Boot Assembly, Transmission Lower — Removal/Cleaning/ Inspection/Installation	6-3-3
Box, Pilot Collective Stick Control Panel — Cleaning/Inspection/ Repair	11-2-28
Bracket, Cargo Hook Emergency Release Cable — Removal/ Installation	13-1-4
Bracket, Tail Rotor Counterweight — Cleaning/Inspection/Repair	5-4-22
Bracket, Transfer Unit Mounting — Removal/Installation	9-2-9
Brackets (Forward and Aft), Fan Shaft Bearing Hanger — Cleaning/Inspection/Repair	6-6-16
Brake, Fore-and-Aft Magnetic — Cleaning/Inspection/Repair	11-3-5
Brake, Fore-and-Aft Magnetic — Removal/Installation	11-3-4
Brake, Lateral Magnetic — Cleaning/Inspection/Repair	11-3-10
Brake, Lateral Magnetic — Installation	11-3-11
Brake, Lateral Magnetic — Removal	11-3-9
Breaker, Remote Control Circuit — Installation	9-6-35

<u>Subject</u>	<u>Para/Task</u>
B (Cont)	
Breaker, Remote Control Circuit — Removal	9-6-34
Breaker (28 VDC AUX RCPT), Circuit — Removal/Installation	9-6-79
Breaker (Auxiliary Circuit Breaker Panel-Typical), Circuit — Removal/Installation	9-6-83
Breaker (DC Equipment Electrical Assembly-Typical), Circuit — Installation	9-6-33
Breaker (DC Equipment Electrical Assembly-Typical), Circuit — Removal	9-6-32
Breaker (Nose Compartment-Typical), Circuit — Installation	9-6-37
Breaker (Nose Compartment-Typical), Circuit — Removal	9-6-36
Breaker in Center Post Circuit Breaker Panel-(Typical), Circuit — Removal/Installation	9-6-8
Breaker in Overhead Console (Typical), Circuit — Removal/ Installation	9-6-7
Breakers (Typical), Circuit — Cleaning/Inspection/Repair	9-6-3
Breather, Tail Rotor Gearbox — Removal/Cleaning/Installation	6-7-3
Breather Tube Assembly — Removal/Installation	6-3-12
Brushes, Starter-Generator — Inspection/Replacement	9-3-13
Buffers (AVIM), Main Rotor Yoke — Cleaning/Inspection/Repair	5-1-34
Bulb, Torquemeter Temperature — Removal/Installation	6-4-9
Bumper, Vertical Fin — Installation	2-3-19
Bumpers (AVIM), Main Rotor Yoke — Cleaning/Inspection/ Repair	5-1-36
Bumpers (AVIM), Main Rotor Yoke — Removal/Installation	5-1-35
Bus Coupler or Terminator (OH-58D(R)), Data — Cleaning/ Inspection/Repair	9-6-60
Bus Coupler or Terminator (OH-58D), Data — Cleaning/ Inspection/Repair	9-6-59
Bus Coupler or Terminator (Typical) (OH-58D), Data — Removal/Installation	9-6-61
Bus Coupler or Terminator (Typical) (OH-58D(R)), Data — Removal/Installation	9-6-62

<u>Subject</u>	<u>Para/Task</u>	<u>Subject</u>	<u>Para/Task</u>
B (Cont)		C	
Bushing, Copilot/Gunner Collective Elbow Assembly — Removal/Installation	11-2-47	COMSEC Unit 1 and 2, Panel Assembly — Removal/Repair/ Installation	9-2-10
Bushing, Directional Control Lower Tunnel Bellcrank — Removal/Installation	11-4-21	COMSEC Unit Mount, HF — Removal/Installation	9-2-1
Bushing (AVIM), Actuator Support — Removal/Installation	11-4-31	CPG Auxiliary Switch Panel, Integrally Lit Panel — Installation	9-6-69
Bushing (AVIM), CPG Cyclic Stick Gimbal Assembly — Removal/ Installation	11-3-66	CPG Auxiliary Switch Panel, Integrally Lit Panel — Removal	9-6-68
Bushing (AVIM), Tail Rotor Pitch Horn — Replacement	5-4-21	CPG Auxiliary Switch Panel- Typical, Switch — Removal/ Installation	9-6-70
Bushing (AVIM), Transducer Bellcrank Support — Removal/ Installation	11-4-17	CPG Channel Select Switch — Removal/Installation	9-6-65
Bushing and Bearing (AVIM), Directional Control Pedal Bellcrank — Removal/ Installation	11-4-8	CPG Channel Select Switch, Integrally Lit Panel — Installation	9-6-67
Bushings, Collective Mixing Lever Assembly — Removal/ Installation	11-2-49	CPG Channel Select Switch, Integrally Lit Panel — Removal	9-6-66
Bushings, Collective/Cyclic Actuator Mount — Removal/ Installation	11-2-55	CPG Cyclic Quick-Disconnect Lever Bushings (AVIM) — Removal/Installation	11-3-77
Bushings, Directional Control Servoactuator Trunnion — Cleaning/Inspection/Repair	7-1-6	CPG Cyclic Stick — Removal/ Installation	11-3-63
Bushings, Directional Control Servoactuator Trunnion — Removal/Installation	7-1-5	CPG Cyclic Stick Fitting Assembly — Cleaning/ Inspection/Repair	11-3-67
Bushings (AVIM), CPG Cyclic Quick-Disconnect Lever — Removal/Installation	11-3-77	CPG Cyclic Stick Fitting Assembly Bearings (AVIM) — Removal/Installation	11-3-68
Bushings (AVIM), CPG Cyclic Stick Socket Housing — Removal/Installation	11-3-84	CPG Cyclic Stick Gimbal Assembly — Cleaning/ Inspection/Repair	11-3-65
Bushings (AVIM), Control Support Assembly — Removal/ Installation	11-2-59	CPG Cyclic Stick Gimbal Assembly Bushing (AVIM) — Removal/Installation	11-3-66
Bushings (AVIM), Link Assembly — Removal/Installation	11-3-79	CPG Cyclic Stick Housing Assembly — Cleaning/ Inspection/Repair	11-3-81
Bushings and Bearing (AVIM), Tail Rotor Pitch Change Lever — Removal/Installation	5-5-7	CPG Cyclic Stick Housing Assembly Bearings — Removal/Installation	11-3-82
Bushings/Pins/Inserts (AVIM), Main Rotor Grip — Removal/ Installation	5-1-29	CPG Cyclic Stick Latch Support and Anchor Ball Assembly — Removal/Installation	11-3-87
Bypass Valve (AVIM), Oil Cooler — Cleaning/Inspection/Repair	4-4-11	CPG Cyclic Stick Link Assembly — Cleaning/Inspection/Repair	11-3-78
Bypass Valve (AVIM), Oil Cooler — Disassembly/Assembly	4-4-10	CPG Cyclic Stick Plate Assembly — Cleaning/Inspection/Repair	11-3-71
Bypass Valve, Oil Cooler — Removal/Installation	4-4-9	CPG Cyclic Stick Plate Assembly Bearing (AVIM) — Removal/ Installation	11-3-72
		CPG Cyclic Stick Quick- Disconnect Anchor Ball Assembly — Cleaning/ Inspection/Repair	11-3-90

<u>Subject</u>	<u>Para/Task</u>
C (Cont)	
CPG Cyclic Stick Quick-Disconnect Latch Assembly — Cleaning/Inspection/Repair	11-3-88
CPG Cyclic Stick Quick-Disconnect Lever Assembly — Cleaning/Inspection/Repair	11-3-76
CPG Cyclic Stick Quick-Disconnect Lever and Link Assembly — Removal/Installation	11-3-75
CPG Cyclic Stick Quick-Disconnect Support Assembly — Cleaning/Inspection/Repair	11-3-89
CPG Cyclic Stick Socket Housing Assembly — Cleaning/Inspection/Repair	11-3-83
CPG Cyclic Stick Socket Housing Bushings (AVIM) — Removal/Installation	11-3-84
CPG Cyclic Stick Socket Housing/Housing Assembly — Removal/Installation	11-3-80
CPG Cyclic Stick Stud — Cleaning/Inspection/Repair	11-3-74
CPG Cyclic Stick Stud Assembly — Removal/Installation	11-3-73
CPG Cyclic Stick Support Assembly — Cleaning/Inspection/Repair	11-3-69
CPG Cyclic Stick Support Assembly Bearing (AVIM) — Removal/Installation	11-3-70
CPG Cyclic Stick Tube Assembly — Cleaning/Inspection/Repair	11-3-86
CPG Cyclic Stick Tube Assembly — Removal/Installation	11-3-85
CPG Seat, Electrical Connector Beneath — Removal/Installation	9-6-78
Cabin Roof Drain — Cleaning/Inspection/Repair	2-2-85
Cabin Roof Skylight — Cleaning/Inspection/Repair	2-2-75
Cabin Roof Skylight — Removal/Installation	2-2-74
Cable, Cargo Hook Emergency Release — Removal/Installation	13-1-3
Cable, Control — Removal/Installation	10-1-7
Cable, Heater Control — Cleaning/Inspection	12-1-10
Cable, Heater Control — Removal/Installation	12-1-9

<u>Subject</u>	<u>Para/Task</u>
C (Cont)	
Cable, Left Rescue Ladder Release — Removal/Installation	13-3-3
Cable, Ng Engine Control — Rigging	4-6-2
Cable, Rescue Ladder Release — Cleaning/Inspection/Repair	13-3-5
Cable, Right Rescue Ladder Release — Removal/Installation	13-3-4
Cable, Vent Control — Cleaning/Inspection/Repair	12-2-6
Cable, Vent Control — Removal/Installation	12-2-5
Cable (OH-58D), Ng Engine Control — Removal/Installation	4-6-1
Cable (OH-58D(R)), Ng Engine Control — Rigging	4-6-3
Cable Aft Support Bracket, Ng Engine — Removal/Installation	4-6-5
Cable Assembly, Standpipe and Ground — Cleaning/Inspection/Repair	6-4-2
Cabling (Avionics Compartment), Electrical Wiring/ — Removal/Installation	10-2-4
Calibration (TAMS), Static	9-7-16
Cap Assembly — Cleaning/Inspection/Repair	6-7-9
Cap Oil Seal Assembly, Forward — Removal/Cleaning/Inspection/Repair/Installation	6-5-2
Cap and Adapter Assembly, Oil Tank — Removal/Installation	4-4-8
Cap, Aft Ng Cable Uniball Bearing and — Removal/Cleaning/Inspection/Installation	4-6-4
Capabilities, and Features, Equipment Characteristics,	1-10
Capacitor on Terminal Junction (Typical), Resistor or — Removal/Installation	9-6-63
Cargo Hook Emergency Release Cable — Removal/Installation	13-1-3
Cargo Hook Emergency Release Cable Bracket — Removal/Installation	13-1-4
Cargo Hook Suspension Assembly	13-2
Cargo Hook Suspension Assembly — Cleaning/Inspection/Repair	13-1-5
Cargo Hook Suspension Assembly — Disassembly/Assembly	13-1-2

<u>Subject</u>	<u>Para/Task</u>	<u>Subject</u>	<u>Para/Task</u>
C (Cont)		C (Cont)	
Cargo Hook Suspension Assembly, Introduction to	13-3	Change Mechanism, Tail Rotor Pitch	5-14
Cargo Hook Suspension Assembly — Removal/ Installation	13-1-1	Change Mechanism, Tail Rotor Pitch — Inspection	5-5-2
Cargo Hook Suspension Assembly, Task List for	13-4	Channel Select Switch, CPG — Removal/Installation	9-6-65
Cargo Release Switch (Pilot Collective Stick Control) — Removal/Installation	9-6-43	Channel Select Switch, Integrally Lit Panel CPG — Installation	9-6-67
Case, Map — Removal/ Installation	2-2-25	Channel Select Switch, Integrally Lit Panel CPG — Removal	9-6-66
Categories of Storage	E-3	Charger-Monitor — Cleaning/ Inspection/Repair	9-3-7
Categories of Storage, Procedures Common to All	E-4	Charger-Monitor — Removal/ Installation	9-3-8
Cell, Fuel — Removal/Installation	10-2-1	Chart Remarks, Maintenance Allocation	B-12
Cell, Fuel	10-5	Chart, Definition of the Maintenance Allocation	B-2
Cell, Introduction to Fuel	10-6	Chart, Maintenance Allocation	B-1
Cell, Task List for Fuel	10-7	Chart, Use of the Maintenance Allocation	B-3
Cell (AVIM), Fuel — Cleaning/ Inspection/Repair	10-2-2	Check Valve — Removal/ Installation	10-1-25
Cell Support Assemblies, Fuel — Cleaning/Inspection/Repair/ Replace	10-2-3	Checklist, DD Form 365 -1 — Basic Weight	G-8
Cell Vent Hose, Fuel — Inspection	10-1-10	Chemical Conversion Coating for Aluminum — Use	2-2-67
Cell Vent Hose, Fuel — Removal/ Installation	10-1-11	Chip Detector, Lower — Removal/ Installation	6-3-11
Center Console Top Cover — Removal/Installation	2-2-99	Chip Detector, Tail Rotor Gearbox — Removal/Installation	6-7-10
Center Post Circuit Breaker Panel (Typical), Circuit Breaker in — Removal/Installation	9-6-8	Chip Detector, Upper — Removal/ Installation	6-3-8
Center Post Circuit Breaker Panel — Typical, Integrally Lit Panel Overhead Console or — Installation	9-6-14	Circuit Breaker (28 VDC AUX RCPT) — Removal/Installation	9-6-79
Center Post Circuit Breaker Panel — Typical, Integrally Lit Panel Overhead Console or — Removal	9-6-12	Circuit Breaker (Auxiliary Circuit Breaker Panel-Typical) — Removal/Installation	9-6-83
Center Post Duct and Panels — Cleaning/Inspection/Repair	2-2-70	Circuit Breaker (DC Equipment Electrical Assembly-Typical) — Installation	9-6-33
Center Post Duct and Panels — Removal/Installation	2-2-69	Circuit Breaker (DC Equipment Electrical Assembly-Typical) — Removal	9-6-32
Chafing Strip, Access Door — Cleaning/Inspection/Repair	2-2-5	Circuit Breaker (Nose Compartment-Typical) — Installation	9-6-37
Chain (TAMS), Signal Conditioning Unit and — Cleaning/Inspection/Repair	9-7-10	Circuit Breaker (Nose Compartment-Typical) — Removal	9-6-36
Change Control Tube, Tail Rotor Pitch — Removal	5-5-13	Circuit Breaker Panel, Auxiliary — Lowering	9-6-81
Change Levers, Tail Rotor Pitch — Installation	5-5-8	Circuit Breaker Panel, Auxiliary — Raising	9-6-82
Change Levers, Tail Rotor Pitch — Removal	5-5-5		

<u>Subject</u>	<u>Para/Task</u>
C (Cont)	
Circuit Breaker in Center Post Circuit Breaker Panel (Typical) — Removal/Installation	9-6-8
Circuit Breaker in Overhead Console (Typical) — Removal/ Installation	9-6-7
Circuit Breaker, Remote Control — Installation	9-6-35
Circuit Breaker, Remote Control — Removal	9-6-34
Circuit Breakers (Typical) — Cleaning/Inspection/Repair	9-6-3
Clamp, Collective Friction — Cleaning/Inspection/Repair	11-2-25
Clamp, Collective Jackshaft Friction — Removal/Installation	11-2-23
Clamps, Crosstube — Removal/ Installation	3-1-36
Classes (Appendix M), Electrical Bonding	M-3
Cleaning, Helicopter	1-4-11
Clearance Form F, DD Form 365- 4 — Weight and Balance	G-12
Clevis, Collective Adjustable Tube Assembly — Removal/ Installation	11-2-51
Clevis, Cyclic Mixer Bellcrank Assembly — Cleaning/ Inspection/Repair	11-3-29
Clevis, Directional Control Pedal Adjustment — Removal/ Inspection/Installation	11-4-9
Clevis, Fuel Control — Removal/ Installation	4-6-9
Clevis Adapter — Cleaning/ Inspection/Repair	7-1-8
Clevis Adapter — Removal/ Installation	7-1-7
Clock — Cleaning/Inspection/ Repair	8-5-3
Clock — Removal/Installation	8-5-4
Clogged Oil Drain Tubes — Removal/Installation	4-4-15
Closed Circuit — Refueling (Power Off or Rapid)	1-4-1
Closeout (Typical) — Cleaning/ Inspection/Repair	2-2-32
Closeout (Typical) — Removal/ Installation	2-2-31
Coating (AVIM), Flame Spray — Use	2-2-68
Coating for Aluminum, Chemical Conversion — Use	2-2-67
Coatings (AVIM), Aliphatic Polyurethane Top — Use	2-2-65

<u>Subject</u>	<u>Para/Task</u>
C (Cont)	
Collective Adjustable Tube Assembly — Removal/ Installation	11-2-50
Collective Adjustable Tube Assembly Clevis — Removal/ Installation	11-2-51
Collective Boosted Bellcrank Assembly — Removal/ Installation	11-2-56
Collective Boosted Bellcrank Assembly (AVIM) — Cleaning/ Inspection/Repair	11-2-57
Collective Control Input Valve Bellcrank Assembly — Cleaning/Inspection/Repair	11-2-68
Collective Control Input Valve Bellcrank Assembly — Removal/Installation	11-2-67
Collective Control Link Assembly — Cleaning/Inspection/Repair	11-2-53
Collective Control Link Assembly — Removal/Installation	11-2-52
Collective Control Panel Assembly Integrally Lit Panel — Removal/Installation	11-2-42
Collective Control System — Rigging	11-1-1
Collective Control System — Rigging (OH-58D(R))	11-1-2
Collective Controls	11-5
Collective Controls — Cleaning/ Inspection/Repair	11-2-1
Collective Controls, Introduction to	11-6
Collective Controls, Task List for	11-7
Collective Elbow Assembly, Copilot/Gunner — Removal/ Installation	11-2-43
Collective Elbow Assembly, Pilot — Removal/Installation	11-2-40
Collective Elbow Assembly Bushing, Copilot/Gunner — Removal/Installation	11-2-47
Collective Elbow Assembly Insert, Copilot/Gunner — Removal/ Installation	11-2-46
Collective Friction Clamp — Cleaning/Inspection/Repair	11-2-25
Collective Friction Knob and Shaft — Removal/Installation	11-2-64
Collective Friction Knob and Shaft Pin — Removal/Installation	11-2-65
Collective Grip Assembly, Copilot/ Gunner — Cleaning/Inspection/ Repair	11-2-12

<u>Subject</u>	<u>Para/Task</u>
C (Cont)	
Collective Hydraulic Actuator — Removal/Installation	7-1-9
Collective Jackshaft — Cleaning/ Inspection/Repair	11-2-17
Collective Jackshaft Adjustment Nut — Removal/Installation	11-2-18
Collective Jackshaft Assembly — Removal/Installation	11-2-16
Collective Jackshaft Friction Adjustment Bearing — Removal/Installation	11-2-19
Collective Jackshaft Friction Clamp — Removal/Installation	11-2-23
Collective Jackshaft Shim and Spacer — Removal/Installation	11-2-20
Collective Jackshaft Spacer — Cleaning/Inspection/Repair	11-2-21
Collective Jackshaft Throttle Tube Assembly — Removal/ Installation	11-2-22
Collective Lever, Main Rotor Controls — Installation	5-2-20
Collective Lever, Main Rotor Controls — Removal	5-2-18
Collective Lever (AVIM), Main Rotor Controls — Cleaning/ Inspection/Repair	5-2-19
Collective Link, Main Rotor Controls — Installation	5-2-23
Collective Link, Main Rotor Controls — Removal	5-2-21
Collective Link (AVIM), Main Rotor Controls — Cleaning/ Inspection/Repair	5-2-22
Collective Mixing Lever Assembly — Removal/Installation	11-2-48
Collective Mixing Lever Assembly Bushings — Removal/ Installation	11-2-49
Collective Pitch Link Assembly — Cleaning/Inspection/Repair	11-2-5
Collective Pitch Link Assembly — Removal/Installation	11-2-4
Collective Plate Assembly — Removal/Installation	11-2-66
Collective Stick Assembly, Copilot/Gunner — Removal/ Installation	11-2-15
Collective Stick Assembly, Pilot — Removal/Installation	11-2-26
Collective Stick Assembly Miscellaneous Parts, Pilot — Removal/Installation	11-2-27
Collective Stick Assembly Plug, Copilot/Gunner — Removal/ Installation	11-2-10

<u>Subject</u>	<u>Para/Task</u>
C (Cont)	
Collective Stick Cover, Pilot — Removal/Installation	11-2-3
Collective Stick Detent Button, Pilot — Cleaning/Inspection/ Repair	11-2-30
Collective Stick Elbow Assembly, Copilot/Gunner — Cleaning/ Inspection/Repair	11-2-45
Collective Stick Elbow Assembly, Pilot — Cleaning/Inspection/ Repair	11-2-33
Collective Stick Inner Tube Assembly, Copilot/Gunner — Cleaning/Inspection/Repair	11-2-13
Collective Stick Inner Tube Assembly, Pilot — Cleaning/ Inspection/Repair	11-2-34
Collective Stick Outer Tube Assembly, Copilot/Gunner — Cleaning/Inspection/Repair	11-2-14
Collective Stick Outer Tube Assembly, Pilot — Cleaning/ Inspection/Repair	11-2-32
Collective Stick Ring Gears, Pilot — Cleaning/Inspection/Repair	11-2-35
Collective Stick Throttle Arm, Copilot/Gunner — Cleaning/ Inspection/Repair	11-2-44
Collective Stick Throttle Arm, Pilot — Cleaning/Inspection/ Repair	11-2-36
Collective Stick Throttle Friction Plug, Pilot — Cleaning/ Inspection/Repair	11-2-29
Collective Stick Tiedown Strap — Removal/Installation	11-2-2
Collective Stick Tube Assemblies, Copilot/Gunner — Removal/ Installation	11-2-11
Collective Stick, Integrally Lit Panel Pilot — Removal/ Installation	9-6-41
Collective Stick-Typical, Switch, Pilot — Removal/Installation	9-6-42
Collective System, Minimum Friction on — Adjusting	11-2-24
Collective Transducers — Removal/Installation	11-2-9
Collective/Cyclic Actuator Mount Bushings — Removal/ Installation	11-2-55
Columns (Appendix D), Explanation of	D-2
Combat Damaged Fuel Cell (Intermediate Storage)	E-34

<u>Subject</u>	<u>Para/Task</u>
C (Cont)	
Combining Bellcrank, Directional Control — Removal/Installation	11-4-11
Combining Bellcrank Bearing Sleeve (AVIM) — Removal/Installation	11-4-12
Common Name, Names, and Designation	1-7
Compass, Standby — Cleaning/Inspection/Repair	8-5-1
Compass, Standby — Removal/Installation	8-5-2
Component Inspection	11-14
Component Inspection, Introduction to	11-15
Component Inspection, Task List for	11-16
Components, Aft Crosstube — Cleaning/Inspection/Repair	3-1-41
Components, Aft Crosstube — Removal/installation	3-1-39
Components, Aft Crosstube Support Beam — Cleaning/Inspection/Repair	3-1-45
Components, Antibacklash Adapter Assembly — Cleaning/Inspection/Repair	6-4-13
Components, Avionic Cooling System — Cleaning/Inspection/Repair	9-1-1
Components, Corrosion Prone	Q-8
Components, Forward Crosstube — Cleaning/Inspection/Repair	3-1-31
Components, Forward Crosstube — Removal/Installation	3-1-29
Components, Fuel System	10-2
Components, Introduction to Fuel System	10-3
Components, Task List for Fuel System	10-4
Components, Transmission — Cleaning/Inspection/Repair	6-3-1
Components (AVIM), Freewheeling Unit — Cleaning/Inspection/Repair	6-5-3
Components (AVIM), Torquemeter Support and Bearing Assembly — Cleaning/Inspection/Repair	6-4-8
Components Involved in an Accident	E-1
Components of Shaft and Bearing Hanger Assembly — Cleaning/Inspection/Repair	6-6-10
Compressor Inlet Temperature Sensor (OH-58D(R)) — Removal/Installation	4-2-15

<u>Subject</u>	<u>Para/Task</u>
C (Cont)	
Computer Mount, IFF — Removal/Installation	9-2-6
COMSEC Unit Mount, HF — Removal/Installation	9-2-1
Conditioning Unit (Mast Torque), Signal — Cleaning/Inspection/Repair	9-7-7
Conditioning Unit (Mast Torque), Signal — Installation	9-7-9
Conditioning Unit (Mast Torque), Signal — Removal	9-7-8
Conditioning Unit (TAMS), Signal — Installation	9-7-12
Conditioning Unit (TAMS), Signal — Removal	9-7-11
Conditioning Unit and Chain (TAMS), Signal — Cleaning/Inspection/Repair	9-7-10
Conditions	6-4
Conductive Coatings (AVIM), Copper Filled Polyurethane — Use	2-2-64
Cone, Main Rotor Hub Lower — Cleaning/Inspection/Repair	5-1-4
Cone Plate Assembly, Main Rotor Upper — Cleaning/Inspection/Repair	5-1-3
Configure Helicopter for Rapid Deployment	13-2-9
Configure Helicopter for Flight After Rapid Deployment	13-2-10
Configuration, Equipment	1-21
Connections (Overhead Console and Center Post Circuit Breaker Panel-Typical), Electrical — Inspection	9-6-13
Connector, DC External Power — Cleaning/Inspection/Repair	9-3-15
Connector, DC External Power — Removal/Installation	9-3-16
Connector, EMI Electrical — Removal/Installation/Repair	9-6-85
Connector (Beneath CPG Seat), Electrical — Removal/Installation	9-6-78
Connector (Digital Fuel Control Panel (OH-58D)), Integrally Lit Panel — Removal/Installation	9-6-19
Connector Pin Arrangement (Appendix F), Typical Electrical	F-5
Console, Overhead — Lowering	9-6-5
Console, Overhead — Raising	9-6-6
Console-Typical, Switch Forward Overhead — Removal/Installation	9-6-10

<u>Subject</u>	<u>Para/Task</u>	<u>Subject</u>	<u>Para/Task</u>
C (Cont)		C (Cont)	
Console Top Cover, Center — Removal/Installation	2-2-99	Control Knob (Overhead Console- Typical), Lighting — Removal/ Installation	9-6-9
Console or Instrument, Dimming Control — Balance	9-6-40	Control Lever, Fuel — Removal/ Installation	4-6-8
Console or Instrument, Dimming Control — Removal/Installation	9-6-39	Control Link Assembly, Collective — Cleaning/Inspection/Repair	11-2-53
Contaminated Hydraulic System — Flushing	7-8-3	Control Link Assembly, Collective — Removal/Installation	11-2-52
Control, Overload Sensing — Cleaning/Inspection/Repair	9-3-17	Control Panel, Armament — Removal/Installation	9-8-1
Control, Overload Sensing — Removal/Installation	9-3-18	Control Panel, Integrally Lit Panel MMS — Installation	9-6-75
Control (Console or Instrument), Dimming — Balance	9-6-40	Control Panel, Integrally Lit Panel MMS — Removal	9-6-74
Control (Console or Instrument), Dimming — Removal/ Installation	9-6-39	Control Panel, Integrally Lit Panel SCAS — Installation	9-6-25
Control (OH-58D), Electronic Supervisory — Cleaning/ Inspection/Repair	9-7-1	Control Panel, Integrally Lit Panel SCAS — Removal	9-6-24
Control (OH-58D), Electronic Supervisory — Installation	9-7-5	Control Panel, Integrally Lit Panel on Armament — Removal/ Installation	9-8-2
Control (OH-58D), Electronic Supervisory — Removal	9-7-3	Control Panel, MMS — Removal/ Installation	9-6-80
Control (QA/QC), Quality Assurance/Quality	1-6	Control Panel, SCAS — Installation	9-6-23
Control Bellcranks, Idlers, and Walking Beams, Flight — Cleaning/Inspection/Repair	11-5-2	Control Panel, SCAS — Removal	9-6-22
Control Cable — Removal/ Installation	10-1-7	Control Panel Assembly Integrally Lit Panel, Collective — Removal/Installation	11-2-42
Control Cable, Heater — Cleaning/Inspection	12-1-10	Control Panel Box, Pilot Collective Stick — Cleaning/ Inspection/Repair	11-2-28
Control Cable, Heater — Removal/Installation	12-1-9	Control Pedals, Directional — Cleaning/Inspection/Repair	11-4-4
Control Cable, Ng Engine — Removal/Installation	4-6-1	Control Pedals from Support Assembly, Directional — Removal	11-4-2
Control Cable (OH-58D), Ng Engine — Rigging	4-6-2	Control Servoactuator, Directional — Removal/Installation	7-1-1
Control Cable (OH-58D(R)), Ng Engine — Rigging	4-6-3	Control Servoactuators (Typical), Cyclic/Collective/Directional — Cleaning/Inspection/Repair	7-1-2
Control Cable, Vent — Cleaning/ Inspection/Repair	12-2-6	Control Support Assembly — Removal/Installation	11-2-58
Control Cable, Vent — Removal/ Installation	12-2-5	Control Support Assembly Bushings (AVIM) — Removal/ Installation	11-2-59
Control Cable Bellows Assembly, Engine — Removal/Installation	4-6-6	Control Supports, Flight — Cleaning/Inspection/Repair	11-5-3
Control Clevis, Fuel — Removal/ Installation	4-6-9	Control System, Collective — Rigging	11-1-1
Control Force Gradient, Directional — Cleaning/ Inspection/Repair	11-4-33	Control System, Collective — Rigging (OH-58D(R))	11-1-2
Control Force Gradient, Directional, — Removal/ Installation	11-4-32	Control System, Cyclic	11-8

<u>Subject</u>	<u>Para/Task</u>
C (Cont)	
Control System, Introduction to Cyclic	11-9
Control System, Task List for Cyclic	11-10
Control Systems, Environmental.....	1-36, 12-1
Control Transducer, Directional — Removal/Installation	11-4-18
Control Tube Driver Plate, Tail Rotor — Cleaning/Inspection/ Repair.....	5-4-6
Control Tube Driver Plate, Tail Rotor — Installation	5-4-7
Control Tube Driver Plate, Tail Rotor — Removal	5-4-5
Control Tube, Tail Rotor Pitch Change — Cleaning/Inspection/ Repair.....	5-5-14
Control Tube, Tail Rotor Pitch Change — Installation	5-5-15
Control Tubes, Flight — Cleaning/ Inspection/Repair.....	11-5-1
Control Unit, Fuel Quantity — Removal/Installation	9-6-64
Control Unit, Generator — Cleaning/Inspection/Repair	9-4-10
Control Unit, Generator — Removal/Installation	9-4-11
Control Unit (ECU) (OH-58D(R)), Electronic — Cleaning/ Inspection/Repair.....	9-7-2
Control Unit (ECU) (OH-58D(R)), Electronic — Installation	9-7-6
Control Unit (ECU) (OH-58D(R)), Electronic — Removal	9-7-4
Control Valve (Engine Oil System), Temperature — Cleaning/Inspection/Repair	6-8-23
Control Valve (Engine Oil System), Temperature — Removal/Installation	6-8-22
Controls, Adjustable Tube Assembly — Removal/ Installation	11-3-37
Controls, Collective	11-5
Controls, Collective — Cleaning/ Inspection/Repair.....	11-2-1
Controls, Cyclic — Rigging.....	11-1-3
Controls, Directional	11-11
Controls, Directional — Rigging	11-1-4
Controls, Flight	1-34, 11-1
Controls, Introduction to Collective	11-6
Controls, Introduction to Directional	11-12
Controls, Main Rotor	5-5
Controls, Powerplant	4-15

