

*** TM 1-1520-238-23-7-1**

TECHNICAL MANUAL

**AVIATION UNIT AND INTERMEDIATE
MAINTENANCE MANUAL**

VOLUME 7 OF 9

PART 1 OF 2

**HELICOPTER, ATTACK,
AH-64A APACHE
(NSN 1520-01-106-9519)
(EIC: RHA)**

**CHAPTER 11
FLIGHT CONTROLS
PART 1**

**FLIGHT CONTROLS
MAINTENANCE – GENERAL**

**FLIGHT CONTROLS
MAINTENANCE – MECHANICAL**

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**HEADQUARTERS, DEPARTMENT OF THE ARMY
16 MAY 1994**

CHAPTER 11
 FLIGHT CONTROL SYSTEM
 PART 1 OF 2

CHAPTER OVERVIEW

Chapter 11 contains the maintenance instructions for the flight control system. Flight control system description, operation, and troubleshooting information is contained in TM 1-1520-238-T.

CHAPTER INDEX

<u>Para Title</u>	<u>Para No.</u>
PART 1	
SECTION I. FLIGHT CONTROLS MAINTENANCE – GENERAL	
Self-Retaining Bolt Fit Check	11.1
Flight Control System Push-Pull Rod Adjustable Rod End Bearing Assembly Replacement/Adjustment	11.2
Flight Control System Push-Pull Rod Non-adjustable Rod End Bearing Replacement	11.3
Flight Control System Bearing/Bushing Replacement (AVIM)	11.4
SECTION II. FLIGHT CONTROLS MAINTENANCE – MECHANICAL	
Flight Controls – Inspection (Main Rotor)	11.5
Main Rotor Swashplate Removal	11.6
Main Rotor Swashplate Installation	11.7
Main Rotor Swashplate Shoulder Pin Replacement	11.8
Longitudinal and Collective Bellcranks Removal/Installation	11.9
Lateral Bellcrank and Lateral Links Removal	11.10
Lateral Bellcrank and Lateral Links Installation	11.11

CHAPTER INDEX – continued

<u>Para Title</u>	<u>Para No.</u>
Aft Longitudinal Bellcrank Removal/Installation	11.12
Longitudinal Links Removal/Installation	11.13
Main Rotor Pitch Link Removal/Installation	11.14
Main Rotor Pitch Link Disassembly/Assembly	11.15
Load Bearing Main Rotor Scissor Removal/Installation	11.16
Load Bearing Scissor Disassembly/Assembly	11.17
Secondary Scissor Disassembly/Assembly	11.17A
Secondary Main Rotor Scissor Removal/Installation	11.18
Torque Link Removal/Installation	11.19
Pilot or CPG Collective Stick Removal	11.20
Pilot or CPG Collective Stick Installation	11.21
Friction Guide Removal/Installation	11.22
Pilot Collective Stick Shear Pin Replacement	11.23
Collective Stick Grip Assembly Removal/Installation	11.24
Collective Stick Grip Control Collar Replacement	11.25
Collective Stick Stabilator Manual Switch Removal/Installation	11.26
Collective Stick Searchlight ON/OFF Switch Replacement	11.27
Collective Stick Searchlight Directional Switch Replacement	11.28
Collective Stick Stores Jettison Switch Replacement	11.29
Collective Stick Stores Jettison Switch Cover Replacement	11.29A
Collective Stick RF Override Switch Replacement	11.30
Collective Stick Boresight Switch Replacement	11.31
Collective Stick TADS/PNVS Switch Replacement	11.32
CPG Collective Stick BUCS Select Trigger Grip Switch Replacement	11.33
Collective Stick Switch and Bracket Assembly Removal/Installation	11.34
Collective Stick Tube Assembly Disassembly/Assembly (AVIM)	11.35

CHAPTER INDEX – continued

<u>Para Title</u>	<u>Para No.</u>
Pilot Collective Stick Cylinder Assembly Removal/Installation	11.36
Collective Stick Cylinder Assembly Disassembly/Assembly (AVIM)	11.37
Pilot Collective Stick Support Removal/Installation	11.38
Pilot Collective Stick Support Assembly Disassembly/Assembly (AVIM)	11.39
CPG Collective Stick Cylinder Removal/Installation	11.40
CPG Collective Stick Support Removal/Installation	11.41
CPG Collective Stick Support Assembly Disassembly/Assembly (AVIM)	11.42
CPG Collective Stick Shear Pin Replacement	11.43
Collective Stick Cover Removal/Installation	11.44
Pilot Cyclic Stick Removal/Installation	11.45
Pilot Cyclic Stick Cover Removal/Installation	11.46
Pilot Cyclic Stick Trim and Force Feel Release Switch Replacement	11.47
Pilot Cyclic Stick Remote Transmitter Selector Switch Replacement	11.48
Cyclic Stick ASE Release Switch Replacement	11.49
Cyclic Stick RADIO-ICS Switch Replacement	11.50
Cyclic Stick Weapons Action Switch Replacement	11.51
Cyclic Stick Trigger Switch Replacement	11.52
Cyclic Stick Symbol Select Switch Replacement	11.53
Pilot Cyclic Stick Housing Removal	11.54
Pilot Cyclic Stick Housing Installation	11.55
Pilot Cyclic Stick Housing Lateral Shear Pin Replacement	11.56
Lateral Feel Spring Cartridge Removal	11.57
Lateral Feel Spring Cartridge Installation	11.58
Longitudinal Feel Spring Cartridge Removal	11.59

CHAPTER INDEX – continued

<u>Para Title</u>	<u>Para No.</u>
Longitudinal Feel Spring Cartridge Installation	11.60
Pilot Cyclic Stick Housing Assembly Disassembly/Assembly (AVIM)	11.61
Pilot Cyclic Stick Flight Control Arm Assembly Disassembly/Assembly (AVIM)	11.62
Cyclic Input Arm Assembly Repair (AVIM)	11.63
Shear Pin Activated Decoupler (SPAD) Switch Replacement (AVIM)	11.64
CPG Cyclic Stick Cover Removal/Installation	11.65
CPG Cyclic Stick and Lateral Link Removal	11.66
CPG Cyclic Stick and Lateral Link Installation	11.67
CPG Adjustable Cyclic Stick Link Removal/Installation	11.68
CPG Cyclic Stick Forward Link Removal/Installation	11.69
CPG Cyclic Stick Aft Link Removal/Installation	11.70
CPG Lock Release Lever Removal/Installation	11.71
CPG Cyclic Stick Remote Control Lever Removal/Installation	11.72
CPG Cyclic Stick Fitting Assembly Removal/Installation	11.73
CPG Cyclic Stick Wire Rope Release Fitting Removal/Installation	11.74
CPG Cyclic Stick Lever Lock Release Retainer Removal/Installation	11.75
CPG Cyclic Stick Lock Release Wire Rope Removal/Installation	11.76
CPG Cyclic Stick Lock Removal/Installation	11.77
CPG Cyclic Stick Base Assembly Removal/Installation	11.78
CPG Cyclic Stick Adjustable Lock Assembly Disassembly/Assembly	11.79
CPG Cyclic Stick Trim and Force Feel Release Switch Replacement	11.80
CPG Cyclic Stick Housing Removal/Installation	11.81
CPG Cyclic Stick Housing Longitudinal Shear Pin Replacement	11.82
CPG Cyclic Stick Housing Lateral Shear Pin Replacement	11.83

CHAPTER INDEX – continued

<u>Para Title</u>	<u>Para No.</u>
CPG Cyclic Stick Housing Assembly Disassembly/Assembly (AVIM)	11.84
CPG Cyclic Stick Flight Control Arm Assembly Disassembly/Assembly (AVIM)	11.85
CPG Cyclic Lateral Push-Pull Rod Assembly Removal/Installation	11.86
CPG to Pilot Lateral F.S. 65.50 Control Bracket Assembly Removal/Installation	11.87
Lateral F.S. 65.50 Push-Pull Rod Assembly Removal/Installation	11.88
CPG to Pilot Control Lateral F.S. 83.45 Idler Bellcrank Removal/Installation	11.89
Lateral F.S. 83.45 Push-Pull Rod Assembly Removal/Installation	11.90
CPG to Pilot Lateral Control F.S. 83.45 Support Bracket Assembly Removal/Installation	11.91
CPG to Pilot Control Lateral F.S. 111.50 Bellcrank Removal/Installation	11.92
Lateral F.S. 111.50 Push-Pull Rod Assembly Removal/Installation	11.93
CPG to Pilot Lateral F.S. 111.50 Bracket Assembly Removal/Installation	11.94
CPG to Pilot Control Lateral F.S. 118.50 Bellcrank Removal/Installation	11.95
Lateral F.S. 118.50 Push-Pull Rod Assembly Removal/Installation	11.96
CPG to Pilot Lateral F.S. 118.50 Control Bracket Assembly Removal/Installation	11.97
Pilot Cyclic Lateral Push-Pull Rod Assembly Removal/Installation	11.98
Lateral F.S. 132.84 Push-Pull Rod Assembly Removal/Installation	11.99
Lateral F.S. 132.84 Bellcrank Removal/Installation	11.100
Lateral F.S. 132.84 Flight Bracket Assembly Removal/Installation	11.101
Lateral F.S. 159.13 Bellcrank Removal/Installation	11.102
Lateral F.S. 159.13 Push-Pull Rod Assembly Removal/Installation	11.103
Lateral F.S. 159.13 Bellcrank Bracket Assembly Removal/Installation	11.104
Lateral F.S. 160.56 Bellcrank Removal/Installation	11.105
Lateral F.S. 160.56 Bellcrank Bracket Assembly Removal/Installation	11.106
Lateral F.S. 164.95 Bellcrank Removal/Installation	11.107