<u>Subject</u>	<u>Para/Task</u>
C (Cont)	
Controls, Task List for Collective	11-7
Controls, Task List for Directional	11-13
Controls Boot, Main Rotor — Removal/Installation	5-2-17
Controls Collective Lever, Main Rotor — Removal	5-2-18
Controls Collective Lever (AVIM), Main Rotor — Cleaning/ Inspection/Repair.....	5-2-19
Controls Collective Link, Main Rotor — Installation	5-2-23
Controls Collective Link, Main Rotor — Removal	5-2-21
Controls Collective Link (AVIM), Main Rotor — Cleaning/ Inspection/Repair.....	5-2-22
Controls Drive Hub Set, Main Rotor — Installation	5-2-12
Controls Drive Hub Set, Main Rotor — Removal	5-2-10
Controls Drive Hub Set (AVIM), Main Rotor — Cleaning/ Inspection/Repair.....	5-2-11
Controls Drive Lever, Main Rotor — Installation	5-2-9
Controls Drive Lever, Main Rotor — Removal	5-2-7
Controls Drive Lever (AVIM), Main Rotor — Cleaning/ Inspection/Repair.....	5-2-8
Controls Drive Pin, Main Rotor — Cleaning/Inspection	5-2-14
Controls Gimbal Ring, Main Rotor — Installation	5-2-16
Controls Gimbal Ring, Main Rotor — Removal	5-2-13
Controls Gimbal Ring (AVIM), Main Rotor — Cleaning/ Inspection/Repair.....	5-2-15
Controls Spacer, Main Rotor — Cleaning/Inspection/Repair	5-2-24
Conversion Coating for Aluminum, Chemical — Use	2-2-67
Cooler, Oil — Cleaning/ Inspection/Repair/Buildup.....	6-8-25
Cooler, Oil — Installation	6-8-26
Cooler, Oil — Removal	6-8-24
Cooler Duct, Oil — Cleaning/ Inspection/Repair.....	6-8-28
Cooler Duct, Oil — Removal/ Installation	6-8-27
Cooling System, Avionics	9-2
Cooling System, Introduction to Avionics	9-3
Cooling System, Task List for Avionics	9-4

<u>Subject</u>	<u>Para/Task</u>	<u>Subject</u>	<u>Para/Task</u>
C (Cont)		C (Cont)	
Cooling System Blower, Avionic — Installation	9-1-3	Corner Mount/Stop Nut/Stop- Down Assembly — Removal/ Installation	2-4-2
Cooling System Blower, Avionic — Removal	9-1-2	Corrosion Data, Fuselage	Q-12
Cooling System Components, Avionic — Cleaning/Inspection/ Repair	9-1-1	Corrosion Inspections	1-58
Cooling System Flexible Air Duct Coupling, Avionic — Removal/ Installation	9-1-6	Corrosion Prone Areas (Appendix Q), Inspection and Repair	Q-7
Cooling System Thermo Switch (Typical), Avionic — Removal/ Installation	9-1-5	Corrosion Prone Areas (Appendix Q), Purpose — Inspection and	Q-3
Copilot/Gunner Collective Elbow Assembly — Removal/ Installation	11-2-43	Corrosion Prone Components	Q-8
Copilot/Gunner Collective Elbow Assembly Bushing — Removal/ Installation	11-2-47	Corrosion Prone Honeycomb Panels	Q-11
Copilot/Gunner Collective Elbow Assembly Insert — Removal/ Installation	11-2-46	Corrosion Repair, Landing Gear	Q-14
Copilot/Gunner Collective Grip Assembly — Cleaning/ Inspection/Repair	11-2-12	Corrosion Repair, Tailboom	Q-13
Copilot/Gunner Collective Stick Assembly — Removal/ Installation	11-2-15	Countermeasures Set AN/ALQ- 144 IR Jammer Mount (Replacement Tailboom) — Installation	2-3-14
Copilot/Gunner Collective Stick Assembly Plug — Removal/ Installation	11-2-10	Countermeasures Set AN/ALQ- 144 IR Jammer Mount — Cleaning/Inspection/Repair	2-3-15
Copilot/Gunner Collective Stick Elbow Assembly — Cleaning/ Inspection/Repair	11-2-45	Countermeasures Set AN/ALQ- 144 IR Jammer Mount — Removal/Installation	2-3-13
Copilot/Gunner Collective Stick Inner Tube Assembly — Cleaning/Inspection/Repair	11-2-13	Counterweight Bracket, Tail Rotor — Cleaning/Inspection/Repair	5-4-22
Copilot/Gunner Collective Stick Outer Tube Assembly — Cleaning/Inspection/Repair	11-2-14	Counterweight Support, Tail Rotor — Cleaning/Inspection/Repair	5-4-17
Copilot/Gunner Collective Stick Throttle Arm — Cleaning/ Inspection/Repair	11-2-44	Coupler or Terminator (OH- 58D(R)), Data Bus — Cleaning/ Inspection/Repair	9-6-60
Copilot/Gunner Collective Stick Tube Assemblies — Removal/ Installation	11-2-11	Coupler or Terminator (Typical) (OH-58D(R)), Data Bus — Removal/Installation	9-6-62
Copilot/Gunner Cyclic Stick Lockout Catch — Removal/ Installation	11-3-27	Coupler or Terminator (Typical) (OH-58D), Data Bus — Removal/Installation	9-6-61
Copper Filled Polyurethane Conductive Coatings (AVIM) — Use	2-2-64	Coupler or Terminator (OH-58D), Data Bus — Cleaning/ Inspection/Repair	9-6-59
Core (AVIM), Main Rotor Blade — Repair	5-1-51	Coupling Angle, Tail Rotor Driveshaft — Inspection and Driveshaft Alignment	6-6-18
Corner Mount — Cleaning/ Inspection	2-4-4	Coupling Disc Pack — Removal/ Cleaning/Installation	6-6-6
		Coupling Disc Pack Assemblies — Inspection	6-6-7
		Coupling Half (Typical), Quick- Disconnect Self-Sealing — Removal/Installation	7-4-6
		Coupling Halves, Quick- Disconnect — Cleaning/ Inspection/Repair	7-4-7
		Cover, Center Console Top — Removal/Installation	2-2-99

<u>Subject</u>	<u>Para/Task</u>
C (Cont)	
Cover, Mast Mounted Sight (MMS) Support — Removal/Installation	5-2-40
Cover, Pilot Collective Stick — Removal/Installation	11-2-3
Cover and Chain (TAMS Signal Conditioning Unit) — Removal/Installation	9-7-13
Cover Latch Assembly, Hydraulic Reservoir — Removal/Installation	7-7-3
Cover Pin and Cap Gasket, Hydraulic Reservoir — Removal/Installation	7-7-2
Covers, Helicopter — Installation	1-7-3
Covers, Raschel Seat — Removal/Installation	2-2-24
Cowl, Air Induction — Cleaning/Inspection/Repair	4-2-3
Cowl (Compressor Inlet Installed, Air Induction — Installation	4-2-5
Cowl (Compressor Inlet Temperature Sensor Installed), Air Induction — Removal	4-2-2
Cowl Access Door, Air Induction — Cleaning/Inspection/Repair	4-2-7
Cowl Access Door, Air Induction — Removal/Installation	4-2-6
Cowl Assembly Exhaust Duct (AVIM), Engine — Removal/Cleaning/Inspection/Repair/Installation	2-2-54
Cowl Assembly Side Door, Engine — Cleaning/Inspection/Repair	2-2-53
Cowl Assembly Side Door, Engine — Removal/Installation	2-2-52
Cowl Assembly, Engine — Cleaning/Inspection/Repair	2-2-51
Cowl Assembly, Engine — Removal/Installation	2-2-50
Cowlings, Fairings, Access Panels, and Doors	2-2
Crew Armor Panels (Typical) — Removal/Installation	2-2-40
Crew Armor Panels — Cleaning/Inspection/Repair	2-2-41
Crew Door — Removal/Installation	2-2-10
Crew Door Hinge Assembly — Disassembly/Assembly	2-2-14
Crew Door Hinge Components — Cleaning/Inspection/Repair	2-2-15
Crew Door Jettison Mechanism — Cleaning/Inspection/Repair	2-2-12

<u>Subject</u>	<u>Para/Task</u>
C (Cont)	
Crew Door Jettison Mechanism — Removal/Installation	2-2-11
Crew Door Latch Assembly — Cleaning/Inspection/Repair	2-2-13
Crew Door Window — Removal/Installation	2-2-88
Crew Door Window Snap Vent — Removal/Installation	2-2-9
Crew Doors — Cleaning/Inspection/Repair	2-2-87
Crew Seat and Armor Seat Panel — Removal/Installation	2-2-33
Crosshead, Tail Rotor — Cleaning/Inspection/Repair	5-4-9
Crosshead, Tail Rotor — Installation	5-4-10
Crosshead, Tail Rotor — Removal	5-4-8
Crosstube, Aft — Cleaning/Inspection/Repair	3-1-35
Crosstube, Aft — Removal/Installation	3-1-33
Crosstube, Forward — Cleaning/Inspection/Repair	3-1-26
Crosstube, Forward — Removal/Installation	3-1-24
Crosstube, Landing Gear — Inspection for Deflection	3-1-3
Crosstube (Nonstandard), Aft — Cleaning/Inspection/Repair	3-1-38
Crosstube (Nonstandard), Forward — Cleaning/Inspection/Repair	3-1-28
Crosstube (Rapid Deployment), Aft — Cleaning/Inspection/Repair	3-1-37
Crosstube (Rapid Deployment), Aft — Removal/Installation	3-1-34
Crosstube (Rapid Deployment), Forward — Cleaning/Inspection/Repair	3-1-27
Crosstube (Rapid Deployment), Forward — Removal/Installation	3-1-25
Crosstube (Rapid Deployment), Landing Gear — Inspection for Deflection	3-1-4
Crosstube Clamps — Removal/Installation	3-1-36
Crosstube Components (Rapid Deployment), Aft — Removal/Installation	3-1-40
Crosstube Components (Rapid Deployment), Forward — Cleaning/Inspection/Repair	3-1-60

<u>Subject</u>	<u>Para/Task</u>	<u>Subject</u>	<u>Para/Task</u>
C (Cont)		C (Cont)	
Crosstube Components (Rapid Deployment), Forward — Removal/Installation	3-1-30	Cushion, Back — Removal/Installation	2-2-20
Crosstube Components, Aft — Cleaning/Inspection/Repair	3-1-41	Cushion, Seat — Cleaning/Inspection/Repair	2-2-28
Crosstube Components, Aft — Removal/Installation	3-1-39	Cushion, Seat — Removal/Installation	2-2-27
Crosstube Components, Forward — Cleaning/Inspection/Repair	3-1-31	Cushion, Seatback — Cleaning/Inspection/Repair	2-2-23
Crosstube Components, Forward — Removal/Installation	3-1-29	Cushion, Seatback — Removal/Installation	2-2-22
Crosstube Strap (Rapid Deployment), Forward — Cleaning/Inspection/Repair	3-1-59	Cutter, Upper Wire — Cleaning/Inspection/Repair	2-2-63
Crosstube Strap, Forward — Cleaning/Inspection/Repair	3-1-7	Cutter, Upper Wire — Removal/Installation	2-2-62
Crosstube Support Assembly (Rapid Deployment), Aft — Cleaning/Inspection/Repair	3-1-9	Cutter (Rapid Deployment), Lower Wire — Cleaning/Inspection/Repair	2-2-61
Crosstube Support Assembly (Rapid Deployment), Forward — Cleaning/Inspection/Repair	3-1-10	Cutter (Rapid Deployment), Lower Wire — Removal/Installation	2-2-60
Crosstube Support Assembly, Aft — Cleaning/Inspection/Repair	3-1-8	Cyclic Adjustable Tube Assembly Rod End Bearing (Typical) — Removal/Installation	11-3-33
Crosstube Support Beam Bushing (AVIM), Aft — Removal/Installation	3-1-47	Cyclic Control Bellcrank Assembly Bearings (AVIM), Input — Removal/Installation	11-3-36
Crosstube Support Beam Components, Aft — Cleaning/Inspection/Repair	3-1-45	Cyclic Control Bellcrank Assembly Bearings, Input — Cleaning/Inspection/Repair	11-3-35
Crosstube Support Beam and Components (Rapid Deployment), Aft — Cleaning/Inspection/Repair	3-1-46	Cyclic Control Bellcrank Assembly Bearings, Input — Removal/Installation	11-3-34
Crosstube Support Beam and Components (Rapid Deployment), Aft — Removal/Installation	3-1-44	Cyclic Control System, Introduction to	11-9
Crosstube Support Beam and Components, Aft — Removal/Installation	3-1-43	Cyclic Control System, Task List for	11-10
Crosstube Support Strap, Aft (Rapid Deployment Gear) — Installation/Removal	1-6-4	Cyclic Control System	11-8
Crosstube Support Strap, Aft (Standard Gear) — Installation/Removal	1-6-3	Cyclic Controls — Rigging	11-1-3
Crosstube Supports (Rapid Deployment), Aft — Cleaning/Inspection/Repair	3-1-42	Cyclic Fitting Assembly Bearings (AVIM), Pilot — Removal/Installation	11-3-61
Crosstube Supports (Rapid Deployment), Forward — Cleaning/Inspection/Repair	3-1-32	Cyclic Friction Knob and Shaft — Cleaning/Inspection/Repair	11-3-25
Cushion, Back — Cleaning/Inspection/Repair	2-2-21	Cyclic Friction Knob and Shaft — Installation	11-3-26
		Cyclic Friction Knob and Shaft — Removal	11-3-24
		Cyclic Grip, Pilot — Removal/Installation	9-6-84
		Cyclic Grip-Typical, Switch — Removal/Installation	9-6-53
		Cyclic Hydraulic Actuator — Removal/Installation	7-1-10
		Cyclic Mixer Bellcrank Assembly — Removal/Installation	11-3-28

<u>Subject</u>	<u>Para/Task</u>
C (Cont)	
Cyclic Mixer Bellcrank Assembly (AVIM) — Cleaning/Inspection/Repair.....	11-3-31
Cyclic Mixer Bellcrank Assembly Clevis — Cleaning/Inspection/Repair.....	11-3-29
Cyclic Mixer Bellcrank Assembly Rod End Bearing — Cleaning/Inspection/Repair.....	11-3-30
Cyclic Pivot Assembly, Pilot — Cleaning/Inspection/Repair	11-3-45
Cyclic Stick, CPG — Removal/Installation	11-3-63
Cyclic Stick Fitting Assembly Bearings (AVIM), CPG — Removal/Installation	11-3-68
Cyclic Stick Fitting Assembly, CPG — Cleaning/Inspection/Repair.....	11-3-67
Cyclic Stick Fitting Assembly, Pilot — Cleaning/Inspection/Repair.....	11-3-60
Cyclic Stick Fitting Assembly, Pilot — Removal/Installation	11-3-58
Cyclic Stick Gimbal Assembly, CPG — Cleaning/Inspection/Repair.....	11-3-65
Cyclic Stick Gimbal/Fitting/Plate and Support Assemblies — Removal/Installation	11-3-64
Cyclic Stick Housing Assembly, CPG — Cleaning/Inspection/Repair.....	11-3-81
Cyclic Stick Indicator Pin Retainer — Cleaning/Inspection/Repair	11-3-46
Cyclic Stick Latch Support and Anchor Ball Assembly, CPG — Removal/Installation	11-3-87
Cyclic Stick Link Assembly, CPG — Cleaning/Inspection/Repair	11-3-78
Cyclic Stick Lockout Catch, Copilot/Gunner — Removal/Installation	11-3-27
Cyclic Stick Pivot Assembly, Pilot — Removal/Installation	11-3-42
Cyclic Stick Pivot Bearing Retainer — Cleaning/Inspection/Repair	11-3-44
Cyclic Stick Pivot Bearing, Pilot — Cleaning/Inspection/Repair	11-3-51
Cyclic Stick Pivot Bearing, Pilot — Removal/Installation	11-3-50
Cyclic Stick and Pivot Support Assembly, Pilot — Removal/Installation	11-3-57

<u>Subject</u>	<u>Para/Task</u>
C (Cont)	
Cyclic Stick Plate Assembly, CPG — Cleaning/Inspection/Repair	11-3-71
Cyclic Stick Stop, Pilot — Cleaning/Inspection/Repair	11-3-48
Cyclic Stick Stud Assembly, CPG — Removal/Installation	11-3-73
Cyclic Stick Stud, CPG — Cleaning/Inspection/Repair	11-3-74
Cyclic Stick Support Assembly, CPG — Cleaning/Inspection/Repair.....	11-3-69
Cyclic Stick Tube Assembly, CPG — Cleaning/Inspection/Repair	11-3-86
Cyclic Stick Tube Assembly, CPG — Removal/Installation	11-3-85
Cyclic Torque Tube — Cleaning/Inspection/Repair.....	11-3-13
Cyclic Torque Tube — Installation	11-3-14
Cyclic Torque Tube — Removal.....	11-3-12
Cyclic Transducer Spacer — Cleaning/Inspection/Repair	11-3-47
Cyclic Transducer, Fore-and-Aft — Installation	11-3-23
Cyclic Transducer, Fore-and-Aft — Removal	11-3-22
Cyclic Transducer, Lateral — Installation	11-3-21
Cyclic Transducer, Lateral — Removal	11-3-20
Cyclic Tube Assembly, Pilot — Cleaning/Inspection/Repair	11-3-59
Cyclic Yoke — Cleaning/Inspection/Repair.....	11-3-19
Cyclic Yoke, Left — Installation	11-3-16
Cyclic Yoke, Left — Removal	11-3-15
Cyclic Yoke, Right — Installation.....	11-3-18
Cyclic Yoke, Right — Removal.....	11-3-17
Cyclic/Collective/Directional Control Servoactuators (Typical) — Cleaning/Inspection/Repair.....	7-1-2
Cylinder (AVIM), Bearing in Force Gradient — Removal/Installation	11-3-3

D

DC Equipment Electrical Assembly-Typical, Circuit Breaker — Installation	9-6-33
DC Equipment Electrical Assembly-Typical, Circuit Breaker — Removal	9-6-32
DC External Power Connector — Cleaning/Inspection/Repair	9-3-15

<u>Subject</u>	<u>Para/Task</u>	<u>Subject</u>	<u>Para/Task</u>
D (Cont)		D (Cont)	
DC External Power Connector — Removal/Installation	9-3-16	Defuel Valve — Removal/ Installation	10-1-20
DC External Power Door Switch — Cleaning/Inspection/Repair	9-3-11	Defueling Helicopter (Using Defueling Truck).....	1-4-4
DC External Power Door Switch — Removal/Installation	9-3-12	Defueling Helicopter (Using Defueling Valve).....	1-4-3
DC Power (Battery and External) — Application/Removal	1-6-5	Deployment, Rapid.....	13-5
DC Voltage Sensor — Cleaning/ Inspection/Repair.....	9-3-21	Deployment, Configure Helicopter for Flight After Rapid	13-2-10
DC Voltage Sensor — Removal/ Installation	9-3-22	Deployment, Configure Helicopter for Rapid	13-2-9
DD Form 365 — Record of Weight and Balance Personnel	G-7	Deployment Jacks, Rapid — Cleaning/Inspection/Repair	13-2-7
DD Form 365-1 — Basic Weight Checklist	G-8	Deployment Skid Gear, Rapid — Mooring Helicopter	1-7-2
DD Form 365-2 — Aircraft Weighing Record.....	G-9	Depreservation (Flyable Storage)	E-16
DD Form 365-3 — Basic Weight and Balance Record.....	G-10	Depreservation (Intermediate Storage).....	E-45
DD Form 365-4 — Weight and Balance Clearance Form F	G-12	Depreservation (Short Term Storage).....	E-30
Damaged Fuel Cell (Intermediate Storage), Combat	E-34	Description, Functional.....	1-22
Damper (AVIM), Main Rotor Hub — Removal/Installation	5-1-15	Description — Equipment List (Appendix F)	F-7
Dampers (AVIM), Main Rotor Hub — Cleaning/Inspection/Repair	5-1-16	Description (Columns 1 and 2), System Group Number and.....	B-6
Data, Equipment	1-13	Description (Flyable Storage)	E-6
Data, Fuselage Corrosion	Q-12	Description (Intermediate Storage).....	E-31
Data, Loading.....	G-11	Description (Short Term Storage)	E-17
Data, Weight and Balance	G-2	Description of Major Components, Location and	1-11
Data, Weight/Balance and Load.....	G-5	Designation, Common Name, Names, and	1-7
Data (Appendix F), Wiring	F-1	Destruction of Army Material to Prevent Enemy Use	1-4
Data Bus Coupler or Terminator (OH-58D(R)) — Cleaning/ Inspection/Repair.....	9-6-60	Detector, Lower Chip — Removal/ Installation	6-3-11
Data Bus Coupler or Terminator (Typical) (OH-58D(R)) — Removal/Installation	9-6-62	Detector, Upper Chip — Removal/ Installation	6-3-8
Data Bus Coupler or Terminator (Typical) (OH-58D) — Removal/Installation	9-6-61	Detent Button, Pilot Collective Stick — Cleaning/Inspection/ Repair.....	11-2-30
Data Bus Coupler or Terminator (OH-58D) — Cleaning/ Inspection/Repair.....	9-6-59	Differences (250-C30R/3 Engine with FADEC vs. 250-C30R/1 Series), Powerplant	1-27
Definition (Appendix G), Weight	G-4	Differences Between Models OH- 58D and OH-58D(R).....	1-12
Definition of the Maintenance Allocation Chart	B-2	Differential Pressure Switch (OH- 58D(R)), Fuel — Removal/ Installation	4-6-11
Definitions (Appendix M)	M-2	Differential Pressure Switch, Fuel — Inspection	4-6-12
Definitions (Appendix Q)	Q-2	Differential Pressure Switch, Fuel — Removal/Installation	4-6-10
Defogging Blower — Removal/ Installation	12-2-4	Digital Fuel Control Panel (OH- 58D) — Installation	9-6-16
Defuel Valve — Cleaning/ Inspection/Repair.....	10-1-21		

<u>Subject</u>	<u>Para/Task</u>
D (Cont)	
Digital Fuel Control Panel (OH-58D) — Removal	9-6-15
Digital Fuel Control Panel (OH-58D) -Typical, Pushbutton Switch — Removal/Installation	9-6-20
Digital Fuel Control Panel (OH-58D), Integrally Lit Panel — Installation	9-6-18
Digital Fuel Control Panel (OH-58D), Integrally Lit Panel — Removal	9-6-17
Digital Fuel Control Panel (OH-58D), Integrally Lit Panel Connector — Removal/Installation	9-6-19
Dimming Control (Console or Instrument) — Balancing	9-6-40
Dimming Control (Console or Instrument) — Removal/Installation	9-6-39
Dimming Resistor, Position Light — Installation	9-5-13
Dimming Resistor, Position Light — Removal	9-5-12
Diode (Typical) — Removal/Installation	9-6-38
Direct Current Power and Distribution System, Introduction to	9-9
Direct Current Power and Distribution System, Task List for	9-10
Direct Current Power and Distribution System	9-8
Directional Control Actuator Input Idler Assembly — Removal/Installation	11-4-28
Directional Control Adjustable Tube Bearing (Typical) — Removal/Installation	11-4-27
Directional Control Aft Walking Beam — Removal/Installation	11-4-40
Directional Control Aft Walking Beam Bearing (AVIM) — Removal/Installation	11-4-41
Directional Control Boosted Tube — Removal/Installation	11-4-39
Directional Control Combining Bellcrank — Removal/Installation	11-4-11
Directional Control Eyebolt and Spring — Removal/Inspection/Installation	11-4-13
Directional Control Force Gradient — Cleaning/Inspection/Repair	11-4-33

<u>Subject</u>	<u>Para/Task</u>
D (Cont)	
Directional Control Force Gradient — Removal/Installation	11-4-32
Directional Control Force Gradient Bearing and Sleeve (AVIM) — Removal/Installation	11-4-34
Directional Control Force Gradient Spring/Guides/Shaft — Removal/Installation	11-4-36
Directional Control Force Gradient Switch — Removal/Installation	11-4-35
Directional Control Forward Walking Beam — Removal/Installation	11-4-25
Directional Control Lower Aft Horizontal Tube — Removal/Installation	11-4-19
Directional Control Lower Forward Horizontal Tube — Removal/Installation	11-4-14
Directional Control Lower Tunnel Bellcrank — Removal/Installation	11-4-20
Directional Control Lower Tunnel Bellcrank Bushing — Removal/Installation	11-4-21
Directional Control Nonboosted Tube — Removal/Installation	11-4-26
Directional Control Pedal Adjustment Clevis — Removal/Inspection/Installation	11-4-9
Directional Control Pedal Adjustment and Support Assembly — Removal/Installation	11-4-1
Directional Control Pedal Bearing (AVIM) — Removal/Installation	11-4-5
Directional Control Pedal Bellcrank — Removal/Installation	11-4-7
Directional Control Pedal Bellcrank Bushing and Bearing (AVIM) — Removal/Installation	11-4-8
Directional Control Pedal Tube — Removal/Installation	11-4-10
Directional Control Pedals — Cleaning/Inspection/Repair	11-4-4
Directional Control Pedals from Support Assembly — Removal	11-4-2
Directional Control Pedals in Support Assembly — Installation	11-4-6
Directional Control Rotary Actuator — Cleaning/Inspection/Repair	11-4-38

<u>Subject</u>	<u>Para/Task</u>
D (Cont)	
Directional Control Rotary Actuator — Removal/Installation	11-4-37
Directional Control Servoactuator — Removal/Installation	7-1-1
Directional Control Servoactuator Support — Removal/Installation	11-4-30
Directional Control Servoactuator Trunnion Bearing — Cleaning/Inspection/Repair	7-1-4
Directional Control Servoactuator Trunnion Bearing — Removal/Installation	7-1-3
Directional Control Servoactuator Trunnion Bushings — Cleaning/Inspection/Repair	7-1-6
Directional Control Servoactuator Trunnion Bushings — Removal/Installation	7-1-5
Directional Control Tailboom Tube — Removal/Installation	11-4-42
Directional Control Transducer — Removal/Installation	11-4-18
Directional Control Transducer Bellcrank and Support — Removal/Installation	11-4-15
Directional Control Upper Horizontal Tube — Removal/Installation	11-4-24
Directional Control Upper Tunnel Bellcrank — Removal/Installation	11-4-23
Directional Control Vertical Tube — Removal/Installation	11-4-22
Directional Controls	11-11
Directional Controls — Rigging	11-1-4
Directional Controls, Introduction to	11-12
Directional Controls, Task List for	11-13
Disc Pack Assembly, Coupling — Inspection	6-6-7
Disc Pack, Coupling — Removal/Cleaning/Installation	6-6-6
Display (MPD), Multiparameter — Cleaning/Inspection/Repair	8-1-8
Display (MPD), Multiparameter — Disassembly/Assembly	8-1-7
Display (MPD), Multiparameter — Removal/Installation	8-1-4
Display BRT Control Knob, Multiparameter — Removal/Installation	8-1-2
Display Fuses (Typical), Multiparameter — Removal/Installation	8-1-3

<u>Subject</u>	<u>Para/Task</u>
D (Cont)	
Display Front Panel (MPD), Multiparameter — Removal/Installation	8-1-4
Display Lamps (MPD), Multiparameter — Replacement	8-1-6
Distribution System, Alternating Current Power and	9-11
Distribution System, Direct Current Power and	9-8
Door, Access — Cleaning/Inspection/Repair	2-2-1
Door, Aft Electrical/Avionics — Cleaning/Inspection/Repair	2-2-90
Door, Aft Electrical/Avionics — Removal/Installation	2-2-89
Door, Aft Fairing Assembly Engine Oil Service — Removal/Installation	2-2-59
Door, Air Induction Cowl Access — Cleaning/Inspection/Repair	4-2-7
Door, Air Induction Cowl Access — Removal/Installation	4-2-6
Door, Crew — Removal/Installation	2-2-10
Door, Hinge Halves/Quick-Disconnect Pin/Lanyard, Access — Cleaning/Inspection/Repair	2-2-4
Door Bonding Jumper (Typical), Access — Inspection/Repair/Replacement	2-2-7
Door Chafing Strip, Access — Cleaning/Inspection/Repair	2-2-5
Door Hinge Assembly, Crew — Disassembly/Assembly	2-2-14
Door Hinge Components, Crew — Cleaning/Inspection/Repair	2-2-15
Door Jettison Mechanism, Crew — Cleaning/Inspection/Repair	2-2-12
Door Jettison Mechanism, Crew — Removal/Installation	2-2-11
Door Latch Assembly, Access — Cleaning/Inspection/Repair	2-2-3
Door Latch Assembly, Crew — Cleaning/Inspection/Repair	2-2-13
Door Switch, AC External Power — Cleaning/Inspection/Repair	9-4-1
Door Switch, AC External Power — Removal/Installation	9-4-2
Door Switch, DC External Power — Cleaning/Inspection/Repair	9-3-11
Door Switch, DC External Power — Removal/Installation	9-3-12
Door Turnlock Receptacles, Access — Inspection/Repair/Replacement	2-2-8

<u>Subject</u>	<u>Para/Task</u>
D (Cont)	
Door Window, Crew — Removal/ Installation	2-2-88
Door Window Snap Vent, Crew — Removal/Installation	2-2-9
Doorframe/Windshield Frame Assembly — Repair	2-2-73
Doors, Access — Removal/ Installation	2-2-6
Doors, Cowlings, Fairings, and Access Panels	2-2
Doors, Crew — Cleaning/ Inspection/Repair	2-2-87
Down Assembly, Stop- — Cleaning/Inspection/Repair	2-4-6
Drain Valve, Oil — Cleaning/ Inspection/Repair	6-8-21
Drain Valve, Oil — Removal/ Installation	6-8-20
Draining, Transmission/ Freewheeling Unit	1-4-7
Drain Valve, Oil Tank — Removal/Installation	4-4-7
Drain, Cabin Roof — Cleaning/ Inspection/Repair	2-2-85
Drains (Appendix Q), Aircraft	Q-10
Drive Hub Set (AVIM), Main Rotor Controls — Cleaning/ Inspection/Repair	5-2-11
Drive Hub Set, Main Rotor Controls — Installation	5-2-12
Drive Hub Set, Main Rotor Controls — Removal	5-2-10
Drive Lever, Main Rotor Controls — Installation	5-2-9
Drive Lever, Main Rotor Controls — Removal	5-2-7
Drive Lever (AVIM), Main Rotor Controls — Cleaning/ Inspection/Repair	5-2-8
Drive Link, Main Rotor Controls — Installation	5-2-6
Drive Link, Main Rotor Controls — Removal	5-2-4
Drive Link (AVIM), Main Rotor Controls — Cleaning/ Inspection/Repair	5-2-5
Drive Pin, Main Rotor Controls — Cleaning/Inspection	5-2-14
Drive Ring Set (AVIM), Main Rotor — Cleaning/Inspection/ Repair	5-1-31
Drive Ring Set (AVIM), Main Rotor — Removal/Installation	5-1-30
Drive Train System — Identification of Foreign Material	6-1-4

<u>Subject</u>	<u>Para/Task</u>
D (Cont)	
Drive Train System	1-29, 6-1
Drive Train System (Flyable Storage)	E-11
Drive Train System (Intermediate Storage)	E-37
Drive Train System (Short Term Storage)	E-22
Driver Plate, Tail Rotor Control Tube — Cleaning/Inspection/ Repair	5-4-6
Driver Plate, Tail Rotor Control Tube — Installation	5-4-7
Driver Plate, Tail Rotor Control Tube — Removal	5-4-5
Driveshaft Assembly, Hydraulic Pump — Cleaning/Inspection/ Repair	7-8-4
Driveshaft Assembly, Hydraulic Pump Alternate Method — Inspection	7-8-5
Driveshaft Coupling Angle, Tail Rotor — Inspection and Driveshaft Alignment	6-6-18
Driveshaft Covers, Tail Rotor — Cleaning/Inspection/Repair	2-3-12
Driveshaft Covers, Tail Rotor — Removal/Installation	2-3-11
Driveshaft, Engine to Transmission	6-6
Driveshaft, Engine-to- Transmission — Cleaning/ Inspection/Repair	6-2-2
Driveshaft, Engine-to- Transmission — Removal/ Installation	6-2-1
Driveshaft, Starter-Generator — Inspection	9-3-1
Driveshafts, Tail Rotor	6-18
Driveshafts, Task List for Tail Rotor	6-20
Droop Compensator Potentiometer Arm — Cleaning/Inspection/Repair	11-2-54
Droop Stop Plug, Main Rotor — Cleaning/Inspection/Repair	5-1-11
Droop Stop Plugs, Main Rotor — Removal/Installation	5-1-10
Droop Stop Stud, Main Rotor — Cleaning/Inspection/Repair	5-1-13
Droop Stop Studs, Main Rotor — Removal/Installation	5-1-12
Dual Tachometer — Cleaning/ Inspection/Repair	8-1-17
Dual Tachometer — Disassembly/ Assembly	8-1-15