CHAPTER INDEX – continued

<u>Para Title</u>	<u>Para No.</u>
Lateral F.S. 164.95 Push-Pull Rod Assembly Removal/Installation	11.108
Lateral F.S. 164.95 Bellcrank Bracket Assembly Removal/Installation	11.109
Lateral F.S. 176.00 Servocylinder Mount Bracket Assembly Removal/Installation	11.110
Pilot Cyclic Longitudinal Push-Pull Rod Assembly Removal/Installation	11.111
CPG to Pilot Control Longitudinal F.S. 82.80 Bellcrank Removal/Installation	11.112
Longitudinal F.S. 82.80 Push-Pull Rod Assembly Removal/Installation	11.113
CPG to Pilot Longitudinal F.S. 82.80 Control Bracket Removal/Installation	11.114
CPG to Pilot Control Longitudinal F.S. 96.59 Bellcrank Removal/Installation	11.115
Longitudinal F.S. 96.59 Push-Pull Rod Assembly Removal/Installation	11.116
CPG to Pilot Longitudinal F.S. 96.59 Control Bracket Assembly Removal/Installation	11.117
CPG to Pilot Control Longitudinal F.S. 118.50 Bellcrank Removal/Installation	11.118
Longitudinal F.S. 118.50 Push-Pull Rod Assembly Removal/Installation	11.119
CPG to Pilot Longitudinal F.S. 118.50 Control Flight Bracket Assembly Removal/Installation	11.120
Longitudinal F.S. 129.25 Bellcrank Removal/Installation	11.121
Longitudinal F.S. 129.25 Push-Pull Rod Assembly Removal/Installation	11.122
Longitudinal F.S. 129.25 Bellcrank Bracket Assembly Removal/Installation	11.123
Longitudinal F.S. 159.62 Bellcrank Removal/Installation	11.124
Longitudinal F.S. 159.62 Push-Pull Rod Assembly Removal/Installation	11.125
Longitudinal F.S. 164.38 Bellcrank Removal/Installation	11.126
Longitudinal F.S. 164.38 Push-Pull Rod Removal/Installation	11.127
Longitudinal F.S. 176.00 Servocylinder Mount Bracket Assembly Removal/Installation	11.128
CPG to Pilot Control Collective F.S. 118.50 Bellcrank Removal/Installation	11.130
CPG Collective F.S. 118.50 Push-Pull Rod Assembly Removal/Installation	11.131

CHAPTER INDEX – continued

<u>Para Title</u>	<u>Para No.</u>
CPG to Pilot Control Collective F.S. 118.50 Support Bracket Removal/Installation	11.132
Pilot Collective Push-Pull Rod Assembly Removal/Installation	11.133
Collective F.S. 161.54 Bellcrank Removal/Installation	11.134
Collective F.S. 161.54 Bracket Assembly Removal/Installation	11.135
Collective F.S. 161.54 Push-Pull Rod Assembly Removal/Installation	11.136
Collective F.S. 161.60 Bellcrank Bracket Assembly Removal/Installation	11.137
Collective F.S. 161.60 Bellcrank Removal/Installation	11.138
Collective F.S. 161.60 Push-Pull Rod Assembly Removal/Installation	11.139
Collective F.S. 164.95 Bellcrank Removal/Installation	11.140
Collective F.S. 164.95 Push-Pull Rod Assembly Removal/Installation	11.141
Collective F.S. 176.00 Servocylinder Mount Bracket Removal/Installation	11.142
CPG Directional Shear Pin Activated Decoupler (SPAD) Push-Pull Rod Assembly Removal/Installation	11.143
CPG Directional Shear Pin Activated Decoupler (SPAD) Removal	11.144
CPG Directional Shear Pin Activated Decoupler (SPAD) Installation	11.145
CPG Directional Shear Pin Activated Decoupler (SPAD) Shear Pin Replacement	11.146
CPG Directional Shear Pin Activated Decoupler (SPAD) Shear Rivet Replacement (AVIM) ..	11.147
CPG Directional Shear Pin Activated Decoupler (SPAD) Assembly Disassembly/Assembly (AVIM)	11.148
CPG Directional F.S. 60.56 Shear Pin Activated Decoupler (SPAD) Bracket Assembly Removal/Installation	11.149
Pilot Station Directional Bellcrank Bracket Assembly Removal/Installation	11.150
Directional F.S. 121.40 Bellcrank and Bracket Removal/Installation	11.151
Pilot Directional Shear Pin Activated Decoupler (SPAD) Removal	11.152
Pilot Directional Shear Pin Activated Decoupler (SPAD) Installation	11.153