<u>Subject</u>	<u>Para/Task</u>
D (Cont)	
Dual Tachometer — Removal/ Installation	8-1-14
Dual Tachometer Lamps — Replacement	8-1-16
Duct Assembly, Avionic Cooling System Motor Intake — Removal/Installation	9-1-4
Duct and Panels, Center Post — Cleaning/Inspection/Repair	2-2-70
Duct and Panels, Center Post — Removal/Installation	2-2-69
Duct, Exhaust — Removal/ Installation	4-3-1
Duct, Oil Cooler — Cleaning/ Inspection/Repair	6-8-28
Duct, Oil Cooler — Removal/ Installation	6-8-27
Ducts, Heating and Ventilation System — Cleaning/Inspection/ Repair	12-1-11
Ducts, Heating and Ventilation System — Removal/Installation	12-1-12
Ducts (AVIM), Exhaust — Cleaning/Inspection/Repair	4-3-2
Duplex Bearing Nut, Input Adapter Nut/Input — Cleaning/ Inspection/Repair	6-7-7
Dynamic Balancing, Main Rotor Tracking and	5-3-2

E

ECU, Electronic Control Unit — Installation	9-7-5
ECU, Electronic Control Unit — Removal	9-7-4
EMI Electrical Connector — Removal/Installation/Repair	9-6-85
Edge Adhesive Fill (AVIM), Weight Pocket — Repair	5-1-52
Elbow Assembly Bearings, Pilot Collective — Removal/ Installation	11-2-41
Elbow Assembly, Copilot/Gunner Collective — Removal/ Installation	11-2-43
Elbow Assembly, Copilot/Gunner Collective Stick — Cleaning/ Inspection/Repair	11-2-45
Elbow Assembly, Pilot Collective — Removal/Installation	11-2-40
Elbow Assembly, Pilot Collective Stick — Cleaning/Inspection/ Repair	11-2-33

<u>Subject</u>	<u>Para/Task</u>
E (Cont)	
Electrical Assembly Electrical Connector, Standpipe — Replacement	6-4-4
Electrical Assembly, Standpipe — Installation	6-4-3
Electrical Assembly, Standpipe — Removal	6-4-1
Electrical Bonding Classes (Appendix M)	M-3
Electrical Bonding Methods (Appendix M)	M-7
Electrical Bonds (Appendix M), Resistance of	M-5
Electrical Connections (Overhead Console and Center Post Circuit Breaker Panel-Typical) — Inspection	9-6-13
Electrical Connector (Beneath CPG Seat) — Removal/ Installation	9-6-78
Electrical Connector Pin Arrangement (Appendix F), Typical	F-5
Electrical Connector, EMI — Removal/Installation/Repair	9-6-85
Electrical Connector, Standpipe Electrical Assembly — Replacement	6-4-4
Electrical Connectors (TM 55- 1500-343-23), Universal Weapons Pylon	Q-15
Electrical Equipment, Armament	9-23
Electrical Equipment, Introduction to Armament	9-24
Electrical Equipment, Introduction to Miscellaneous	9-18
Electrical Equipment, Miscellaneous — Cleaning/ Inspection/Repair	9-6-2
Electrical Equipment, Miscellaneous	9-17
Electrical Equipment, Powerplant and Transmission	9-20
Electrical Equipment, Task List for Armament	9-25
Electrical Equipment, Task List for Miscellaneous	9-19
Electrical System	1-20, 9-1
Electrical System (Flyable Storage)	E-13
Electrical System (Intermediate Storage)	E-39
Electrical System (Short Term Storage)	E-24
Electrical Systems	1-32

<u>Subject</u>	<u>Para/Task</u>
E (Cont)	
Electrical Wiring/Cabling (Avionics Compartment) — Removal/ Installation	10-2-4
Electrical/Avionics Door, Aft — Cleaning/Inspection/Repair	2-2-90
Electrical/Avionics Door, Aft — Removal/Installation	2-2-89
Electronic Control Unit (ECU) (OH-58D(R)) — Cleaning/ Inspection/Repair	9-7-2
Electronic Control Unit (ECU) (OH-58D(R)) — Installation	9-7-6
Electronic Control Unit (ECU) (OH-58D(R)) — Removal	9-7-4
Electronic Supervisory Control (OH-58D) — Cleaning/ Inspection/Repair	9-7-1
Electronic Supervisory Control (OH-58D) — Installation	9-7-5
Electronic Supervisory Control (OH-58D) — Removal	9-7-3
Electronics Assembly (IEA), Interface — Cleaning/ Inspection/Repair	9-8-5
Electronics Assembly (IEA), Interface — Removal/ Installation	9-8-6
Electronics Assembly (IEA) Shock Mount, Interface — Removal/ Installation	9-8-7
Electronics Unit (AEU), Armament — Cleaning/Inspection/Repair	9-8-3
Electronics Unit (AEU), Armament — Removal/Installation	9-8-4
Electronics Unit (MSSEU), Missile Sight Subsystem — Cleaning/Inspection/Repair	9-8-8
Electronics Unit (MSSEU), Missile Sight Subsystem — Removal/ Installation	9-8-9
Electronics (RHE), Remote Hellfire — Cleaning/Inspection/ Repair	9-8-10
Electronics (RHE), Remote Hellfire — Removal/Installation	9-8-11
Elements, Filter — Replacement	7-3-2
Emergency Equipment	1-39
Emergency Equipment, Introduction to Miscellaneous	14-3
Emergency Equipment, Miscellaneous	14-1
Emergency Equipment, Task List for Miscellaneous	14-4
Emergency Equipment (Intermediate Storage)	E-41

<u>Subject</u>	<u>Para/Task</u>
E (Cont)	
Emergency Equipment (Short Term Storage)	E-26
Emergency Release Cable Bracket, Cargo Hook — Removal/Installation	13-1-4
Emergency Release Cable, Cargo Hook — Removal/Installation	13-1-3
Energy Attenuating Wire — Cleaning/Inspection/Repair	2-2-39
Energy Attenuating Wire — Removal/Installation	2-2-38
Engage Switch, ICS — Removal/ Installation	9-6-87
Engage Switch, SCAS Pitch and Roll — Removal/Installation	9-6-26
Engage Switch, SCAS Yaw — Removal/Installation	9-6-27
Engine	1-17
Engine — Assembly	4-1-4
Engine — Disassembly	4-1-3
Engine (Flyable Storage)	E-7
Engine (Intermediate Storage)	E-32
Engine (Short Term Storage)	E-18
Engine Accessory Gearbox Seal — Removal/Installation	4-1-10
Engine Areas (Appendix Q)	Q-9
Engine Assembly	4-2
Engine Assembly (OH-58D(R)) — Installation	4-1-6
Engine Assembly (OH-58D(R)) — Removal	4-1-2
Engine Assembly (OH-58D) — Installation	4-1-5
Engine Assembly (OH-58D) — Removal	4-1-1
Engine Control Cable Bellows Assembly — Removal/ Installation	4-6-6
Engine Cowl Assembly — Cleaning/Inspection/Repair	2-2-51
Engine Cowl Assembly — Removal/Installation	2-2-50
Engine Cowl Assembly Exhaust Duct (AVIM) — Removal/ Cleaning/Inspection Repair/ Installation	2-2-54
Engine Cowl Assembly Side Door — Cleaning/Inspection/Repair	2-2-53
Engine Cowl Assembly Side Door — Removal/Installation	2-2-52
Engine Mount Legs — Cleaning/ Inspection	4-7-3
Engine Mount Legs — Removal/ Installation	4-7-1
Engine Mount Trunnion — Cleaning/Inspection/Repair	4-7-2

<u>Subject</u>	<u>Para/Task</u>
E (Cont)	
Engine Mounts.....	4-18
Engine Oil Pressure Transducer — Checking.....	4-1-8
Engine Oil System.....	1-16, 4-11
Engine Oil System — Draining.....	1-4-5
Engine Oil System — Servicing.....	1-4-6
Engine Scavenge Oil Filter Assembly — Removal/ Installation.....	4-4-17
Engine Scavenge Oil Filter Element — Removal/ Installation.....	4-4-16
Engine to Transmission Driveshaft.....	6-6
Engine Vent and Fuel Supply Hoses — Removal/Installation.....	10-1-8
Engine, Rotor, and Transmission Instruments, Introduction to.....	8-3
Engine, Rotor, and Transmission Instruments.....	8-2
Engine to Transmission — Alignment.....	4-7-4
Engine to Transmission Driveshaft — Cleaning/ Inspection/Repair.....	6-2-2
Engine to Transmission Driveshaft — Removal/ Installation.....	6-2-1
Engine/Rotor/Transmission Instruments — Cleaning/ Inspection.....	8-1-1
Environmental Control Systems.....	1-36
Environmental Control Systems.....	12-1
Equipment, Armament Electrical.....	9-23
Equipment, Emergency.....	1-39, 14-1
Equipment, Miscellaneous Electrical — Cleaning/ Inspection/Repair.....	9-6-2
Equipment, Miscellaneous Electrical.....	9-17
Equipment, Mission.....	13-1
Equipment, Weighing.....	G-15
Equipment (Armament), Mission.....	1-38
Equipment (Avionics), Mission.....	1-37
Equipment (Column 5 and Section III), Tools and Test.....	B-9
Equipment (Flyable Storage), Avionics.....	E-10
Equipment (Intermediate Storage), Avionics.....	E-36
Equipment (Intermediate Storage), Emergency.....	E-41
Equipment (Short Term Storage), Avionics.....	E-21
Equipment (Short Term Storage), Emergency.....	E-26

<u>Subject</u>	<u>Para/Task</u>
E (Cont)	
Equipment Characteristics, Capabilities, and Features.....	1-10
Equipment Configuration.....	1-21
Equipment Data.....	1-13
Equipment Improvement Recommendations (EIR), Reporting.....	1-8
Equipment List (Appendix F), Description -.....	F-7
Equipment List (Appendix F).....	F-6
Erosion Shield, Main Rotor Blade — Repair.....	5-1-44
Erosion Strip (AVIM), Main Rotor Blade Inboard — Repair/ Replacement.....	5-1-49
Erosion Strip Splice Cover (AVIM), Main Rotor Blade — Removal/Replacement.....	5-1-50
Erosion Strip Splice Cover, Main Rotor Blade — Repair.....	5-1-48
Erosion Strip, Main Rotor Blade Inboard — Repair.....	5-1-47
Erosion Strip, Main Rotor Blade Outboard — Repair.....	5-1-46
Exhaust Duct — Removal/ Installation.....	4-3-1
Exhaust Duct (AVIM) — Cleaning/ Inspection/Repair.....	4-3-2
Exhaust Duct (AVIM), Engine Cowl Assembly — Removal/ Cleaning/Inspection/Repair/ Installation.....	2-2-54
Exhaust System.....	4-8
Expandable Bolt, Lanyard on Main Rotor — Removal/ Installation.....	5-1-7
Expandable Bolt, Main Rotor — Cleaning/Inspection/Repair.....	5-1-8
Expandable Bolt, Main Rotor — Removal/Installation.....	5-1-6
Expandable and Durable Items List.....	D-1
Explanation of Columns (Appendix D).....	D-2
Extension, Aft Fairing — Cleaning/Inspection/Repair.....	2-2-58
Extension, Aft Fairing — Removal/Installation.....	2-2-56
External Fuselage Fittings — Cleaning/Inspection/Repair.....	2-2-96
External Power Connector, DC — Cleaning/Inspection/Repair.....	9-3-15
External Power Connector, DC — Removal/Installation.....	9-3-16
External Power Door Switch, AC — Cleaning/Inspection/Repair.....	9-4-1

<u>Subject</u>	<u>Para/Task</u>
E (Cont)	
External Power Door Switch, AC — Removal/Installation	9-4-2
External Power Receptacle, AC — Cleaning/Inspection/Repair	9-4-3
External Power Receptacle, AC — Removal/Installation	9-4-4
External Power Reset Switch, AC — Cleaning/Inspection/Repair	9-4-5
External Power Reset Switch, AC — Removal/Installation	9-4-6
External Power, AC — Application	1-6-6
External Power, DC — Application	1-6-5
Extinguisher, Fire — Removal/ Inspection/Installation	14-1-1
Eyebolt (Rapid Deployment) — Cleaning/Inspection/Repair	3-1-23
Eyebolt (Rapid Deployment) — Removal/Installation	3-1-21
Eyebolt — Cleaning/Inspection/ Repair	3-1-22
Eyebolt — Removal/Installation	3-1-20
Eyebolt and Spring, Directional Control — Removal/Inspection/ Installation	11-4-13

F

FADEC (OH-58D(R)), AUTO/MAN Switch — Removal/Installation	9-6-16.1
Fairing Assembly Seal, Forward — Removal/Installation	2-2-49
Fairing Assembly, Aft — Cleaning/Inspection/Repair	2-2-57
Fairing Assembly, Aft — Removal/Installation	2-2-55
Fairing Assembly, Forward — Cleaning/Inspection/Repair	2-2-48
Fairing Assembly, Forward — Removal/Installation	2-2-47
Fairing Extension, Aft — Cleaning/Inspection/Repair	2-2-58
Fairing Extension, Aft — Removal/Installation	2-2-56
Fairing Seals, Oil Cooler — Removal/Installation	4-4-14
Fairleads, Tailboom — Inspection/ Removal/Installation	2-3-7
Fan (AVIM), Particle Separator — Cleaning/Inspection/Repair	4-2-10
Fan (AVIM), Particle Separator — Disassembly/Assembly	4-2-9
Fan Shaft Assembly — Installation	6-6-14
Fan Shaft Assembly — Removal	6-6-11

<u>Subject</u>	<u>Para/Task</u>
F (Cont)	
Fan Shaft Bearing Hanger Brackets (Forward and Aft) — Cleaning/Inspection/Repair	6-6-16
Fan Shaft Bearing Hanger Brackets (Forward and Aft) — Removal/Installation	6-6-15
Fan Shaft/Blower Housing, Bearing Hangers/Bearings/ Impeller/ — Cleaning/ Inspection/Repair	6-6-13
Fan Shaft/Blower Housing, Bearing Hangers/Bearings/ Impeller/ — Removal/ Installation	6-6-12
Fan and Duct, Particle Separator — Installation	4-2-11
Fan and Duct, Particle Separator — Removal	4-2-8
Features, Equipment Characteristics, Capabilities, and	1-10
Fill (AVIM), Weight Pocket Edge Adhesive — Repair	5-1-52
Filter Assemblies, Hydraulic	7-8
Filter Assemblies, Introduction to Hydraulic	7-9
Filter Assemblies, Task List for Hydraulic	7-10
Filter Assembly, Hydraulic — Removal/Cleaning/Inspection/ Repair/Installation	7-3-1
Filter Bypass Valve Assembly, Oil — Cleaning/Inspection/Repair	6-8-10
Filter Bypass Valve Assembly, Oil — Removal/Installation	6-8-9
Filter Elements — Replacement	7-3-2
Filter Inlet Hose, Oil — Removal/ Installation	6-8-13
Filter Manifold, Oil — Cleaning/ Inspection/Repair	6-8-5
Filter Manifold, Oil — Removal/ Installation	6-8-4
Filters, Transmission Oil — Removal/Cleaning/Installation	6-8-3
Fin — Repair/Touchup	2-3-21
Fin — Stowing/Unstowing	1-7-8
Fin Assembly — Cleaning/ Inspection/Repair	2-3-16
Fin Assembly (AVIM) — Repairing Minor Puncture Damage and Rebonding of Sleeve	2-3-17
Fin Bumper, Vertical — Installation	2-3-19
Fin Skin (AVIM) — Repairing Voids	2-3-20

<u>Subject</u>	<u>Para/Task</u>
F (Cont)	
Fin Support (Pivotable) — Removal/Installation	2-3-23
Fin Support Fittings — Removal/ Installation	2-3-24
Fin, Pivotable — Removal/ Installation	2-3-22
Fire Extinguisher — Removal/ Inspection/Installation	14-1-1
Firesleeves, Bleed Air Firesleeves — Removal/Installation	12-1-13
Firesleeves, Bleed Air Tube — Cleaning/Inspection	12-1-14
Firewall, Aft	4-24
Firewall, Aft — Cleaning/ Inspection/Repair	4-9-2
Firewall, Forward	4-21
Firewall, Forward — Cleaning/ Inspection/Repair	4-8-2
Firewall Assembly, Aft — Removal/Installation	4-9-1
Firewall Assembly, Forward — Removal/Installation	4-8-1
Firewall Pan, Aft — Removal/ Installation	4-9-3
Firewall Seal, Aft — Removal/ Installation	4-9-4
Firewall Seals, Forward — Removal/Installation	4-8-4
First Aid Kit — Removal/ Inspection/Installation	14-1-2
Fitting, UWP Mount — Cleaning/ Inspection/Repair	2-2-94
Fitting (Rapid Deployment), Tiedown — Removal/ Installation	3-1-55
Fitting Assembly Bearings (AVIM), CPG Cyclic Stick — Removal/Installation	11-3-68
Fitting Assembly, CPG Cyclic Stick — Cleaning/Inspection/ Repair	11-3-67
Fitting Assembly, Pilot Cyclic Stick — Cleaning/Inspection/ Repair	11-3-60
Fitting Assembly, Pilot Cyclic Stick — Removal/Installation	11-3-58
Fittings (Rapid Deployment), Tow — Removal/Installation	3-1-49
Fittings, External Fuselage — Cleaning/Inspection/Repair	2-2-96
Fittings, Fin Support — Removal/ Installation	2-3-24
Fittings, Pitot-Static Tubing and — Cleaning/Inspection/Repair	8-3-1
Fittings, Pitot-Static Tubing and — Installation	8-3-3

<u>Subject</u>	<u>Para/Task</u>
F (Cont)	
Fittings, Pitot-Static Tubing and — Removal	8-3-2
Fittings, Pylon — Cleaning/ Inspection/Repair	6-3-15
Fittings, Pylon — Removal/ Installation	6-3-14
Fittings, Tow — Cleaning/ Inspection/Repair	3-1-50
Fittings, Tow — Removal/ Installation	3-1-48
Fittings, and Quick-Disconnects, Hydraulic Hoses, Lines, Tubes,	7-11
Fittings, and Quick-Disconnects, Task List for Hydraulic Hoses, Lines, Tubes,	7-13
Flame Spray Coating (AVIM) — Use	2-2-68
Flasher, Anticollision Light — Installation	9-5-5
Flasher, Anticollision Light — Removal	9-5-4
Flex Hose (Typical) — Removal/ Installation	7-4-3
Flexible Air Duct Coupling, Avionic Cooling System — Removal/Installation	9-1-6
Flight Control Bellcranks, Idlers, and Walking Beams — Cleaning/Inspection/Repair	11-5-2
Flight Control Supports — Cleaning/Inspection/Repair	11-5-3
Flight Control Tubes — Cleaning/ Inspection/Repair	11-5-1
Flight Controls	1-34, 11-1
Flight Instruments	8-5
Flight Instruments, Introduction to	8-6
Flight Instruments, Task List for	8-7
Flight Safety Parts	1-60
Flight Safety Parts Program	1-61
Floodlight (Typical) — Installation	9-5-7
Floodlight (Typical) — Removal	9-5-6
Folding Horizontal Stabilizer — Cleaning/Inspection/Repair	2-3-26
Folding Horizontal Stabilizer — Removal/Installation	2-3-27
Folding Horizontal Stabilizer Hinge Area — Cleaning/ Inspection/Repair	2-3-29
Folding Horizontal Stabilizer Upper Surface — Cleaning/ Inspection	2-3-25
Folding Horizontal Stabilizer, Left/ Right — Removal/Installation	2-3-28
Footswitch (Typical) — Removal/ Installation	9-6-76

<u>Subject</u>	<u>Para/Task</u>
F (Cont)	
Force Gradient, Directional Control — Cleaning/Inspection/Repair.....	11-4-33
Force Gradient, Directional Control — Removal/Installation	11-4-32
Force Gradient, Fore-and-Aft — Cleaning/Inspection/Repair	11-3-2
Force Gradient, Fore-and-Aft — Removal/Installation	11-3-1
Force Gradient, Lateral — Cleaning/Inspection/Repair	11-3-7
Force Gradient, Lateral — Removal/Installation	11-3-6
Force Gradient Bearing and Sleeve (AVIM), Directional Control — Removal/Installation	11-4-34
Force Gradient Cylinder (AVIM), Bearing in — Removal/Installation	11-3-3
Force Gradient Spring/Guides/Shaft, Directional Control — Removal/Installation	11-4-36
Force Gradient Switch, Directional Control — Removal/Installation	11-4-35
Force Gradient Tube Assembly — Cleaning/Inspection/Repair	11-3-8
Force Trim Switch, SCAS — Removal/Installation	9-6-29
Fore-and-Aft Cyclic Transducer — Installation	11-3-23
Fore-and-Aft Cyclic Transducer — Removal	11-3-22
Fore-and-Aft Force Gradient — Cleaning/Inspection/Repair	11-3-2
Fore-and-Aft Force Gradient — Removal/Installation	11-3-1
Fore-and-Aft Magnetic Brake — Cleaning/Inspection/Repair	11-3-5
Fore-and-Aft Magnetic Brake — Removal/Installation	11-3-4
Formation Lights (Typical), NVG — Removal/Installation	9-5-14
Formation Lights Switch, NVG — Removal/Installation	9-5-15
Forms (Appendix G)	G-6
Forms and Records, Maintenance	1-3
Forward Cap Oil Seal Assembly — Removal/Cleaning/Inspection/Repair/Installation	6-5-2
Forward Crosstube — Cleaning/Inspection/Repair.....	3-1-26
Forward Crosstube — Removal/Installation	3-1-24
Forward Crosstube (Nonstandard) — Cleaning/Inspection/Repair	3-1-28

<u>Subject</u>	<u>Para/Task</u>
F (Cont)	
Forward Crosstube (Rapid Deployment) — Cleaning/Inspection/Repair.....	3-1-27
Forward Crosstube (Rapid Deployment) — Removal/Installation	3-1-25
Forward Crosstube Components — Cleaning/Inspection/Repair	3-1-31
Forward Crosstube Components — Removal/Installation	3-1-29
Forward Crosstube Components (Rapid Deployment) — Cleaning/Inspection/Repair	3-1-60
Forward Crosstube Components (Rapid Deployment) — Removal/Installation	3-1-30
Forward Crosstube Strap — Cleaning/Inspection/Repair	3-1-7
Forward Crosstube Strap (Rapid Deployment) — Cleaning/Inspection/Repair.....	3-1-59
Forward Crosstube Support Assembly (Rapid Deployment) — Cleaning/Inspection/Repair	3-1-10
Forward Crosstube Supports (Rapid Deployment) — Cleaning/Inspection/Repair	3-1-32
Forward Fairing Assembly — Cleaning/Inspection/Repair	2-2-48
Forward Fairing Assembly — Removal/Installation	2-2-47
Forward Fairing Assembly Seal — Removal/Installation	2-2-49
Forward Firewall	4-21
Forward Firewall — Cleaning/Inspection/Repair	4-8-2
Forward Firewall Assembly — Removal/Installation	4-8-1
Forward Firewall Seals — Removal/Installation	4-8-4
Forward Overhead Console-Typical, Switch — Removal/Installation	9-6-10
Forward Overhead Console-Typical, Transformer — Removal/Installation	9-6-11
Forward Shaft Assembly — Cleaning/Inspection/Repair	6-6-3
Forward Shaft Assembly — Removal/Installation (OH-58D(R))	6-6-2
Forward Shaft Assembly — Removal/Installation (OH-58D).....	6-6-1
Forward Support Fittings, Lower — Removal/Installation	2-2-95

<u>Subject</u>	<u>Para/Task</u>
F (Cont)	
Forward Transverse Beam (AVIM)	
— Cleaning/Inspection/Repair	2-4-10
Forward Walking Beam,	
Directional Control — Removal/	
Installation	11-4-25
Frame Assembly, Doorframe/	
Windshield — Repair	2-2-73
Freewheeling Unit	6-15
Freewheeling Unit — Installation	6-5-7
Freewheeling Unit — Removal	6-5-1
Freewheeling Unit —	
Serviceability Check	6-1-2
Freewheeling Unit, Introduction to	6-16
Freewheeling Unit, Task List for	6-17
Freewheeling Unit, Transmission	
— Draining	1-4-7
Freewheeling Unit, Transmission	
— Servicing	1-4-8
Freewheeling Unit Components	
(AVIM) — Cleaning/Inspection/	
Repair	6-5-3
Freewheeling Unit Tail Rotor	
Drive Output Adapter Wear	
Sleeve (AVIM) — Removal/	
Installation	6-5-6
Freewheeling Unit Tail Rotor	
Drive Output Oil Seal (AVIM)	
— Removal/Installation	6-5-4
Freewheeling Unit Tail Rotor	
Output Shaft Bearing (AVIM) —	
Removal/Installation	6-5-5
Friction Clamp, Collective —	
Cleaning/Inspection/Repair	11-2-25
Friction Knob and Shaft Pin,	
Collective — Removal/	
Installation	11-2-65
Friction Knob and Shaft,	
Collective — Removal/	
Installation	11-2-64
Friction Knob and Shaft, Cyclic —	
Cleaning/Inspection/Repair	11-3-25
Friction Knob and Shaft, Cyclic —	
Installation	11-3-26
Friction Knob and Shaft, Cyclic —	
Removal	11-3-24
Friction on Collective System,	
Minimum — Adjusting	11-2-24
Front Panel, Multiparameter	
Display (MPD) — Removal/	
Installation	8-1-5
Fuel Cell	10-5
Fuel Cell — Removal/Installation	10-2-1
Fuel Cell, Introduction to	10-6
Fuel Cell, Task List for	10-7
Fuel Cell (AVIM) — Cleaning/	
Inspection/Repair	10-2-2

<u>Subject</u>	<u>Para/Task</u>
F (Cont)	
Fuel Cell (Intermediate Storage),	
Combat Damaged	E-34
Fuel Cell Support Assemblies —	
Cleaning/Inspection/Repair/	
Replacement	10-2-3
Fuel Cell Vent Hose — Inspection	10-1-10
Fuel Cell Vent Hose — Removal/	
Installation	10-1-11
Fuel Control Clevis — Removal/	
Installation	4-6-9
Fuel Control Lever — Removal/	
Installation	4-6-8
Fuel Control Panel (OH-58D),	
Digital — Installation	9-6-16
Fuel Control Panel (OH-58D),	
Digital — Removal	9-6-15
Fuel Control Panel (OH-58D),	
Integrally Lit Panel Digital —	
Installation	9-6-18
Fuel Control Panel (OH-58D),	
Integrally Lit Panel Digital —	
Removal	9-6-17
Fuel Control Panel (OH-58D),	
Toggle Switch Digital —	
Removal/Installation	9-6-21
Fuel Differential Pressure Switch	
(OH-58D(R)) — Removal/	
Installation	4-6-11
Fuel Differential Pressure Switch	
— Inspection	4-6-12
Fuel Differential Pressure Switch	
— Removal/Installation	4-6-10
Fuel Indicating System —	
Checking	10-2-5
Fuel Pressure Switch —	
Removal/Installation	10-1-12
Fuel Pressure Warning Switch	
(OH-58D(R)), Low — Removal/	
Installation	4-6-13
Fuel Probe — Removal/	
Installation	10-1-13
Fuel Quantity Control Unit —	
Removal/Installation	9-6-64
Fuel Shutoff Lever — Cleaning/	
Inspection/Repair	10-1-2
Fuel Shutoff Lever — Installation	10-1-3
Fuel Shutoff Lever — Removal	10-1-1
Fuel Shutoff Lever and Valve —	
Rigging	10-1-4
Fuel Shutoff Valve — Inspection	10-1-6
Fuel Shutoff Valve — Removal/	
Installation	10-1-5
Fuel Sump — Cleaning/Inspection	10-1-15
Fuel Sump — Installation	10-1-16
Fuel Sump — Removal	10-1-14
Fuel System	1-14, 1-33

<u>Subject</u>	<u>Para/Task</u>
F (Cont)	
Fuel System	10-1
Fuel System (Flyable Storage)	E-8
Fuel System (Intermediate Storage).....	E-33
Fuel System (Short Term Storage).....	E-19
Fuel System Components, Introduction to.....	10-3
Fuel System Components, Task List for	10-4
Fuel System Components	10-2
Fuel System Hoses — Cleaning/ Inspection	10-1-9
Function (Column 3), Maintenance	B-7
Functional Description	1-22
Functional Groupings	B-5
Functions, Maintenance	B-4
Fuselage	2-4
Fuselage Attach Fittings, Tailboom and Aft — Cleaning/ Inspection/Repair	2-3-3
Fuselage Corrosion Data.....	Q-12
Fuselage Fittings, External — Cleaning/Inspection/Repair	2-2-96
Fuses, Multiparameter Display (MPD) (Typical) — Removal/ Installation	8-1-3

G

Gage, Sight — Removal/ Installation	6-3-13
Gear, Alighting.....	3-1
Gear, Landing	1-25, 3-2
Gear, Landing — Inspection	3-1-1
Gear, Landing — Removal/ Installation	3-1-5
Gear (Rapid Deployment), Landing	3-1-6
Gear (Intermediate Storage), Landing	E-43
Gear (Rapid Deployment), Landing — Removal/Installation	3-1-6
Gear (Short Term Storage), Landing	E-28
Gear Crosstube (Rapid Deployment), Landing — Inspection for Deflection	3-1-4
Gear Crosstube, Landing — Inspection for Deflection	3-1-3
Gear Interrupt Switch, Weight-On — Removal/Installation	9-6-86
Gear Support Fitting Assemblies, Landing — Removal/ Installation/Inspection	2-2-97

<u>Subject</u>	<u>Para/Task</u>
G (Cont)	
Gear Support Fitting, Landing — Cleaning/Inspection/Repair	3-1-58
Gear Support Fitting, Landing — Removal/Installation	3-1-57
Gear Switch (Rapid Deployment Landing Gear), Weight-On — Removal/Installation	9-6-1
Gear Switch, Weight-On — Removal/Installation	9-6-77
Gearbox, Introduction to Tail Rotor.....	6-22
Gearbox, Tail Rotor — Cleaning/ Inspection/Repair.....	6-7-2
Gearbox, Tail Rotor — Draining/ Servicing	1-4-9
Gearbox, Tail Rotor — Removal/ Installation	6-7-1
Gearbox, Tail Rotor — Serviceability Check	6-1-3
Gearbox, Tail Rotor	1-19, 6-21
Gearbox, Task List for Tail Rotor.....	6-23
Gearbox Boot, Tail Rotor — Removal/Installation	5-5-16
Gearbox Breather, Tail Rotor — Removal/Cleaning/Installation.....	6-7-3
Gearbox Chip Detector, Tail Rotor — Removal/Installation	6-7-10
Gearbox Housing Packing, Tail Rotor — Removal/Installation	5-5-18
Gearbox Input Seal, Tail Rotor — Removal/Installation	6-7-6
Gearbox Input Seal, Tail Rotor — Removal/Installation	6-7-5
Gearbox Pitch Change Housing, Tail Rotor — Cleaning/ Inspection/Repair.....	5-5-21
Gearbox Support Assembly, Tail Rotor — Cleaning/Inspection/ Repair.....	2-3-6
Gearbox Trunnion Seal and Bearing, Tail Rotor — Removal/Installation	5-5-17
General Information for Preventive Maintenance Inspections	1-55
Generator, AC — Cleaning/ Inspection/Repair.....	9-4-7
Generator, AC — Installation.....	9-4-9
Generator, AC — Removal.....	9-4-8
Generator, Starter — Removal/ Installation	9-3-14
Generator Brushes, Starter — Inspection/Replacement	9-3-13
Generator Control Unit — Cleaning/Inspection/Repair	9-4-10

<u>Subject</u>	<u>Para/Task</u>
G (Cont)	
Generator Control Unit — Removal/Installation	9-4-11
Generator Driveshaft, Starter — Inspection	9-3-1
Gimbal Assembly, CPG Cyclic Stick — Cleaning/Inspection/ Repair	11-3-65
Gimbal Assembly Bushing (AVIM), CPG Cyclic Stick — Removal/Installation	11-3-66
Gimbal/Fitting/Plate and Support Assemblies, CPG Cyclic Stick — Removal/Installation	11-3-64
Gimbal Ring, Main Rotor Controls — Installation	5-2-16
Gimbal Ring, Main Rotor Controls — Removal	5-2-13
Gimbal Ring (AVIM), Main Rotor Controls — Cleaning/ Inspection/Repair	5-2-15
Glareshield, Instrument Panel — Cleaning/Inspection/Repair	8-1-19
Glareshield, Instrument Panel — Removal/Installation	8-1-18
Gradient Tube Assembly, Force — Cleaning/Inspection/Repair	11-3-8
Gradient, Lateral Force — Cleaning/Inspection/Repair	11-3-7
Gradient, Lateral Force — Removal/Installation	11-3-6
Gravity or Open Port — Refueling (Power Off or Rapid)	1-4-2
Grip and Adapter Assembly (AVIM), Main Rotor — Removal/Installation	5-1-38
Grip Assembly, Copilot/Gunner Collective — Cleaning/ Inspection/Repair	11-2-12
Grip Assembly, Main Rotor — Cleaning/Inspection/Repair	5-1-28
Grip Assembly, Pilot Collective Stick Throttle — Cleaning/ Inspection/Repair	11-2-31
Grip Bushings/Pins/Inserts (AVIM), Main Rotor — Removal/Installation	5-1-29
Grip Lead Lag Bearing (AVIM), Main Rotor — Cleaning/ Inspection/Repair	5-1-25
Grip Lead Lag Bearings (AVIM), Main Rotor — Removal/ Installation	5-1-24
Grip, Pilot Cyclic — Removal/ Installation	9-6-84
Grip-Typical, Switch Cyclic — Removal/Installation	9-6-53

<u>Subject</u>	<u>Para/Task</u>
G (Cont)	
Ground Cable Assembly, Standpipe and — Cleaning/ Inspection/Repair	6-4-2
Ground Handling and Jacking	1-45
Ground Handling and Jacking, Introduction to	1-46
Ground Handling and Jacking, Task List for	1-48
Ground Module (Typical) — Removal/Installation	9-6-52
Group Number and Description (Column 1 and 2), System	B-6
Groupings, Functional	B-5

H

HF Amplifier-Coupler Mounting Tray — Removal/Installation	9-2-3
HF COMSEC Unit Mount — Removal/Installation	9-2-1
HF RT Unit Mounting Tray — Removal/Installation	9-2-2
Halves, Quick-Disconnect Coupling — Cleaning/ Inspection/Repair	7-4-7
Handling and Jacking, Ground	1-45
Hanger, Tail Rotor Bearing — Alignment	6-6-17
Hanger Assembly, Shaft and Bearing — Removal/Installation	6-6-8
Hanger Brackets, Fan Shaft Bearing (Forward and Aft) — Cleaning/Inspection/Repair	6-6-16
Hanger Brackets, Fan Shaft Bearing (Forward and Aft) — Removal/Installation	6-6-15
Hanger Supports, Tailboom Bearing — Cleaning/Inspection/ Repair	2-3-9
Hanger Supports, Tailboom Bearing — Removal/Installation	2-3-10
Hard Points, — Cleaning/ Inspection/Repair	2-2-86
Heat Resistant Adhesive and Structural Bonding (AVIM) — Use	2-2-66
Heater Control Cable — Cleaning/Inspection	12-1-10
Heater Control Cable — Removal/ Installation	12-1-9
Heater Overheat Switch — Removal/Installation	9-6-44
Heater Tube and Gasket, Bleed Air — Removal/Installation	4-1-9
Heating System	12-2
Heating System, Introduction to	12-3

<u>Subject</u>	<u>Para/Task</u>
H (Cont)	
Heating System, Task List for	12-4
Heating and Ventilation System Ducts — Cleaning/Inspection/ Repair	12-1-11
Heating and Ventilation System Ducts — Removal/Installation	12-1-12
Helicopter — Defueling Using Truck	1-4-4
Helicopter — Defueling Using Valve	1-4-3
Helicopter, Hoisting — Main Rotor Hub and Blades Removed	1-8-3
Helicopter, Hoisting — Main Rotor Installed (MMS Installed or Removed)	1-8-2
Helicopter, Hoisting — Mast Removed	1-8-1
Helicopter, Jacking	1-6-8
Helicopter, Mooring — Rapid Deployment Skid Gear	1-7-3
Helicopter, Mooring — Standard Skid Gear	1-7-1
Helicopter, Sling Loading	1-8-4
Helicopter, Towing/Parking	1-6-1
Helicopter Cleaning	1-4-11
Helicopter Covers — Installation	1-7-3
Helicopter Inventory Master Guide	C-1
Helicopter Safing Procedures	1-6-7
Helicopter Weighing	G-13
Helicopter with Rapid Deployment Skid Gear, Towing	1-6-2
Helicopters, Inspection of Stored	E-5
Hellfire Electronics (RHE), Remote — Cleaning/Inspection/ Repair	9-8-10
Hellfire Electronics (RHE), Remote — Removal/Installation	9-8-11
Hinge Assembly, Crew Door — Disassembly/Assembly	2-2-14
Hinge Components, Crew Door — Cleaning/Inspection/Repair	2-2-15
Hinge Halves/Quick-Disconnect Pin/Lanyard, Access Door — Cleaning/Inspection/Repair	2-2-4
Hoist, MMS (Alternate Removal of Major Components)	13-2-8
Hoist Assembly, MMS — Cleaning/Inspection/Repair	13-2-2
Hoist Assembly, MMS — Disassembly/Assembly	13-2-3
Hoist Assembly, MMS — Installation/Removal	13-2-1
Hoist Ball (Rapid Deployment), MMS Platform Ball and — Removal/Installation	3-1-53

<u>Subject</u>	<u>Para/Task</u>
H (Cont)	
Hoisting Helicopter — Main Rotor Hub and Blades Removed	1-8-3
Hoisting Helicopter — Main Rotor Installed (MMS Installed or Removed)	1-8-2
Hoisting Helicopter — Mast Removed	1-8-1
Hoisting and Sling Loading, Introduction	1-53
Hoisting and Sling Loading, Task List	1-54
Hoisting and Sling Loading	1-52
Honeycomb Panels (Typical) — Cleaning/Inspection	2-2-80
Honeycomb Panels — Repair	2-2-81
Honeycomb Panels, Corrosion Prone	Q-11
Hook Suspension Assembly, Cargo — Cleaning/Inspection/ Repair	13-1-5
Hook Suspension Assembly, Cargo — Disassembly/ Assembly	13-1-2
Hook Suspension Assembly, Cargo — Removal/Installation	13-1-1
Hook Suspension Assembly, Cargo	13-2
Horizontal Stabilizer — Folding/ Unfolding	1-7-7
Horizontal Stabilizer, Folding — Cleaning/Inspection/Repair	2-3-26
Horizontal Stabilizer, Folding — Removal/Installation	2-3-27
Horizontal Stabilizer, Left/Right Folding — Removal/Installation	2-3-28
Horizontal Stabilizer Hinge Area, Folding — Cleaning/Inspection/ Repair	2-3-29
Horizontal Stabilizer Upper Surface, Folding — Cleaning/ Inspection	2-3-25
Horizontal Tube, Directional Control Lower Aft — Removal/ Installation	11-4-19
Horizontal Tube, Directional Control Lower Forward — Removal/Installation	11-4-14
Horn, Tail Rotor Pitch — Cleaning/Inspection/Repair	5-4-20
Horn Assembly (AVIM), Main Rotor Pitch — Cleaning/ Inspection/Repair	5-1-22
Horn Assembly (AVIM), Main Rotor Pitch — Removal/ Installation	5-1-21

<u>Subject</u>	<u>Para/Task</u>
H (Cont)	
Horn Attaching Hardware, Main Rotor Pitch Link — Removal/Installation	5-1-14
Horn Bushings (AVIM), Main Rotor Pitch — Removal/Installation	5-1-23
Hose, Fuel Cell Vent — Inspection	10-1-10
Hose, Fuel Cell Vent — Removal/Installation	10-1-11
Hose, Oil Filter Inlet — Removal/Installation	6-8-13
Hose (Typical), Flex — Removal/Installation	7-4-3
Hoses, Engine Vent and Fuel Supply — Removal/Installation	10-1-8
Hoses, Fuel System — Cleaning/Inspection	10-1-9
Hoses, Hydraulic — Cleaning/Inspection/Repair	7-4-4
Housing Assembly Bearings, CPG Cyclic Stick — Removal/Installation	11-3-82
Housing Assembly, CPG Cyclic Stick — Cleaning/Inspection/Repair	11-3-81
Housing Assembly, CPG Cyclic Stick Socket — Cleaning/Inspection/Repair	11-3-83
Housing/Housing Assembly, CPG Cyclic Stick Socket — Removal/Installation	11-3-80
Hub (AVIM), Tail Rotor — Assembly	5-4-26
Hub (AVIM), Tail Rotor — Disassembly	5-4-23
Hub (AVIM), Tail Rotor — Repair	5-4-25
Hub and Blade Assembly, Rotor	5-2
Hub and Blades, Tail Rotor	5-11
Hub Components (AVIM), Tail Rotor — Cleaning/Inspection	5-4-24
Hub Damper (AVIM), Main Rotor — Cleaning/Inspection/Repair	5-1-16
Hub Damper (AVIM), Main Rotor — Removal/Installation	5-1-15
Hub Damper Shims (AVIM), Main Rotor — Removal/Installation	5-1-17
Hub Lower Cone, Main Rotor — Cleaning/Inspection/Repair	5-1-4
Hub Lower Plate, Main Rotor — Cleaning/Inspection/Repair	5-1-32
Hub Shear Bearing (AVIM), Main Rotor — Removal/Installation	5-1-19
Hub Shear Bearings (AVIM), Main Rotor — Cleaning/Inspection/Repair	5-1-20

<u>Subject</u>	<u>Para/Task</u>
H (Cont)	
Hub Upper Plate, Main Rotor — Cleaning/Inspection/Repair	5-1-18
Hub Yoke, Main Rotor — Cleaning/Inspection/Repair	5-1-37
Hub and Blade Assembly, Main Rotor — Installation	5-1-2
Hub and Blade Assembly, Main Rotor — Removal	5-1-1
Hub and Blades Removed, Main Rotor — Hoisting Helicopter	1-8-3
Hydraulic Actuator, Collective — Removal/Installation	7-1-9
Hydraulic Actuator, Cyclic — Removal/Installation	7-1-10
Hydraulic Filter Assemblies	7-8
Hydraulic Filter Assemblies, Introduction to	7-9
Hydraulic Filter Assemblies, Task List for	7-10
Hydraulic Filter Assembly — Removal/Cleaning/Inspection/Repair/Installation	7-3-1
Hydraulic Hoses — Cleaning/Inspection/Repair	7-4-4
Hydraulic Hoses, Lines, Tubes, Fittings, and Quick-Disconnects	7-11
Hydraulic Hoses, Lines, Tubes, Fittings, and Quick-Disconnects, Introduction to	7-12
Hydraulic Hoses, Lines, Tubes, Fittings, and Quick-Disconnects, Task List for	7-13
Hydraulic Pressure Switch — Cleaning/Inspection/Repair	7-5-2
Hydraulic Pump	7-23
Hydraulic Pump — Cleaning/Inspection/Repair	7-8-2
Hydraulic Pump — Removal/Installation	7-8-1
Hydraulic Pump, Introduction to	7-24
Hydraulic Pump, Task List for	7-25
Hydraulic Pump Driveshaft Assembly — Cleaning/Inspection/Repair	7-8-4
Hydraulic Pump Driveshaft Assembly Alternate Method — Inspection	7-8-5
Hydraulic Reservoir	7-20
Hydraulic Reservoir — Cleaning/Inspection/Repair	7-7-8
Hydraulic Reservoir — Draining/Servicing	1-4-10
Hydraulic Reservoir — Removal/Installation	7-7-1
Hydraulic Reservoir, Introduction to	7-21

<u>Subject</u>	<u>Para/Task</u>
H (Cont)	
Hydraulic Reservoir, Task List for	7-22
Hydraulic Reservoir Cover Latch Assembly — Removal/ Installation	7-7-3
Hydraulic Reservoir Cover Pin and Cap Gasket — Removal/ Installation	7-7-2
Hydraulic Reservoir Return Port Union — Removal/Installation	7-7-4
Hydraulic Reservoir Screen — Removal/Installation	7-7-7
Hydraulic Reservoir Sight Plug — Removal/Installation	7-7-5
Hydraulic Reservoir Strainer and Cover Gasket — Removal/ Installation	7-7-6
Hydraulic Reservoir Support Bracket — Removal/Installation	7-7-9
Hydraulic Solenoid Valve.....	7-17
Hydraulic Solenoid Valve — Cleaning/Inspection/Repair	7-6-3
Hydraulic Solenoid Valve — Removal/Installation	7-6-1
Hydraulic Solenoid Valve Solenoid — Removal/ Installation	7-6-2
Hydraulic Solenoid Valve, Introduction to.....	7-18
Hydraulic Solenoid Valve, Task List for	7-19
Hydraulic System	1-15, 1-30
Hydraulic System	7-1
Hydraulic System — Bleeding.....	7-2-1
Hydraulic System (Flyable Storage).....	E-9
Hydraulic System (Intermediate Storage).....	E-35
Hydraulic System (Short Term Storage).....	E-20
Hydraulic System, Contaminated — Flushing	7-8-3
Hydraulic System Bleeding.....	7-5
Hydraulic System Bleeding, Introduction to.....	7-6
Hydraulic System Bleeding, Task List for	7-7
Hydraulic System Switch — Removal/Installation	9-6-31
Hydraulic System Tubing — Cleaning/Inspection/Repair	7-4-2

I

ICS Engage Switch — Removal/ Installation	9-6-87
--	--------

<u>Subject</u>	<u>Para/Task</u>
I (Cont)	
ICS Switch, Remote — Removal/ Installation	9-6-88
IEA, Interface Electronics Assembly — Cleaning/ Inspection/Repair.....	9-8-5
IEA, Interface Electronics Assembly — Removal/ Installation	9-8-6
IFF Computer Mount — Removal/ Installation	9-2-6
IFF Transponder Mount — Removal/Installation	9-2-7
IR Jammer Mount (Replacement Tailboom), Countermeasures Set AN/ALQ-144 — Installation	2-3-14
IR Jammer Mount, Countermeasures Set AN/ALQ- 144 — Cleaning/Inspection/ Repair.....	2-3-15
IR Jammer Mount, Countermeasures Set AN/ALQ- 144 — Removal/Installation.....	2-3-13
Identifications (Appendix F), Wire	F-2
Idler, Tail Rotor Pitch Change — Cleaning/Inspection/Repair	5-5-10
Idler, Tail Rotor Pitch Change — Installation	5-5-12
Idler, Tail Rotor Pitch Change — Removal	5-5-9
Idler Assembly, Directional Control Actuator Input — Removal/Installation	11-4-28
Idler Bearing (AVIM), Actuator — Removal/Installation	11-4-29
Idler Bushings and Bearing (AVIM), Tail Rotor Pitch Change — Removal/Installation	5-5-11
Ignition System	4-14
Impeller/Fan Shaft/Blower Housing, Bearing Hangers/ Bearings/ — Cleaning/ Inspection/Repair.....	6-6-13
Impeller/Fan Shaft/Blower Housing, Bearing Hangers/ Bearings/ — Removal/ Installation	6-6-12
Indicating System, Fuel — Checking	10-2-5
Indicator, Standby Airspeed — Cleaning/Inspection/Repair	8-2-5
Indicator, Standby Airspeed — Removal/Installation	8-2-6
Indicator, Standby Attitude — Cleaning/Inspection/Repair	8-2-3
Indicator, Standby Attitude — Removal/Installation	8-2-4

<u>Subject</u>	<u>Para/Task</u>
I (Cont)	
Indicator, TGT/TRQ — Cleaning/ Inspection/Repair	8-1-13
Indicator, TGT/TRQ — Disassembly/Assembly	8-1-11
Indicator, TGT/TRQ — Removal/ Installation	8-1-10
Indicator Pin Retainer, Cyclic Stick — Cleaning/Inspection/ Repair	11-3-46
Induction, Air	4-5
Induction Cowl, Air — Cleaning/ Inspection/Repair	4-2-3
Induction Cowl (Compressor Inlet Temperature Sensor Installed), Air — Installation	4-2-5
Induction Cowl (Compressor Inlet Temperature Sensor Installed), Air — Removal	4-2-2
Information, Warranty	1-9
Inlet in Access Door, Air — Removal/Installation	2-2-2
Inlet Shield Assembly — Cleaning/Inspection/Repair	2-2-46
Inlet Shield Assembly — Removal/Installation	2-2-45
Inlet Shield Inspection Panel — Removal/Installation	2-2-44
Inner Ring Assembly for Rotational Movement, Swashplate — Inspection	5-2-39
Input Adapter Nut/Input Duplex Bearing Nut — Cleaning/ Inspection/Repair	6-7-7
Input Cyclic Control Bellcrank Assembly Bearings (AVIM) — Removal/Installation	11-3-36
Input Cyclic Control Bellcrank Assembly Bearings — Cleaning/Inspection/Repair	11-3-35
Input Cyclic Control Bellcrank Assembly Bearings — Removal/Installation	11-3-34
Input Pinion Magnetic Seal (AVIM) — Removal/Cleaning/ Inspection/Repair/Installation	6-3-7
Input Valve Bellcrank Assembly, Collective Control — Cleaning/ Inspection/Repair	11-2-68
Input Valve Bellcrank Assembly, Collective Control — Removal/ Installation	11-2-67
Insert, Copilot/Gunner Collective Elbow Assembly — Removal/ Installation	11-2-46

<u>Subject</u>	<u>Para/Task</u>
I (Cont)	
Inserts, Pilot Cyclic Pivot Support Assembly — Removal/ Installation	11-3-62
Inspection, Component	11-14
Inspection, Introduction to Component	11-15
Inspection, Task List for Component	11-16
Inspection Panel, Inlet Shield — Removal/Installation	2-2-44
Inspection and Corrosion Prone Areas (Appendix Q), Purpose -	Q-3
Inspection and Repair — Corrosion Prone Areas (Appendix Q)	Q-7
Inspection of Stored Helicopters	E-5
Inspections, Corrosion	1-58
Inspections, General Information Preventive Maintenance	1-55
Inspections, Special	1-57
Installation Torque Range, Recommended	P-4
Instructions, Preliminary Weighing	G-14
Instructions, Weighing	G-16
Instrument and Air Data Systems, Pitot-Static	8-8
Instrument Panel Glareshield — Cleaning/Inspection/Repair	8-1-19
Instrument Panel Glareshield — Removal/Installation	8-1-18
Instrument System	1-31
Instrument Systems	8-1
Instruments (Intermediate Storage)	E-40
Instruments (Short Term Storage)	E-25
Instruments, Engine, Rotor, and Transmission	8-2
Instruments, Engine/Rotor/ Transmission — Cleaning/ Inspection	8-1-1
Instruments, Flight	8-5
Instruments, Introduction to Flight	8-6
Instruments, Introduction to Miscellaneous	8-13
Instruments, Miscellaneous	8-12
Instruments, Navigation	8-11
Instruments, Task List for Flight	8-7
Instruments, Task List for Miscellaneous	8-14
Insulation Blanket, Soundproofing — Removal/Installation	2-2-26
Integrally Lit Panel, Collective Control Panel Assembly — Removal/Installation	11-2-42
Integrally Lit Panel (CPG Auxiliary Switch Panel) — Installation	9-6-69

<u>Subject</u>	<u>Para/Task</u>
I (Cont)	
Integrally Lit Panel (CPG Auxiliary Switch Panel) — Removal	9-6-68
Integrally Lit Panel (CPG Channel Select Switch) — Installation	9-6-67
Integrally Lit Panel (CPG Channel Select Switch) — Removal	9-6-66
Integrally Lit Panel (Digital Fuel Control Panel (OH-58D)) — Installation	9-6-18
Integrally Lit Panel (Digital Fuel Control Panel (OH-58D)) — Removal	9-6-17
Integrally Lit Panel (MMS Control Panel) — Installation	9-6-75
Integrally Lit Panel (MMS Control Panel) — Removal	9-6-74
Integrally Lit Panel (Overhead Console or Center Post Circuit Breaker Panel-Typical) — Installation	9-6-14
Integrally Lit Panel (Pilot Collective Stick) — Removal/ Installation	9-6-41
Integrally Lit Panel (Pilot MFD Auxiliary Control Panel) — Installation	9-6-72
Integrally Lit Panel (Pilot MFD Auxiliary Control Panel) — Removal	9-6-71
Integrally Lit Panel (SCAS Control Panel) — Installation	9-6-25
Integrally Lit Panel (SCAS Control Panel) — Removal	9-6-24
Integrally Lit Panel (Typical) — Cleaning/Inspection/Repair	9-6-4
Integrally Lit Panel Connector (Digital Fuel Control Panel (OH-58D)) — Removal/ Installation	9-6-19
Integrally Lit Panel on Armament Control Panel — Removal/ Installation	9-8-2
Integrally Lit Panel Overhead Console or Center Post Circuit Breaker Panel (Typical), — Removal	9-6-12
Intended Use of Bonding (Appendix M)	M-1
Interface Electronics Assembly (IEA) — Cleaning/Inspection/ Repair	9-8-5
Interface Electronics Assembly (IEA) — Removal/Installation	9-8-6
Interface Electronics Assembly (IEA) Shock Mount — Removal/Installation	9-8-7

<u>Subject</u>	<u>Para/Task</u>
I (Cont)	
Introduction (Appendix P)	P-1
Introduction (Appendix Q), Purpose	Q-1
Introduction to Actuators	7-3
Introduction to Aft Firewall	4-25
Introduction to Air Induction	4-6
Introduction to Alternating Current Power and Distribution System	9-12
Introduction to Armament Electrical Equipment	9-24
Introduction to Avionic System Mounts	9-6
Introduction to Avionics Cooling System	9-3
Introduction to Cargo Hook Suspension Assembly	13-3
Introduction to Collective Controls	11-6
Introduction to Component Inspection	11-15
Introduction to Cowlings, Fairings, Access Panels, and Doors	2-2
Introduction to Cyclic Control System	11-9
Introduction to Direct Current Power and Distribution System	9-9
Introduction to Directional Controls	11-12
Introduction to Drive Train System	6-3
Introduction to Engine Assembly	4-3
Introduction to Engine Mounts	4-19
Introduction to Engine Oil System	4-12
Introduction to Engine To Transmission Driveshaft	6-7
Introduction to Engine, Rotor, and Transmission Instruments	8-3
Introduction to Exhaust System	4-9
Introduction to Flight Instruments	8-6
Introduction to Forward Firewall	4-22
Introduction to Freewheeling Unit	6-16
Introduction to Fuel Cell	10-6
Introduction to Fuel System Components	10-3
Introduction to Fuselage	2-5
Introduction to Ground Handling and Jacking	1-46
Introduction to Heating System	12-3
Introduction to Hoisting and Sling Loading	1-53
Introduction to Hydraulic Filter Assemblies	7-9
Introduction to Hydraulic Hoses, Lines, Tubes, Fittings, and Quick-Disconnects	7-12
Introduction to Hydraulic Pump	7-24

<u>Subject</u>	<u>Para/Task</u>
I (Cont)	
Introduction to Hydraulic Reservoir.....	7-21
Introduction to Hydraulic Solenoid Valve.....	7-18
Introduction to Hydraulic System Bleeding	7-6
Introduction to Landing Gear	3-3
Introduction to Lighting System	9-15
Introduction to Main Rotor Controls	5-6
Introduction to Main Rotor Hub and Blade Assembly.....	5-3
Introduction to Main Rotor Tracking and Dynamic Balancing	5-9
Introduction to Maintenance Manual	1-1
Introduction to Miscellaneous Electrical Equipment.....	9-18
Introduction to Miscellaneous Emergency Equipment.....	14-3
Introduction to Miscellaneous Instruments	8-13
Introduction to Mooring	1-50
Introduction to Oil System.....	6-25
Introduction to Pitot-Static Instrument and Air Data Systems.....	8-9
Introduction to Powerplant Controls	4-16
Introduction to Powerplant and Transmission Electrical Equipment	9-21
Introduction to Pressure Switch, Manifolds, and Relief Valve.....	7-15
Introduction to Pylon	2-11
Introduction to Rapid Deployment	13-6
Introduction to Rescue Ladder	13-9
Introduction to Rigging	11-3
Introduction to Rotor Hub and Blade Assembly	5-3
Introduction to Serviceability Checks.....	6-3
Introduction to Servicing	1-41
Introduction to Standpipe Electrical Assembly, Torquemeter System, and Main Rotor Mast Assembly.....	6-13
Introduction to Tail Rotor Driveshafts	6-19
Introduction to Tail Rotor Gearbox	6-22
Introduction to Tail Rotor Hub and Blades	5-12
Introduction to Tail Rotor Pitch Change Mechanism	5-15
Introduction to Tailboom	2-8

<u>Subject</u>	<u>Para/Task</u>
I (Cont)	
Introduction to Transmission	6-10
Introduction to Ventilating System	12-6
Inventoriable Items.....	C-3
Inventory Master Guide, Helicopter	C-1
Inventory, Periods of	C-4
Involved in an Accident, Components.....	E-1
Items, Inventoriable	C-3
J	
Jacking, Ground Handling and	1-45
Jacking, Introduction to Ground Handling and	1-46
Jacking, Task List for Ground Handling and	1-48
Jacking Helicopter	1-6-8
Jacks, Rapid Deployment — Cleaning/Inspection/Repair	13-2-7
Jackshaft, Collective — Cleaning/Inspection/Repair.....	11-2-17
Jackshaft Adjustment Nut, Collective — Removal/Installation	11-2-18
Jackshaft Assembly, Collective — Removal/Installation	11-2-16
Jackshaft Friction Adjustment Bearing, Collective — Removal/Installation	11-2-19
Jackshaft Friction Clamp, Collective — Removal/Installation	11-2-23
Jackshaft Shim and Spacer, Collective — Removal/Installation	11-2-20
Jackshaft Spacer, Collective — Cleaning/Inspection/Repair	11-2-21
Jackshaft Support Assembly — Removal/Installation	11-2-37
Jackshaft Support Assembly Bearing — Removal/Installation	11-2-38
Jackshaft Support Assembly and Bearing — Cleaning/Inspection/Repair.....	11-2-39
Jackshaft Throttle Tube Assembly, Collective — Removal/Installation	11-2-22
Jets (Number One and Two), Transmission Oil — Cleaning/Inspection/Repair.....	6-8-12
Jets (Number One and Two), Transmission Oil — Removal/Installation	6-8-11
Jettison Mechanism, Crew Door — Cleaning/Inspection/Repair	2-2-12

<u>Subject</u>	<u>Para/Task</u>
J (Cont)	
Jettison Mechanism, Crew Door — Removal/Installation	2-2-11
Junction Block (Typical) — Removal/Installation	9-6-51
Junction Mount (2TB3), Terminal — Removal/Installation	9-6-50

K	
Keylock Switch — Removal/ Installation	9-6-54
Kit, First Aid — /Removal/ Inspection/Installation	14-1-2
Knob Assembly, Pilot Cyclic Position Adjustment — Removal/Installation	11-3-54
Knob and Shaft Pin, Collective Friction — Removal/Installation	11-2-65
Knob and Shaft, Collective Friction — Removal/Installation	11-2-64
Knob and Shaft, Cyclic Friction — Cleaning/Inspection/Repair	11-3-25
Knob and Shaft, Cyclic Friction — Installation	11-3-26
Knob and Shaft, Cyclic Friction — Removal	11-3-24
Knuckle Assembly (Rapid Deployment), Leg and — Removal/Installation	3-1-51
Knuckle Assembly (Typical) (Rapid Deployment) (AVIM), Landing Gear — Disassembly/ Assembly	3-1-56
Knuckle Assembly Components (Rapid Deployment), Leg and — Cleaning/Inspection/Repair	3-1-52

L	
LVDT, TAMS Linear Variable Differential Transformer — Cleaning/Inspection/Repair	9-7-14
LVDT, TAMS Linear Variable Differential Transformer — Removal/Installation	9-7-15
Ladder, Introduction to Rescue	13-9
Ladder, Rescue — Cleaning/ Inspection/Repair	13-3-2
Ladder, Rescue — Removal/ Installation	13-3-1
Ladder, Rescue	13-8
Ladder, Task List for Rescue	13-10
Ladder Release Cable, Rescue — Cleaning/Inspection/Repair	13-3-5

<u>Subject</u>	<u>Para/Task</u>
L (Cont)	
Lamps, Dual Tachometer — Replacement	8-1-16
Lamps, Multiparameter Display (MPD) — Replacement	8-1-6
Lamps, TGT/TRQ — Replacement	8-1-12
Landing Gear	1-25, 3-2
Landing Gear — Inspection	3-1-1
Landing Gear — Removal/ Installation	3-1-5
Landing Gear (Intermediate Storage)	E-43
Landing Gear (Rapid Deployment) — Inspection	3-1-2
Landing Gear (Rapid Deployment) — Removal/Installation	3-1-6
Landing Gear (Short Term Storage)	E-28
Landing Gear Corrosion Repair	Q-14
Landing Gear Crosstube — Inspection for Deflection	3-1-3
Landing Gear Crosstube (Rapid Deployment) — Inspection for Deflection	3-1-4
Landing Gear Knuckle Assembly (Typical) (Rapid Deployment) — Disassembly/Assembly (AVIM)	3-1-56
Landing Gear Support Fitting — Cleaning/Inspection/Repair	3-1-58
Landing Gear Support Fitting — Removal/Installation	3-1-57
Landing Gear Support Fitting Assemblies — Removal/ Installation/Inspection	2-2-97
Lanyard on Main Rotor Expandable Bolt — Removal/ Installation	5-1-7
Latch Assembly, Access Door — Cleaning/Inspection/Repair	2-2-3
Latch Assembly, CPG Cyclic Stick Quick-Disconnect — Cleaning/Inspection/Repair	11-3-88
Latch Assembly, Crew Door — Cleaning/Inspection/Repair	2-2-13
Latch Support and Anchor Ball Assembly, CPG Cyclic Stick — Removal/Installation	11-3-87
Lateral Cyclic Transducer — Installation	11-3-21
Lateral Cyclic Transducer — Removal	11-3-20
Lateral Force Gradient — Cleaning/Inspection/Repair	11-3-7
Lateral Force Gradient — Removal/Installation	11-3-6

<u>Subject</u>	<u>Para/Task</u>
L (Cont)	
Lateral Magnetic Brake — Cleaning/Inspection/Repair	11-3-10
Lateral Magnetic Brake — Installation	11-3-11
Lateral Magnetic Brake — Removal	11-3-9
Lead Lag Bearing (AVIM), Main Rotor Grip — Cleaning/ Inspection/Repair	5-1-25
Lead Lag Bearings (AVIM), Main Rotor Grip — Removal/ Installation	5-1-24
Leaks, Water — Isolation	2-2-91
Leaks, Water — Repair	2-2-92
Left Access Panel (Typical), Right or — Cleaning/Inspection/ Repair	2-2-84
Left Access Panel (Typical), Right or — Removal/Installation	2-2-83
Left Cyclic Yoke — Installation	11-3-16
Left Cyclic Yoke — Removal	11-3-15
Left Rescue Ladder Release Cable — Removal/Installation	13-3-3
Left/Right Horizontal Stabilizer — Removal/Installation	2-3-28
Leg and Knuckle Assembly (Rapid Deployment) — Removal/Installation	3-1-51
Leg and Knuckle Assembly Components (Rapid Deployment) — Cleaning/ Inspection/Repair	3-1-52
Legs, Engine Mount — Cleaning/ Inspection	4-7-3
Legs, Engine Mount — Removal/ Installation	4-7-1
Level and Work Times (Column 4), Maintenance	B-8
Level Switch, Oil — Removal/ Installation	4-4-4
Lever, Fuel Control — Removal/ Installation	4-6-8
Lever, Fuel Shutoff — Cleaning/ Inspection/Repair	10-1-2
Lever, Fuel Shutoff — Installation	10-1-3
Lever, Fuel Shutoff — Removal	10-1-1
Lever (AVIM), Tail Rotor Pitch Change — Cleaning/Inspection/ Repair	5-5-6
Lever Assembly, CPG Cyclic Stick Quick-Disconnect — Cleaning/Inspection/Repair	11-3-76
Lever Assembly, Collective Mixing — Removal/Installation	11-2-48
Lever Supports, Mixing — Removal/Installation	11-2-6