CHAPTER INDEX – continued

<u>Para Title</u>	<u>Para No.</u>
Pilot Directional Shear Pin Activated Decoupler (SPAD) Assembly Disassembly/Assembly (AVIM)	11.154
Pilot Directional Shear Pin Activated Decoupler (SPAD) Shear Pin Replacement	11.155
Pilot Directional Shear Pin Activated Decoupler (SPAD) Transducer Arm Shear Rivet Replacement (AVIM)	11.156
Pilot Directional Shear Pin Activated Decoupler (SPAD) Shear Rivet Replacement (AVIM) ...	11.157
CPG to Pilot Control Directional F.S. 112.50 Bellcrank Removal/Installation	11.158
Directional F.S. 112.50 Push-Pull Rod Assembly Removal/Installation	11.159
CPG to Pilot Directional F.S. 112.50 Control Bracket Removal/Installation	11.160
CPG to Pilot Control Directional F.S. 118.50 Bellcrank Removal/Installation	11.161
CPG to Pilot Control Directional F.S. 118.50 Support Bracket Removal/Installation	11.162
CPG to Pilot Control Directional F.S. 120.00 Rig Connecting Link Removal/Installation	11.163
Directional F.S. 121.40 Push-Pull Rod Assembly Removal/Installation	11.164
Directional F.S. 156.07 Bellcrank Removal/Installation	11.165
Directional F.S. 156.07 Push-Pull Rod Assembly Removal/Installation	11.166
Directional F.S. 159.98 Bellcrank and Bracket Removal/Installation	11.167
Directional F.S. 159.98 Push-Pull Rod Assembly Removal/Installation	11.168
Directional F.S. 164.33 Push-Pull Rod Removal/Installation	11.169
Directional F.S. 164.33 Bellcrank Removal/Installation	11.170
Directional F.S. 164.33 Bellcrank Bracket Removal/Installation	11.171
Pilot Longitudinal Shear Pin Activated Decoupler (SPAD) Removal/Installation	11.172
Pilot Longitudinal Shear Pin Activated Decoupler (SPAD) Shear Pin Replacement	11.173
Pilot Longitudinal Shear Pin Activated Decoupler (SPAD) Assembly Disassembly/Assembly (AVIM)	11.174
Pilot Pedal Adjust Handle Support Assembly Removal/Installation	11.175

CHAPTER INDEX – continued

<u>Para Title</u>	<u>Para No.</u>
Directional Magnetic Brake Removal/Installation	11.176
Directional Feel Spring Cartridge Removal	11.177
Directional Feel Spring Cartridge Installation	11.178
Feel Spring Cartridge Disassembly/Assembly (AVIM)	11.179
Lateral Magnetic Brake Removal/Installation	11.180
Longitudinal Magnetic Brake Removal/Installation	11.181
Motional Transducer Removal/Installation	11.182
Motional Transducer Support Bracket Replacement	11.183
Directional Magnetic Brake Support Removal/Installation	11.184
Directional Magnetic Brake Support Disassembly/Assembly (AVIM)	11.185
Lateral Magnetic Brake Mechanism Assembly Removal/Installation	11.186
Lateral Magnetic Brake Mechanism Assembly Disassembly/Assembly (AVIM)	11.187
Longitudinal Magnetic Brake Spring Mechanism Removal/Installation	11.188
Longitudinal Magnetic Brake Spring Mechanism Disassembly/Assembly (AVIM)	11.189

PART 2**SECTION III. AUTOMATIC STABILIZATION EQUIPMENT MAINTENANCE**

Automatic Stabilization Equipment (ASE) Inspection	11.190
ASE Panel Removal/Installation	11.191
ASE Panel Light Indicating Panel Removal/Installation (AVIM)	11.192
ASE Panel Switch Replacement (AVIM)	11.193
ASE Panel BUCS TST Switch Replacement (AVIM)	11.194
ASE Panel Circuit Card Assembly (CCA) Replacement (AVIM)	11.195
CPG Directional Control Position Linear Variable Differential Transducer (LVDT) Removal ...	11.196

CHAPTER INDEX – continued

<u>Para Title</u>	<u>Para No.</u>
CPG Directional Control Position Linear Variable Differential Transducer (LVDT) Installation .	11.197
CPG Lateral Control Position Linear Variable Differential Transducer (LVDT) Removal	11.198
CPG Lateral Control Position Linear Variable Differential Transducer (LVDT) Installation	11.199
CPG Longitudinal Control Position Linear Variable Differential Transducer (LVDT) Removal .	11.200
CPG Longitudinal Control Position Linear Variable Differential Transducer (LVDT) Installation	11.201
CPG Collective Stick Position Linear Variable Differential Transducer (LVDT) Rod End Replacement	11.202
CPG Collective Control Position Linear Variable Differential Transducer (LVDT) Removal . . .	11.203
CPG Collective Control Position Linear Variable Differential Transducer (LVDT) Installation . .	11.204
Pilot Collective Control Variable Resistor Removal/Installation	11.205
Pilot Collective Control Variable Resistor Adjustment	11.206
Pilot Collective Control Position Linear Variable Differential Transducer (LVDT) Removal	11.207
Pilot Collective Control Position Linear Variable Differential Transducer (LVDT) Installation . .	11.208
Pilot Collective Stick Position Linear Variable Differential Transducer (LVDT) and Variable Resistor Rod End Replacement	11.209
Pilot Directional Control Position Linear Variable Differential Transducer (LVDT) Removal . . .	11.210
Pilot Directional Control Position Linear Variable Differential Transducer (LVDT) Installation .	11.211
Pilot Lateral Control Position Linear Variable Differential Transducer (LVDT) Removal	11.212
Pilot Lateral Control Position Linear Variable Differential Transducer (LVDT) Installation	11.213

CHAPTER INDEX – continued

<u>Para Title</u>	<u>Para No.</u>
Pilot Longitudinal Control Position Linear Variable Differential Transducer (LVDT) Removal . .	11.214
Pilot Longitudinal Control Position Linear Variable Differential Transducer (LVDT) Installation	11.215
Linear Variable Differential Transducer (LVDT) Adjustment	11.216
Linear Variable Differential Transducer (LVDT) Adjustment Criteria	11.217
Digital Automatic Stabilization Equipment (DASE) Computer Removal/Installation	11.218
Digital Automatic Stabilization Equipment (DASE) Computer Cover Removal/Installation (AVIM)	11.219
Digital Automatic Stabilization Equipment (DASE) Computer Cover Seal Replacement (AVIM)	11.220
Digital Automatic Stabilization Equipment (DASE) Computer Circuit Card Removal/Installation (AVIM)	11.221
Digital Automatic Stabilization Equipment (DASE) Computer Power Supply Removal/Installation (AVIM)	11.222
Digital Automatic Stabilization Equipment (DASE) Electrical Equipment Chassis Replacement (AVIM)	11.223
Stabilator Actuator Removal/Installation	11.224
Stabilator Actuator Disassembly/Assembly	11.225
Stabilator Controller Removal	11.226
Stabilator Controller Installation	11.227
Stabilator Controller Circuit Card Assembly (CCA) Removal/Installation (AVIM)	11.228
Stabilator Controller Interconnect Circuit Card Assembly (CCA) Removal/Installation (AVIM) .	11.229
Stabilator Controller Electrical Chassis Repair (AVIM)	11.230
Stabilator Position Transducer Removal/Installation	11.231
 SECTION IV. DIRECTIONAL CONTROL SYSTEM MAINTENANCE	
Directional Control System Inspection	11.232

CHAPTER INDEX – continued

<u>Para Title</u>	<u>Para No.</u>
Pilot Directional Control Pedal and Pedal Skirt Removal/Installation	11.233
Pilot Directional Control Pedal Pivot Support Assembly Removal/Installation	11.234
Pilot Directional Control Pedal Release Shaft Assembly Removal/Installation	11.235
Pilot Directional Control Pedal Housing Assembly Removal/Installation	11.236
Directional Control Pedal Adjust Spring Removal/Installation	11.237
Directional Control Pedal Adjusting Crank Assembly Removal/Installation (AVIM)	11.238
CPG Directional Control Pedal and Pedal Skirt Removal/Installation	11.239
CPG Directional Control Pedal Weight Removal/Installation	11.240
CPG Directional Control Pedal Pivot Support Assembly Removal/Installation	11.241
CPG Directional Control Pedal Release Shaft Assembly Removal/Installation	11.242
CPG Directional Control Pedal Housing Assembly Removal/Installation	11.243
CPG Left or Right Directional Control Pedal Protective Cover Removal/Installation	11.244
Pilot Left or Right Directional Control Pedal Protective Cover Removal/Installation	11.244A
Directional F.S. 199.25 Bellcrank Removal	11.245
Directional F.S. 199.25 Bellcrank Installation	11.246
Directional F.S. 199.25 Push-Pull Rod Removal/Installation	11.247
Directional F.S. 199.25 Tail Rotor Fitting Removal/Installation	11.248
Directional F.S. 216.25 Bellcrank Removal	11.249
Directional F.S. 216.25 Bellcrank Installation	11.250
Directional F.S. 216.25 Bellcrank Bracket Removal/Installation	11.251
Directional F.S. 216.25 Push-Pull Rod Removal/Installation	11.252
Tail Rotor Control Bracket Removal/Installation	11.253
Directional F.S. 275 Bellcrank Removal/Installation	11.254
Directional F.S. 275 Rotor Control Bracket Removal/Installation	11.255
Directional F.S. 275 Push-Pull Rod Removal/Installation	11.256

CHAPTER INDEX – continued

<u>Para Title</u>	<u>Para No.</u>
Directional F.S. 348 Bellcrank Removal/Installation	11.257
Directional F.S. 348 Tail Rotor Bracket Removal/Installation	11.258
Directional F.S. 348 Push-Pull Rod with Guides Removal	11.259
Directional F.S. 348 Push-Pull Rod with Guides Installation	11.260
Directional Servocylinder Support and Support Bracket Removal/Installation	11.261
Tail Rotor Swashplate Removal/Installation	11.262
Tail Rotor Swashplate Control Bellcrank Removal	11.263
Tail Rotor Swashplate Control Bellcrank Installation	11.264
Tail Rotor Bellcrank Link Removal/Installation	11.265
Tail Rotor Connecting Link Removal/Installation	11.266
Directional F.S. 520 Bellcrank Removal/Installation	11.267
Directional F.S. 520 Bellcrank Bracket Removal/Installation	11.268
Directional F.S. 520 Push-Pull Rod Removal/Installation	11.269
Directional F.S. 534 Bellcrank Removal/Installation	11.270
Directional F.S. 534 Push-Pull Rod Removal/Installation	11.271
Directional F.S. 542 Bellcrank Removal/Installation	11.272
Directional Push-Pull Rod Guide Disassembly/Assembly	11.273
Tail Rotor Drive Link Removal	11.274
Tail Rotor Drive Link Installation	11.275
Tail Rotor Electrical Lead Removal/Installation	11.276
Tail Rotor Pitch Link Removal/Installation	11.277
Tail Rotor De-ice Brush Block Removal/Installation	11.278
Tail Rotor De-ice Brush and Shunt Replacement (AVIM)	11.279