<u>Subject</u>	<u>Para/Task</u>
L (Cont)	
Lever and Link Assembly, CPG Cyclic Stick Quick-Disconnect — Removal/Installation	11-3-75
Lever and Valve, Fuel Shutoff — Rigging	10-1-4
Light (Typical), Anticollision — Installation	9-5-3
Light (Typical), Anticollision — Removal	9-5-2
Light (Typical), Side Position — Installation	9-5-9
Light (Typical), Side Position — Removal	9-5-8
Light Dimming Resistor, Position — Installation	9-5-13
Light Dimming Resistor, Position — Removal	9-5-12
Light, Tail Position — Installation	9-5-11
Light, Tail Position — Removal	9-5-10
Light, Utility — Installation	9-5-21
Light, Utility — Removal	9-5-20
Light Flasher, Anticollision — Installation	9-5-5
Light Flasher, Anticollision — Removal	9-5-4
Lighting Control Knob (Overhead Console-Typical) — Removal/ Installation	9-6-9
Lighting System, Introduction to	9-15
Lighting System, Task List for	9-16
Lighting System	9-14
Lights, Battery Preheat Indicator — Cleaning/Inspection/Repair	9-3-5
Lights, Battery Preheat Indicator — Removal/Installation	9-3-6
Lights (Typical) — Cleaning/ Inspection/Repair	9-5-1
Lights (Typical), NVG Formation — Removal/Installation	9-5-14
Linear Variable Differential Transformer (LVDT), TAMS — Cleaning/Inspection/Repair	9-7-14
Linear Variable Differential Transformer (LVDT), TAMS — Removal/Installation	9-7-15
Link, Main Rotor Pitch — Installation	5-2-3
Link, Main Rotor Pitch — Removal	5-2-1
Link, Tail Rotor Pitch — Cleaning/ Inspection/Repair	5-4-3
Link, Tail Rotor Pitch — Installation	5-4-4
Link, Tail Rotor Pitch — Removal	5-4-2
Link Assembly, CPG Cyclic Stick — Cleaning/Inspection/Repair	11-3-78

<u>Subject</u>	<u>Para/Task</u>
L (Cont)	
Link Assembly, Collective Control — Cleaning/Inspection/Repair	11-2-53
Link Assembly, Collective Control — Removal/Installation	11-2-52
Link Assembly, Collective Pitch — Cleaning/Inspection/Repair	11-2-5
Link Assembly, Collective Pitch — Removal/Installation	11-2-4
Link Assembly Bushings (AVIM) — Removal/Installation	11-3-79
List (Appendix F), Description — Equipment	F-7
List (Appendix F), Equipment	F-6
Lit Panel (Typical), Integrally — Cleaning/Inspection/Repair	9-6-4
Load Data, Weight/Balance and	G-5
Loading, Hoisting and Sling	1-52
Loading Data	G-11
Loading Helicopter, Sling	1-8-4
Location and Description of Major Components	1-11
Lockout Catch, Copilot/Gunner Cyclic Stick — Removal/ Installation	11-3-27
Low Fuel Pressure Warning Switch (OH-58D(R)) — Removal/Installation	4-6-13
Lower Aft Horizontal Tube, Directional Control — Removal/ Installation	11-4-19
Lower Boot Assembly, Transmission — Removal/ Cleaning/Inspection/Installation	6-3-3
Lower Chip Detector — Removal/ Installation	6-3-11
Lower Forward Horizontal Tube, Directional Control — Removal/ Installation	11-4-14
Lower Forward Support Fittings — Removal/Installation	2-2-95
Lower Tunnel Bellcrank, Directional Control — Removal/ Installation	11-4-20
Lower Tunnel Bellcrank Bushing, Directional Control — Removal/ Installation	11-4-21
Lower Window — Cleaning/ Inspection/Repair	2-2-77
Lower Window — Removal/ Installation	2-2-76
Lower Wire Cutter (Rapid Deployment) — Cleaning/ Inspection/Repair	2-2-61
Lower Wire Cutter (Rapid Deployment) — Removal/ Installation	2-2-60

<u>Subject</u>	<u>Para/Task</u>
L (Cont)	
Lubrication	1-44
M	
MFD Auxiliary Control Panel, Integrally Lit Panel Pilot — Installation	9-6-72
MFD Auxiliary Control Panel, Integrally Lit Panel Pilot — Removal	9-6-71
MFD Auxiliary Control Panel- Typical, Switch Pilot — Removal/Installation	9-6-73
MMS Control Panel — Removal/ Installation	9-6-80
MMS Control Panel, Integrally Lit Panel — Installation	9-6-75
MMS Control Panel, Integrally Lit Panel — Removal	9-6-74
MMS Hoist (Alternate Removal of Major Components)	13-2-8
MMS Hoist Assembly — Cleaning/Inspection/Repair	13-2-2
MMS Hoist Assembly — Disassembly/Assembly	13-2-3
MMS Hoist Assembly — Installation/Removal	13-2-1
MMS Installed or Removed, Main Rotor Installed — Hoisting Helicopter	1-8-2
MMS Platform Assembly — Cleaning/Inspection/Repair	13-2-5
MMS Platform Assembly — Disassembly/Assembly	13-2-6
MMS Platform Assembly — Installation/Removal	13-2-4
MMS Platform Ball and Hoist Ball (Rapid Deployment) — Removal/Installation	3-1-53
MMS Platform Ball and MMS Hoist Ball (Rapid Deployment) — Cleaning/Inspection/Repair	3-1-54
MPD, Multiparameter Display — Cleaning/Inspection/Repair	8-1-8
MPD, Multiparameter Display — Disassembly/Assembly	8-1-7
MPD, Multiparameter Display — Removal/Installation	8-1-4
Magnetic Brake, Fore-and-Aft — Cleaning/Inspection/Repair	11-3-5
Magnetic Brake, Fore-and-Aft — Removal/Installation	11-3-4
Magnetic Brake, Lateral — Cleaning/Inspection/Repair	11-3-10
Magnetic Brake, Lateral — Installation	11-3-11

<u>Subject</u>	<u>Para/Task</u>	<u>Subject</u>	<u>Para/Task</u>
M (Cont)		M (Cont)	
Magnetic Brake, Lateral — Removal	11-3-9	Main Rotor Controls Antidrive Lever (AVIM) — Cleaning/ Inspection/Repair	5-2-26
Magnetic Seal (AVIM), Input Pinion — Removal/Installation	6-3-7	Main Rotor Controls Boot — Removal/Installation	5-2-17
Main Rotor Autorotation RPM — Adjustment	5-3-1	Main Rotor Controls Collective Lever — Installation	5-2-20
Main Rotor Blade (AVIM) — Refinishing	5-1-41	Main Rotor Controls Collective Lever — Removal	5-2-18
Main Rotor Blade Bolt — Cleaning/Inspection/Repair	5-1-9	Main Rotor Controls Collective Lever (AVIM) — Cleaning/ Inspection/Repair	5-2-19
Main Rotor Blade Core (AVIM) — Repair	5-1-51	Main Rotor Controls Collective Link — Installation	5-2-23
Main Rotor Blade Erosion Shield — Repair	5-1-44	Main Rotor Controls Collective Link — Removal	5-2-21
Main Rotor Blade Erosion Strip Splice Cover — Repair	5-1-48	Main Rotor Controls Collective Link (AVIM) — Cleaning/ Inspection/Repair	5-2-22
Main Rotor Blade Erosion Strip Splice Cover (AVIM) — Replacement	5-1-50	Main Rotor Controls Drive Hub Set — Installation	5-2-12
Main Rotor Blade Inboard Erosion Strip — Repair	5-1-47	Main Rotor Controls Drive Hub Set — Removal	5-2-10
Main Rotor Blade Inboard Erosion Strip (AVIM) — Repair/ Replacement	5-1-49	Main Rotor Controls Drive Hub Set (AVIM) — Cleaning/ Inspection/Repair	5-2-11
Main Rotor Blade Outboard Erosion Strip — Repair	5-1-46	Main Rotor Controls Drive Lever — Installation	5-2-9
Main Rotor Blade Skin by Patching (AVIM) — Repair	5-1-40	Main Rotor Controls Drive Lever — Removal	5-2-7
Main Rotor Blade Trailing Edge — Repair	5-1-45	Main Rotor Controls Drive Lever (AVIM) — Cleaning/Inspection/ Repair	5-2-8
Main Rotor Blade Trim Tab — Repair	5-1-43	Main Rotor Controls Drive Link — Installation	5-2-6
Main Rotor Blade Trim Tab (AVIM) — Removal/Installation	5-1-42	Main Rotor Controls Drive Link — Removal	5-2-4
Main Rotor Blades — De-Icing	1-4-12	Main Rotor Controls Drive Link (AVIM) — Cleaning/Inspection/ Repair	5-2-5
Main Rotor Blades — Folding/ Unfolding (Alternate Method)	1-7-6	Main Rotor Controls Drive Pin — Cleaning/Inspection	5-2-14
Main Rotor Blades — Folding/ Unfolding (Standard Method)	1-7-5	Main Rotor Controls Gimbal Ring — Installation	5-2-16
Main Rotor Blades — Inspection	5-1-39	Main Rotor Controls Gimbal Ring — Removal	5-2-13
Main Rotor Blades — Removal/ Cleaning/Inspection/Installation	5-1-5	Main Rotor Controls Gimbal Ring (AVIM) — Cleaning/Inspection/ Repair	5-2-15
Main Rotor Control Antidrive Lever — Installation	5-2-27	Main Rotor Controls Spacer — Cleaning/Inspection/Repair	5-2-24
Main Rotor Control Antidrive Link (AVIM) — Cleaning/Inspection/ Repair	5-2-29	Main Rotor Drive Ring Set (AVIM) — Cleaning/Inspection/Repair	5-1-31
Main Rotor Control Antidrive Link — Installation	5-2-30	Main Rotor Drive Ring Set (AVIM) — Removal/Installation	5-1-30
Main Rotor Control Antidrive Link — Removal	5-2-28		
Main Rotor Controls	5-5		
Main Rotor Controls Antidrive Lever — Removal	5-2-25		

<u>Subject</u>	<u>Para/Task</u>
M (Cont)	
Main Rotor Droop Stop Plug — Cleaning/Inspection/Repair	5-1-11
Main Rotor Droop Stop Plugs — Removal/Installation	5-1-10
Main Rotor Droop Stop Stud — Cleaning/Inspection/Repair	5-1-13
Main Rotor Droop Stop Studs — Removal/Installation	5-1-12
Main Rotor Expandable Bolt — Disassembly/Cleaning/ Inspection/Repair/Assembly	5-1-8
Main Rotor Expandable Bolt — Removal/Installation	5-1-6
Main Rotor Expandable Bolt, Lanyard on — Removal/ Installation	5-1-7
Main Rotor Grip and Adapter Assembly (AVIM) — Removal/ Installation	5-1-38
Main Rotor Grip Assembly — Cleaning/Inspection/Repair	5-1-28
Main Rotor Grip Bushings/Pins/ Inserts (AVIM) — Removal/ Installation	5-1-29
Main Rotor Grip Lead Lag Bearing (AVIM) — Cleaning/ Inspection/Repair	5-1-25
Main Rotor Grip Lead Lag Bearings (AVIM) — Removal/ Installation	5-1-24
Main Rotor Hub and Blade Assembly — Installation	5-1-2
Main Rotor Hub and Blade Assembly — Removal	5-1-1
Main Rotor Hub and Blades Removed — Hoisting Helicopter	1-8-3
Main Rotor Hub Damper (AVIM) — Cleaning/Inspection/Repair	5-1-16
Main Rotor Hub Damper (AVIM) — Removal/Installation	5-1-15
Main Rotor Hub Damper Shims (AVIM) — Removal/Installation	5-1-17
Main Rotor Hub Lower Cone — Cleaning/Inspection/Repair	5-1-4
Main Rotor Hub Lower Plate — Cleaning/Inspection/Repair	5-1-32
Main Rotor Hub Shear Bearing (AVIM) — Cleaning/Inspection/ Repair	5-1-20
Main Rotor Hub Shear Bearing (AVIM) — Removal/Installation	5-1-19
Main Rotor Hub Upper Plate — Cleaning/Inspection/Repair	5-1-18
Main Rotor Hub Yoke — Cleaning/Inspection/Repair	5-1-37

<u>Subject</u>	<u>Para/Task</u>
M (Cont)	
Main Rotor Installed (MMS Installed or Removed) — Hoisting Helicopter	1-8-2
Main Rotor Mast Assembly — Cleaning/Inspection	6-4-18
Main Rotor Mast Assembly — Installation	6-4-20
Main Rotor Mast Assembly — Removal	6-4-15
Main Rotor Mast Assembly (AVIM) — Assembly	6-4-19
Main Rotor Mast Assembly (AVIM) — Disassembly	6-4-16
Main Rotor Mast Assembly, Standpipe Electrical Assembly, Torquemeter System, and	6-12
Main Rotor Mast Assembly Components (AVIM) — Cleaning/Inspection/Repair	6-4-17
Main Rotor Pitch Horn Assembly (AVIM) — Cleaning/Inspection/ Repair	5-1-22
Main Rotor Pitch Horn Assembly (AVIM) — Removal/Installation	5-1-21
Main Rotor Pitch Horn Bushings (AVIM) — Removal/Installation	5-1-23
Main Rotor Pitch Link — Installation	5-2-3
Main Rotor Pitch Link — Removal	5-2-1
Main Rotor Pitch Link Assembly — Cleaning/Inspection/Repair	5-2-2
Main Rotor Pitch Link Horn Attaching Hardware — Removal/Installation	5-1-14
Main Rotor Swashplate and Support — Cleaning/Inspection/ Repair	5-2-31
Main Rotor Swashplate and Support — Installation	5-2-38
Main Rotor Swashplate and Support — Removal	5-2-33
Main Rotor Swashplate and Support (AVIM) — Assembly	5-2-37
Main Rotor Swashplate and Support (AVIM) — Disassembly	5-2-34
Main Rotor Swashplate and Support Components (AVIM) — Cleaning/Inspection/Repair	5-2-35
Main Rotor Swashplate and Support Components (AVIM) — Painting	5-2-36
Main Rotor Swashplate Uniball Friction — Checking and Adjustment	5-2-32
Main Rotor Tracking and Balancing	5-8

<u>Subject</u>	<u>Para/Task</u>
M (Cont)	
Main Rotor Tracking and Dynamic Balancing	5-3-2
Main Rotor Upper Cone Plate Assembly — Cleaning/ Inspection/Repair	5-1-3
Main Rotor Yoke Adapter Assembly — Cleaning/ Inspection/Repair	5-1-26
Main Rotor Yoke Adapter Mount Bushings (AVIM) — Removal/ Installation	5-1-27
Main Rotor Yoke Buffers (AVIM) — Cleaning/Inspection/Repair	5-1-34
Main Rotor Yoke Bumpers (AVIM) — Cleaning/Inspection	5-1-36
Main Rotor Yoke Bumpers (AVIM) — Removal/Installation	5-1-35
Main Transmission	1-18
Main Transmission — Serviceability Check	6-1-1
Maintenance Allocation Chart	B-1
Maintenance Allocation Chart, Definition of the	B-2
Maintenance Allocation Chart, Use of the	B-3
Maintenance Allocation Chart Remarks	B-12
Maintenance Forms and Records	1-3
Maintenance Function (Column 3)	B-7
Maintenance Functions	B-4
Maintenance Levels and Work Times (Column 4)	B-8
Maintenance Manual, Introduction to	1-1
Maintenance Manual, Scope of	1-2
Maintenance of Preservation (Flyable Storage)	E-15
Maintenance of Preservation (Intermediate Storage)	E-44
Maintenance of Preservation (Short Term Storage)	E-29
Maintenance Step (Left Side) — Cleaning/Inspection/Repair	2-2-79
Maintenance Step (Left Side) — Removal/Installation	2-2-78
Major Components, Location and Description of	1-11
Manifold, Filter Oil — Cleaning/ Inspection/Repair	6-8-5
Manifold, Oil Filter — Removal/ Installation	6-8-4
Manifold, Pressure — Cleaning/ Inspection/Repair	7-5-4.1
Manifold, Pressure — Removal/ Installation	7-5-4

<u>Subject</u>	<u>Para/Task</u>
M (Cont)	
Manifold, Return — Removal/ Installation	7-5-3
Manifolds and Relief Valve, Introduction to Pressure Switch	7-15
Manifolds and Relief Valve, Pressure Switch	7-14
Manifolds and Relief Valve, Task List for Pressure Switch	7-16
Manual, Introduction to Maintenance	1-1
Manual, Scope of Maintenance	1-2
Map Case — Removal/Installation	2-2-25
Mast Assembly, Main Rotor — Assembly	6-4-19
Mast Assembly, Main Rotor — Cleaning/Inspection	6-4-18
Mast Assembly, Main Rotor — Disassembly	6-4-16
Mast Assembly Components (AVIM), Main Rotor — Cleaning/Inspection/Repair	6-4-17
Mast Assembly, Main Rotor — Installation	6-4-20
Mast Assembly, Main Rotor — Removal	6-4-15
Mast Mounted Sight (MMS) Support Cover — Removal/ Installation	5-2-40
Mast Torque, Signal Conditioning Unit — Cleaning/Inspection/ Repair	9-7-7
Mast Torque, Signal Conditioning Unit — Installation	9-7-9
Mast Torque, Signal Conditioning Unit — Removal	9-7-8
Master Guide, Helicopter Inventory	C-1
Material to Prevent Enemy Use, Destruction of Army	1-4
Methods (Appendix M), Electrical Bonding	M-7
Minimum Friction on Collective System — Adjusting	11-2-24
Miscellaneous Electrical Equipment	9-17
Miscellaneous Electrical Equipment — Cleaning/ Inspection/Repair	9-6-2
Miscellaneous Electrical Equipment, Introduction to	9-18
Miscellaneous Electrical Equipment, Task List for	9-19
Miscellaneous Emergency Equipment	14-1
Miscellaneous Emergency Equipment, Introduction to	14-2

<u>Subject</u>	<u>Para/Task</u>
M (Cont)	
Miscellaneous Emergency Equipment, Task List for.....	14-3
Miscellaneous Instruments	8-12
Miscellaneous Instruments, Introduction to	8-13
Miscellaneous Instruments, Task List for	8-14
Miscellaneous Parts, Pilot Collective Stick Assembly — Removal/Installation	11-2-27
Missile Sight Subsystem Electronics Unit (MSSEU) — Cleaning/Inspection/Repair	9-8-8
Missile Sight Subsystem Electronics Unit (MSSEU) — Removal/Installation	9-8-9
Mission Equipment	13-1
Mission Equipment (Armament)	1-38
Mission Equipment (Avionics)	1-37
Mixer Bellcrank Assembly, Cyclic — Removal/Installation	11-3-28
Mixer Bellcrank Assembly (AVIM), Cyclic — Cleaning/Inspection/Repair	11-3-31
Mixer Bellcrank Assembly Rod End Bearing, Cyclic — Cleaning/Inspection/Repair	11-3-30
Mixing Lever Assembly Bushings, Collective — Removal/Installation	11-2-49
Mixing Lever Assembly, Collective — Removal/Installation	11-2-48
Mixing Lever Supports — Removal/Installation	11-2-6
Mixing Valve — Assembly	12-1-4
Mixing Valve — Cleaning/Inspection/Repair	12-1-3
Mixing Valve — Disassembly	12-1-2
Mixing Valve — Installation	12-1-5
Mixing Valve — Removal	12-1-1
Models OH-58D and OH-58D(R), Differences Between	1-12
Module (Typical), Ground — Removal/Installation	9-6-52
Monitor Unit, AC Power — Cleaning/Inspection/Repair	9-4-14
Monitor Unit, AC Power — Removal/Installation	9-4-15
Monitor, Charger — Cleaning/Inspection/Repair	9-3-7
Monitor, Charger — Removal/Installation	9-3-8
Mooring	1-49
Mooring, Introduction to	1-50
Mooring, Task List for	1-51

<u>Subject</u>	<u>Para/Task</u>
M (Cont)	
Mooring Helicopter — Rapid Deployment Skid Gear	1-7-2
Mooring Helicopter — Standard Skid Gear	1-7-1
Motor Intake Duct Assembly, Avionic Cooling System — Removal/Installation	9-1-4
Mount, Corner — Cleaning/Inspection	2-4-4
Mount, HF COMSEC Unit — Removal/Installation	9-2-1
Mount, IFF Computer — Removal/Installation	9-2-6
Mount, IFF Transponder — Removal/Installation	9-2-7
Mount (Typical), Terminal Junction — Removal/Installation	9-6-50
Mount Bolt — Cleaning/Inspection/Repair	2-4-8
Mount Fitting, UWP — Cleaning/Inspection/Repair	2-2-94
Mount Legs, Engine — Cleaning/Inspection	4-7-3
Mount Legs, Engine — Removal/Installation	4-7-1
Mount Trunnion, Engine — Cleaning/Inspection/Repair	4-7-2
Mounting Bracket, Transfer Unit — Removal/Installation	9-2-9
Mounting Rack, Video Recorder — Removal/Installation	9-2-8
Mounting Tray, HF Amplifier-Coupler — Removal/Installation	9-2-3
Mounting Tray, HF RT Unit — Removal/Installation	9-2-2
Mounting Tray, VHF AM RT Unit — Removal/Installation	9-2-5
Mounting Tray, VHF FM 1 or 2 RT Unit — Removal/Installation	9-2-4
Mounts, Avionic System	9-5
Mounts, Engine	4-18
Mounts, Introduction to Avionic System	9-6
Mounts, Task List for Avionic System	9-7
Multiparameter Display (MPD) — Cleaning/Inspection/Repair	8-1-8
Multiparameter Display (MPD) — Disassembly/Assembly	8-1-7
Multiparameter Display (MPD) — Removal/Installation	8-1-4
Multiparameter Display BRT Control Knob — Removal/Installation	8-1-2

<u>Subject</u>	<u>Para/Task</u>
M (Cont)	
Multiparameter Display Front Panel (MPD) — Removal/Installation	8-1-5
Multiparameter Display Fuses (Typical) — Removal/Installation	8-1-3
Multiparameter Display Lamps (MPD) — Replacement	8-1-6

N

Ng Engine Cable Aft Support Bracket — Removal/Installation	4-6-5
Ng Engine Control Cable — Removal/Installation	4-6-1
Ng Engine Control Cable (OH-58D) — Rigging	4-6-2
Ng Engine Control Cable (OH-58D(R)) — Rigging	4-6-3
NVG Formation Lights (Typical) — Removal/Installation	9-5-14
NVG Formation Lights Switch — Removal/Installation	9-5-15
Names and Designation, Common Name	1-7
Navigation Instruments	8-11
Night Vision Power Converter — Cleaning/Inspection/Repair	9-5-22
Night Vision Power Converter (Typical) — Installation	9-5-24
Night Vision Power Converter (Typical) — Removal	9-5-23
Nonboosted Tube, Directional Control — Removal/Installation	11-4-26
Nonstandard, Aft Crosstube — Cleaning/Inspection/Repair	3-1-38
Nonstandard, Forward Crosstube — Cleaning/Inspection/Repair	3-1-28
Nose Compartment-Typical, Circuit Breaker — Installation	9-6-37
Nose Compartment-Typical, Circuit Breaker — Removal	9-6-36
Nr Sensor (OH-58D(R)) — Cleaning/Inspection	6-3-17
Nr Sensor (OH-58D(R)) — Removal/Installation	6-3-16
Nut, Stop — Cleaning/Inspection/Repair	2-4-5
Nut, Tee/Retainer/Packing/ — Removal/Installation	7-4-5

O

OH-58D and OH-58D(R), Differences Between Models	1-12
--	------

<u>Subject</u>	<u>Para/Task</u>
O (Cont)	
Oil Cooler — Cleaning/Inspection/Repair/Buildup	6-8-25
Oil Cooler — Installation	6-8-26
Oil Cooler — Removal	6-8-24
Oil Cooler Bypass Valve — Removal/Installation	4-4-9
Oil Cooler Bypass Valve (AVIM) — Cleaning/Inspection/Repair	4-4-11
Oil Cooler Bypass Valve (AVIM) — Disassembly/Assembly	4-4-10
Oil Cooler Duct — Cleaning/Inspection/Repair	6-8-28
Oil Cooler Duct — Removal/Installation	6-8-27
Oil Cooler Fairing Seals — Removal/Installation	4-4-14
Oil Drain Tubes, Clogged — Removal/Installation	4-4-15
Oil Drain Valve — Cleaning/Inspection/Repair	6-8-21
Oil Drain Valve — Removal/Installation	6-8-20
Oil Filter Assembly, Engine Scavenge — Removal/Installation	4-4-17
Oil Filter Bypass Valve Assembly — Cleaning/Inspection/Repair	6-8-10
Oil Filter Bypass Valve Assembly — Removal/Installation	6-8-9
Oil Filter Element, Engine Scavenge — Removal/Installation	4-4-16
Oil Filter Inlet Hose — Removal/Installation	6-8-13
Oil Filter Manifold — Cleaning/Inspection/Repair	6-8-5
Oil Filter Manifold — Removal/Installation	6-8-4
Oil Filters, Transmission — Removal/Cleaning/Installation	6-8-3
Oil Jets (Number One and Two), Transmission — Cleaning/Inspection/Repair	6-8-12
Oil Jets (Number One and Two), Transmission — Removal/Installation	6-8-11
Oil Level Switch — Removal/Installation	4-4-4
Oil Pressure Regulator Valve — Adjustment	6-8-7
Oil Pressure Regulator Valve — Disassembly/Assembly	6-8-8
Oil Pressure Regulator Valve — Removal/Installation	6-8-6
Oil Pressure Switch (AVIM) — Testing/Checking	6-8-16

<u>Subject</u>	<u>Para/Task</u>
O (Cont)	
Oil Pressure Switch — Cleaning/ Inspection/Repair	6-8-15
Oil Pressure Switch — Removal/ Installation	6-8-14
Oil Pressure Transducer — Cleaning/Inspection/Repair	6-8-18
Oil Pressure Transducer — Removal/Installation	6-8-17
Oil Pressure Transducer, Engine — Checking	4-1-8
Oil Pressure Transducer (AVIM) — Testing/Checking	6-8-19
Oil Pressure Transducer (Typical) — Removal/Installation	4-1-7
Oil Pump, Transmission — Cleaning/Inspection/Repair	6-8-2
Oil Pump, Transmission — Removal/Installation	6-8-1
Oil Seal (AVIM), Freewheeling Unit Tail Rotor Drive Output — Removal/Installation	6-5-4
Oil Seal Assembly, Forward Cap — Removal/Cleaning/ Inspection/Repair/Installation	6-5-2
Oil Service Door, Aft Fairing Assembly Engine — Removal/ Installation	2-2-59
Oil System	6-24
Oil System, Engine	1-16, 4-11
Oil System, Engine — Draining	1-4-5
Oil System, Engine — Servicing	1-4-6
Oil System, Introduction to	6-25
Oil System, Task List for	6-26
Oil Tank Assembly — Cleaning/ Inspection/Repair	4-4-3
Oil Tank Assembly — Disassembly/Assembly	4-4-2
Oil Tank Assembly — Removal/ Installation	4-4-1
Oil Tank Cap and Adapter Assembly — Removal/ Installation	4-4-8
Oil Tank Drain Valve — Removal/ Installation	4-4-7
Oil Tank Sight Glass — Removal/ Installation	4-4-5
Oil Tank Support — Cleaning/ Inspection/Repair	4-4-13
Oil Tank Support — Removal/ Installation	4-4-12
Oil Tank Temperature Transducer — Removal/Installation	4-4-6
Oil Temperature Thermoswitch, Tail Rotor Gearbox — Removal/Installation	6-7-4
Operation, Principles of	1-23

<u>Subject</u>	<u>Para/Task</u>
O (Cont)	
Output Shaft Seal (AVIM), Tail Rotor Gearbox — Removal/ Installation	6-7-8
Outside Air Thermometer — Cleaning/Inspection/Removal/ Installation	8-5-5
Overhaul and Retirement Schedule	1-59
Overhead Console — Lowering	9-6-5
Overhead Console — Raising	9-6-6
Overhead Console (Typical), Circuit Breaker in — Removal/ Installation	9-6-7
Overhead Console (Typical), Lighting Control Knob — Removal/Installation	9-6-9
Overhead Console — Typical, Transformer Forward — Removal/Installation	9-6-11
Overhead Console and Center Post Circuit Breaker Panel (Typical), Electrical Connections — Inspection	9-6-13
Overhead Console or Center Post Circuit Breaker Panel — Typical, Integrally Lit Panel — Installation	9-6-14
Overhead Console or Center Post Circuit Breaker Panel — Typical, Integrally Lit Panel — Removal	9-6-12
Overheat Switch, Heater — Removal/Installation	9-6-44
Overload Sensing Control — Cleaning/Inspection/Repair	9-3-17
Overload Sensing Control — Removal/Installation	9-3-18
P	
Pack, Coupling Disc — Removal/ Cleaning/Installation	6-6-6
Pack Assemblies, Coupling Disc — Inspection	6-6-7
Packing, Tail Rotor Gearbox Housing — Removal/ Installation	5-5-18
Pan, Aft Firewall — Removal/ Installation	4-9-3
Pan Assembly (Typical), Seat — Cleaning/Inspection/Repair	2-2-35
Pan Assembly (Typical), Seat — Removal/Installation	2-2-34
Panel, Armament Control — Removal/Installation	9-8-1

<u>Subject</u>	<u>Para/Task</u>	<u>Subject</u>	<u>Para/Task</u>
P (Cont)		P (Cont)	
Panel, Auxiliary Circuit Breaker — Lowering	9-6-81	Parts, Flight Safety	1-60
Panel, Auxiliary Circuit Breaker — Raising	9-6-82	Parts Program, Flight Safety	1-61
Panel, Crew Seat and Armor Seat — Removal/Installation	2-2-33	Patching (AVIM), Main Rotor Blade Skin by — Repair	5-1-40
Panel, MMS Control — Removal/Installation	9-6-80	Pedal Adjustment Clevis, Directional Control — Removal/Inspection/Installation	11-4-9
Panel, SCAS Control — Installation	9-6-23	Pedal Adjustment and Support Assembly — Cleaning/Inspection/Repair	11-4-3
Panel, SCAS Control — Removal	9-6-22	Pedal Adjustment and Support Assembly, Directional Control — Removal/Installation	11-4-1
Panel (OH-58D), Digital Fuel Control — Installation	9-6-16	Pedal Bearing (AVIM), Directional Control — Removal/Installation	11-4-5
Panel (OH-58D), Digital Fuel Control — Removal	9-6-15	Pedal Bellcrank, Directional Control — Removal/Installation	1-4-7
Panel (Typical), Integrally Lit — Cleaning/Inspection/Repair	9-6-4	Pedal Bellcrank Bushing and Bearing (AVIM), Directional Control — Removal/Installation	11-4-8
Panel Assembly (COMSEC Unit 1 and 2) — Removal/Repair/Installation	9-2-10	Pedal Tube, Directional Control — Removal/Installation	11-4-10
Panel Glareshield, Instrument — Cleaning/Inspection/Repair	8-1-19	Pedals, Directional Control — Cleaning/Inspection/Repair	11-4-4
Panel Glareshield, Instrument — Removal/Installation	8-1-18	Pedals from Support Assembly, Directional Control — Removal	11-4-2
Panels, Armor — Cleaning/Inspection/Repair	2-2-43	Pedals in Support Assembly, Directional Control — Installation	11-4-6
Panels (Typical), Armor — Removal/Installation	2-2-42	Periods of Inventory	C-4
Panels (Typical), Crew Armor — Removal/Installation	2-2-40	Pilot Collective Elbow Assembly — Removal/Installation	11-2-40
Panels (Typical), Honeycomb — Cleaning/Inspection	2-2-80	Pilot Collective Elbow Assembly Bearings — Removal/Installation	11-2-41
Panels (Typical), Honeycomb — Repair	2-2-81	Pilot Collective Stick, Integrally Lit Panel — Removal/Installation	9-6-41
Panels, Center Post Duct and — Cleaning/Inspection/Repair	2-2-70	Pilot Collective Stick-Typical, Switch — Removal/Installation	9-6-42
Panels, Center Post Duct and — Removal/Installation	2-2-69	Pilot Collective Stick Assembly — Removal/Installation	11-2-26
Panels, Crew Armor — Cleaning/Inspection/Repair	2-2-41	Pilot Collective Stick Assembly Miscellaneous Parts — Removal/Installation	11-2-27
Parking/Towing Helicopter	1-6-1	Pilot Collective Stick Control Panel, Cargo Release Switch — Removal/Installation	9-6-43
Particle Separator — Cleaning/Inspection/Repair	4-2-13	Pilot Collective Stick Control Panel Box — Cleaning/Inspection/Repair	11-2-28
Particle Separator — Removal/Installation	4-2-12	Pilot Collective Stick Cover — Removal/Installation	11-2-3
Particle Separator Fan (AVIM) — Cleaning/Inspection/Repair	4-2-10	Pilot Collective Stick Detent Button — Cleaning/Inspection/Repair	11-2-30
Particle Separator Fan (AVIM) — Disassembly/Assembly	4-2-9		
Particle Separator Fan and Duct — Installation	4-2-11		
Particle Separator Fan and Duct — Removal	4-2-8		
Particle Separator Vortex Generator Tubes — Removal/Installation	4-2-14		