CHAPTER INDEX – continued

<u>Para Title</u>	<u>Para No.</u>
SECTION V. FLIGHT CONTROLS RIGGING MAINTENANCE	
Rigging Flight Controls	11.280
Rigging Collective Flight Controls Between Pilot and CPG Collective Sticks	11.281
Rigging Collective Flight Controls Between Pilot Collective Stick and Collective Servocylinder	11.282
Rigging Pilot and CPG Collective Stick Stop Bolts	11.283
Rigging Collective Upper Flight Controls	11.284
Rigging Longitudinal Flight Controls Between Pilot and CPG Cyclic Sticks	11.285
Rigging Longitudinal Flight Controls Between Pilot Cyclic Stick and Longitudinal Servocylinder	11.286
Rigging Pilot and CPG Longitudinal Cyclic Stick Stop Bolts	11.287
Rigging Upper Longitudinal Flight Controls	11.288
Rigging Lateral Flight Controls Between Pilot and CPG Cyclic Stick	11.289
Rigging Lateral Flight Controls Between Pilot Cyclic Stick and Lateral Servocylinder	11.290
Rigging Pilot and CPG Lateral Cyclic Stick Stop Bolts	11.291
Rigging Upper Lateral Flight Controls	11.292
Rigging Directional Flight Controls Between Pilot and CPG Pedals	11.293
Rigging Directional Flight Controls Between Pilot Pedals and Directional Servocylinder	11.294
Rigging Pilot and CPG Directional Pedal Stop Bolts	11.295
Rigging Tail Rotor Directional Flight Controls	11.296
Servocylinder Rod End Adjustment	11.297
Rigging Horizontal Stabilator	11.298

SECTION I. FLIGHT CONTROLS MAINTENANCE – GENERAL

11.1. SELF-RETAINING BOLT FIT CHECK

11.1.1. Description

This task covers: Bolt Fit Check.

11.1.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
0.0015 - 0.0250-inch thickness gage (item 152, App H)

Personnel Required:

67R Attack Helicopter Repairer

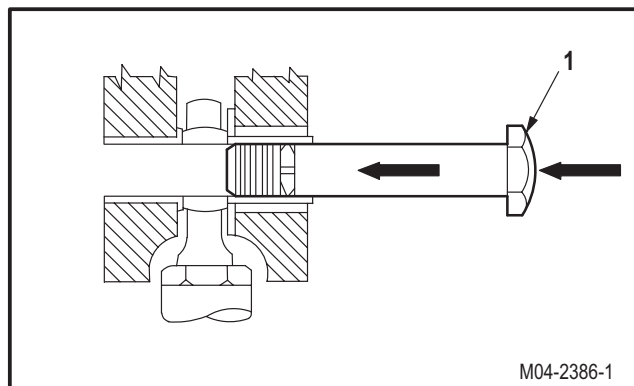
NOTE

The self-retaining bolt and attaching surfaces shall be clean and dry. No lubrication shall be used for installation.

11.1.3. Bolt Fit Check

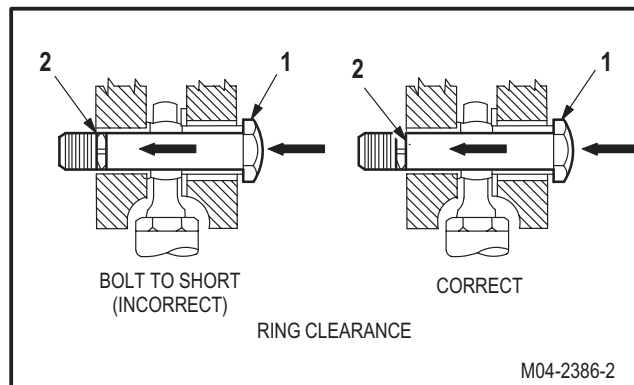
a. **Install self-retaining bolt (1) through items to be assembled.**

- (1) Aline bores of items to be assembled.
- (2) Push bolt (1) through assembly until fully seated.



b. **Check for retaining ring (2) clearance.**

- (1) If retaining ring (2) does not completely emerge through other side of assembly, bolt (1) is too short and must be replaced.