<u>Subject</u>	<u>Para/Task</u>
P (Cont)	
Pilot Collective Stick Elbow Assembly — Cleaning/ Inspection/Repair	11-2-33
Pilot Collective Stick Inner Tube Assembly — Cleaning/ Inspection/Repair	11-2-34
Pilot Collective Stick Outer Tube Assembly — Cleaning/ Inspection/Repair	11-2-32
Pilot Collective Stick Ring Gears — Cleaning/Inspection/Repair	11-2-35
Pilot Collective Stick Throttle Arm — Cleaning/Inspection/Repair	11-2-36
Pilot Collective Stick Throttle Friction Plug — Cleaning/ Inspection/Repair	11-2-29
Pilot Collective Stick Throttle Grip Assembly — Cleaning/ Inspection/Repair	11-2-31
Pilot Cyclic Fitting Assembly Bearings (AVIM) — Removal/ Installation	11-3-61
Pilot Cyclic Grip — Removal/ Installation	9-6-84
Pilot Cyclic Pivot Assembly — Cleaning/Inspection/Repair	11-3-45
Pilot Cyclic Pivot Support Assembly Inserts — Removal/ Installation	11-3-62
Pilot Cyclic Position Adjustment Indicator Pin — Cleaning/ Inspection/Repair	11-3-56
Pilot Cyclic Position Adjustment Indicator Pin — Removal/ Installation	11-3-55
Pilot Cyclic Position Adjustment Knob Assembly — Removal/ Installation	11-3-54
Pilot Cyclic Position Adjustment Rod End — Cleaning/ Inspection/Repair	11-3-53
Pilot Cyclic Position Adjustment Rod End — Removal/ Installation	11-3-52
Pilot Cyclic Stick Fitting Assembly — Cleaning/Inspection/Repair	11-3-60
Pilot Cyclic Stick Fitting Assembly — Removal/Installation	11-3-58
Pilot Cyclic Stick Pivot Assembly — Removal/Installation	11-3-42
Pilot Cyclic Stick Pivot Bearing — Cleaning/Inspection/Repair	11-3-51
Pilot Cyclic Stick Pivot Bearing — Removal/Installation	11-3-50

<u>Subject</u>	<u>Para/Task</u>
P (Cont)	
Pilot Cyclic Stick and Pivot Support Assembly — Removal/ Installation	11-3-57
Pilot Cyclic Stick Stop — Cleaning/Inspection/Repair	11-3-48
Pilot Cyclic Tube Assembly — Cleaning/Inspection/Repair	11-3-59
Pin, Pilot Cyclic Position Adjustment Indicator — Cleaning/Inspection/Repair	11-3-56
Pin, Pilot Cyclic Position Adjustment Indicator — Removal/Installation	11-3-55
Pinion Magnetic Seal (AVIM), Input — Removal/Cleaning/ Inspection/Repair/Installation	6-3-7
Pitch Change Control Tube, Tail Rotor — Cleaning/Inspection/ Repair	5-5-14
Pitch Change Control Tube, Tail Rotor — Installation	5-5-15
Pitch Change Control Tube, Tail Rotor — Removal	5-5-13
Pitch Change Housing, Tail Rotor Gearbox — Cleaning/ Inspection/Repair	5-5-21
Pitch Change Idler, Tail Rotor — Cleaning/Inspection/Repair	5-5-10
Pitch Change Idler, Tail Rotor — Installation	5-5-12
Pitch Change Idler, Tail Rotor — Removal	5-5-9
Pitch Change Idler Bushings and Bearing (AVIM), Tail Rotor — Removal/Installation	5-5-11
Pitch Change Lever (AVIM), Tail Rotor — Cleaning/Inspection/ Repair	5-5-6
Pitch Change Lever Bushings and Bearing (AVIM), Tail Rotor — Removal/Installation	5-5-7
Pitch Change Levers, Tail Rotor — Installation	5-5-8
Pitch Change Levers, Tail Rotor — Removal	5-5-5
Pitch Change Mechanism, Tail Rotor	5-14
Pitch Change Mechanism, Tail Rotor — Inspection	5-5-2
Pitch Change Rod Assembly, Tail Rotor — Cleaning/Inspection/ Repair	5-5-3
Pitch Change Rod Assembly, Tail Rotor — Installation	5-5-4
Pitch Change Rod Assembly, Tail Rotor — Removal	5-5-1

<u>Subject</u>	<u>Para/Task</u>
P (Cont)	
Pitch Change Trunnion, Tail Rotor — Cleaning/Inspection/Repair	5-5-20
Pitch Change Trunnion Cap, Tail Rotor — Cleaning/Inspection/ Repair	5-5-19
Pitch Horn Assemblies (AVIM), Main Rotor — Removal/ Installation	5-1-21
Pitch Horn Assembly (AVIM), Main Rotor — Cleaning/ Inspection/Repair	5-1-22
Pitch Horn, Tail Rotor — Cleaning/Inspection/Repair	5-4-20
Pitch Horn Bushing (AVIM), Tail Rotor — Replacement	5-4-21
Pitch Horn Bushings (AVIM), Main Rotor — Removal/ Installation	5-1-23
Pitch Link Assembly, Collective — Cleaning/Inspection/Repair	11-2-5
Pitch Link Assembly, Collective — Removal/Installation	11-2-4
Pitch Link Assembly, Main Rotor — Cleaning/Inspection/Repair	5-2-2
Pitch Link Horn Attaching Hardware, Main Rotor — Removal/Installation	5-1-14
Pitch Link, Main Rotor — Installation	5-2-3
Pitch Link, Main Rotor — Removal	5-2-1
Pitch Link, Tail Rotor — Cleaning/ Inspection/Repair	5-4-3
Pitch Link, Tail Rotor — Installation	5-4-4
Pitch Link, Tail Rotor — Removal	5-4-2
Pitch Rate Sensor — Cleaning/ Inspection/Repair	9-6-55
Pitch Rate Sensor — Removal/ Installation	9-6-56
Pitch and Roll Engage Switch, SCAS — Removal/Installation	9-6-26
Pitot Tube — Cleaning/Inspection/ Repair	8-3-5
Pitot Tube — Removal/Installation	8-3-4
Pitot-Static Instrument and Air Data Systems	8-8
Pitot-Static Instrument and Air Data Systems, Introduction to	8-9
Pitot-Static Instrument and Air Data Systems, Task List for	8-10
Pitot-Static Tubing and Fittings — Cleaning/Inspection/Repair	8-3-1
Pitot-Static Tubing and Fittings — Installation	8-3-3

<u>Subject</u>	<u>Para/Task</u>
P (Cont)	
Pitot-Static Tubing and Fittings — Removal	8-3-2
Pivot Assembly, Pilot Cyclic — Cleaning/Inspection/Repair	11-3-45
Pivot Assembly, Pilot Cyclic Stick — Removal/Installation	11-3-42
Pivot Assembly Bearing (AVIM) — Removal/Installation	11-3-49
Pivot Bearing, Pilot Cyclic Stick — Cleaning/Inspection/Repair	11-3-51
Pivot Bearing, Pilot Cyclic Stick — Removal/Installation	11-3-50
Pivot Bearing Retainer, Cyclic Stick — Cleaning/Inspection/ Repair	11-3-44
Pivot Support Assembly Inserts, Pilot Cyclic — Removal/ Installation	11-3-62
Pivot Support Bearing — Cleaning/Inspection/Repair	11-3-43
Pivotable, Fin — Removal/ Installation	2-3-22
Pivotable Fin Support — Removal/Installation	2-3-23
Plate, Main Rotor Hub Lower — Cleaning/Inspection/Repair	5-1-32
Plate, Main Rotor Hub Upper — Cleaning/Inspection/Repair	5-1-18
Plate Assembly, CPG Cyclic Stick — Cleaning/Inspection/Repair	11-3-71
Plate Assembly, Collective — Removal/Installation	11-2-66
Plate Assembly, Main Rotor Upper Cone — Cleaning/ Inspection/Repair	5-1-3
Plate Assembly Bearing (AVIM), CPG Cyclic Stick — Removal/ Installation	11-3-72
Platform Assembly, MMS — Cleaning/Inspection/Repair	13-2-5
Platform Assembly, MMS — Disassembly/Assembly	13-2-6
Platform Assembly, MMS — Installation/Removal	13-2-4
Plenum Assembly — Cleaning/ Inspection/Repair	12-2-2
Plenum Assembly — Installation	12-2-3
Plenum Assembly — Removal	12-2-1
Plug, Copilot/Gunner Collective Stick Assembly — Removal/ Installation	11-2-10
Points, Hard — Cleaning/ Inspection/Repair	2-2-86
Polyurethane Conductive Coatings (AVIM), Copper Filled — Use	2-2-64

<u>Subject</u>	<u>Para/Task</u>
P (Cont)	
Polyurethane Top Coatings (AVIM), Aliphatic — Use	2-2-65
Position Adjustment Indicator Pin, Pilot Cyclic — Cleaning/ Inspection/Repair	11-3-56
Position Adjustment Indicator Pin, Pilot Cyclic — Removal/ Installation	11-3-55
Position Adjustment Knob Assembly, Pilot Cyclic — Removal/Installation	11-3-54
Position Adjustment Rod End, Pilot Cyclic — Cleaning/ Inspection/Repair	11-3-53
Position Adjustment Rod End, Pilot Cyclic — Removal/ Installation	11-3-52
Position Light, Tail — Installation	9-5-11
Position Light, Tail — Removal	9-5-10
Position Light (Typical), Side — Installation	9-5-9
Position Light (Typical), Side — Removal	9-5-8
Position Light Dimming Resistor — Installation	9-5-13
Position Light Dimming Resistor — Removal	9-5-12
Potentiometer Arm, Droop Compensator — Cleaning/ Inspection/Repair	11-2-54
Power (Battery and External), DC — Application/Removal	1-6-5
Power (External), AC — Application/Removal	1-6-6
Power Converter (Typical), Night Vision — Installation	9-5-24
Power Converter (Typical), Night Vision — Removal	9-5-23
Power Converter, Night Vision — Cleaning/Inspection/Repair	9-5-22
Power Door Switch, DC External — Cleaning/Inspection/Repair	9-3-11
Power Door Switch, DC External — Removal/Installation	9-3-12
Power Monitor Unit, AC — Cleaning/Inspection/Repair	9-4-14
Power Monitor Unit, AC — Removal/Installation	9-4-15
Power Off or Rapid Refueling — Closed Circuit	1-4-1
Power Off or Rapid, Refueling — Gravity or Open Port	1-4-2
Power Switch, SCAS — Removal/ Installation	9-6-30
Power and Distribution System, Alternating Current	9-11

<u>Subject</u>	<u>Para/Task</u>
P (Cont)	
Power and Distribution System, Direct Current	9-8
Power and Distribution System, Introduction to Alternating Current	9-12
Power and Distribution System, Introduction to Direct Current	9-9
Power and Distribution System, Task List for Alternating Current	9-13
Power and Distribution System, Task List for Direct Current	9-10
Powerplant Controls	4-15
Powerplant Differences (250- C30R/3 Engine with FADEC vs. 250-C30R/1 Series)	1-27
Powerplant	1-26, 4-1
Powerplant and Transmission Electrical Equipment	9-20
Powerplant and Transmission Electrical Equipment, Introduction to	9-21
Powerplant and Transmission Electrical Equipment, Task List for	9-22
Preheat Indicator Lights, Battery — Cleaning/Inspection/Repair	9-3-5
Preheat Indicator Lights, Battery — Removal/Installation	9-3-6
Preliminary Weighing Instructions	G-14
Preparation (Appendix M), Surface	M-6
Preparation for Storage or Shipment	1-5
Preservation (Appendix Q)	Q-6
Preservation (Flyable Storage), Maintenance of	E-15
Preservation (Intermediate Storage), Maintenance of	E-44
Preservation (Short Term Storage), Maintenance of	E-29
Pressure Manifold — Cleaning/ Inspection/Repair	7-5-4.1
Pressure Manifold — Removal/ Installation	7-5-4
Pressure Switch — Removal/ Installation	7-5-1
Pressure Switch, Fuel — Removal/Installation	10-1-12
Pressure Switch, Fuel Differential — Inspection	4-6-12
Pressure Switch, Fuel Differential — Removal/Installation	4-6-10
Pressure Switch, Hydraulic — Cleaning/Inspection/Repair	7-5-2

<u>Subject</u>	<u>Para/Task</u>
P (Cont)	
Pressure Switch Manifolds and Relief Valve, Introduction to	7-15
Pressure Switch Manifolds and Relief Valve, Task List for	7-16
Pressure Switch, Manifolds and Relief Valve	7-14
Pressure Switch, Oil — Cleaning/Inspection/Repair	6-8-15
Pressure Switch, Oil — Removal/Installation	6-8-14
Pressure Switch (AVIM), Oil — Testing/Checking	6-8-16
Pressure Switch (OH-58D(R)), Fuel Differential — Removal/Installation	4-6-11
Pressure Transducer (AVIM), Oil — Testing/Checking	6-8-19
Pressure Transducer (Typical), Oil — Removal/Installation	4-1-7
Pressure Transducer, Oil — Cleaning/Inspection/Repair	6-8-18
Pressure Transducer, Oil — Removal/Installation	6-8-17
Prevention (Appendix Q)	Q-5
Preventive Maintenance Inspections, General Information	1-55
Principles of Operation	1-23
Probe, Fuel — Removal/Installation	10-1-13
Procedures, Helicopter Safing	1-6-7
Procedures Common to all Categories of Storage	E-4
Prone Components, Corrosion	Q-8
Prone Honeycomb Panels, Corrosion	Q-11
Protective Rubber Pad Below Fuel Receiver — Removal/Installation	2-2-98
Pump Driveshaft Assembly, Hydraulic — Cleaning/Inspection/Repair	7-8-4
Pump Driveshaft Assembly Alternate Method, Hydraulic — Inspection	7-8-5
Pump, Boost — Cleaning/Inspection	10-1-18
Pump, Boost — Installation	10-1-19
Pump, Boost — Removal	10-1-17
Pump, Hydraulic	7-23
Pump, Hydraulic — Cleaning/Inspection/Repair	7-8-2
Pump, Hydraulic — Removal/Installation	7-8-1
Pump, Introduction to Hydraulic	7-24
Pump, Task List for Hydraulic	7-25

<u>Subject</u>	<u>Para/Task</u>
P (Cont)	
Pump, Transmission Oil — Cleaning/Inspection/Repair	6-8-2
Pump, Transmission Oil — Removal/Installation	6-8-1
Purpose — Inspection and Corrosion Prone Areas (Appendix Q)	Q-3
Purpose — Introduction (Appendix Q)	Q-1
Pushbutton Switch (Digital Fuel Control Panel (OH-58D) - Typical) — Removal/Installation	9-6-20
Pylon	2-10
Pylon — Cleaning/Inspection	2-4-1
Pylon (UWP) Mount Fitting Cover, Universal Weapons — Removal/Installation	2-2-93
Pylon Fittings — Cleaning/Inspection/Repair	6-3-15
Pylon Fittings — Removal/Installation	6-3-14

Q

Quality Assurance/Quality Control (QA/QC)	1-6
Quantity Control Unit, Fuel — Removal/Installation	9-6-64
Quick-Disconnect Anchor Ball Assembly, CPG Cyclic Stick — Cleaning/Inspection/Repair	11-3-90
Quick-Disconnect Coupling Halves — Cleaning/Inspection/Repair	7-4-7
Quick-Disconnect Latch Assembly, CPG Cyclic Stick — Cleaning/Inspection/Repair	11-3-88
Quick-Disconnect Lever Assembly, CPG Cyclic Stick — Cleaning/Inspection/Repair	11-3-76
Quick-Disconnect Lever Bushings (AVIM), CPG Cyclic — Removal/Installation	11-3-77
Quick-Disconnect Lever and Link Assembly, CPG Cyclic Stick — Removal/Installation	11-3-75
Quick-Disconnect Self-Sealing Coupling Half (Typical) — Removal/Installation	7-4-6
Quick-Disconnect Support Assembly, CPG Cyclic Stick — Cleaning/Inspection/Repair	11-3-89
Quick-Disconnects, Hydraulic Hoses Lines Tubes Fittings and	7-11

R

<u>Subject</u>	<u>Para/Task</u>
R (Cont)	
RRA, Rocket Remote Assembly — Cleaning/Inspection/Repair	9-8-12
RRA, Rocket Remote Assembly — Removal/Installation	9-8-13
RT Unit Mounting Tray, HF — Removal/Installation	9-2-2
Range (Appendix P), Recommended Installation Torque	P-4
Rapid Deployment	13-5
Rapid Deployment, Aft Crosstube — Cleaning/Inspection/Repair	3-1-37
Rapid Deployment, Aft Crosstube — Removal/Installation	3-1-34
Rapid Deployment, Aft Crosstube Components — Removal/ Installation	3-1-40
Rapid Deployment, Aft Crosstube Support Assembly — Cleaning/ Inspection/Repair	3-1-9
Rapid Deployment, Aft Crosstube Support Beam and Components — Cleaning/ Inspection/Repair	3-1-46
Rapid Deployment, Aft Crosstube Support Beam and Components — Removal/ Installation	3-1-44
Rapid Deployment, Aft Crosstube Supports — Cleaning/ Inspection/Repair	3-1-42
Rapid Deployment, Configure Helicopter for	13-2-9
Rapid Deployment, Configure Helicopter for Flight After	13-2-10
Rapid Deployment, Eyebolt — Cleaning/Inspection/Repair	3-1-23
Rapid Deployment, Eyebolt — Removal/Installation	3-1-21
Rapid Deployment, Forward Crosstube — Cleaning/ Inspection/Repair	3-1-27
Rapid Deployment, Forward Crosstube — Removal/ Installation	3-1-25
Rapid Deployment, Forward Crosstube Components — Cleaning/Inspection/Repair	3-1-60
Rapid Deployment, Forward Crosstube Components — Removal/Installation	3-1-30
Rapid Deployment, Forward Crosstube Support Assembly — Cleaning/Inspection/Repair	3-1-10

<u>Subject</u>	<u>Para/Task</u>
R (Cont)	
Rapid Deployment, Forward Crosstube Support Assembly — Cleaning/Inspection/Repair	3-1-59
Rapid Deployment, Forward Crosstube Supports — Cleaning/Inspection/Repair	3-1-32
Rapid Deployment, Landing Gear — Inspection	3-1-2
Rapid Deployment, Landing Gear — Removal/Installation	3-1-6
Rapid Deployment, Landing Gear Knuckle Assembly (Typical) — Disassembly/Assembly (AVIM)	3-1-56
Rapid Deployment, Leg and Knuckle Assembly — Removal/ Installation	3-1-51
Rapid Deployment, Leg and Knuckle Assembly Components — Cleaning/Inspection/Repair	3-1-52
Rapid Deployment, MMS Platform Ball and Hoist Ball — Removal/ Installation	3-1-53
Rapid Deployment, MMS Platform Ball and MMS Hoist Ball — Cleaning/Inspection/Repair	3-1-54
Rapid Deployment, Skid Shoes and Skid Tube Rivnuts — Removal/Installation	3-1-16
Rapid Deployment, Skid Tube Assembly — Cleaning/ Inspection/Repair	3-1-12
Rapid Deployment, Skid Tube Assembly — Removal/ Installation	3-1-14
Rapid Deployment, Tiedown Fitting — Removal/Installation	3-1-55
Rapid Deployment, Tow Fittings — Removal/Installation	3-1-49
Rapid Deployment Jacks — Cleaning/Inspection/Repair	13-2-7
Rapid Deployment Landing Gear, Weight-On Gear Switch — Removal/Installation	9-6-1
Rapid Deployment Skid Gear — Mooring Helicopter	1-7-2
Rapid Deployment Skid Gear, Towing Helicopter with	1-6-2
Rapid or Power Off Refueling — Closed Circuit	1-4-1
Rapid or Power Off Refueling — Gravity or Open Port	1-4-2
Raschel Seat Covers — Removal/ Installation	2-2-24
Rate Sensor, Pitch — Cleaning/ Inspection/Repair	9-6-55

<u>Subject</u>	<u>Para/Task</u>	<u>Subject</u>	<u>Para/Task</u>
R (Cont)		R (Cont)	
Rate Sensor, Pitch — Removal/ Installation	9-6-56	Release Switch (Pilot Collective Stick Control), Cargo — Removal/Installation	9-6-43
Rate Sensor, Roll — Cleaning/ Inspection/Repair	9-6-57	Relief Valve — Cleaning/ Inspection/Repair	7-5-5.1
Rate Sensor, Roll — Removal/ Installation	9-6-58	Relief Valve — Removal/ Installation	7-5-5
Rebound Assembly — Cleaning/ Inspection/Repair	2-2-37	Relief Valve, Pressure Switch Manifolds and	7-14
Rebound Assembly — Removal/ Installation	2-2-36	Remarks (Column 6 and Section IV)	B-10
Receiver Assembly — Removal/ Inspection/Repair/Installation	10-1-24	Remote Assembly (RRA), Rocket — Cleaning/Inspection/Repair	9-8-12
Receiver, Protective Rubber Pad Below Fuel — Removal/ Installation	2-2-98	Remote Assembly (RRA), Rocket — Removal/Installation	9-8-13
Receptacle, AC External Power — Cleaning/Inspection/Repair	9-4-3	Remote Control Circuit Breaker — Installation	9-6-35
Receptacle, AC External Power — Removal/Installation	9-4-4	Remote Control Circuit Breaker — Removal	9-6-34
Recommendations (EIR), Reporting Equipment Improvement	1-8	Remote Hellfire Electronics (RHE) — Cleaning/Inspection/Repair	9-8-10
Recommended Installation Torque Range (Appendix P)	P-4	Remote Hellfire Electronics (RHE) — Removal/Installation	9-8-11
Record of Weight and Balance Personnel, DD Form 365	G-7	Remote ICS Switch — Removal/ Installation	9-6-88
Recorder Mounting Rack, Video — Removal/Installation	9-2-8	Remote Sensor — Cleaning/ Inspection/Repair	12-1-8
Records, Maintenance Forms and	1-3	Remote Sensor — Removal/ Installation	12-1-7
Rectifier Unit (TRU) Plate and Brackets, Transformer — Removal/Installation	9-3-4	Repair — Corrosion Prone Areas (Appendix Q), Inspection and	Q-7
Rectifier Unit (TRU), Transformer — Cleaning/Inspection/Repair	9-3-2	Repair, Landing Gear Corrosion	Q-14
Rectifier Unit (TRU), Transformer — Removal/Installation	9-3-3	Repair, Tailboom Corrosion	Q-13
References (Appendix A)	A-1	Repair and Replacement (Appendix F), Wire	F-8
Refinishing (Appendix M)	M-9	Replacement (Appendix F), Wire Repair and	F-8
Refueling (Power Off or Rapid) — Closed Circuit	1-4-1	Reporting Equipment Improvement Recommendations (EIR)	1-8
Refueling (Power Off or Rapid) — Gravity or Open Port	1-4-2	Requirements (Storage of Helicopter)	E-2
Regulator Valve, Oil Pressure — Adjustment	6-8-7	Requirements, Special	1-47
Regulator Valve, Oil Pressure — Disassembly/Assembly	6-8-8	Requirements, Tool and Test Equipment	B-11
Regulator Valve, Oil Pressure — Removal/Installation	6-8-6	Rescue Ladder	13-8
Regulator, Voltage — Cleaning/ Inspection/Repair	9-3-19	Rescue Ladder — Cleaning/ Inspection/Repair	13-3-2
Regulator, Voltage — Removal/ Installation	9-3-20	Rescue Ladder — Removal/ Installation	13-3-1
Relay (Typical) — Removal/ Installation	9-6-45	Rescue Ladder, Introduction to	13-9
		Rescue Ladder, Task List for	13-10
		Rescue Ladder Release Cable — Cleaning/Inspection/Repair	13-3-5
		Rescue Ladder Release Cable, Left — Removal/Installation	13-3-3

<u>Subject</u>	<u>Para/Task</u>
R (Cont)	
Rescue Ladder Release Cable, Right — Removal/Installation	13-3-4
Reservoir, Hydraulic	7-20
Reservoir, Hydraulic — Cleaning/ Inspection/Repair	7-7-8
Reservoir, Hydraulic — Draining/ Servicing	1-4-10
Reservoir, Hydraulic — Removal/ Installation	7-7-1
Reservoir, Introduction to Hydraulic	7-21
Reservoir, Task List for Hydraulic	7-22
Reservoir Cover Latch Assembly, Hydraulic — Removal/ Installation	7-7-3
Reservoir Cover Pin and Cap Gasket, Hydraulic — Removal/ Installation	7-7-2
Reservoir Return Port Union, Hydraulic — Removal/ Installation	7-7-4
Reservoir Screen, Hydraulic — Removal/Installation	7-7-7
Reservoir Sight Plug, Hydraulic — Removal/Installation	7-7-5
Reservoir Strainer and Cover Gasket, Hydraulic — Removal/ Installation	7-7-6
Reservoir Support Bracket, Hydraulic — Removal/ Installation	7-7-9
Reset Switch, AC External Power — Cleaning/Inspection/Repair	9-4-5
Reset Switch, AC External Power — Removal/Installation	9-4-6
Resistance (Appendix M), Bond	M-10
Resistance of Electrical Bonds (Appendix M)	M-5
Resistor or Capacitor on Terminal Junction (Typical) — Removal/ Installation	9-6-63
Responsibility (Appendix G)	G-3
Responsibility (Appendix Q)	Q-4
Restraint, Seat — Cleaning/ Inspection/Repair	2-2-17
Restraint, Seat — Removal/ Installation	2-2-16
Restraint (Energy Attenuating), Seat — Cleaning/Inspection/ Repair	2-2-19
Restraint (Energy Attenuating), Seat — Removal/Installation	2-2-18
Retainer, Cyclic Stick Indicator Pin — Cleaning/Inspection/ Repair	11-3-46

<u>Subject</u>	<u>Para/Task</u>
R (Cont)	
Retainer, Cyclic Stick Pivot Bearing — Cleaning/Inspection/ Repair	11-3-44
Retainer/Packing/Nut, Tee/ — Removal/Installation	7-4-5
Retaining Nut, Tail Rotor — Cleaning/Inspection/Repair	5-4-18
Retirement Schedule, Overhaul and	1-59
Return Manifold — Cleaning/ Inspection/Repair	7-5-3.1
Return Manifold — Removal/ Installation	7-5-3
Return Port Union, Hydraulic Reservoir — Removal/ Installation	7-7-4
Rigging	11-2
Rigging, Introduction to	11-3
Rigging, Task List for	11-4
Right Cyclic Yoke — Installation	11-3-18
Right Cyclic Yoke — Removal	11-3-17
Right or Left Access Panel (Typical) — Cleaning/ Inspection/Repair	2-2-84
Right or Left Access Panel (Typical) — Removal/ Installation	2-2-83
Right Rescue Ladder Release Cable — Removal/Installation	13-3-4
Rigid Tube Assembly (Typical) — Removal/Installation	7-4-1
Ring Assembly for Rotational Movement, Swashplate Inner — Inspection	5-2-39
Ring Gears, Pilot Collective Stick — Cleaning/Inspection/Repair	11-2-35
Ring Set (AVIM), Main Rotor Drive — Cleaning/Inspection/ Repair	5-1-31
Ring Set (AVIM), Main Rotor Drive — Removal/Installation	5-1-30
Rivnut, Skid Shoes and Skid Tube — Cleaning/Inspection/ Repair	3-1-17
Rivnut, Skid Shoes and Skid Tube — Removal/Installation	3-1-15
Rivnuts (Rapid Deployment) (AVIM), Skid Shoes and Skid Tube — Cleaning/Inspection/ Repair	3-1-19
Rocket Remote Assembly (RRA) — Cleaning/Inspection/Repair	9-8-12
Rocket Remote Assembly (RRA) — Removal/Installation	9-8-13

<u>Subject</u>	<u>Para/Task</u>
R (Cont)	
Rod Assembly, Tail Rotor Pitch Change — Cleaning/Inspection/ Repair.....	5-5-3
Rod Assembly, Tail Rotor Pitch Change — Installation.....	5-5-4
Rod Assembly, Tail Rotor Pitch Change — Removal.....	5-5-1
Rod End, Pilot Cyclic Position Adjustment — Cleaning/ Inspection/Repair.....	11-3-53
Rod End, Pilot Cyclic Position Adjustment — Removal/ Installation.....	11-3-52
Rod End, Throttle Arm — Removal/Installation.....	4-6-7
Roll Rate Sensor — Cleaning/ Inspection/Repair.....	9-6-57
Roll Rate Sensor — Removal/ Installation.....	9-6-58
Roof Drain, Cabin — Cleaning/ Inspection/Repair.....	2-2-85
Roof Skylight, Cabin — Cleaning/ Inspection/Repair.....	2-2-75
Roof Skylight, Cabin — Removal/ Installation.....	2-2-74
Rotary Actuator, Directional Control — Cleaning/Inspection/ Repair.....	11-4-38
Rotary Actuator, Directional Control — Removal/Installation.....	11-4-37
Rotor Assembly, Tail — Assembly.....	5-4-14
Rotor Assembly, Tail — Balancing.....	5-4-15
Rotor Assembly, Tail — Cleaning/ Inspection/Repair.....	5-4-13
Rotor Assembly, Tail — Disassembly.....	5-4-12
Rotor Assembly, Tail — Installation.....	5-4-16
Rotor Assembly, Tail — Removal.....	5-4-11
Rotor Autorotation RPM, Main — Adjustment.....	5-3-1
Rotor Bellcrank, Tail — Removal/ Installation.....	11-4-43
Rotor Blade (AVIM), Main — Refinishing.....	5-1-41
Rotor Blade Bolt, Main — Cleaning/Inspection/Repair.....	5-1-9
Rotor Blade Core (AVIM), Main — Repair.....	5-1-51
Rotor Blade Erosion Shield, Main — Repair.....	5-1-44
Rotor Blades (AVIM), Tail — Cleaning/Inspection/Repair/ Refinishing.....	5-4-27

<u>Subject</u>	<u>Para/Task</u>
R (Cont)	
Rotor Blades, Main — De-Icing.....	1-4-12
Rotor Blades, Main — Folding/ Unfolding (Alternate Method).....	1-7-6
Rotor Blades, Main — Folding/ Unfolding (Standard Method).....	1-7-5
Rotor Blades, Main — Inspection.....	5-1-39
Rotor Blades, Main — Removal/ Cleaning/Inspection/Installation.....	5-1-5
Rotor Control Antidrive Lever, Main — Installation.....	5-2-27
Rotor Control Antidrive Link, Main — Installation.....	5-2-30
Rotor Control Antidrive Link, Main — Removal.....	5-2-28
Rotor Control Antidrive Link (AVIM), Main — Cleaning/ Inspection/Repair.....	5-2-29
Rotor Controls, Main.....	5-5
Rotor Controls Antidrive Lever, Main — Removal.....	5-2-25
Rotor Controls Antidrive Lever (AVIM), Main — Cleaning/ Inspection/Repair.....	5-2-26
Rotor Controls Collective Lever, Main — Installation.....	5-2-20
Rotor Controls Drive Lever, Main — Removal.....	5-2-7
Rotor Controls Drive Link, Main — Installation.....	5-2-6
Rotor Controls Drive Link, Main — Removal.....	5-2-4
Rotor Controls Drive Link (AVIM), Main — Cleaning/Inspection/ Repair.....	5-2-5
Rotor Crosshead, Tail — Cleaning/Inspection/Repair.....	5-4-9
Rotor Crosshead, Tail — Installation.....	5-4-10
Rotor Crosshead, Tail — Removal.....	5-4-8
Rotor Driveshaft Covers, Tail — Cleaning/Inspection/Repair.....	2-3-12
Rotor Driveshaft Covers, Tail — Removal/Installation.....	2-3-11
Rotor Driveshafts, Tail.....	6-18
Rotor Expandable Bolt, Main — Disassembly/Cleaning/ Inspection/Repair/Assembly.....	5-1-8
Rotor Expandable Bolt, Main — Removal/Installation.....	5-1-6
Rotor Gearbox, Tail.....	1-19, 6-21
Rotor Gearbox, Tail — Draining/ Servicing.....	1-4-9
Rotor Gearbox, Tail — Serviceability Check.....	6-1-3