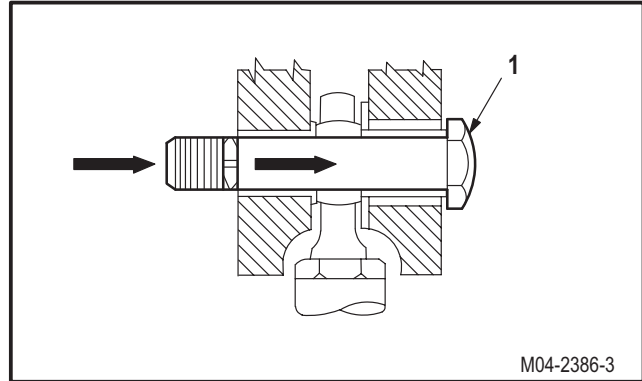


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11.1. SELF-RETAINING BOLT FIT CHECK – continued

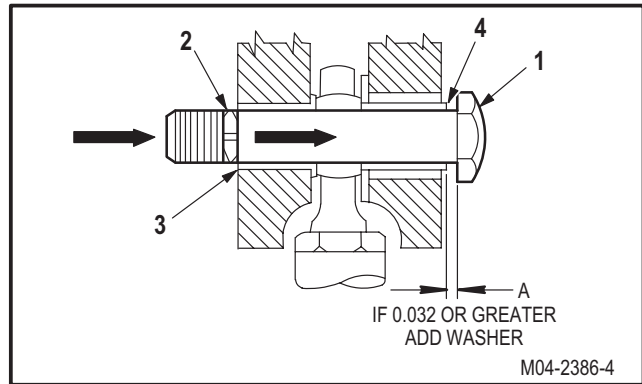
c. Check for proper retention.

- (1) If bolt (1) can be pulled out of assembly without any restraining force, bolt (1) and assembly should be checked for proper size.



d. Check gap under head of bolt (1).

- (1) Pull on bolt (1) until retaining ring (2) inside edge is flush with surface (3).
- (2) Measure gap between head of bolt (1) and surface (4). Use thickness gage.
- (3) If gap A is **0.032 INCH** or more, add AN960 washer under head of bolt (1).
- (4) Maximum thickness of washer combination to be added is **0.128 INCH** (two washers **0.063 INCH** thick) or a combination of one thick washer and a **0.032 INCH** thick washer for a lesser gap).



e. Check that retaining ring (2) clears surface (3) completely.

- (1) Remove one washer and replace with thinner washer if retaining ring (2) does not clear surface (3).

END OF TASK

11.2. FLIGHT CONTROL SYSTEM PUSH-PULL ROD ADJUSTABLE ROD END BEARING ASSEMBLY REPLACEMENT/ADJUSTMENT

11.2.1. Description

This task covers: Removal. Cleaning. Inspection. Installation. Adjustment.

11.2.2. Initial Setup**Tools:**

Aircraft mechanic's tool kit (item 376, App H)

Materials/Parts:

Wire (item 224, App F)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical
 Inspector

WARNING

FLIGHT SAFETY PART

The rod end assemblies are flight safety parts. Failure to follow maintenance instructions may result in serious injury or death of crewmembers and/or serious damage to the helicopter.

GO TO NEXT PAGE

11.2. FLIGHT CONTROL SYSTEM PUSH-PULL ROD ADJUSTABLE ROD END BEARING ASSEMBLY
REPLACEMENT/ADJUSTMENT – continued

NOTE

This task is typical for the following push-pull rods:

Collective F.S. 164.95
Collective F.S. 161.60
CPG collective
CPG directional SPAD
Lateral cyclic
Directional F.S. 112.50
Directional F.S. 159.98
Directional F.S. 275
Lateral F.S. 83.45
Lateral F.S. 111.50
Lateral F.S. 132.84
Lateral F.S. 159.13
Lateral F.S. 164.95
Longitudinal F.S. 82.80
Longitudinal F.S. 96.59
Longitudinal F.S. 137.20
Longitudinal F.S. 159.62
Longitudinal F.S. 164.38

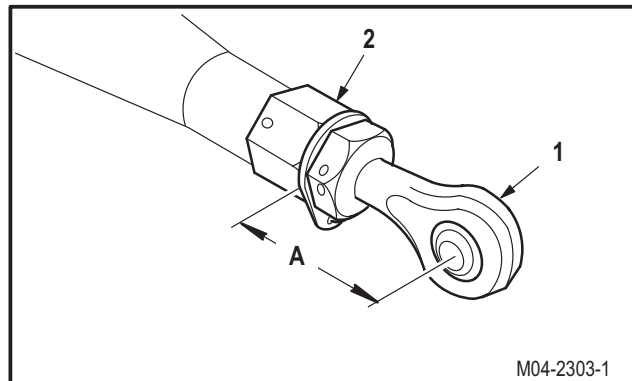
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11.2. FLIGHT CONTROL SYSTEM PUSH-PULL ROD ADJUSTABLE ROD END BEARING ASSEMBLY REPLACEMENT/ADJUSTMENT – continued

11.2.3. Removal

- a. **Measure and record distance A from center of bolt hole in rod end bearing (1) to top of fixed nut (2).**
- b. **Remove and discard rod end bearing (1) from push-pull rod (3).**

- (1) Remove lockwire.
- (2) Hold fixed nut (2). Loosen nut (4).
- (3) Remove rod end bearing (1) from rod (3).
- (4) Remove keywasher (5) and nut (4) from rod end bearing (1). Discard rod end bearing (1).

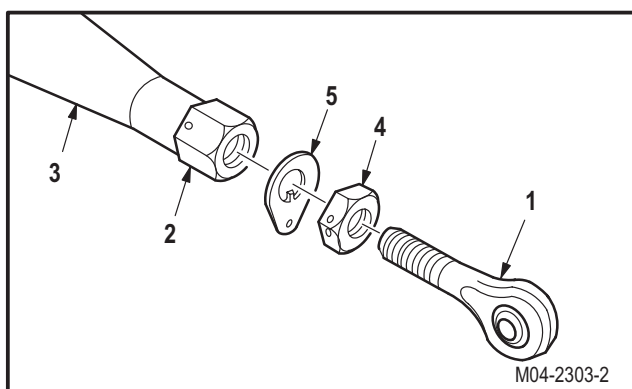


11.2.4. Cleaning

- a. **Clean removed and attaching parts** (para 1.47).

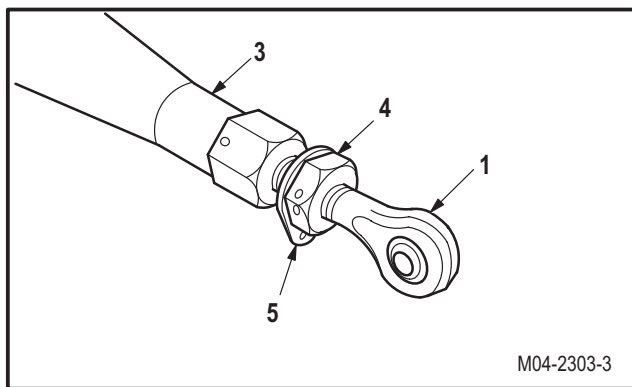
11.2.5. Inspection

- a. **Check removed and attaching parts for damage and wear** (para 11.5).
- b. **Check removed and attaching parts for corrosion** (para 1.49).
- c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5).
- d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4).



11.2.6. Installation

- a. **Install new rod end bearing (1) on rod (3).**
 - (1) Install nut (4) on rod end bearing (1) as far as it will go.
 - (2) Install keywasher (5) on rod end bearing (1) as far as it will go.
 - (3) Install rod end bearing (1) on rod (3).



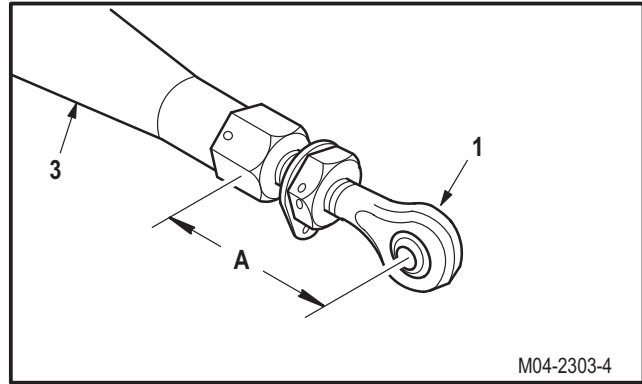
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11.2. FLIGHT CONTROL SYSTEM PUSH-PULL ROD ADJUSTABLE ROD END BEARING ASSEMBLY REPLACEMENT/ADJUSTMENT – continued

11.2.7. Adjustment

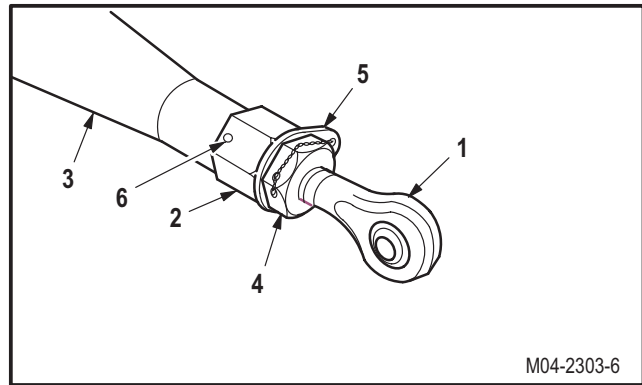
a. **Adjust rod end bearing (1) on rod (3) to obtain distance A recorded in paragraph 11.2.3.**

- (1) Hold rod end bearing (1) in position.
- (2) Hold fixed nut (2).
- (3) Tighten nut (4) against keywasher (5).
- (4) Ensure that rod end position has not been disturbed.



b. **Check for proper thread engagement by attempting to insert wire in witness hole (6).**

- (1) If wire can be inserted in witness hole (6), thread engagement is not correct. Use wire (item 224, App F).
- (2) Check for correct parts and adjust push-pull rod during rigging procedure.
- (3) If wire cannot be inserted in witness hole (6), thread engagement is correct.
- (4) Lockwire nut (4) to keywasher (5). Use wire (item 224, App F).



c. **Inspect (QA).**

d. **Perform rig check on collective, directional, lateral, or longitudinal flight control system, as required (para 11.280).**

END OF TASK