<u>Subject</u>	<u>Para/Task</u>
R (Cont)	
Rotor Gearbox Support Assembly, Tail — Cleaning/Inspection/ Repair	2-3-6
Rotor Grip Assembly, Main — Cleaning/Inspection/Repair	5-1-28
Rotor Hub and Blade Assembly	5-2
Rotor Hub and Blade Assembly, Main — Installation	5-1-2
Rotor Hub (AVIM), Tail — Assembly	5-4-26
Rotor Hub (AVIM), Tail — Disassembly	5-4-23
Rotor Hub (AVIM), Tail — Repair	5-4-25
Rotor Hub Components (AVIM), Tail — Cleaning/Inspection	5-4-24
Rotor Mast Assembly, Main — Cleaning/Inspection	6-4-18
Rotor Mast Assembly, Main — Installation	6-4-20
Rotor Mast Assembly, Main — Removal	6-4-15
Rotor Mast Assembly (AVIM), Main — Assembly	6-4-19
Rotor Mast Assembly (AVIM), Main — Disassembly	6-4-16
Rotor Mast Assembly Components (AVIM), Main — Cleaning/Inspection/Repair	6-4-17
Rotor Pitch Link, Main — Cleaning/Inspection/Repair	5-2-2
Rotor Retaining Nut, Tail — Cleaning/Inspection/Repair	5-4-18
Rotor Swashplate and Support, Main — Installation	5-2-38
Rotor Swashplate and Support Components (AVIM), Main — Cleaning/Inspection/Repair	5-2-35
Rotor System (Flyable Storage)	E-12
Rotor System (Intermediate Storage)	E-38
Rotor System (Short Term Storage)	E-23
Rotor Tiedowns — Installation/ Removal	1-7-4
Rotor and Transmission Instruments, Engine	8-2
Rotor, Tail — Inspection	5-4-1
Rotors	1-28, 5-1
Rubber Pad Below Fuel Receiver, Protective — Removal/ Installation	2-2-98

S

SCAS Control Panel — Installation	9-6-23
--	--------

<u>Subject</u>	<u>Para/Task</u>
S (Cont)	
SCAS Control Panel — Removal	9-6-22
SCAS Control Panel, Integrally Lit Panel — Installation	9-6-25
SCAS Control Panel, Integrally Lit Panel — Removal	9-6-24
SCAS Force Trim Switch — Removal/Installation	9-6-29
SCAS Pitch and Roll Engage Switch — Removal/Installation	9-6-26
SCAS Power Switch — Removal/ Installation	9-6-30
SCAS Test Switch — Removal/ Installation	9-6-28
SCAS Yaw Engage Switch — Removal/Installation	9-6-27
Safety Parts, Flight	1-60
Safety Parts Program, Flight	1-61
Safing Procedures, Helicopter	1-6-7
Scavenge Oil Filter Assembly, Engine — Removal/Installation	4-4-17
Scavenge Oil Filter Element, Engine — Removal/Installation	4-4-16
Schedule, Overhaul and Retirement	1-59
Scope (Appendix D)	D-1
Scope (Appendix G)	G-1
Scope (Of Maintenance Manual)	1-2
Screen, Hydraulic Reservoir — Removal/Installation	7-7-7
Seal, Aft Firewall — Removal/ Installation	4-9-4
Seal, Engine Accessory Gearbox — Removal/Installation	4-1-10
Seal, Forward Fairing Assembly — Removal/Installation	2-2-49
Seal, Tail Rotor Gearbox Input — Removal/Installation	6-7-5
Seal, Tail Rotor Gearbox Input — Removal/Installation	6-7-6
Seal, Torquemeter Support Bearing — Removal/Installation	6-4-6
Seal (AVIM), Input Pinion Magnetic — Removal/Cleaning/ Inspection/Repair/Installation	6-3-7
Seal (AVIM), Tail Rotor Gearbox Output Shaft — Removal/ Installation	6-7-8
Sealing (Appendix M)	M-8
Seals, Forward Firewall — Removal/Installation	4-8-4
Seals, Oil Cooler Fairing — Removal/Installation	4-4-14
Searchlight — Cleaning/ Inspection/Repair	9-5-17
Searchlight — Corrosion Treatment	9-5-18

<u>Subject</u>	<u>Para/Task</u>
S (Cont)	
Searchlight — Installation	9-5-19
Searchlight — Removal	9-5-16
Seat Covers, Raschel — Removal/Installation	2-2-24
Seat Cushion — Cleaning/ Inspection/Repair	2-2-28
Seat Cushion — Removal/ Installation	2-2-27
Seat Pan Assembly (Typical) — Cleaning/Inspection/Repair	2-2-35
Seat Pan Assembly (Typical) — Removal/Installation	2-2-34
Seat Restraint — Cleaning/ Inspection/Repair	2-2-17
Seat Restraint — Removal/ Installation	2-2-16
Seat Restraint (Energy Attenuating) — Cleaning/ Inspection/Repair	2-2-19
Seat Restraint (Energy Attenuating) — Removal/ Installation	2-2-18
Seatback Cushion — Cleaning/ Inspection/Repair	2-2-23
Seatback Cushion — Removal/ Installation	2-2-22
Security (Helicopter Inventory Master Guide)	C-2
Segmented Shaft (Typical), Adapter/Bearing Hanger/ — Removal/Installation	6-6-9
Select Switch, CPG Channel — Removal/Installation	9-6-65
Selection and Use of Torque Wrench (Appendix P)	P-6
Self-Sealing Coupling Half (Typical), Quick-Disconnect — Removal/Installation	7-4-6
Sensing Control, Overload — Cleaning/Inspection/Repair	9-3-17
Sensing Control, Overload — Removal/Installation	9-3-18
Sensor (OH-58D(R)), Compressor Inlet Temperature — Removal/ Installation	4-2-15
Sensor (OH-58D(R)), Nr — Cleaning/Inspection	6-3-17
Sensor (OH-58D(R)), Nr — Removal/Installation	6-3-16
Sensor, DC Voltage — Cleaning/ Inspection/Repair	9-3-21
Sensor, DC Voltage — Removal/ Installation	9-3-22
Sensor, Pitch Rate — Cleaning/ Inspection/Repair	9-6-55

<u>Subject</u>	<u>Para/Task</u>
S (Cont)	
Sensor, Pitch Rate — Removal/ Installation	9-6-56
Sensor, Remote — Cleaning/ Inspection/Repair	12-1-8
Sensor, Remote — Removal/ Installation	12-1-7
Sensor, Roll Rate — Cleaning/ Inspection/Repair	9-6-57
Sensor, Roll Rate — Removal/ Installation	9-6-58
Separator, Particle — Cleaning/ Inspection/Repair	4-2-13
Separator, Particle — Removal/ Installation	4-2-12
Separator Fan (AVIM), Particle — Cleaning/Inspection/Repair	4-2-10
Separator Fan (AVIM), Particle — Disassembly/Assembly	4-2-9
Separator Fan and Duct, Particle — Installation	4-2-11
Separator Fan and Duct, Particle — Removal	4-2-8
Separator Vortex Generator Tubes, Particle — Removal/ Installation	4-2-14
Serviceability	6-2
Serviceability, Standards of	1-56
Servicing	1-40
Servicing Tables, Approved	1-43
Servicing, Introduction to	1-41
Servicing, Task List for	1-42
Servicing, Transmission/ Freewheeling Unit	1-4-8
Servoactuator, Directional Control — Removal/Installation	7-1-1
Servoactuator Support, Directional Control — Removal/ Installation	11-4-30
Servoactuator Trunnion Bearing, Directional Control — Cleaning/ Inspection/Repair	7-1-4
Servoactuator Trunnion Bearing, Directional Control — Removal/ Installation	7-1-3
Servoactuators (Typical), Cyclic/ Collective/Directional Control — Cleaning/Inspection/Repair	7-1-2
Shaft Assembly, Aft Short — Cleaning/Inspection/Repair	6-6-5
Shaft Assembly, Aft Short — Removal/Installation	6-6-4
Shaft Assembly, Fan — Installation	6-6-14
Shaft Assembly, Fan — Removal	6-6-11
Shaft Assembly, Forward — Cleaning/Inspection/Repair	6-6-3

<u>Subject</u>	<u>Para/Task</u>
S (Cont)	
Shaft Assembly, Forward — Removal/Installation (OH- 58D(R))	6-6-2
Shaft Assembly, Forward — Removal/Installation (OH-58D).....	6-6-1
Shaft and Bearing Hanger Assembly — Removal/ Installation	6-6-8
Shaft and Bearing Hanger Assembly, Components of — Cleaning/Inspection/Repair	6-6-10
Shaft Support Bearing (AVIM), Freewheeling Unit Tail Rotor Output — Removal/Installation.....	6-5-5
Shear Bearing (AVIM), Main Rotor Hub — Cleaning/ Inspection/Repair.....	5-1-20
Shear Bearing (AVIM), Main Rotor Hub — Removal/ Installation	5-1-19
Shield Assembly, Inlet — Cleaning/Inspection/Repair	2-2-46
Shield Assembly, Inlet — Removal/Installation	2-2-45
Shield Inspection Panel, Inlet — Removal/Installation	2-2-44
Shim and Spacer, Collective Jackshaft — Removal/ Installation	11-2-20
Shims (AVIM), Main Rotor Hub Damper — Removal/Installation	5-1-17
Shipment, Preparation for Storage or	1-5
Shock Mount, Interface Electronics Assembly (IEA) — Removal/Installation	9-8-7
Shoe, Alternate Skid — Conversion To	3-1-18
Shoe, Alternate Skid — Removal/ Installation/Cleaning/Inspection	3-1-18.1
Shoes and Skid Tube Rivnut, Skid — Cleaning/Inspection/ Repair.....	3-1-17
Shoes and Skid Tube Rivnut, Skid — Removal/Installation	3-1-15
Shoes and Skid Tube Rivnuts (Rapid Deployment), Skid — Removal/Installation	3-1-16
Short Shaft Assembly, Aft — Cleaning/Inspection/Repair	6-6-5
Short Shaft Assembly, Aft — Removal/Installation	6-6-4
Shunt (Typical) — Installation	9-6-48
Shunt (Typical) — Removal	9-6-47
Shutoff Lever, Fuel — Cleaning/ Inspection/Repair.....	10-1-2

<u>Subject</u>	<u>Para/Task</u>
S (Cont)	
Shutoff Lever, Fuel — Installation	10-1-3
Shutoff Lever, Fuel — Removal	10-1-1
Shutoff Lever and Valve, Fuel — Rigging.....	10-1-4
Shutoff Valve, Fuel — Inspection	10-1-6
Shutoff Valve, Fuel — Removal/ Installation	10-1-5
Side Door, Engine Cowl Assembly — Cleaning/ Inspection/Repair.....	2-2-53
Side Door, Engine Cowl Assembly — Removal/ Installation	2-2-52
Side Position Light (Typical) — Installation	9-5-9
Side Position Light (Typical) — Removal	9-5-8
Sight Gage — Removal/ Installation	6-3-13
Sight Glass, Oil Tank — Removal/Installation	4-4-5
Sight Plug, Hydraulic Reservoir — Removal/Installation	7-7-5
Sight Subsystem Electronics Unit (MSSEU), Missile — Cleaning/ Inspection/Repair.....	9-8-8
Sight Subsystem Electronics Unit (MSSEU), Missile — Removal/ Installation	9-8-9
Signal Conditioning Unit (Mast Torque) — Cleaning/Inspection/ Repair.....	9-7-7
Signal Conditioning Unit (Mast Torque) — Installation.....	9-7-9
Signal Conditioning Unit (Mast Torque) — Removal	9-7-8
Signal Conditioning Unit (TAMS) — Installation	9-7-12
Signal Conditioning Unit (TAMS) — Removal	9-7-11
Signal Conditioning Unit and Chain (TAMS) — Cleaning/ Inspection/Repair.....	9-7-10
Signal Conditioning Unit, Cover and Chain TAMS — Removal/ Installation	9-7-13
Skid Assembly, Tail — Removal/ Installation	2-3-18
Skid Shoe, Alternate — Conversion to	3-1-18
Skid Shoe, Alternate — Removal/ Installation/Cleaning/Inspection	3-1-18.1
Skid Shoes and Skid Tube Rivnut — Cleaning/Inspection/Repair	3-1-17
Skid Shoes and Skid Tube Rivnut — Removal/Installation	3-1-15

<u>Subject</u>	<u>Para/Task</u>
S (Cont)	
Skid Shoes and Skid Tube Rivnuts (Rapid Deployment) — Removal/Installation	3-1-16
Skid Shoes and Skid Tube Rivnuts (Rapid Deployment) (AVIM)— Cleaning/Inspection/ Repair	3-1-19
Skid Tube Assembly — Cleaning/ Inspection/Repair	3-1-11
Skid Tube Assembly — Removal/ Installation	3-1-13
Skid Tube Assembly (Rapid Deployment) — Cleaning/ Inspection/Repair	3-1-12
Skid Tube Assembly (Rapid Deployment) — Removal/ Installation	3-1-14
Skid Tube Rivnuts (Rapid Deployment) (AVIM), Skid Shoes and — Cleaning/ Inspection/Repair	3-1-19
Skin (AVIM), Fin — Repairing Voids	2-3-20
Skylight, Cabin Roof — Cleaning/ Inspection/Repair	2-2-75
Skylight, Cabin Roof — Removal/ Installation	2-2-74
Sling Loading, Hoisting and	1-52
Sling Loading, Introduction to Hoisting and	1-53
Sling Loading, Task List for Hoisting and	1-54
Sling Loading Helicopter	1-8-4
Snap Vent, Crew Door Window — Removal/Installation	2-2-9
Socket (Typical) — Removal/ Installation	9-6-46
Socket Housing Assembly, CPG Cyclic Stick — Cleaning/ Inspection/Repair	11-3-83
Socket Housing Bushings (AVIM), CPG Cyclic Stick — Removal/ Installation	11-3-84
Socket Housing/Housing Assembly, CPG Cyclic Stick — Removal/Installation	11-3-80
Solenoid — Removal/Installation	12-1-6
Solenoid, Hydraulic Solenoid Valve — Removal/Installation	7-6-2
Solenoid Valve, Hydraulic	7-17
Solenoid Valve, Hydraulic — Cleaning/Inspection/Repair	7-6-3
Solenoid Valve, Hydraulic — Removal/Installation	7-6-1
Solenoid Valve, Introduction to Hydraulic	7-18

<u>Subject</u>	<u>Para/Task</u>
S (Cont)	
Solenoid Valve, Task List for Hydraulic	7-19
Soundproofing Insulation Blanket — Removal/Installation	2-2-26
Spacer — Cleaning/Inspection/ Repair	5-4-19
Spacer, Collective Jackshaft — Cleaning/Inspection/Repair	11-2-21
Spacer, Cyclic Transducer — Cleaning/Inspection/Repair	11-3-47
Spacer, Main Rotor Controls — Cleaning/Inspection/Repair	5-2-24
Special Inspections	1-57
Special Requirements	1-47
Specified Torques	P-5
Splice Cover, Main Rotor Blade Erosion Strip — Repair	5-1-48
Splice Cover (AVIM), Main Rotor Blade Erosion Strip — Replacement	5-1-50
Spray Coating (AVIM), Flame — Use	2-2-68
Spring Assembly — Cleaning/ Inspection/Repair	2-4-9
Spring/Guides/Shaft, Directional Control Force Gradient — Removal/Installation	11-4-36
Spring, Directional Control Eyebolt and — Removal/ Inspection/Installation	11-4-13
Stabilizer, Folding Horizontal — Cleaning/Inspection/Repair	2-3-26
Stabilizer, Folding Horizontal — Removal/Installation	2-3-27
Stabilizer Hinge Area, Folding Horizontal — Cleaning/ Inspection/Repair	2-3-29
Stabilizer, Horizontal — Folding/ Unfolding	1-7-7
Stabilizer, Left/Right Horizontal — Removal/Installation	2-3-28
Stabilizer, Upper Surface, Folding Horizontal — Cleaning/ Inspection	2-3-25
Standard Skid Gear Mooring — Helicopter	1-7-1
Standards of Serviceability	1-56
Standby Airspeed Indicator — Cleaning/Inspection/Repair	8-2-5
Standby Airspeed Indicator — Removal/Installation	8-2-6
Standby Altimeter — Cleaning/ Inspection/Repair	8-2-1
Standby Altimeter — Removal/ Installation	8-2-2

<u>Subject</u>	<u>Para/Task</u>
S (Cont)	
Standby Attitude Indicator — Cleaning/Inspection/Repair	8-2-3
Standby Attitude Indicator — Removal/Installation	8-2-4
Standby Compass — Cleaning/ Inspection/Repair	8-5-1
Standby Compass — Removal/ Installation	8-5-2
Standpipe Electrical Assembly — Installation	6-4-3
Standpipe Electrical Assembly — Removal	6-4-1
Standpipe Electrical Assembly, Torquemeter System, and Main Rotor Mast Assembly, Task List for	6-14
Standpipe Electrical Assembly, Torquemeter System, and Main Rotor Mast Assembly	6-12
Standpipe Electrical Assembly Electrical Connector — Replacement	6-4-4
Standpipe and Ground Cable Assembly — Cleaning/ Inspection/Repair	6-4-2
Starter-Generator — Removal/ Installation	9-3-14
Starter-Generator Brushes — Inspection/Replacement	9-3-13
Starter-Generator Driveshaft — Inspection	9-3-1
Static Calibration (TAMS)	9-7-16
Step (Left Side), Maintenance — Cleaning/Inspection/Repair	2-2-79
Step (Left Side), Maintenance — Removal/Installation	2-2-78
Stick, CPG Cyclic — Removal/ Installation	11-3-63
Stick Assembly, Copilot/Gunner Collective — Removal/ Installation	11-2-15
Stick Assembly, Pilot Collective — Removal/Installation	11-2-26
Stick Gimbal/Fitting/Plate/Support Assemblies, Cyclic — Removal/ Installation	11-3-64
Stick and Pivot Support Assembly, Pilot Cyclic — Removal/Installation	11-3-57
Stick Tiedown Strap, Collective — Removal/Installation	11-2-2
Stop, Pilot Cyclic Stick — Cleaning/Inspection/Repair	11-3-48
Stop Nut — Cleaning/Inspection/ Repair	2-4-5

<u>Subject</u>	<u>Para/Task</u>
S (Cont)	
Stop Nut/Stop-Down Assembly, Corner Mount/ — Removal/ Installation	2-4-2
Stop Plug, Main Rotor Droop — Cleaning/Inspection/Repair	5-1-11
Stop Plugs, Main Rotor Droop — Removal/Installation	5-1-10
Stop Stud, Main Rotor Droop — Cleaning/Inspection/Repair	5-1-13
Stop Studs, Main Rotor Droop — Removal/Installation	5-1-12
Stop-Down Assembly — Cleaning/Inspection/Repair	2-4-6
Stop-Down Assembly, Corner Mount/Stop Nut/ — Removal/ Installation	2-4-2
Storage, Categories of	E-3
Storage, Procedures Common to all Categories of	E-4
Storage or Shipment, Preparation for	1-5
Stored Helicopters, Inspection of	E-5
Strainer and Cover Gasket, Hydraulic Reservoir — Removal/Installation	7-7-6
Strap, Forward Crosstube — Cleaning/Inspection/Repair	3-1-7
Stud, CPG Cyclic Stick — Cleaning/Inspection/Repair	11-3-74
Stud Assembly, CPG Cyclic Stick — Removal/Installation	11-3-73
Studs, Main Rotor Droop Stop — Removal/Installation	5-1-12
Sump, Fuel — Cleaning/ Inspection	10-1-15
Sump, Fuel — Installation	10-1-16
Sump, Fuel — Removal	10-1-14
Sump Valve — Cleaning/ Inspection/Repair	10-1-23
Sump Valve — Removal/ Installation	10-1-22
Supervisory Control (OH-58D), Electronic — Cleaning/ Inspection/Repair	9-7-1
Supervisory Control (OH-58D), Electronic — Installation	9-7-5
Supervisory Control (OH-58D), Electronic — Removal	9-7-3
Support, Avionics — Cleaning/ Inspection/Repair	2-2-82
Support, Directional Control Servoactuator — Removal/ Installation	11-4-30
Support, Main Rotor Swashplate and — Cleaning/Inspection/ Repair	5-2-31

<u>Subject</u>	<u>Para/Task</u>
S (Cont)	
Support, Main Rotor Swashplate and — Removal	5-2-33
Support, Oil Tank — Cleaning/Inspection/Repair	4-4-13
Support, Oil Tank — Removal/Installation	4-4-12
Support, Tail Rotor Counterweight — Cleaning/Inspection/Repair	5-4-17
Support, Taillight — Cleaning/Inspection/Repair	2-3-30
Support, Taillight — Removal/Installation	2-3-31
Support (AVIM), Main Rotor Swashplate and — Assembly	5-2-37
Support (AVIM), Main Rotor Swashplate and — Disassembly	5-2-34
Support (Pivotable), Fin — Removal/Installation	2-3-23
Support Assemblies, Fuel Cell — Cleaning/Inspection/Repair/Replacement	10-2-3
Support Assembly, Actuator — Removal/Installation	11-2-62
Support Assembly, Aft Crosstube — Cleaning/Inspection/Repair	3-1-8
Support Assembly, CPG Cyclic Stick — Cleaning/Inspection/Repair	11-3-69
Support Assembly, CPG Cyclic Stick Quick-Disconnect — Cleaning/Inspection/Repair	11-3-89
Support Assembly, Control — Removal/Installation	11-2-58
Support Assembly, Directional Control Pedals in — Installation	11-4-6
Support Assembly, Jackshaft — Removal/Installation	11-2-37
Support Assembly, Pedal Adjustment and — Cleaning/Inspection/Repair	11-4-3
Support Assembly (AVIM), Actuator — Cleaning/Inspection/Repair	11-2-63
Support Assembly Bearing (AVIM), CPG Cyclic Stick — Removal/Installation	11-3-70
Support Assembly Bearing, Jackshaft — Removal/Installation	11-2-38
Support Assembly and Bearing, Jackshaft — Cleaning/Inspection/Repair	11-2-39
Support Assembly Bushings (AVIM), Control — Removal/Installation	11-2-59

<u>Subject</u>	<u>Para/Task</u>
S (Cont)	
Support Beam Bushing (AVIM), Aft Crosstube — Removal/Installation	3-1-47
Support Beam and Components, Aft Crosstube — Removal/Installation	3-1-43
Support Bearing, Pivot — Cleaning/Inspection/Repair	11-3-43
Support Bearing (AVIM), Torquemeter — Removal/Installation	6-4-7
Support and Bearing Assembly, Torquemeter — Installation	6-4-11
Support and Bearing Assembly, Torquemeter — Removal	6-4-5
Support and Bearing Assembly Components (AVIM), Torquemeter — Cleaning/Inspection/Repair	6-4-8
Support Bearing Seal, Torquemeter — Removal/Installation	6-4-6
Support Bracket, Hydraulic Reservoir — Removal/Installation	7-7-9
Support Bushing (AVIM), Actuator — Removal/Installation	11-4-31
Support Components (AVIM), Main Rotor Swashplate and — Painting	5-2-36
Support Cover, Mast Mounted Sight (MMS) — Removal/Installation	5-2-40
Support Fitting, Landing Gear — Cleaning/Inspection/Repair	3-1-58
Support Fitting, Landing Gear — Removal/Installation	3-1-57
Support Fitting Assemblies, Landing Gear — Removal/Installation/Inspection	2-2-97
Support Fittings, Fin — Removal/Installation	2-3-24
Support Fittings, Lower Forward — Removal/Installation	2-2-95
Support Strap (Rapid Deployment), Aft Crosstube — Installation/Removal	1-6-4
Support Strap (Standard Gear), Aft Crosstube — Installation/Removal	1-6-3
Supports, Flight Control — Cleaning/Inspection/Repair	11-5-3
Supports, Mixing Lever — Removal/Installation	11-2-6
Surface Preparation (Appendix M)	M-6

<u>Subject</u>	<u>Para/Task</u>
S (Cont)	
Suspension Assembly, Cargo Hook	13-2
Suspension Assembly, Cargo Hook — Cleaning/Inspection/Repair	13-1-5
Suspension Assembly, Cargo Hook — Disassembly/Assembly	13-1-2
Suspension Assembly, Cargo Hook — Removal/Installation	13-1-1
Suspension Assembly, Introduction to Cargo Hook	13-3
Suspension Assembly, Task List for Cargo Hook	13-4
Swashplate Inner Ring Assembly for Rotational Movement — Inspection	5-2-39
Swashplate Uniball Friction, Main Rotor — Checking and Adjustment	5-2-32
Swashplate and Support, Main Rotor — Cleaning/Inspection/Repair	5-2-31
Swashplate and Support, Main Rotor — Installation	5-2-38
Swashplate and Support, Main Rotor — Removal	5-2-33
Swashplate and Support (AVIM), Main Rotor — Assembly	5-2-37
Swashplate and Support (AVIM), Main Rotor — Disassembly	5-2-34
Swashplate and Support Components (AVIM), Main Rotor — Cleaning/Inspection/Repair	5-2-35
Swashplate and Support Components (AVIM), Main Rotor — Painting	5-2-36
Switch, Directional Control Force Gradient — Removal/Installation	11-4-35
Switch, Fuel Pressure — Removal/Installation	10-1-12
Switch, Heater Overheat — Removal/Installation	9-6-44
Switch, Hydraulic Pressure — Cleaning/Inspection/Repair	7-5-2
Switch, Hydraulic System — Removal/Installation	9-6-31
Switch, ICS Engage — Removal/Installation	9-6-87
Switch, ICS Remote — Removal/Installation	9-6-88
Switch, Keylock — Removal/Installation	9-6-54
Switch, NVG Formation Lights — Removal/Installation	9-5-15

<u>Subject</u>	<u>Para/Task</u>
S (Cont)	
Switch, Oil Level — Removal/Installation	4-4-4
Switch, Oil Pressure — Cleaning/Inspection/Repair	6-8-15
Switch, Oil Pressure — Removal/Installation	6-8-14
Switch, Pressure — Removal/Installation	7-5-1
Switch, SCAS Power — Removal/Installation	9-6-30
Switch, SCAS Test — Removal/Installation	9-6-28
Switch, Weight-On-Gear Interrupt — Removal/Installation	9-6-86
Switch, Weight-On-Gear — Removal/Installation	9-6-77
Switch (AVIM), Oil Pressure — Testing/Checking	6-8-16
Switch (CPG Auxiliary Switch Panel-Typical) — Removal/Installation	9-6-70
Switch (Cyclic Grip-Typical) — Removal/Installation	9-6-53
Switch (Digital Fuel Control Panel (OH-58D)), Toggle — Removal/Installation	9-6-21
Switch (Digital Fuel Control Panel (OH-58D)-Typical), Pushbutton — Removal/Installation	9-6-20
Switch (FADEC) (OH-58D(R)), AUTO/MAN — Removal/Installation	9-6-16.1
Switch (Forward Overhead Console-Typical) — Removal/Installation	9-6-10
Switch (OH-58D(R)), Low Fuel Pressure Warning — Removal/Installation	4-6-13
Switch (Pilot Collective Stick-Typical) — Removal/Installation	9-6-42
Switch (Pilot MFD Auxiliary Control Panel-Typical) — Removal/Installation	9-6-73
Symbols (Appendix F)	F-4
System, Drive Train	1-29
System, Electrical	1-20
System, Engine Oil — Draining	1-4-5
System, Engine Oil — Servicing	1-4-6
System, Engine Oil	1-16
System, Fuel	1-14
System, Fuel	1-33
System, Hydraulic — Bleeding	7-2-1
System, Hydraulic	1-15
System, Hydraulic	1-30
System, Instrument	1-31

<u>Subject</u>	<u>Para/Task</u>	<u>Subject</u>	<u>Para/Task</u>
S (Cont)		T (Cont)	
System (Flyable Storage), Drive Train	E-11	TAMS Target Plate and Top Target Support — Removal/ Inspection/Repair/Installation	2-4-3
System (Flyable Storage), Electrical	E-13	TGT/TRQ Indicator — Cleaning/ Inspection/Repair	8-1-13
System (Flyable Storage), Fuel	E-8	TGT/TRQ Indicator — Disassembly/Assembly	8-1-11
System (Flyable Storage), Hydraulic	E-9	TGT/TRQ Indicator — Removal/ Installation	8-1-10
System (Flyable Storage), Rotor	E-12	TGT/TRQ Lamps — Replacement	8-1-12
System (Intermediate Storage), Drive Train	E-37	TRU Plate and Brackets, Transformer Rectifier Unit — Removal/Installation	9-3-4
System (Intermediate Storage), Electrical	E-39	TRU, Transformer Rectifier Unit — Cleaning/Inspection/Repair	9-3-2
System (Intermediate Storage), Fuel	E-33	TRU, Transformer Rectifier Unit — Removal/Installation	9-3-3
System (Intermediate Storage), Hydraulic	E-35	Tables, Approved Servicing	1-43
System (Intermediate Storage), Rotor	E-38	Tachometer, Dual — Cleaning/ Inspection/Repair	8-1-17
System (Short Term Storage), Drive Train	E-22	Tachometer, Dual — Disassembly/Assembly	8-1-15
System (Short Term Storage), Electrical	E-24	Tachometer, Dual — Removal/ Installation	8-1-14
System (Short Term Storage), Fuel	E-19	Tachometer Lamps, Dual — Replacement	8-1-16
System (Short Term Storage), Hydraulic	E-20	Tail Position Light — Installation	9-5-11
System (Short Term Storage), Rotor	E-23	Tail Position Light — Removal	9-5-10
System Group Number and Description (Columns 1 and 2)	B-6	Tail Rotor — Inspection	5-4-1
System Hoses, Fuel — Cleaning/ Inspection	10-1-9	Tail Rotor Assembly — Assembly	5-4-14
System Switch, Hydraulic — Removal/Installation	9-6-31	Tail Rotor Assembly — Balancing	5-4-15
Systems, Electrical	1-32	Tail Rotor Assembly — Cleaning/ Inspection/Repair	5-4-13
Systems, Environmental Control	1-36	Tail Rotor Assembly — Disassembly	5-4-12
Systems, Utility	1-35	Tail Rotor Assembly — Installation	5-4-16
T		Tail Rotor Assembly — Removal	5-4-11
TAMS Linear Variable Differential Transformer (LVDT) — Cleaning/Inspection/Repair	9-7-14	Tail Rotor Bearing Hanger — Alignment	6-6-17
TAMS Linear Variable Differential Transformer (LVDT) — Removal/Installation	9-7-15	Tail Rotor Bellcrank — Removal/ Installation	11-4-43
TAMS Signal Conditioning Unit, Cover and Chain — Removal/ Installation	9-7-13	Tail Rotor Bellcrank Bearing (AVIM) — Removal/Installation	11-4-44
TAMS Signal Conditioning Unit — Installation	9-7-12	Tail Rotor Blades (AVIM) — Cleaning/Inspection/Repair/ Refinishing	5-4-27
TAMS Signal Conditioning Unit — Removal	9-7-11	Tail Rotor Control Tube Driver Plate — Cleaning/Inspection/ Repair	5-4-6
TAMS Static Calibration	9-7-16	Tail Rotor Control Tube Driver Plate — Installation	5-4-7
		Tail Rotor Control Tube Driver Plate — Removal	5-4-5
		Tail Rotor Counterweight Bracket — Cleaning/Inspection/Repair	5-4-22

<u>Subject</u>	<u>Para/Task</u>
T (Cont)	
Tail Rotor Counterweight Support — Cleaning/Inspection/Repair	5-4-17
Tail Rotor Crosshead — Cleaning/Inspection/Repair	5-4-9
Tail Rotor Crosshead — Installation	5-4-10
Tail Rotor Crosshead — Removal	5-4-8
Tail Rotor Drive Output Adapter Wear Sleeve (AVIM), Freewheeling Unit — Removal/ Installation	6-5-6
Tail Rotor Drive Output Oil Seal (AVIM), Freewheeling Unit — Removal/Installation	6-5-4
Tail Rotor Driveshaft Coupling Angle — Inspection and Driveshaft Alignment	6-6-18
Tail Rotor Driveshaft Covers — Cleaning/Inspection/Repair	2-3-12
Tail Rotor Driveshaft Covers — Removal/Installation	2-3-11
Tail Rotor Driveshafts, Introduction to	6-19
Tail Rotor Driveshafts, Task List for	6-20
Tail Rotor Driveshafts	6-18
Tail Rotor Gearbox	1-19, 6-21
Tail Rotor Gearbox, Introduction to	6-22
Tail Rotor Gearbox, Task List for	6-23
Tail Rotor Gearbox — Cleaning/ Inspection/Repair	6-7-2
Tail Rotor Gearbox — Draining/ Servicing	1-4-9
Tail Rotor Gearbox — Removal/ Installation	6-7-1
Tail Rotor Gearbox — Serviceability Check	6-1-3
Tail Rotor Gearbox Boot — Removal/Installation	5-5-16
Tail Rotor Gearbox Breather — Removal/Cleaning/Installation	6-7-3
Tail Rotor Gearbox Chip Detector — Removal/Installation	6-7-10
Tail Rotor Gearbox Housing Packing — Removal/Installation	5-5-18
Tail Rotor Gearbox Input Seal — Removal/Installation	6-7-5
Tail Rotor Gearbox Input Seal — Removal/Installation	6-7-6
Tail Rotor Gearbox Oil Temperature Thermoswitch — Removal/Installation	6-7-4
Tail Rotor Gearbox Output Shaft Seal (AVIM) — Removal/ Installation	6-7-8

<u>Subject</u>	<u>Para/Task</u>
T (Cont)	
Tail Rotor Gearbox Pitch Change Housing — Cleaning/ Inspection/Repair	5-5-21
Tail Rotor Gearbox Support Assembly — Cleaning/ Inspection/Repair	2-3-6
Tail Rotor Gearbox Trunnion Seal and Bearing — Removal/ Installation	5-5-17
Tail Rotor Hub (AVIM) — Assembly	5-4-26
Tail Rotor Hub (AVIM) — Disassembly	5-4-23
Tail Rotor Hub (AVIM) — Repair	5-4-25
Tail Rotor Hub and Blades	5-11
Tail Rotor Hub Components (AVIM) — Cleaning/Inspection	5-4-24
Tail Rotor Output Shaft Support Bearing (AVIM), Freewheeling Unit — Removal/Installation	6-5-5
Tail Rotor Pitch Change Control Tube — Cleaning/Inspection/ Repair	5-5-14
Tail Rotor Pitch Change Control Tube — Installation	5-5-15
Tail Rotor Pitch Change Control Tube — Removal	5-5-13
Tail Rotor Pitch Change Idler — Cleaning/Inspection/Repair	5-5-10
Tail Rotor Pitch Change Idler — Installation	5-5-12
Tail Rotor Pitch Change Idler — Removal	5-5-9
Tail Rotor Pitch Change Idler Bushings and Bearing (AVIM) — Removal/Installation	5-5-11
Tail Rotor Pitch Change Lever (AVIM) — Cleaning/Inspection/ Repair	5-5-6
Tail Rotor Pitch Change Lever Bushings and Bearing (AVIM) — Removal/Installation	5-5-7
Tail Rotor Pitch Change Levers — Installation	5-5-8
Tail Rotor Pitch Change Levers — Removal	5-5-5
Tail Rotor Pitch Change Mechanism — Inspection	5-5-2
Tail Rotor Pitch Change Mechanism	5-14
Tail Rotor Pitch Change Rod Assembly — Cleaning/ Inspection/Repair	5-5-3
Tail Rotor Pitch Change Rod Assembly — Installation	5-5-4

<u>Subject</u>	<u>Para/Task</u>
T (Cont)	
Tail Rotor Pitch Change Rod Assembly — Removal	5-5-1
Tail Rotor Pitch Change Trunnion — Cleaning/Inspection/Repair	5-5-20
Tail Rotor Pitch Change Trunnion Cap — Cleaning/Inspection/Repair	5-5-19
Tail Rotor Pitch Horn — Cleaning/Inspection/Repair	5-4-20
Tail Rotor Pitch Horn Bushing (AVIM) — Replacement	5-4-21
Tail Rotor Pitch Link — Cleaning/Inspection/Repair	5-4-3
Tail Rotor Pitch Link — Installation	5-4-4
Tail Rotor Pitch Link — Removal	5-4-2
Tail Rotor Retaining Nut — Cleaning/Inspection/Repair	5-4-18
Tail Skid Assembly — Removal/Installation	2-3-18
Tailboom	2-7
Tailboom — Cleaning/Inspection (Visual and Fluorescent Penetrant) Repair	2-3-1
Tailboom — Installation	2-3-8
Tailboom — Removal	2-3-2
Tailboom and Aft Fuselage Attach Fittings — Cleaning/Inspection/Repair	2-3-3
Tailboom Attach Bolts — Cleaning/Inspection/Repair	2-3-5
Tailboom Attach Bolts — Cleaning/Inspection	2-3-4
Tailboom Bearing Hanger Supports — Cleaning/Inspection/Repair	2-3-9
Tailboom Bearing Hanger Supports — Removal/Installation	2-3-10
Tailboom Corrosion Repair	Q-13
Tailboom Fairleads — Inspection/Removal/Installation	2-3-7
Tailboom Tube, Directional Control — Removal/Installation	11-4-42
Taillight Support — Cleaning/Inspection/Repair	2-3-30
Taillight Support — Removal/Installation	2-3-31
Tank Assembly, Oil — Cleaning/Inspection/Repair	4-4-3
Tank Assembly, Oil — Disassembly/Assembly	4-4-2
Tank Assembly, Oil — Removal/Installation	4-4-1
Tank Cap and Adapter Assembly, Oil — Removal/Installation	4-4-8

<u>Subject</u>	<u>Para/Task</u>
T (Cont)	
Tank Drain Valve, Oil — Removal/Installation	4-4-7
Tank Sight Glass, Oil — Removal/Installation	4-4-5
Tank Support, Oil — Cleaning/Inspection/Repair	4-4-13
Tank Support, Oil — Removal/Installation	4-4-12
Tank Temperature Transducer, Oil — Removal/Installation	4-4-6
Target Plate and Top Target Support, TAMS — Removal/Inspection/Repair/Installation	2-4-3
Task List for Actuators	7-4
Task List for Aft Firewall	4-26
Task List for Air Induction	4-7
Task List for Alternating Current Power and Distribution System	9-13
Task List for Armament Electrical Equipment	9-25
Task List for Avionic System Mounts	9-7
Task List for Avionics Cooling System	9-4
Task List for Cargo Hook Suspension Assembly	13-4
Task List for Collective Controls	11-7
Task List for Component Inspection	11-16
Task List for Cyclic Control System	11-10
Task List for Direct Current Power and Distribution System	9-10
Task List for Directional Controls	11-13
Task List for Engine Assembly	4-4
Task List for Engine Mounts	4-20
Task List for Engine Oil System	4-13
Task List for Engine To Transmission Driveshaft	6-8
Task List for Engine, Rotor, and Transmission Instruments	8-4
Task List for Exhaust System	4-10
Task List for Flight Instruments	8-7
Task List for Forward Firewall	4-23
Task List for Freewheeling Unit	6-17
Task List for Fuel Cell	10-7
Task List for Fuel System Components	10-4
Task List for Fuselage	2-6
Task List for Ground Handling and Jacking	1-48
Task List for Heating System	12-4
Task List for Hoisting and Sling Loading	1-54
Task List for Hydraulic Filter Assemblies	7-10

<u>Subject</u>	<u>Para/Task</u>
T (Cont)	
Task List for Hydraulic Hoses, Lines, Tubes, Fittings, and Quick-Disconnects	7-13
Task List for Hydraulic Pump	7-25
Task List for Hydraulic Reservoir	7-22
Task List for Hydraulic Solenoid Valve	7-19
Task List for Hydraulic System Bleeding	7-7
Task List for Landing Gear	3-4
Task List for Lighting System	9-16
Task List for Main Rotor Controls	5-7
Task List for Main Rotor Hub and Blade Assembly	5-4
Task List for Main Rotor Tracking and Dynamic Balancing	5-10
Task List for Miscellaneous Electrical Equipment	9-19
Task List for Miscellaneous Emergency Equipment	14-4
Task List for Miscellaneous Instruments	8-14
Task List for Mooring	1-51
Task List for Oil System	6-26
Task List for Pitot-Static Instrument and Air Data Systems	8-10
Task List for Powerplant Controls	4-17
Task List for Powerplant and Transmission Electrical Equipment	9-22
Task List for Pressure Switch, Manifolds, and Relief Valve	7-16
Task List for Pylon	2-12
Task List for Rapid Deployment	13-7
Task List for Rescue Ladder	13-10
Task List for Rigging	11-4
Task List for Serviceability Checks	6-5
Task List for Servicing	1-42
Task List for Standpipe Electrical Assembly, Torquemeter System, and Main Rotor Mast Assembly	6-14
Task List for Tail Rotor Driveshafts	6-20
Task List for Tail Rotor Gearbox	6-23
Task List for Tail Rotor Hub and Blades	5-13
Task List for Tail Rotor Pitch Change Mechanism	5-16
Task List for Tailboom	2-9
Task List for Transmission	6-11
Task List for Ventilating System	12-7
Tee/Retainer/Packing/Nut — Removal/Installation	7-4-5

<u>Subject</u>	<u>Para/Task</u>
T (Cont)	
Temperature Bulb, Torquemeter — Removal/Installation	6-4-9
Temperature Control Valve (Engine Oil System) — Cleaning/Inspection/Repair	6-8-23
Temperature Control Valve (Engine Oil System) — Removal/Installation	6-8-22
Temperature Sensor (OH-58D(R)), Compressor Inlet — Removal/Installation	4-2-15
Temperature Transducer — Removal/Installation	6-3-10
Terminal Board (Typical) — Removal/Installation	9-6-49
Terminal Junction (Typical), Resistor or Capacitor on — Removal/Installation	9-6-63
Terminal Junction Mount (Typical) — Removal/Installation	9-6-50
Test Equipment (Column 5 and Section III), Tools and	B-9
Test Equipment Requirements, Tool and	B-11
Test of Bond (Appendix M)	M-11
Test Switch, SCAS — Removal/Installation	9-6-28
Thermo Switch (Typical), Avionic Cooling System — Removal/Installation	9-1-5
Thermometer, Outside Air — Cleaning/Inspection/Removal/Installation	8-5-5
Thermostat — Removal/Installation	6-3-9
Thermoswitch, Tail Rotor Gearbox Oil Temperature — Removal/Installation	6-7-4
Throttle Arm, Copilot/Gunner Collective Stick — Cleaning/Inspection/Repair	11-2-44
Throttle Arm, Pilot Collective Stick — Cleaning/Inspection/Repair	11-2-36
Throttle Arm Rod End — Removal/Installation	4-6-7
Throttle Friction Plug, Pilot Collective Stick — Cleaning/Inspection/Repair	11-2-29
Throttle Grip Assembly, Pilot Collective Stick — Cleaning/Inspection/Repair	11-2-31
Tiedown Fitting (Rapid Deployment) — Removal/Installation	3-1-55

<u>Subject</u>	<u>Para/Task</u>
T (Cont)	
Tiedown Strap, Collective Stick — Removal/Installation	11-2-2
Tiedowns, Rotor — Installation/ Removal	1-7-4
Toggle Switch (Digital Fuel Control Panel (OH-58D)) — Removal/Installation	9-6-21
Tool and Test Equipment Requirements	B-11
Tools (Appendix M)	M-4
Tools and Test Equipment (Column 5 and Section III).....	B-9
Top Target Support, TAMS Target Plate and — Removal/ Inspection/Repair/Installation	2-4-3
Torque (Appendix P)	P-3
Torque Transducer — Removal/ Installation	6-4-10
Torque Tube, Cyclic — Cleaning/ Inspection/Repair	11-3-13
Torque Tube, Cyclic — Installation	11-3-14
Torque Tube, Cyclic — Removal	11-3-12
Torque Values (Appendix P)	P-2
Torque Wrench (Appendix P), Selection and Use of	P-6
Torquemeter Support Bearing (AVIM) — Removal/Installation	6-4-7
Torquemeter Support and Bearing Assembly — Installation	6-4-11
Torquemeter Support and Bearing Assembly — Removal	6-4-5
Torquemeter Support and Bearing Assembly Components (AVIM) — Cleaning/Inspection/Repair	6-4-8
Torquemeter Support Bearing Seal — Removal/Installation	6-4-6
Torquemeter System Antibacklash Adapter Assembly — Installation	6-4-14
Torquemeter System Antibacklash Adapter Assembly — Removal	6-4-12
Torquemeter System and Main Rotor Mast Assembly Standpipe Electrical Assembly, Task List for	6-14
Torquemeter System and Main Rotor Mast Assembly, Standpipe Electrical Assembly	6-12
Torquemeter Temperature Bulb — Removal/Installation	6-4-9
Torques, Specified	P-5
Tow Fittings — Cleaning/ Inspection/Repair	3-1-50
Tow Fittings — Removal/ Installation	3-1-48

<u>Subject</u>	<u>Para/Task</u>
T (Cont)	
Tow Fittings (Rapid Deployment) — Removal/Installation	3-1-49
Towing Helicopter with Rapid Deployment Skid Gear	1-6-2
Towing/Parking Helicopter	1-6-1
Tracking and Dynamic Balancing, Main Rotor	5-8
Tracking and Dynamic Balancing, Main Rotor	5-3-2
Trailing Edge, Main Rotor Blade — Repair	5-1-45
Train System, Drive	1-29, 6-1
Train System (Flyable Storage), Drive	E-11
Train System (Intermediate Storage), Drive	E-37
Train System (Short Term Storage), Drive	E-22
Transducer — Cleaning/ Inspection/Repair	11-5-5
Transducer — Functional Test	11-5-4
Transducer, Directional Control — Removal/Installation	11-4-18
Transducer, Engine Oil Pressure — Checking	4-1-8
Transducer, Fore-and-Aft Cyclic — Installation	11-3-23
Transducer, Fore-and-Aft Cyclic — Removal	11-3-22
Transducer, Lateral Cyclic — Installation	11-3-21
Transducer, Lateral Cyclic — Removal	11-3-20
Transducer, Oil Pressure — Cleaning/Inspection/Repair	6-8-18
Transducer, Oil Pressure — Removal/Installation	6-8-17
Transducer, Oil Tank Temperature — Removal/ Installation	4-4-6
Transducer, Temperature — Removal/Installation	6-3-10
Transducer, Torque — Removal/ Installation	6-4-10
Transducer (AVIM), Oil Pressure — Testing/Checking	6-8-19
Transducer (Typical), Oil Pressure — Removal/ Installation	4-1-7
Transducer Bellcrank Bearing (AVIM) — Removal/Installation	11-4-16
Transducer Bellcrank Support Bushing (AVIM) — Removal/ Installation	11-4-17

<u>Subject</u>	<u>Para/Task</u>
T (Cont)	
Transducer Bellcrank and Support, Directional Control — Removal/Installation	11-4-15
Transducer Spacer, Cyclic — Cleaning/Inspection/Repair	11-3-47
Transducers, Collective — Removal/Installation	11-2-9
Transfer Unit Mounting Bracket — Removal/Installation	9-2-9
Transformer (Forward Overhead Console-Typical) — Removal/Installation	9-6-11
Transformer Auto, 26V — Cleaning/Inspection/Repair	9-4-12
Transformer Auto, 26V — Removal/Installation	9-4-13
Transformer Rectifier Unit (TRU) — Cleaning/Inspection/Repair	9-3-2
Transformer Rectifier Unit (TRU) — Removal/Installation	9-3-3
Transformer Rectifier Unit (TRU) Plate and Brackets — Removal/Installation	9-3-4
Transmission	6-9
Transmission — Buildup	6-3-4
Transmission — Installation	6-3-6
Transmission — Preservation and Packaging	6-3-5
Transmission — Removal	6-3-2
Transmission, Engine-To- — Alignment	4-7-4
Transmission, Introduction to	6-10
Transmission, Main — Serviceability Check	6-1-1
Transmission, Main	1-18
Transmission, Task List for	6-11
Transmission Components — Cleaning/Inspection/Repair	6-3-1
Transmission Driveshaft, Engine to	6-6
Transmission Driveshaft, Engine to — Cleaning/Inspection/Repair	6-2-2
Transmission Driveshaft, Engine to — Removal/Installation	6-2-1
Transmission Electrical Equipment, Introduction to Powerplant and	9-21
Transmission Electrical Equipment, Powerplant and	9-20
Transmission Electrical Equipment, Task List for Powerplant and	9-22
Transmission/Freewheeling Unit — Draining	1-4-7

<u>Subject</u>	<u>Para/Task</u>
T (Cont)	
Transmission/Freewheeling Unit — Servicing	1-4-8
Transmission Instruments, Engine/Rotor/ — Cleaning/Inspection	8-1-1
Transmission Instruments, Engine, Rotor, and	8-2
Transmission Instruments, Introduction to Engine Rotor and	8-3
Transmission Lower Boot Assembly — Removal/Cleaning/Inspection/Installation	6-3-3
Transmission Oil Filters — Removal/Cleaning/Installation	6-8-3
Transmission Oil Jets (Number One and Two) — Cleaning/Inspection/Repair	6-8-12
Transmission Oil Jets (Number One and Two) — Removal/Installation	6-8-11
Transmission Oil Pump — Cleaning/Inspection/Repair	6-8-2
Transmission Oil Pump — Removal/Installation	6-8-1
Transponder Mount, IFF — Removal/Installation	9-2-7
Transverse Beam (AVIM), Aft — Cleaning/Inspection/Repair	2-4-11
Transverse Beam (AVIM), Forward — Cleaning/Inspection/Repair	2-4-10
Transverse Beam Assemblies (AVIM) — Removal/Installation	2-4-12
Tray, VHF AM RT Unit Mounting — Removal/Installation	9-2-5
Tray, VHF FM 1 or 2 RT Unit Mounting — Removal/Installation	9-2-4
Trim Switch, SCAS Force — Removal/Installation	9-6-29
Trim Tab, Main Rotor Blade — Repair	5-1-43
Trim Tab (AVIM), Main Rotor Blade — Removal/Installation	5-1-42
Truck, Defueling Helicopter Using	1-4-4
Trunnion Bearing, Directional Control Servoactuator — Removal/Installation	7-1-3
Trunnion Bearing Assembly — Cleaning/Inspection/Repair	11-2-8
Trunnion Bearing Assembly — Removal/Installation	11-2-7
Trunnion Bushings, Directional Control Servoactuator — Cleaning/Inspection/Repair	7-1-6

<u>Subject</u>	<u>Para/Task</u>
T (Cont)	
Trunnion Bushings, Directional Control Servoactuator — Removal/Installation	7-1-5
Trunnion Cap, Tail Rotor Pitch Change — Cleaning/Inspection/Repair	5-5-19
Trunnion Seal and Bearing, Tail Rotor Gearbox — Removal/Installation	5-5-17
Trunnion, Engine Mount — Cleaning/Inspection/Repair	4-7-2
Trunnion, Tail Rotor Pitch Change — Cleaning/Inspection/Repair	5-5-20
Tube, Cyclic Torque — Cleaning/Inspection/Repair	11-3-13
Tube, Cyclic Torque — Installation	11-3-14
Tube, Cyclic Torque — Removal	11-3-12
Tube, Directional Control Boosted — Removal/Installation	11-4-39
Tube, Directional Control Nonboosted — Removal/Installation	11-4-26
Tube, Directional Control Pedal — Removal/Installation	11-4-10
Tube, Directional Control Tailboom — Removal/Installation	11-4-42
Tube, Directional Control Upper Horizontal — Removal/Installation	11-4-24
Tube, Directional Control Vertical — Removal/Installation	11-4-22
Tube, Pitot — Cleaning/Inspection/Repair	8-3-5
Tube, Pitot — Removal/Installation	8-3-4
Tube Assemblies, Copilot/Gunner Collective Stick — Removal/Installation	11-2-11
Tube Assembly, Adjustable — Disassembly/Assembly	11-2-61
Tube Assembly, Adjustable — Removal/Installation	11-2-60
Tube Assembly, Boosted — Removal/Installation	11-3-41
Tube Assembly, Breather — Removal/Installation	6-3-12
Tube Assembly, CPG Cyclic Stick — Cleaning/Inspection/Repair	11-3-86
Tube Assembly, CPG Cyclic Stick — Removal/Installation	11-3-85
Tube Assembly, Collective Adjustable — Removal/Installation	11-2-50

<u>Subject</u>	<u>Para/Task</u>
T (Cont)	
Tube Assembly, Collective Jackshaft Throttle — Removal/Installation	11-2-22
Tube Assembly, Copilot/Gunner Collective Stick Inner — Cleaning/Inspection/Repair	11-2-13
Tube Assembly, Copilot/Gunner Collective Stick Outer — Cleaning/Inspection/Repair	11-2-14
Tube Assembly, Force Gradient — Cleaning/Inspection/Repair	11-3-8
Tube Assembly, Pilot Collective Stick Inner — Cleaning/Inspection/Repair	11-2-34
Tube Assembly, Pilot Collective Stick Outer — Cleaning/Inspection/Repair	11-2-32
Tube Assembly, Pilot Cyclic — Cleaning/Inspection/Repair	11-3-59
Tube Assembly, Skid — Cleaning/Inspection/Repair	3-1-11
Tube Assembly, Skid — Removal/Installation	3-1-13
Tube Assembly (Rapid Deployment), Skid — Cleaning/Inspection/Repair	3-1-12
Tube Assembly (Rapid Deployment), Skid — Removal/Installation	3-1-14
Tube Assembly (Typical), Cyclic Adjustable — Removal/Installation	11-3-32
Tube Assembly (Typical), Rigid — Removal/Installation	7-4-1
Tube Assembly Clevis, Collective Adjustable — Removal/Installation	11-2-51
Tube Assembly Controls, Adjustable — Removal/Installation	11-3-37
Tube Assembly Rod End Bearing (Typical), Cyclic Adjustable — Removal/Installation	11-3-33
Tube Firesleeves, Bleed Air — Cleaning/Inspection	12-1-14
Tube Firesleeves, Bleed Air — Removal/Installation	12-1-13
Tube and Gasket, Bleed Air Heater — Removal/Installation	4-1-9
Tubes, Clogged Oil Drain — Removal/Installation	4-4-15
Tubes, Flight Control — Cleaning/Inspection/Repair	11-5-1
Tubing, Hydraulic System — Cleaning/Inspection/Repair	7-4-2

<u>Subject</u>	<u>Para/Task</u>
T (Cont)	
Tubing and Fittings, Pitot Static — Cleaning/Inspection/Repair	8-3-1
Tubing and Fittings, Pitot Static — Installation	8-3-3
Tubing and Fittings, Pitot Static — Removal	8-3-2
Turnlock Receptacles, Access Door — Inspection/Repair/ Replacement	2-2-8
Typical Electrical Connector Pin Arrangement (Appendix F).....	F-5
U	
UWP Mount Fitting — Cleaning/ Inspection/Repair	2-2-94
UWP Mount Fitting Cover, Universal Weapons Pylon — Removal/Installation	2-2-93
Underwater Acoustic Beacon — Cleaning/Inspection/Repair	14-1-4
Underwater Acoustic Beacon — Removal/Installation	14-1-3
Uniball Bearing and Cap, Aft Ng Cable — Removal/Cleaning/ Inspection/Installation	4-6-4
Uniball Friction, Main Rotor Swashplate — Checking and Adjustment	5-2-32
Unit 1S and 2, Panel Assembly COMSEC — Removal/ Installation	9-2-10
Unit, Freewheeling	6-15
Unit, Freewheeling — Installation	6-5-7
Unit, Freewheeling — Removal	6-5-1
Unit, Freewheeling — Serviceability Check	6-1-2
Unit, Generator Control — Cleaning/Inspection/Repair	9-4-10
Unit, Generator Control — Removal/Installation	9-4-11
Unit, Transmission/Freewheeling — Draining	1-4-7
Unit, Transmission/Freewheeling — Servicing	1-4-8
Unit (AEU), Armament Electronics — Cleaning/Inspection/Repair	9-8-3
Unit (AEU), Armament Electronics — Removal/Installation	9-8-4
Unit (ECU) (OH-58D(R)), Electronic Control — Cleaning/ Inspection/Repair	9-7-2
Unit (ECU) (OH-58D(R)), Electronic Control — Installation	9-7-6

<u>Subject</u>	<u>Para/Task</u>
U (Cont)	
Unit (ECU) (OH-58D(R)), Electronic Control — Removal	9-7-4
Unit Components (AVIM), Freewheeling	6-5-3
Unit (TRU), Transformer Rectifier — Cleaning/Inspection/Repair	9-3-2
Unit (TRU), Transformer Rectifier — Removal/Installation	9-3-3
Universal Weapons Pylon (UWP) Mount Fitting Cover — Removal/Installation	2-2-93
Universal Weapons Pylon Electrical Connectors (TM 55- 1500-343-23)	Q-15
Upper Chip Detector — Removal/ Installation	6-3-8
Upper Horizontal Tube, Directional Control — Removal/ Installation	11-4-24
Upper Tunnel Bellcrank, Directional Control — Removal/ Installation	11-4-23
Upper Wire Cutter — Cleaning/ Inspection/Repair	2-2-63
Upper Wire Cutter — Removal/ Installation	2-2-62
Use of Bonding (Appendix M), Intended	M-1
Use of Torque Wrench (Appendix P), Selection and	P-6
Use of the Maintenance Allocation Chart	B-3
Utility Light — Installation	9-5-21
Utility Light — Removal	9-5-20
Utility Systems	1-35

V

VHF AM RT Unit Mounting Tray — Removal/Installation	9-2-5
VHF FM 1 or 2 RT Unit Mounting Tray — Removal/Installation	9-2-4
Values (Appendix P), Torque.....	P-2
Valve (AVIM), Oil Cooler Bypass — Cleaning/Inspection/Repair	4-4-11
Valve (AVIM), Oil Cooler Bypass — Disassembly/Assembly	4-4-10
Valve (Engine Oil System), Temperature Control — Cleaning/Inspection/Repair	6-8-23
Valve (Engine Oil System), Temperature Control — Removal/Installation	6-8-22
Valve — Defueling Helicopter Using	1-4-3

<u>Subject</u>	<u>Para/Task</u>
V (Cont)	
Valve Assembly, Oil Filter Bypass — Cleaning/Inspection/Repair	6-8-10
Valve Assembly, Oil Filter Bypass — Removal/Installation	6-8-9
Valve Bellcrank Assembly, Collective Control Input — Cleaning/Inspection/Repair	11-2-68
Valve Bellcrank Assembly, Collective Control Input — Removal/Installation	11-2-67
Valve, Check — Removal/ Installation	10-1-25
Valve, Defuel — Cleaning/ Inspection/Repair	10-1-21
Valve, Defuel — Removal/ Installation	10-1-20
Valve, Fuel Shutoff — Inspection	10-1-6
Valve, Fuel Shutoff — Removal/ Installation	10-1-5
Valve, Hydraulic Solenoid	7-17
Valve, Hydraulic Solenoid — Cleaning/Inspection/Repair	7-6-3
Valve, Hydraulic Solenoid — Removal/Installation	7-6-1
Valve, Mixing — Assembly	12-1-4
Valve, Mixing — Cleaning/ Inspection/Repair	12-1-3
Valve, Mixing — Disassembly	12-1-2
Valve, Mixing — Installation	12-1-5
Valve, Mixing — Removal	12-1-1
Valve, Oil Cooler Bypass — Removal/Installation	4-4-9
Valve, Oil Drain — Cleaning/ Inspection/Repair	6-8-21
Valve, Oil Drain — Removal/ Installation	6-8-20
Valve, Oil Pressure Regulator — Adjustment	6-8-7
Valve, Oil Pressure Regulator — Disassembly/Assembly	6-8-8
Valve, Oil Pressure Regulator — Removal/Installation	6-8-6
Valve, Relief — Cleaning/ Inspection/Repair	7-5-5.1
Valve, Relief — Removal/ Installation	7-5-5
Valve, Sump — Cleaning/ Inspection/Repair	10-1-23
Valve, Sump — Removal/ Installation	10-1-22
Valve, Solenoid, Hydraulic Solenoid — Removal/ Installation	7-6-2
Vent Control Cable — Cleaning/ Inspection/Repair	12-2-6

<u>Subject</u>	<u>Para/Task</u>
V (Cont)	
Vent Control Cable — Removal/ Installation	12-2-5
Vent and Fuel Supply Hoses, Engine — Removal/Installation	10-1-8
Ventilating System, Introduction to	12-6
Ventilating System, Task List for	12-7
Ventilating System	12-5
Ventilation System Ducts, Heating and — Cleaning/Inspection/ Repair	12-1-11
Ventilation System Ducts, Heating and — Removal/Installation	12-1-12
Vertical Fin Bumper — Installation	2-3-19
Vertical Tube, Directional Control — Removal/Installation	11-4-22
Video Recorder Mounting Rack — Removal/Installation	9-2-8
Vision Power Converter (Typical), Night — Installation	9-5-24
Vision Power Converter (Typical), Night — Removal	9-5-23
Vision Power Converter, Night — Cleaning/Inspection/Repair	9-5-22
Voltage Regulator — Cleaning/ Inspection/Repair	9-3-19
Voltage Regulator — Removal/ Installation	9-3-20
Voltage Sensor, DC — Cleaning/ Inspection/Repair	9-3-21
Voltage Sensor, DC — Removal/ Installation	9-3-22
Vortex Generator Tubes, Particle Separator — Removal/ Installation	4-2-14

W

Walking Beam, Directional Control Forward — Removal/ Installation	11-4-25
Warranty Information	1-9
Water Leaks — Isolation	2-2-91
Water Leaks — Repair	2-2-92
Weapons Pylon Electrical Connectors (TM 55-1500-343- 23), Universal	Q-15
Wear Sleeve (AVIM), Freewheeling Unit Tail Rotor Drive Output Adapter (AVIM) — Removal/Installation	6-5-6
Weighing, Helicopter	G-13
Weighing Equipment	G-15
Weighing Instructions	G-16
Weighing Instructions, Preliminary	G-14

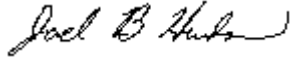
<u>Subject</u>	<u>Para/Task</u>
W (Cont)	
Weighing Record, DD Form 365-2 — Aircraft	G-9
Weight Definition (Appendix G)	G-4
Weight Pocket Edge Adhesive Fill (AVIM) — Repair	5-1-52
Weight and Balance Clearance Form F, DD Form 365-4 —	G-12
Weight and Balance Data	G-2
Weight and Balance Personnel, DD Form 365 — Record of	G-7
Weight and Balance Record, DD Form 365-3 — Basic	G-10
Weight-On-Gear Interrupt Switch — Removal/Installation	9-6-86
Weight-On-Gear Switch — Removal/Installation	9-6-77
Weight-On-Gear Switch (Rapid Deployment Landing Gear) — Removal/Installation	9-6-1
Weight/Balance and Load Data	G-5
Window, Crew Door — Removal/ Installation	2-2-88
Window, Lower — Cleaning/ Inspection/Repair	2-2-77
Window, Lower — Removal/ Installation	2-2-76
Windshield Assembly — Cleaning/Inspection/Repair	2-2-72
Windshield Assembly — Removal/ Installation	2-2-71
Windshield Frame Assembly, Doorframe/ — Repair	2-2-73
Wire Cutter (Rapid Deployment), Lower — Cleaning/Inspection/ Repair	2-2-61
Wire Cutter (Rapid Deployment), Lower — Removal/Installation	2-2-60
Wire Cutter, Upper — Cleaning/ Inspection/Repair	2-2-63
Wire Cutter, Upper — Removal/ Installation	2-2-62
Wire, Energy Attenuating — Cleaning/Inspection/Repair	2-2-39

<u>Subject</u>	<u>Para/Task</u>
W (Cont)	
Wire, Energy Attenuating — Removal/Installation	2-2-38
Wire Identifications (Appendix F)	F-2
Wire Repair and Replacement (Appendix F)	F-8
Wiring Data (Appendix F)	F-1
Wiring/Cabling (Avionics Compartment), Electrical — Removal/Installation	10-2-4
Work Times (Column 4), Maintenance Level and	B-8
X	
Y	
Yaw Engage Switch, SCAS — Removal/Installation	9-6-27
Yoke Adapter Assembly, Main Rotor — Cleaning/Inspection/ Repair	5-1-26
Yoke Adapter Mount Bushings (AVIM), Main Rotor — Removal/Installation	5-1-27
Yoke Buffers (AVIM), Main Rotor — Cleaning/Inspection/Repair	5-1-34
Yoke Bumpers (AVIM), Main Rotor — Cleaning/Inspection	5-1-36
Yoke Bumpers (AVIM), Main Rotor — Removal/Installation	5-1-35
Yoke, Cyclic — Cleaning/ Inspection/Repair	11-3-19
Yoke, Left Cyclic — Installation	11-3-16
Yoke, Left Cyclic — Removal	11-3-15
Yoke, Main Rotor Hub — Cleaning/Inspection/Repair	5-1-37
Yoke, Right Cyclic — Installation	11-3-18
Yoke, Right Cyclic — Removal	11-3-17

Z

**By Order of the Secretary of the
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